

LB5900 Series SPI & I2C General Information

LadyBug LB5900 series USB power sensors with option SPI are capable of operation through SPI (Serial Peripheral Interface) or I2C (Inter-Integrated Circuit). The option adds capability and a cable that extends out of the rear bulkhead with a 10 pin connector. The sensors internal calibration tables, and patented thermal stability assure reliable, accurate measurements regardless of the interface method.



The SPI Option allows either SPI or I2C connectivity; selection is done by grounding or sourcing Pin 1 of the connector. Each interface technology has its own advantages, LadyBug recommends that the user research these options prior to selecting the interface. LB5900 sensors act as slave devices in both interface technologies.

Data can be collected rapidly using either interface, please review the data sheet for the specific sensor to determine measurement rates. Maximum data clock rates for SPI is 1 MHz; I2C is 400 kHz, however actual measurement speed is determined by the measurement settings.

The sensor can be fully powered using the SPI/I2C interface cable, this is the recommended method; however power can be applied using a USB power only cable. To select SPI/I2C as the power source, connect Pin 4 (Select SPI/I2C Power) to Pin 6 (Power).

The sensor's input voltage specification must not be exceeded. Unless otherwise indicated in the specific sensor data sheet, recommended supply voltage is 4.65 to 5.35 volts. Maximum supply voltage is 5.5 volts, damage level is 5.95 volts. Additional specifications can be found in the individual sensor's data sheet.

The data, clock and control lines on LB5900 sensors use 3.3 volt logic levels, however as inputs, they are 5 volt tolerant. This means that the sensor can generally be used with control systems running at 5 volts or 3.3 volts. Most modern microcontrollers running at 5 volts will recognize 3.3 volt logic levels, LadyBug recommends that this be verified if 5 volt systems will be employed.

The sensor's cable is installed at the factory and is not removable or replaceable by the user. The cable extends 8-9" outside of the case, consult the factory for special lengths. The 10 wire ribbon

cable exits the housing adjacent to the USB connector. With option SPI, a standard USB cable can also be connected and the sensor will function as a USB sensor when SPI/I2C is not enabled.

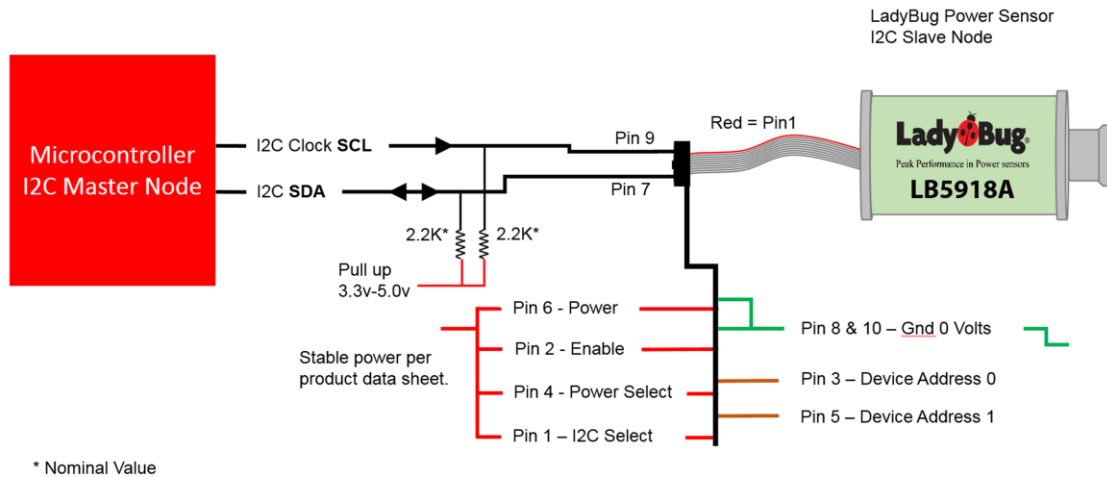
Typical connections are shown below. Consult LadyBug sales or the following links for more information.

[SPI Interface Guide](#)

[LB5900 Series Programming Manual](#)

[SPI/I2c Demonstration Kit](#)

Typical I2C Connection



Typical SPI Connection

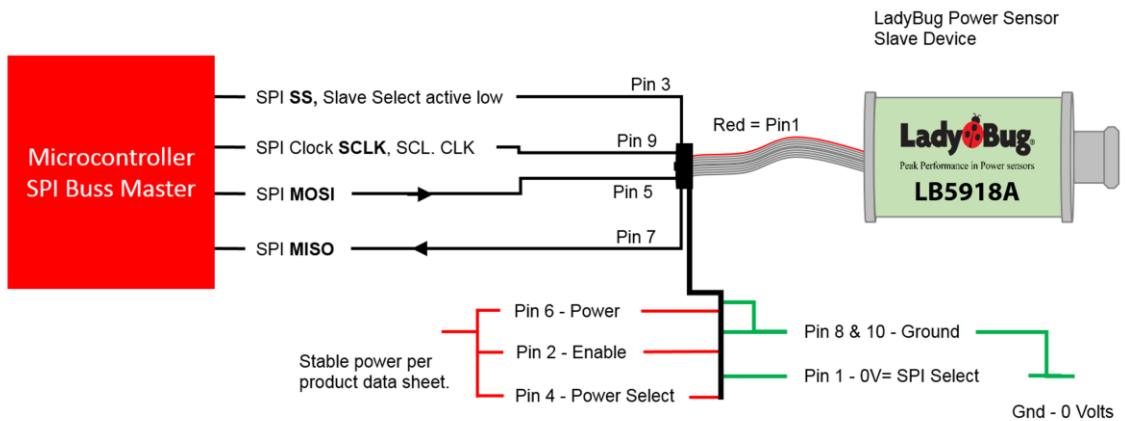


Figure 1 Typical SPI connection