Digital Gas Sensor Developers Kit


NOTE: The Digital Gas Sensor Developer Kit is pre-configured with a Carbon Monoxide Sensor and UART communication.

Register at http://www.spec-sensors.com/register/ to get:

1) The DSDK Tool which allows you to:
   a. Easily reconfigure the digital gas sensor for another sensor
   b. Data log 1 Hz sample rate measurements
   c. Re-zero or re-span the gas measurement calibration
   d. Adjust the potentiostat control circuit
   e. Adjust the temperature sensor offset
2) The hardware design files including:
   a. Schematic
   b. Part list
   c. Gerber/design files
3) Firmware source code for adjusting to your application

CONNECTING THE DIGITAL GAS SENSOR DEVELOPER KIT TO YOUR COMPUTER:

1. **Connect D-ULPSM Rev 0.3 module to the USB-to-UART Module via the Pinout Adapter Board.**
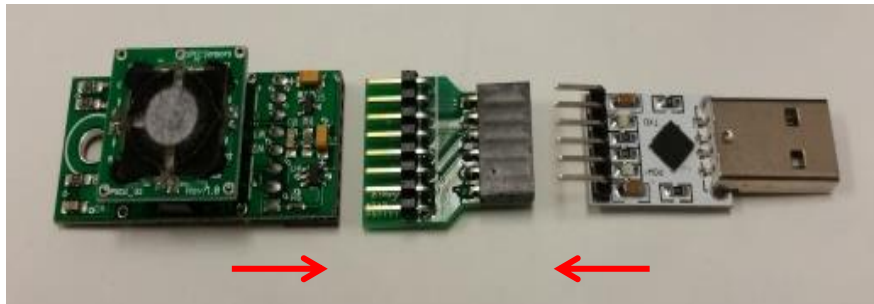

2. **Connect the USB to your computer**
   a. If device drivers are not automatically downloaded and installed, you can find device drivers for your operating system by searching www.silabs.com for: "CP210x USB to UART Bridge VCP Drivers".
3. **Determine the COM port that is associated with the module**
   a. On Windows operating systems, locate and open the Device Manager.
   b. The device should be listed under the heading, *Ports (COM & LPT)*, as *Silicon Labs CP210x USB to UART Bridge (COMXX)*, where *XX* is replaced by the number of the associated COM port. Make a note of the port number)

MEASURING GAS WITH A TERMINAL PROGRAM:

1. **Download and install a terminal program, such as Tera Term.**
2. **Open Tera Term and establish a serial connection with the module**
   a. In the "New Connection" window, select the "Serial" radio button.
   b. In the drop down list, select the appropriate COM port, identified above, then Select "OK".
   c. On the Menu bar, select "Setup", then select "Serial port…"
   d. Use serial parameters: 9600 baud, 8 data bits, 1 stop bit, no parity, no flow control, then Select "OK"
3. **In the terminal window:**
   a. Type any key to TRIGGER a measurement. The response time is about 1 second.
   b. To start a continuous data output stream, type 'cc' (lower-case, without quotation marks).
   c. The terminal prompts for an interval time. Type any of the 4 choices: 1, 10, 60, or 600 (seconds) and then press "Enter" on your keyboard.
   d. The format of the output is: [Unique Sensor Serial Number, Gas Concentration (ppb), Temperature (°C), Relative Humidity (%), Gas Sensor Measurement (ADC counts), Temperature Sensor Measurement (ADC counts), Relative Humidity Sensor Measurement (ADC counts), Days Elapsed, Hours Elapsed, Minutes Elapsed, Seconds Elapsed].
   e. Type 'r' at any time to reset the module and stop the continuous data output stream.

NORMAL STARTUP

The electrochemical sensor output has the normal startup profile pictured here. When powering the sensor, its output may rapidly increase followed by a gradual decrease. Once this process is complete, the sensor output will be the most accurate and stable. The time, magnitude, and polarity of this response may vary depending on the sensor type and the length of time the sensor has been unpowered. For the best results, it is recommended that the module remains always on power. The D-ULPSM module automatically enters a low-power state between TRIGGER measurements.
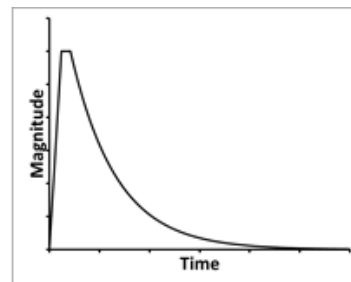
DEVICE CONNECTION AND PINOUT

Electrical connections to the Digital Gas Sensor are made via a rectangular female socket connector (Sullins Connector Solutions P/N: PPPC041LGBN-RC. The recommended mate for the host board is P/N: PBC08SBAN). This connector also provides mechanical rigidity on one end of the board. A through-hole is located on the opposite end of the board as an option for additional mechanical connection.
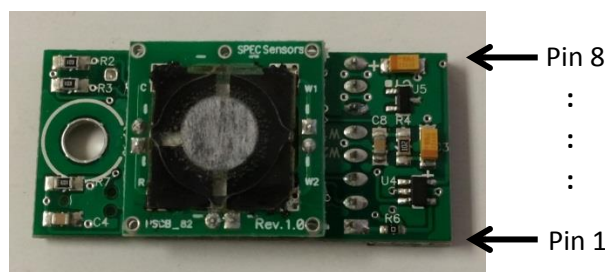
Pin #	Function
8	V+
7	N/C
6	GND
5	unused
4	unused
3	TXD
2	RXD
1	N/C

Pin Description:
V+: Supply voltage: 2.6 V < V+ < 3.6 V
GND: Ground
N/C: No connection. Leave these pins floating.
TXD: UART transmit. Connect to UART RXD on the host device.
RXD: UART receive. Connect to UART TXD on the host device.

USB to UART Module Settings:
Voltage level: 3.3 V
Baud: 9600
Data bits: 8
Stop bits: 1
Parity: None
Flow Control: None