RTD Phidget

Contents

Getting Started

Welcome to the TMP1200 user guide! In order to get started, make sure you have the following hardware on hand:

- TMP1200 RTD Phidget
- VINT Hub
- Phidget cable
- USB cable and computer
- platinum RTD

Next, you will need to connect the pieces:

1. Connect the TMP1200 to the VINT Hub using the Phidget cable.
2. Connect the RTD to the Phidget. See the technical section for more information.
3. Connect the VINT Hub to your computer with a USB cable.

Using the TMP1200

Phidget Control Panel

In order to demonstrate the functionality of the TMP1200, 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 TMP1200.

First Look

After plugging the TMP1200 into your computer and opening the Phidget Control Panel, you will see something like this:
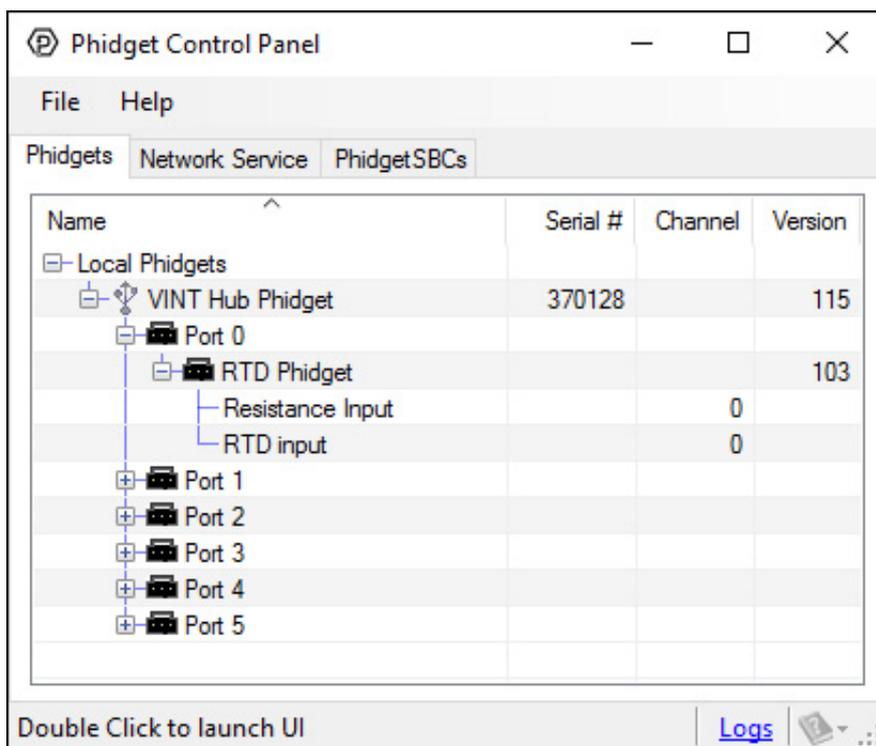
The Phidget Control Panel will list all connected Phidgets and associated objects, as well as the following information:

- **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 If your Phidget is listed in red, your firmware is out of date.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.

Resistance Input
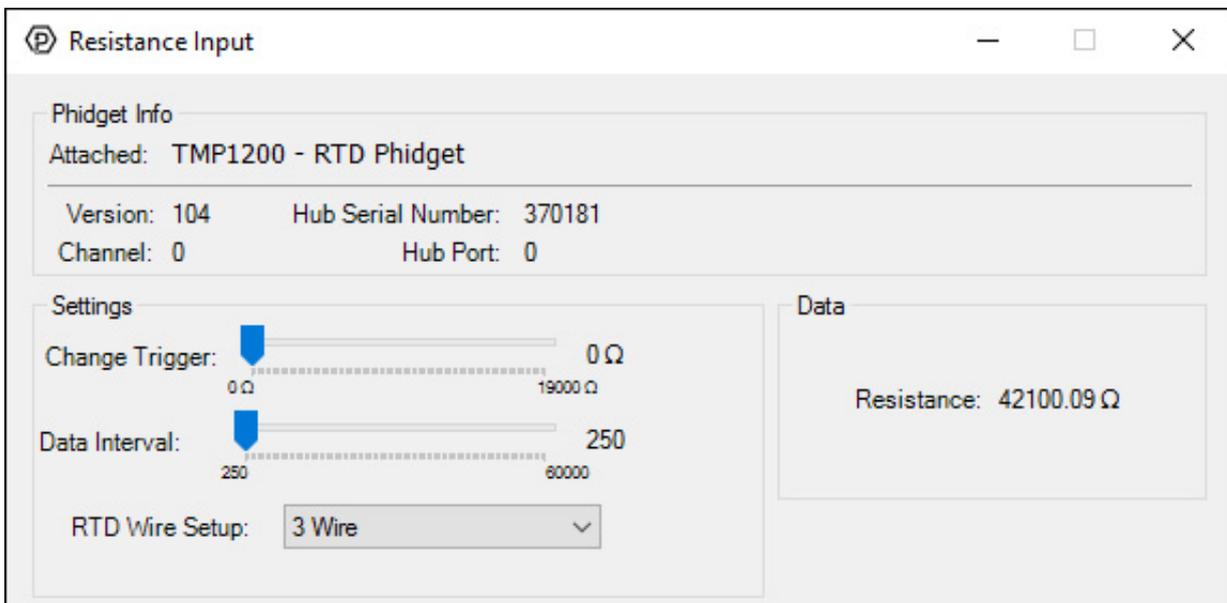
When you double click on an Resistance Input object, a window like the one pictured will open.

