

Wheatstone Bridge Phidget

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Getting Started

Welcome to the DAQ1500 user guide! In order to get started, make sure you have the following hardware on hand:

- DAQ1500 - Wheatstone Bridge Phidget
- VINT Hub
- Phidget cable
- USB cable and computer
- something to use with the DAQ1500 (e.g. load cell, strain gauge, etc.)

Next, you will need to connect the pieces:



1. Connect the DAQ1500 to the VINT Hub using the Phidget cable.
2. Connect a load cell or strain gauge to the DAQ1500. See your product's data sheet for connection details.
3. Connect the VINT Hub to your computer with a USB cable.

TO
TOP

Now that you have everything together, let's start using the DAQ1500!

Using the DAQ1500

Phidget Control Panel

In order to demonstrate the functionality of the DAQ1500, the Phidget Control Panel running on a Windows machine will be used.

The Phidget Control Panel is available for use on both macOS and Windows machines.

Windows

To open the Phidget Control Panel on Windows, find the  icon in the taskbar. If it is not there, open up the start menu and search for Phidget Control Panel



macOS

To open the Phidget Control Panel on macOS, open Finder and navigate to the Phidget Control Panel in the Applications list. Double click on the  icon to bring up the Phidget Control Panel.

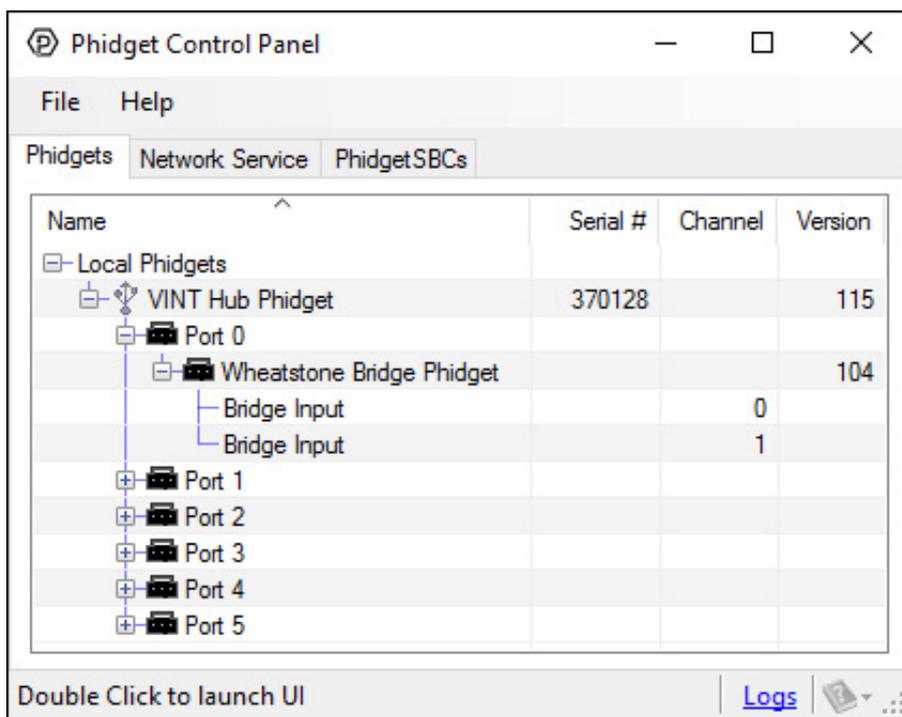
For more information, take a look at the getting started guide for your operating system:

- Getting started with Windows
- Getting started with macOS

Linux users can follow the getting started with Linux guide and continue reading here for more information about the DAQ1500.

First Look

After plugging the DAQ1500 into your computer and opening the Phidget Control Panel, you will see something like this:



