The ME118 SN754410 Dual 1A H-Bridge Module

Rev. 1

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Background:

Texas Instrument's SN754410 is a quadruple half-H driver with control logic, integrated into a 16-pin DIP IC. Each driver has 1A maximum current drive capability. Two half-H drivers may be combined together to form a full H-bridge, so that it can be used for bi-directional control of motors or other peripherals (this is how the ME118 SN754410 Module uses it). The IC has thermal shutdown protection, which will disable the chip if it is operated beyond its current-drive specifications.

The ME118 SN754410 Dual 1A H-Bridge Module provides a convenient and robust interface to the SN754410. Separate connectors provide access to the logic-level inputs, H-bridge output connections, and the IC's power supply. The module makes use of a 74HC14, which simplifies the drive logic by reducing it to two inputs per H-bridge: direction and enable. Clamping diodes are included on the module PCB to protect the circuit from inductive kickback.

Using the ME118 SN754410 Dual 1A H-Bridge Module:

In order to make use of the ME118 SN754410 Dual 1A H-Bridge Module, you will need to be familiar with the various connectors and their purposes. Since each connector has a single logical function (inputs, outputs, power supply, etc.) this is straightforward.

Logic-Level Inputs (J1):

Access to the logic-level inputs of the SN754410 is provided through J1. Directional and enable control for each of the IC's two H-Bridges is specified through these connections.

Logic ground connections must also be made through this connector. This will ensure that the ground of the (off-board) logic command circuitry and the ground of the ME118 SN754410 Module agree.

The pinout of J1 is as follows:

J1	Connection
Pin 1	logic ground
Pin 2	Channel A direction
Pin 3	Channel A enable
Pin 4	Channel B direction
Pin 5	Channel B enable
Pin 6	logic ground

Motor/Load Connections (J2):

Connections of up to two independent motors or similar loads should be made through the screw-terminal connector located at J2. The pinout of J2 is as follows:

J2	Connection
pin 1 & pin 2	motor/load A
pin 3 & pin 4	motor/load B

SN754410 Power Supply and High-Current Ground Connector (J3):

J3, pin 1 : The SN754410 requires a power supply for its logic circuitry. Provisions for this are made through J3, pin 1. An LM2931Z-5.0 low drop-out, 100mA voltage regulator is provided on the SN754410

Module PCB so that any voltage between 5.6V (minimum) and 18V (maximum) may be supplied to J3, pin 1. This makes the SN754410 module much easier to use, since it includes its own voltage regulation and does not require an externally regulated +5V supply.

SN754410 Power Supply Requirements: +5.6V < Vin (J3, pin 1) < +18V

J3, pin 2: Since the SN754410 is capable of switching two H-Bridge channels at a maximum of 1A each, care must be taken in the methods employed returning this substantial current to ground. For this reason, a separate high-current ground connection is available at J3, pin 2. A separate connection should be made between J3, pin 2 and the power supply of the motors/loads connected to the IC's outputs. This will ensure that the logic power supply maintains a clean ground.

ME118 SN754410 Dual 1A H-Bridge Module Schematic: