

# 1138 User Guide

From Phidgets Support

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## Getting Started

### Checking the Contents

#### You should have received:

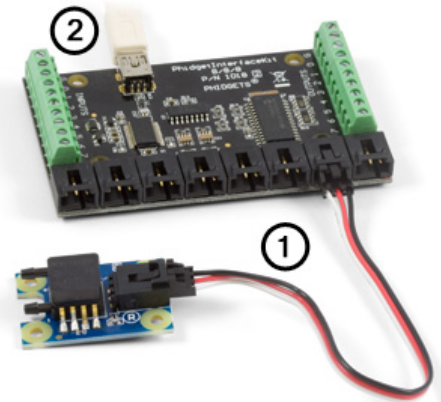
- A differential gas pressure sensor
- A sensor cable

#### In order to test your new Phidget you will also need:

- A PhidgetInterfaceKit 8/8/8 or PhidgetTextLCD
- A USB cable


### Connecting the Pieces

1. Connect the Gas Pressure Sensor to one of the Analog Inputs on the PhidgetInterfaceKit 8/8/8 using the sensor cable.
2. Connect the PhidgetInterfaceKit to your PC using the USB cable.




## Testing Using Windows 2000 / XP / Vista / 7

Make sure you have the current version of the Phidget library installed on your PC. If you don't, follow these steps:

1. Go to the Quick Downloads section on the Windows page
2. Download and run the Phidget21 Installer (32-bit, or 64-bit, depending on your system)
3. You should see the  icon on the right hand corner of the Task Bar.


## Running Phidgets Sample Program

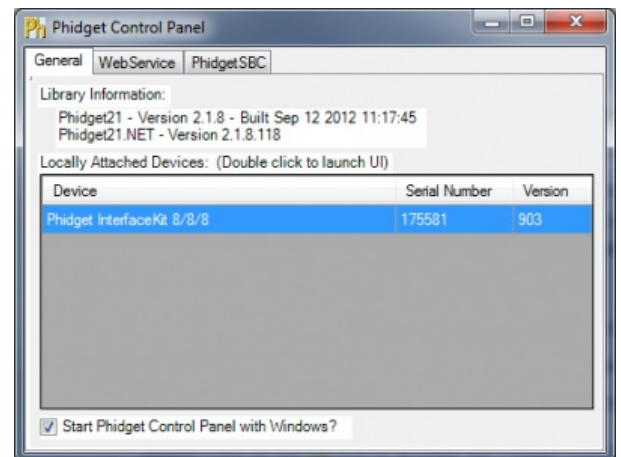
Double clicking on the  icon loads the Phidget Control Panel; we will use this program to ensure that your new Phidget works properly.

The source code for the **InterfaceKit-full** sample program can be found in the quick downloads section on the C# Language Page. If you'd like to see examples in other languages, you can visit our Languages page.

### Updating Device Firmware

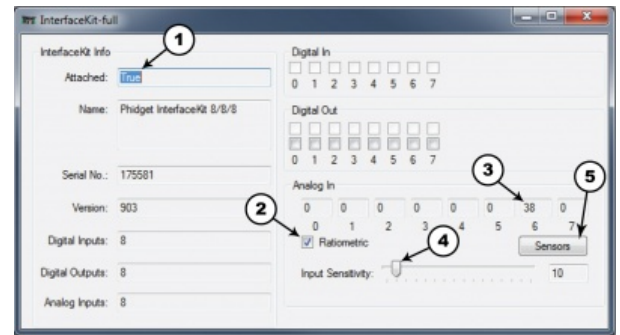
If an entry in this list is red, it means the firmware for that device is out of date. Double click on the entry to be given the option of updating the firmware. If you choose not to update the firmware, you can still run the example for that device after refusing.

Double Click on the  icon to activate the Phidget Control Panel and make sure that the **Phidget InterfaceKit 8/8/8** is properly attached to your PC.

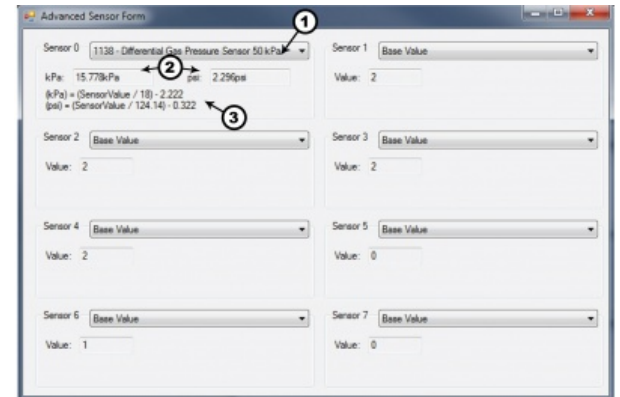


1. Double Click on **Phidget InterfaceKit 8/8/8** in the Phidget Control Panel to bring up InterfaceKit-full and check that the box labelled Attached contains the word True.
2. Make sure that the Ratiometric box is Ticked.

