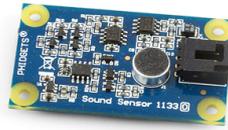


1133 User Guide



Go to this device's product page ^[1]

Getting Started

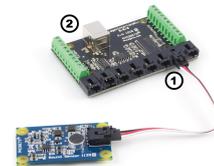
Checking the Contents

You should have received: In order to test your new Phidget you will also need:

- A sound sensor
- A PhidgetInterfaceKit 8/8/8 or a PhidgetTextLCD
- A sensor cable
- A USB cable

Connecting the Pieces

1. Connect the Sound Sensor to the Analog Input 6 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

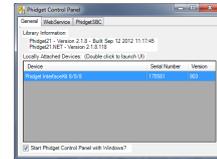
Double clicking on the  icon loads the Phidget Control Panel; we will use this program to ensure that your new Phidget works properly.

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.

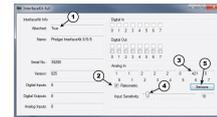
Updating Device Firmware

If an entry in this list is red, it means the firmware for that device is out of date.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 NOT Ticked.
3. When the Sound Sensor is placed beside a computer in a quiet room, the SensorValue will be approximately 10.
4. You can adjust the input sensitivity by moving the slider pointer.
5. Click on the Sensors button to bring up the Advanced Sensor Form.



1. In the Sensor 6 box, select the 1133 - Sound Sensor from the drop down menu.
2. The sound pressure measured by the sensor is shown here.
3. Formula used to convert the analog input SensorValue into decibels.



Testing Using Mac OS X

1. Go to the Quick Downloads section on the Mac OS X page
2. Download and run the Phidget OS X Installer
3. Click on System Preferences >> Phidgets (under Other) to activate the Preference Pane
4. Make sure that the is properly attached.
5. 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 pressure level of sound is measured in dB. The 1133 measures sound across a very wide range, with a frequency range of 100Hz to 8kHz and pressure level from 50dB to 100dB. The formula reports SPL (Sound Pressure Level), but the sensor is not sophisticated enough to be used as a substitute for a professional SPL Meter.

Formulas

The Formula to translate SensorValue into a sound pressure level is:

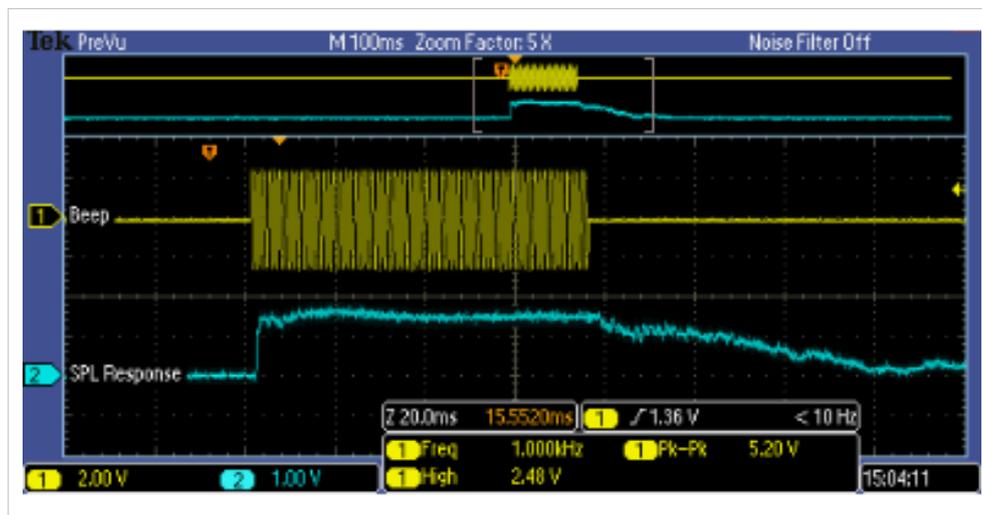
$$\text{Sound Pressure Level due to a 1kHz tone (dB)} = 16.801 \times \ln(\text{SensorValue}) + 9.872$$

Formula Dependencies

It is important to note that measuring sound pressure levels is very complex and depends on factors other than only the perceived volume. One of the major contributing factors is the frequency of the sound source. Different frequencies of a sine wave with identical amplitudes will generate very different sound pressure levels. Other factors can be the distance between the sound source and the microphone, and even the type of sound source, such as speakers. The bandpass filter of any speaker can affect the output gain at certain frequencies without any change in the volume knob of the speaker. Electrical noise in the power supplied to the sensor can affect the output. If the power supply is very noisy, this will introduce an offset in the output. It is much more noticeable when trying to measure smaller sound pressure levels due to the very small voltages of the microphone being affected much more. As a result, the previous formula is only accurate for a 1kHz pure tone. At other frequencies, there can be up to an 8dB difference between the calculated SPL and the output of a calibrated Sound Pressure Level meter.

Sensor Response

The following graph is the response of the Sound Sensor to a 1kHz beep. The beep lasts 75ms. The 1133 has a response time of 1.40ms when placed 30 cm (11.9 inches) from the sound source. The output from the Sound Sensor reduces to normal over the next 80ms.

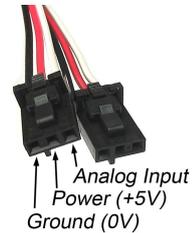


The output of the sensor can vary by up to 20 SensorValue in a pressure-stable environment. This is especially noticeable at lower output voltages. The best way to deal with this is to average a handful of reported values.

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.

For more code samples, find your preferred language on the [Languages](#) page.

Product History

Date	Board Revision	Device Version	Comment
March 2010	0	N/A	Product Release

References

[1] http://www.phidgets.com/products.php?product_id=1133

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