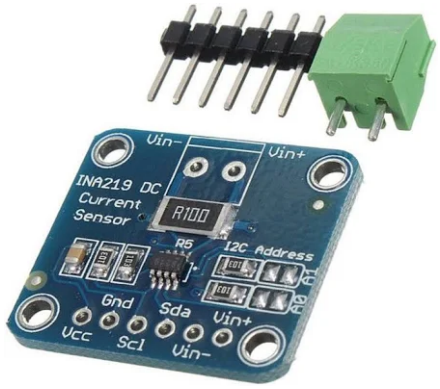
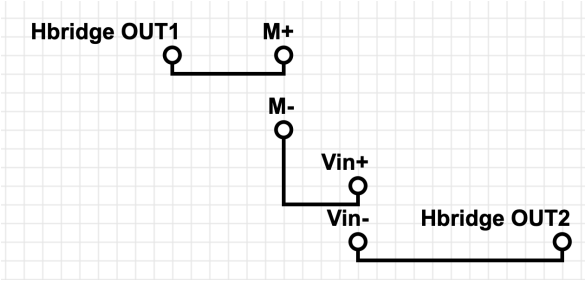
The INA219 Current Sensor



The INA219 current sensor breakout board has a current sensing resistor of 0.1 ohm resistor between Vin+ and Vin-.
The INA219 is a special op amp with a built-in ADC to read the voltage across Vin+ and Vin- and convert directly to an integer in the units of mA. It is precallibrated so there is nothing you need to do other than wiring it into your circuit and calling the initialization and read functions.
The communication between a microcontroller and the INA219 is I2C, a common digital communication slightly more complicated than UART.

Place the current sensing resistor **in series with the motor and hbridge** outputs.



Use ina219.c and ina219.h to initialize and communicate with the INA219. The I2C functions are in i2c_master_noint.c and i2c_master_noint.h. The I2C functions are called by functions in ina219.c, you do not need to call any I2C functions directly, just include them in your project folder. The PIC32MX170F256B has 2 sets of I2C pins, this code uses SDA1 and SCL1. The I2C pins are not remappable.

Connect SDA to the PIC SDA1, SCL to the PIC SCL1, VDD to 3.3V, GND to GND, and Vin+ and Vin- in series with the motor.