- At the top of the window, information about your device and the properties of this particular channel will be listed.
- On the left, change trigger and/or data interval can be changed. For more information on these settings, see the Data Rate/Change Trigger page. You can also select the type of wiring setup you're using to connect the RTD.
- On the right, the current reading of the resistance is listed in ohms.

RTD Input
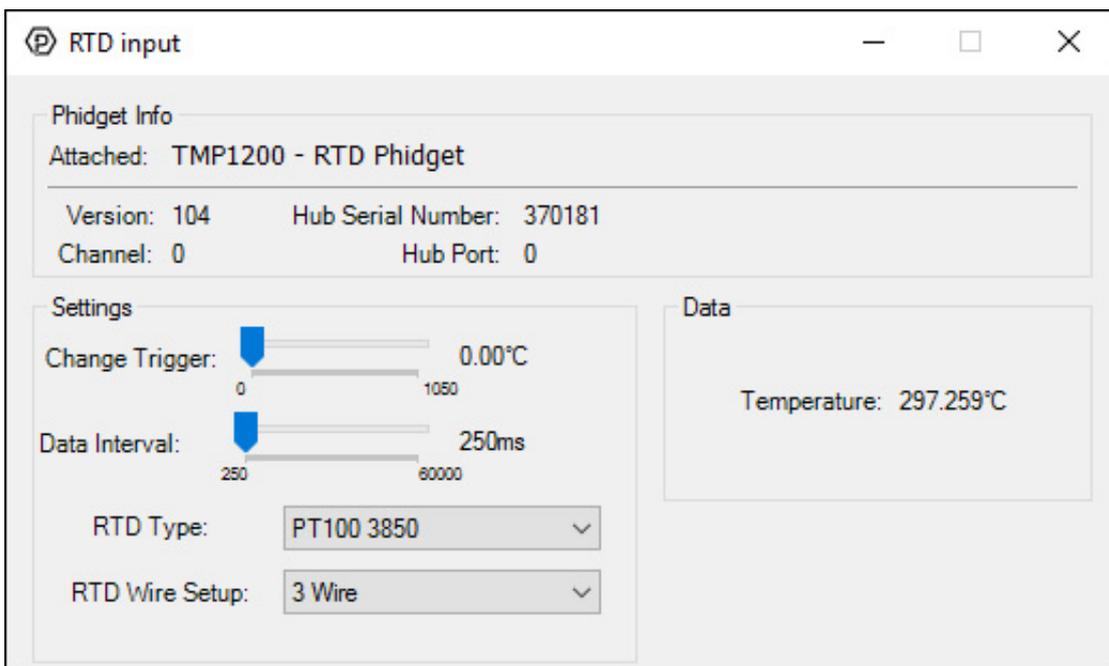
When you double click on an RTD Input object, a window like the one pictured will open.

- At the top of the window, information about your device and the properties of this particular channel will be listed.
- On the left, change trigger and/or data interval can be changed. For more information on these settings, see the Data Rate/Change Trigger page. You can also select the RTD type and the wiring setup to automatically calculate the temperature from the sensor reading.
- On the right, the current reading of the temperature is listed in degrees Celsius.

Technical Details

Wiring Modes

Two-Wire Mode

This is the simplest wiring setup for an RTD, but also the least accurate because the resistance of the leads are not taken into account. To connect a 2-wire RTD to the RTD Phidget, connect one wire to the RTD+ terminal, and the other to the RTD- terminal. Then connect the EXC+ terminal to the RTD+ terminal and the EXC- to the RTD- terminal with two short wires.

In your program, set `RTDWireSetup` to 2-wire mode. In the Phidget22 API select the TMP1200 and your programming language of choice to see exact naming conventions.

Three-Wire Mode

In a three-wire RTD, the extra wire is added to measure the resistance of one of the leads. This calculation assumes that both leads have the same resistance. Your RTD should have two wires that share a color; connect one of these wires to the RTD- terminal and the other to the EXC- terminal. The differently colored wire connects to the RTD+ terminal. Then connect the EXC+ terminal to the RTD+ terminal with a short wire.

In your program, set `RTDWireSetup` to 3-wire mode. In the Phidget22 API select the TMP1200 and your programming language of choice to see exact naming conventions.