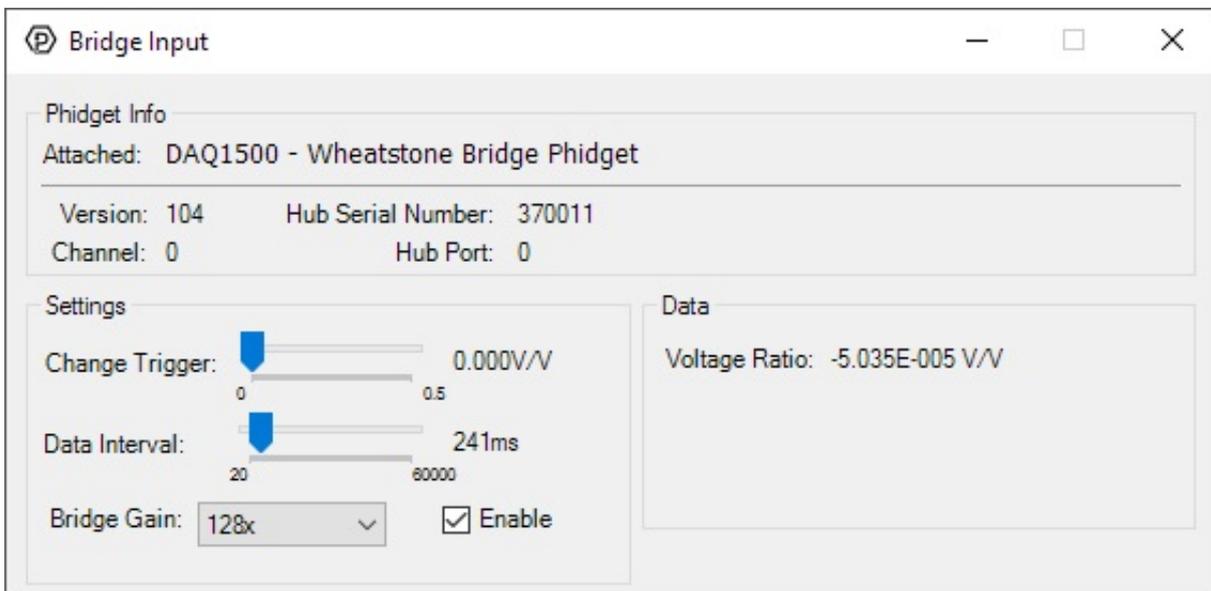
The Phidget Control Panel will list all connected Phidgets and associated objects, as well as the following information:

- **Serial number:** allows you to differentiate between similar Phidgets.
- **Channel:** allows you to differentiate between similar objects on a Phidget.
- **Version number:** corresponds to the firmware version your Phidget is running. If your Phidget is listed in red, your firmware is out of date. Update the firmware by double-clicking the entry.

The Phidget Control Panel can also be used to test your device. Double-clicking on an object will open an example.

Bridge Input

Double-click on the Voltage Ratio object, labelled Bridge Input, in order to run the example:



General information about the selected object will be displayed at the top of the window. You can also experiment with the following functionality:

- Modify the change trigger and/or data interval value by dragging the sliders. For more information on these settings, see the data interval/change trigger page.
- Toggle the Enable checkbox in order enable/disable the DAQ1500.
- Select a gain from the Bridge Gain drop-down menu. For more information about choosing the best gain, see the technical section.

Technical Details

Gain-sensitive Specifications

Gain Resolution (nV/V) Noise Floor (nV/V) Output Range (mV/V)

1x	59.60	5000	±500
2x	29.80	2600	±250
64x	0.931	133	±7.8125
128x	0.466	87	±3.9063

Connecting your Strain Gauge/Load Cell

Load cells are pressure sensors that can be used with the DAQ1500. For more information, see our Load Cell Primer.

If no documentation is available for your strain gauge, it's possible to use a multimeter to determine how to connect it, provided there are no electronics in the sensor. First, measure resistance between the 4 wires. There are 6 combinations - two combinations will have a resistance 20-40% higher than the other four. Choose one of these high-resistance combinations, and wire it into 5V and G on the DAQ1500. Connect the other two wires into +/- . Apply a load, if the V/V responds in the opposite way to your expectations, flip the +/- wires.

