The NMIH-0010 H-Bridge

Features:
• 1-A Output-Current Capability Per Driver
• Applications Include Half-H and Full-H Solenoid Drivers and Motor Drivers
• Designed for Positive-Supply Applications
• Wide Supply-Voltage Range of 4.5 V to 36 V
• TTL- and CMOS-Compatible High-Impedance Diode-Clamped Inputs
• Separate Input-Logic Supply
• Thermal Shutdown
• Internal ESD Protection
• Input Hysteresis Improves Noise Immunity
• 3-State Outputs
• Minimized Power Dissipation
• Sink/Source Interlock Circuitry Prevents Simultaneous Conduction
• No Output Glitch During Power Up or Power Down
• Added 6 LEDs to display function
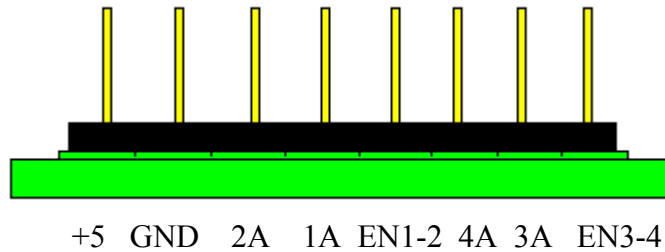• Heatsink for dissipation
• Board size, 1.2" x 1.6"

Benefits:
• Visual indication of status: power, enable, and inputs
• Compact size
• Good thermal distribution
• Internally protected
• Simple connections
• Easy interface
• Easy mounting via PCB holes

NMIH-0010 is a quadruple high-current half-H driver designed to provide bidirectional drive currents up to 1.1 A continuous at voltages from 4.5 V to 36 V. The device is designed to drive inductive loads such as relays, solenoids, dc and bipolar stepping motors, as well as other high-current/high-voltage loads in positive-supply applications. With up to 2 A peak per driver current handling capabilities (up to 2075 mW power dissipation total), the NMIH-0010 is an excellent h-bridge for brushed DC and stepper motors.
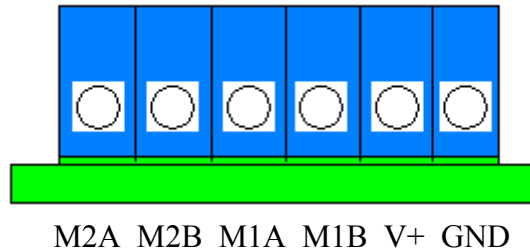
All inputs are compatible with TTL-and low-level CMOS logic. Each output (Y) is a complete totem-pole driver with a Darlington transistor sink and a pseudo-Darlington source. Drivers are enabled in pairs with drivers 1 and 2 enabled by 1,2EN input and drivers 3 and 4 enabled by 3,4EN input. When an enable input is high, the associated drivers are enabled. Their outputs then become active and in phase with the1A, 2A, 3A and 4A inputs. When the enable input is low, those drivers are disabled and their outputs are off and in a high-impedance state. With the proper data inputs, each pair of drivers form a full-H (or bridge) reversible drive suitable for solenoid or motor applications derived from the controlled input levels.
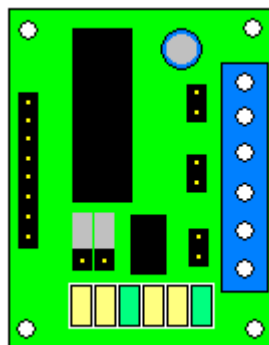
Connections for the NMIH-0010

The NMIH-0010 has TTL/CMOS compatible inputs. Looking at the module, screw terminals away from you, board with LED's up, the 0.1 spaced header pin connections are +5, Gnd, 2A, 1A, 1-2EN, 4A, 3A, 3-4EN as shown below.
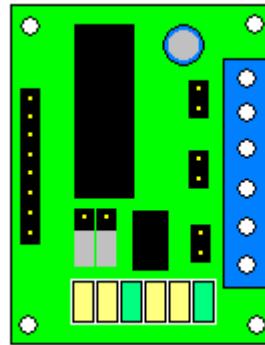
+5 GND 2A 1A EN1-2 4A 3A EN3-4

