Motoron M2H18v20 Dual High-Power Motor Controller for Raspberry Pi (Connectors Soldered)
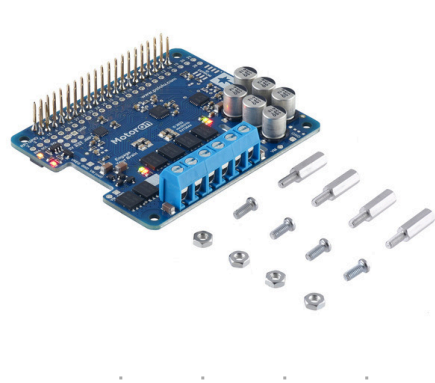
Pololu item #: 5054
Brand: Pololu   supply outlook
Status: Rationed (Active and Preferred) ❓
✔ RoHS 3

Price break	Unit price (US$)
1	104.95

Quantity: 1   Add to cart

backorders allowed   Add to list

The Motoron M2H18v20 Dual High-Power Motor Controller makes it easy to control DC motors from a Raspberry Pi (Model B+ or newer) through an I²C interface. The M2H18v20 supports motor supply voltages from **6.5 V to 30 V** and can deliver continuous output currents up to **20 A** per motor. This version ships with aluminum standoffs and **with soldered stackable headers and terminal blocks**.

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Description   **Specs (14)**   **Pictures (12)**   **Resources (5)**   FAQs (0)   **On the blog (1)**   **Distributors (25)**

Overview

The Motoron M2H family of dual high-power motor controller add-on boards makes it easy to control up two bidirectional, brushed DC **motors** with a compatible Raspberry Pi (Model B+ or newer). The M2H controllers are designed to stack on top of a Raspberry Pi (Model B+ or newer), similar to a HAT (Hardware Attached on Top), and multiple controllers can be stacked on top of each other, allowing independent control of many motors. Unlike most of our **motor drivers** and motor driver **expansion boards for Raspberry Pi**, the Motoron does not require any PWM outputs on your Raspberry Pi. Instead, the Raspberry Pi communicates with the Motoron using I²C, so only two GPIO pins are needed regardless of how many Motorons you connect. Four types are available so you can pick the one with the appropriate operating voltage range and output current capabilities for your project:
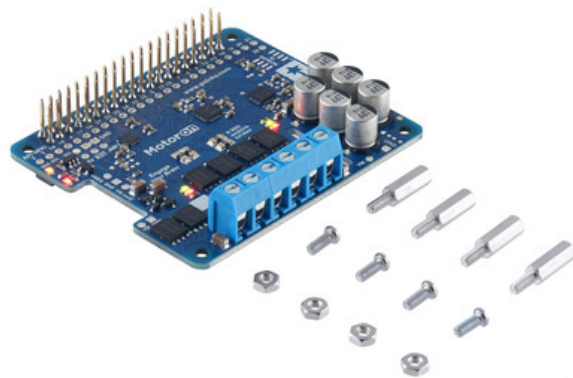
	Motoron M2H18v20 Dual High-Power Motor Controller for Raspberry Pi	**Motoron M2H18v18 Dual High-Power Motor Controller for Raspberry Pi**	**Motoron M2H24v16 Dual High-Power Motor Controller for Raspberry Pi**	**Motoron M2H24v14 Dual High-Power Motor Controller for Raspberry Pi**
Absolute max motor supply voltage:	30 V		40 V	
Recommended max nominal battery voltage:	18 V		28 V	
Max continuous current per channel:	20 A	18 A	16 A	14 A
Available versions:	• **assembled** • **kit** • **board only**	• **assembled** • **kit** • **board only**	• **assembled** • **kit** • **board only**	• **assembled** • **kit** • **board only**