Measurement Considerations

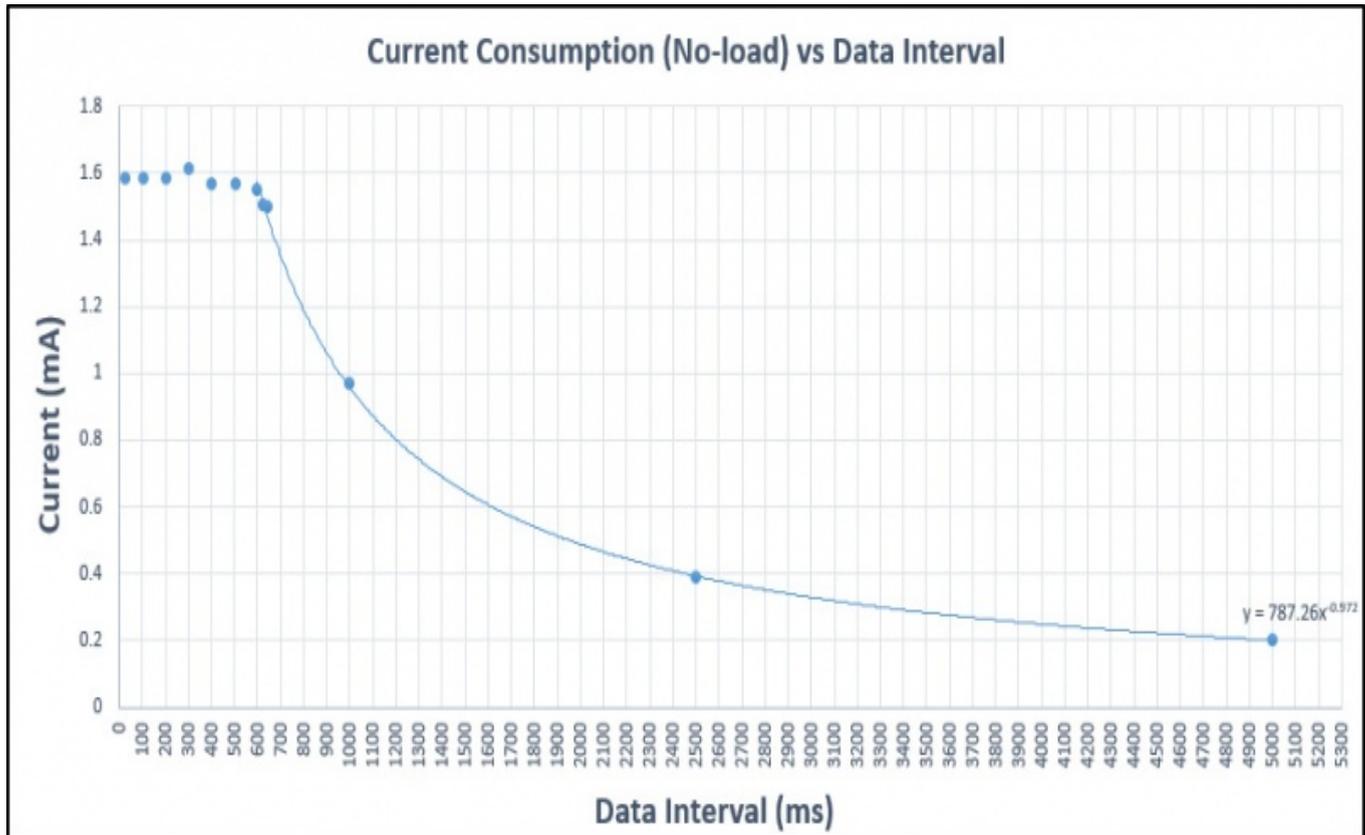
The DAQ1500 is designed to measure voltages as a ratio of the supply voltage - it's not practical to make measurements of absolute voltages with this product.

For maximum accuracy, all wires from the DAQ1500 to the sensor should be the same length and thickness. Changes in temperature will change the resistance of the wires - if they are all the same, the errors will cancel out.

The bridge inputs can be powered down, reducing power consumption with DAQ1500 sensors, and useful for reducing heating of sensors, which can introduce errors.

Current Consumption

The amount of current consumed by the DAQ1500 varies based on the data interval you select:



Use the following equation to approximate the relationship between current consumption and data interval (up to a maximum data interval of 60000ms):

$$y = 787.26x^{-0.972}$$

This figure is the no-load current, so to estimate total current consumption, you'll need to measure the current consumption at a known data interval so you can determine the offset, which should be no higher than 50mA.

What to do Next

- Software Overview - Find your preferred programming language here to learn how to write your own code with Phidgets!
- General Phidget Programming - Read this general guide to the various aspects of programming with Phidgets. Learn how to log data into a spreadsheet, use Phidgets over the network, and much more.
- Phidget22 API - The API is a universal library of all functions and definitions for programming with Phidgets. Just select your language and device and it'll give you a complete list of all properties, methods, events, and enumerations that are at your disposal.