

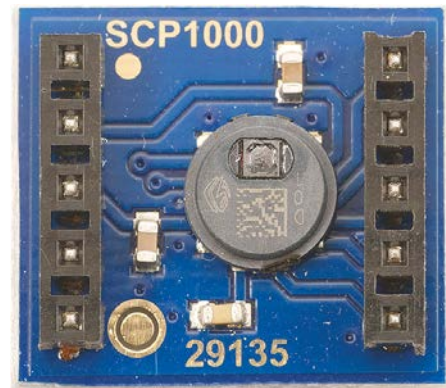
SCP1000 Pressure Sensor Module (#29135)

The SCP1000 Pressure Sensor Module is an absolute pressure sensor which can detect atmospheric pressure from 30 to 120 kPa. The pressure data is internally calibrated and temperature compensated. The SCP1000 also provides temperature data and has 4 measurement modes, as well as standby and power-down mode.

All that is required to obtain pressure data in kPa or temperature in degrees Celsius is a single multiplication operation using constants. Communication is via an SPI bus which also provides additional control lines such as an interrupt line and trigger input.

Features

- 4 measurement modes plus standby and power down mode
- SPI interface for easy communication with microcontrollers
- PCB with DIP header makes breadboard prototyping easier
- Pressure resolution: 1.5 Pa
- Temperature resolution: 0.05 °C



Key Specifications

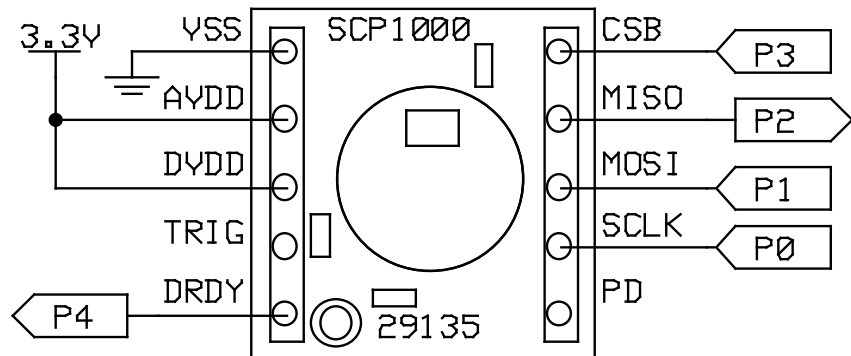
- Power requirements: 2.4 VDC to 3.3 VDC @ 25 µA
- Communication: SPI interface (max 500 kHz)
- Operating temperature: -22 to +185 °F (-30 to +85 °C)
- Dimensions: 0.60 x 0.69 x 0.45 in (15.2 x 17.5 x 11.4 mm)

Application Ideas

- Barometric pressure for weather station
- Altimeter for model rocketry
- Pressure chamber sensor
- Cabin pressure sensor (plane/submarine)

Quick Start Circuit

Use this circuit with the Propeller Spin demo available from the 29135 product page at www.parallax.com.



Connecting and Testing

The SCP1000 runs at a maximum voltage of 3.3 V. When using the multicore Propeller P8X32A or another 3.3 V microcontroller, you can connect the sensor as shown in the Quick Start Circuit above. A Propeller Spin application is available from the 29135 product page at www.parallax.com. Other example Propeller objects are available from the Propeller Object Exchange at obex.parallax.com.

BASIC Stamp 2 Series

For BASIC Stamp® modules and other 5 V microcontrollers you will need to interface using a voltage translator or converter for signals going into the SCP1000. Signals coming out of the SCP1000 into the BASIC Stamp module should not require level shifting.

Calibration

The SCP1000 returns atmospheric pressure and temperature. To calibrate for use as an altimeter you will need a reference for pressure vs. altitude and a formula to calculate altitude based on pressure. This information is not provided by Parallax Inc; however, a Google search of 'barometric pressure vs. altitude' yields many resources including a Wikipedia article and a barometric pressure calculator. For example, if you type into the pressure calculator an altitude of 1000 meters it tells you at that altitude the pressure is 90 kPa.

Resources and Downloads

The module schematic, example code and the sensor component manufacturer datasheet are available from the SCP1000 Pressure Sensor Module product page. Go to www.parallax.com and search '29135'. Please see the manufacturer datasheet for more information on communication protocol and commands.

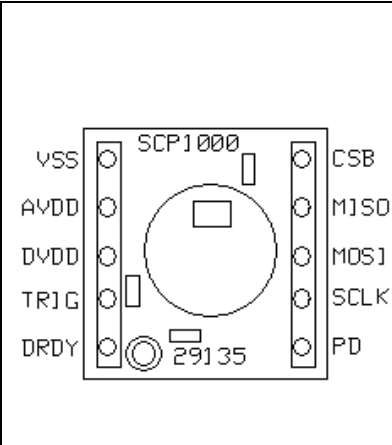
Specifications

Symbol	Quantity	Minimum	Typical	Maximum	Units
Vdd	Supply Voltage †	2.4	—	3.3	V

† provided by manufacturer's datasheet

Pin Definitions and Ratings

Pin	Name	Function
J1-1	VSS	Analog/Digital Common Ground → 0V
J1-2	AVDD	Analog Supply Voltage
J1-3	DVDD	Digital Supply Voltage
J1-4	TRIG*	Trigger Input (Connect to VSS if not used)
J1-5	DRDY	Interrupt Signal (data ready)
J2-1	CSB*	SPI Chip Select
J2-2	MISO	SPI Data Output
J2-3	MOSI*	SPI Data Input
J2-4	SCLK*	SPI Clock Input
J2-5	PD*	Power Down (Connect to VSS if not used)



*The microcontroller must actively drive the signal in high and low states.

Revision History

Version 1.1: Corrected Pin Definitions and Ratings table. Version 1.2: Corrected pressure resolution, p.1.