The screw terminal outputs (facing) are M2A, M2B, M1A, M1B, V+, and GND as shown below.
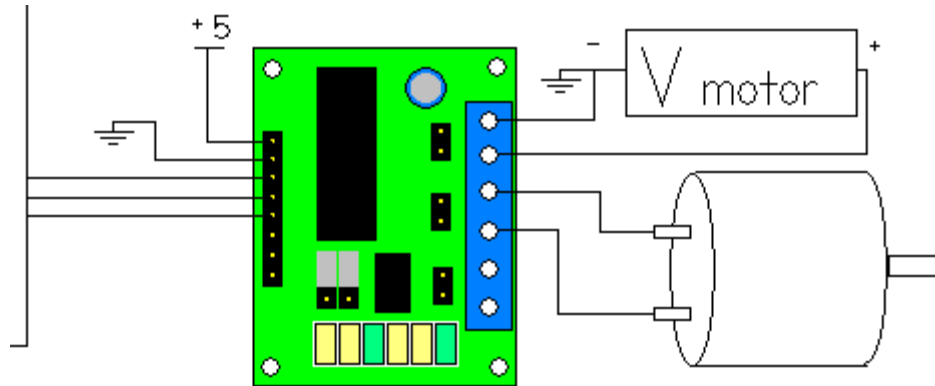
M2A M2B M1A M1B V+ GND

You may either choose to have the Enable lines, EN1-2 controlled by your microcontroller, or have them always enabled by moving the jumpers to either the controller position or tied high as shown below. The LEDs show the status of the Enable and drive lines.
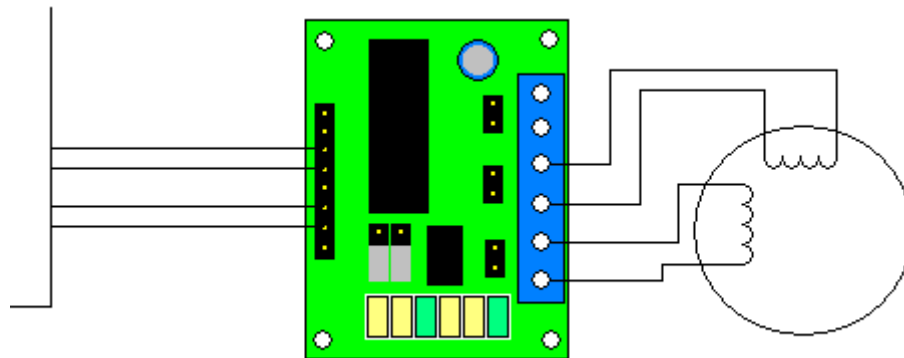
MCU controlled   Always Enabled

The above diagram shows a possible connection from your microcontroller to the NMIH-0010. The Enable line for the first 2 drivers controlled, and also the lines for switching 2 of the drivers. If your motor is turning opposite of what you want, either switch the motor connections, or the control connections, or the control in your program.

A possible connection for a 4 wire bipolar stepper motor is shown below, with both Enables jumpered to be always on.

Be sure to check your connections for the stepper to ensure proper sequencing of the motor. Note also that 5 and 6 wire unipolar steppers can be connected as bipolar steppers, ignoring the center tap wires.

The h-bridge outputs M (Y) correspond to the following truth table

FUNCTION TABLE
(each driver)

INPUTS†		OUTPUT
A	EN	Y
H	H	H
L	H	L
X	L	Z

H = high-level, L = low-level
X = irrelevant
Z = high-impedance (off)
† In the thermal shutdown mode, the output is in a high-impedance state regardless of the input levels.

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