Each of the four types above is available in three versions to provide different options for the through-hole connectors: they can be purchased as an assembled product with stackable headers and terminal blocks soldered in, as a kit with connectors included but not soldered in, or as a standalone board without connectors.
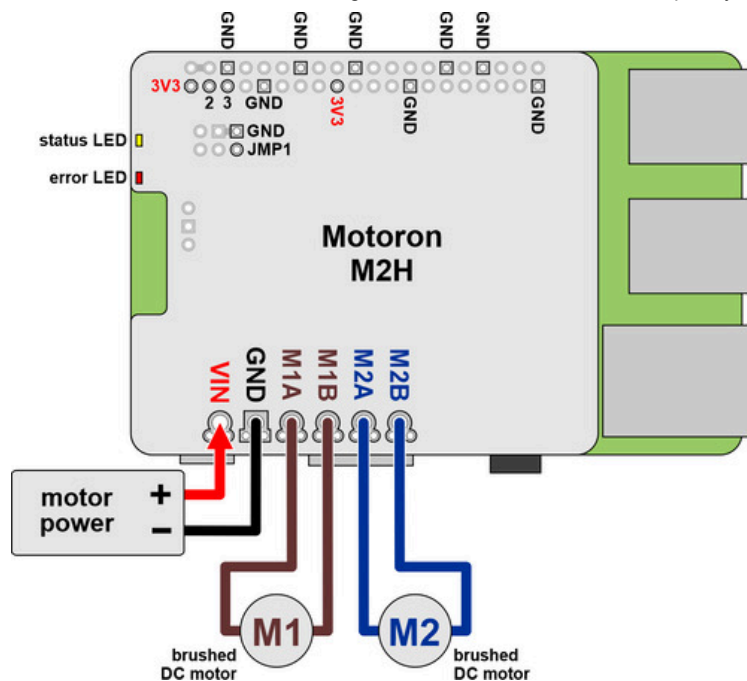
For a lower-power, lower-cost alternative, please consider the **Motoron M3H256 Triple Motor Controller for Raspberry Pi**. For applications using an Arduino or compatible controller, consider the **Motoron M2S Dual High-Power Motor Controllers for Arduino**.

Details for item #5054

Motoron M2H18v20 Dual High-Power Motor Controller for Raspberry Pi (Connectors Soldered).
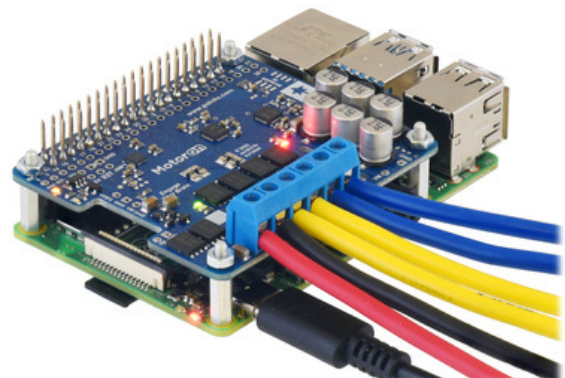
**A Motoron M2H dual motor controller being controlled by a Raspberry Pi.**

The **M2H18v20** controller supports motor supply voltages from **6.5 V to 30 V** (absolute maximum, not intended for use with 24 V batteries) and can deliver continuous output currents up to **20 A** per motor. The M2H18v20 can be distinguished from other types of M2H controllers by its **larger** discrete MOSFETs and the number **150** on top of the tall silver electrolytic capacitors.

This version ships with **soldered stackable headers and terminal blocks**. It includes a set of four **M2.5 standoffs** (11 mm length), **screws**, and **nuts** that can be used to secure the board at the proper height.

The M2H18v20 is also available as a **kit with connectors included but not soldered in**, or as a **standalone board without connectors**.

> **Terminal block warnings:**
> 1) The 5mm blue terminal blocks are rated for up to 16 A, so for higher-current applications we recommend getting an unsoldered version and then soldering thick wires directly to the board.
> 2) The included terminal blocks are taller than the headers, so precautions must be taken when stacking multiple Motoron M2H modules assembled with 5mm terminal blocks. As shown in the picture below, the terminal block pins should be trimmed, and the nuts included with the standoffs can be used as extra spacers.