- When the sensor is plugged in, the value in Analog In should be close to 40.
- You can adjust the input sensitivity by moving the slider pointer.
- Click on the Sensors button to bring up the Advanced Sensor Form.



- In the Sensor box of the input you attached the sensor to, select the 1138 - Differential Gas Pressure Sensor from the drop down menu.
- This is the pressure differential between the sensor ports, measured in Pascals and pounds per square inch.
- Formula used to convert the analog input SensorValue into.



## Testing Using Mac OS X

- Go to the Quick Downloads section on the Mac OS X page
- Download and run the Phidget OS X Installer
- Click on System Preferences >> Phidgets (under Other) to activate the Preference Pane
- Make sure that the is properly attached.
- Double Click on in the Phidget Preference Pane to bring up the Sample program. This program will function in a similar way as the Windows version.

## Using Linux

For a step-by-step guide on getting Phidgets running on Linux, check the Linux page.

## Using Windows Mobile / CE 5.0 / CE 6.0

For a step-by-step guide on getting Phidgets running on Windows CE, check the Windows CE page.

## Technical Details

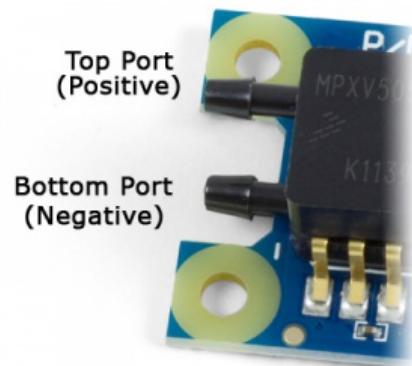
The Differential Gas Pressure Sensor uses bipolar processing to provide an accurate, high level analog input signal that is proportional to the applied pressure. When the sensor is plugged in, the SensorValue should default to about 40, which corresponds to 0 kPa between the two ports.

## Ports

The sensor comes with a positive top port and a negative bottom port. These ports have a diameter of 2.79mm to 3.30 mm (nominal 3mm).

Take caution when connecting the pressure ports- this sensor only measures a positive pressure differential, and you could damage the sensor if you connect it in reverse. Ensure that the upper port is always at an equal or higher pressure than the lower port.

For hosing, we recommend using polyurethane tubing. We have had good results with 2.4mm ID tubing from Emiplastics.com. In imperial measurement, 3/32" ID tubing is equivalent. This is available through laboratory supply stores such as Cole Parmer.



## Formulas

The Formula to translate SensorValue into Pressure is:

$$\text{Pressure (kPa)} = \frac{\text{SensorValue}}{18} - 2.222$$

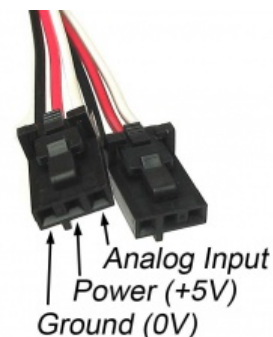
$$\text{Pressure (psi)} = \frac{\text{SensorValue}}{124.14} - 0.322$$

**Note:** 1.0 kPa = 0.145 psi

## Other Interfacing Alternatives

If you want maximum accuracy, you can use the RawSensorValue property from the PhidgetInterfaceKit. To adjust a formula, substitute (SensorValue) with (RawSensorValue / 4.095) If the sensor is being interfaced to your own Analog to Digital Converter and not a Phidget device, our formulas can be modified by replacing (SensorValue) with (Vin \* 200). It is important to consider the voltage reference and input voltage range of your ADC for full accuracy and range.

Each Analog Input uses a 3-pin, 0.100 inch pitch locking connector. Pictured here is a plug with the connections labelled. The connectors are commonly available - refer to the Analog Input Primer for manufacturer part numbers.



## API

Phidget analog sensors do not have their own API- they simply output a voltage that is converted to a digital value and accessed through the "Sensor" properties and events on the PhidgetInterfaceKit API. It is not possible to programmatically identify which sensor is attached to the Analog Input. To an InterfaceKit, every sensor looks the same. Your application will need to apply formulas from this manual to the **SensorValue** (an integer that ranges from 0 to 1000) to convert it into the units of the quantity being measured. For example, this is how you would use a temperature sensor in a C# program:

```
// set up the interfacekit object
InterfaceKit IFK = new InterfaceKit();

// Link the new interfacekit object to the connected board
IFK.open("localhost", 5001);

// Get sensorvalue from analog input zero
int sensorvalue = IFK.sensors[0].Value;

// Convert sensorvalue into temperature in degrees Celsius
double roomtemp = Math.Round(((sensorvalue * 0.22222) - 61.11), 1);
```

See the PhidgetInterfaceKit User Guide for more information on the API and a description of our architecture.