Four-Wire Mode

A four-wire RTD is normally used in precision measurement, when the assumption that both leads have the same resistance is not accurate enough. Unfortunately the RTD Phidget **does not** support this particular feature of four-wire RTDs. It does, however, support the use of four-wire RTDs using the same assumption as three-wire mode. To connect a four-wire RTD, simply connect one pair of same-colored wires to the RTD+ and EXC+ terminals, and the other pair to the RTD- and EXC- terminals.

In your program, set `RTDWireSetup` to 4-wire mode. In the Phidget22 API select the TMP1200 and your programming language of choice to see exact naming conventions.

Line Resistance Measurement

In three and four wire modes, this device will measure the line resistance every 5 minutes. This measurement will cause a delay in measurement for data intervals of less than 500ms. To force the line resistance to be recalculated, you must close and re-open the device.

Current Consumption

The amount of current consumed by the TMP1200 depends on the DataInterval being used:

TMP1200_0 Current Consumption vs. Data Interval

$y = 1486.1x^{-0.961}$
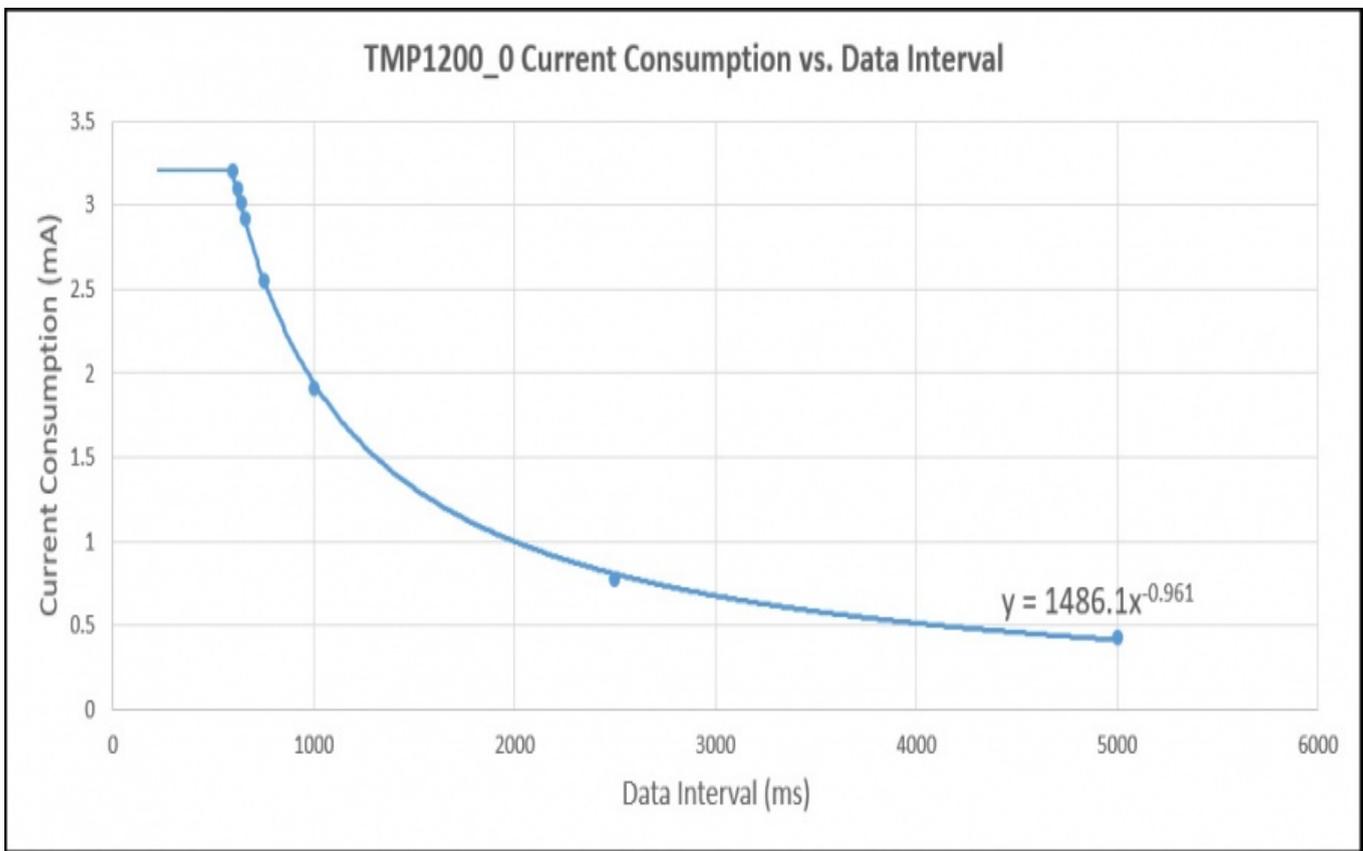
What to do Next

- 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.