trimmed leads

extra nuts for additional spacing
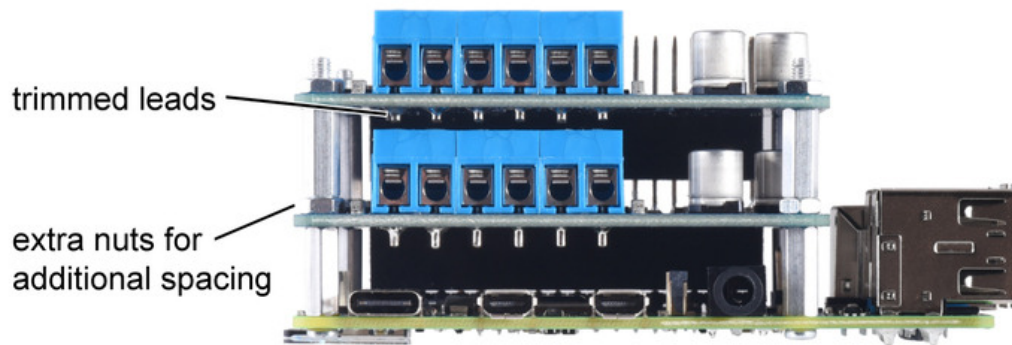
Two Motoron M2H boards with terminal blocks can be stacked if you trim the leads on the terminal blocks and space out each board using hex nuts in addition to the 11mm standoffs.

Features and specifications

- Two motor control channels allow for independent control of up to two bidirectional brushed DC motors

- Reverse-voltage protection on motor power supply

- Logic voltage range: 3.0 V to 5.5 V

- Control interface: I²C

- I²C clock speed: up to 400 kHz

- Optional cyclic redundancy checking (CRC)

- Configurable motion parameters:

  - Max acceleration/deceleration forward/reverse

  - Starting speed forward/reverse

  - Direction change delay forward/reverse

- PWM frequency: eight options available from 1 kHz to 80 kHz

- Current sensing

- Configurable hardware current limiting

- Command timeout feature stops motors if the Raspberry Pi stops functioning

- Configurable automatic error response

- Motor power supply (VIN) voltage measurement

- Optional pins make it easy to power the Raspberry Pi from reverse-protected motor power through an **external regulator** (not included)

- Two status LEDs

- Motor direction indicator LEDs

- **Motoron Python library** simplifies using the Motoron with Python or MicroPython

- Comprehensive **user's guide**
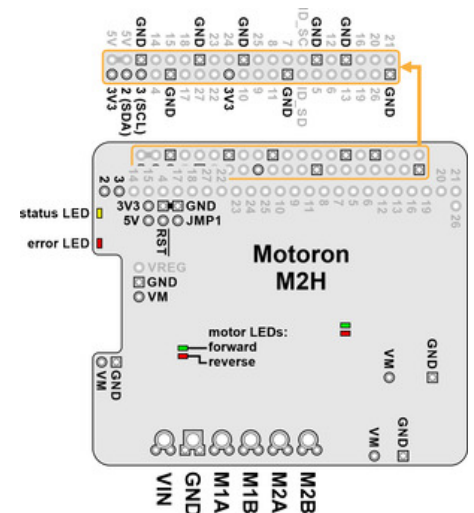
Motoron M2H Dual High-Power Motor Controller for Raspberry Pi pinout.
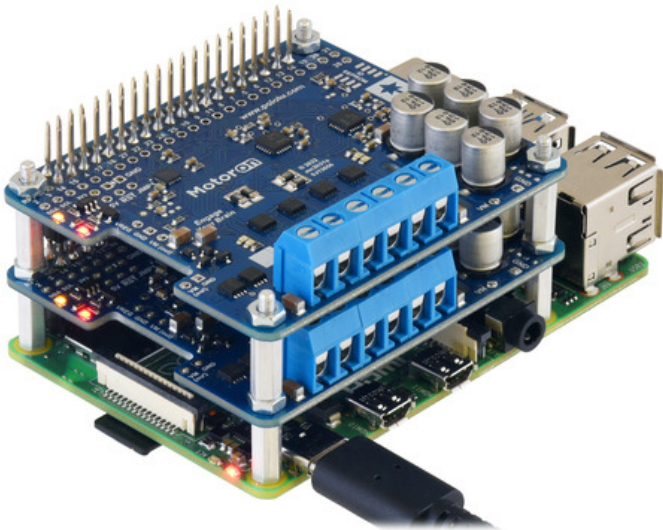
Two Motoron M2H shields stacked on a Raspberry Pi.

Real-world power dissipation consideration

The MOSFETs can handle large current spikes for short durations (e.g. 100 A for a few milliseconds), and the driver's current chopping will keep the average current under the set limit. The peak ratings are for quick transients (e.g. when a motor is first turned on), and the continuous rating is dependent on various conditions, such as the ambient temperature. PWMing the motor will introduce additional heating proportional to the frequency. The actual current you can deliver will depend on how well you can keep the motor driver cool. The driver's printed circuit board is designed to draw heat out of the MOSFETs, but performance can be improved by adding a heat sink or air flow. For high-current installations, the motor and power supply wires should also be soldered directly instead of going through the 5mm blue terminal blocks, which are rated for up to 16 A.

> **Warning:** This motor driver has no over-temperature shut-off. An over-temperature or over-current condition can cause **permanent damage** to the motor driver. You might consider using either the Motoron's current sense or an **external current sensor** to monitor your current draw.
>
> This product can get **hot** enough to burn under normal operating conditions. Take care when handling this product and other components connected to it.

The Motoron family

The tables below list the members of the Motoron family and show the key differences among them. Each type is available in several versions to provide different options for the through-hole connectors: they can be purchased as an assembled product with connectors soldered in, as a kit with connectors included but not soldered in, or (for Arduino and Raspberry Pi expansions) as a standalone board without connectors.

Motoron motor controllers micro versions			
M1T550	M2T550	M1T256	M2T256
M1U550	M2U550	M1U256	M2U256
Control interface:	I²C or UART serial		
Motor channels:	1 (single)	2 (dual)	1 (single)	2 (dual)
Minimum motor supply voltage:	1.8 V		4.5 V	
Absolute max motor supply voltage:	22 V		48 V	
Recommended max nominal battery voltage:	16 V		36 V	

Max continuous current per channel:	1.8 A	1.6 A	2.2 A	1.8 A
Logic voltage range:	3.0 V to 4.9 V[1]		3.0 V to 5.5 V	
Current sensing/limiting:	–	–	–	–
Available versions with I²C:	• **headers soldered** • **headers included**	• **headers soldered** • **headers included**	• **headers soldered** • **headers included**	• **headers soldered** • **headers included**
Available verions with UART serial:	• **headers soldered** • **headers included**	• **headers soldered** • **headers included**	• **headers soldered** • **headers included**	• **headers soldered** • **headers included**
Price:	$12.49 – $14.49	$15.95 – $17.95	$16.95 – $18.95	$23.95 – $25.95

1 The M1x550 and M2x550 are <u>not</u> recommended for use with 5V nominal logic.

Motoron motor controllers
Arduino and Raspberry Pi form factor versions

M3S550	**M3S256**	**M2S24v14**	**M2S24v16**	**M2S18v18**	**M2S18v20**
M3H550	**M3H256**	**M2H24v14**	**M2H24v16**	**M2H18v18**	**M2H18v20**

Control interface:	I²C					
Motor channels:	3 (triple)		2 (dual)			
Minimum motor supply voltage:	1.8 V	4.5 V	6.5 V			
Absolute max motor supply voltage:	22 V	48 V	40 V		30 V	
Recommended max nominal battery voltage:	16 V	36 V	28 V		18 V	
Max continuous current per channel:	1.7 A	2 A	14 A	16 A	18 A	20 A
Logic voltage range:	**M3S550** 3.1 V to 5.5 V **M3H550** 3.0 V to 4.9 V[1]	3.0 V to 5.5 V	3.0 V to 5.5 V			
Current sensing/limiting:	–	–	✔	✔	✔	✔
Available versions for Arduino:	**M3S550** • **assembled** • **kit** • **board only**	**M3S256** • **assembled** • **kit** • **board only**	**M2S24v14** • **assembled** • **kit** • **board only**	**M2S24v16** • **assembled** • **kit** • **board only**	**M2S18v18** • **assembled** • **kit** • **board only**	**M2S18v20** • **assembled** • **kit** • **board only**
Available versions for Raspberry Pi:	**M3H550** • **assembled** • **kit** • **board only**	**M3H256** • **assembled** • **kit** • **board only**	**M2H24v14** • **assembled** • **kit** • **board only**	**M2H24v16** • **assembled** • **kit** • **board only**	**M2H18v18** • **assembled** • **kit** • **board only**	**M2H18v20** • **assembled** • **kit** • **board only**
Price:	$20.95 – $30.95	$34.95 – $44.95	$59.95 – $69.95	$79.95 – $89.95	$59.95 – $69.95	$95.95 – $104.95

1 The M3H550 is <u>not</u> recommended for use with 5V nominal logic.