

  
Dracal  
TECHNOLOGIES  
RTD223 USB  
Adapter with  
Terminal Block



# Dracal TECHNOLOGIES RTD223 USB Adapter with Terminal Block User Manual

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## Overview

- At Dracal Technologies, we want to democratize access to precision data
- to engineers and scientists to ease their lives so they achieve their goals more quickly. We believe that precision data should not be compromised by ease of use.
- Dracal's measuring instruments connect through a USB port. Units with the VCP option allow users to integrate sensor data without using a 3rd party software. The USB units are compatible with DracalView, the graphical software, and command-line interfaces.
- The calibratable units are equipped with a 3-point user-calibration mechanism that allows the handler to align multiple instruments together precisely or to adjust the accuracy of an instrument with a more precise reference.
- The RTD series are USB adapters for Pt100 RTD probes, Class AA (1/3 DIN) or less. Connect any suitable probe to the adapter to measure temperature with outstanding precision. The RTD223 is designed for those who trust 3-screw terminal blocks to connect an RTD probe, and acquire precision temperature measurements.

## Product Overview and Specifications

### Product Overview

The RTD223 is a high-precision USB adapter designed for use with 2- or 3-wire 100-ohm Pt100 RTD probes, offering accurate temperature measurements.

The sensors are connected using a 3-screw terminal block, ensuring a secure installation. In 3-wire connection, the RTD223 corrects the measured value, compensating for errors introduced by the length of the probe cable. With its 18-bit precision electronics, the RTD223 can detect small variations in temperature, making it suitable for a wide range of applications. The compact USB-key form factor simplifies integration, even in space-constrained applications.

### Key specifications

## Temperature

- Adapter operating range -200 °C to 800 °C
- Typical accuracy (excluding probe)  $\pm 0.06$  °C
- Resolution 0.02 °C

## Miscellaneous

- Pt100 probe available: RTD-PT100-SIL.
- Supply: Powered by a USB port or a powered USB HUB.
- Operating temperature range: -20 °C to 70 °C.
- Supported by the SensGate DAQ unit.
- Simultaneous operation of multiple Dracal sensors is supported.\*
- Only limited by allowable USB topologies and OS capacity. Fifty simultaneous USB sensors have been tested under Windows 8.

## Safety Guidelines

WARNING: Electromagnetic interference (EMI) may decrease the sensor's accuracy. Avoid using this device near EMI sources such as motors, high-voltage transformers, and fluorescent tubes.

WARNING: This product should not be used in applications where its failure may cause personal injury.

## Installation and Setup

TIP: As for any precision measurement equipment, powering the unit at least 15 minutes before using it is advised.

## Installation

1. Download the DracalView\* software at <https://www.dracal.com/en/software/>
2. Follow the installer's instructions. The whole process should take less than a minute. The setup is now completed.
3. Insert the unit into a free USB port.

\*Includes a set of command-line tools.

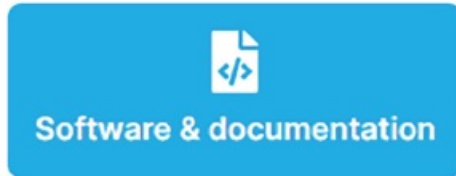
## Usage Guidelines and Applications

### Operation – DracalView

We recommend launching DracalView to check if the instrument is connected correctly and works as expected. Here are the main steps of the Getting Started with DracalView guide.

1. Connect an instrument.
2. Launch DracalView.
3. Verify the instrument appears in the Sources tab.
4. Modify units and decimals in the Configuration tab (Optional).
5. Customize the names of channels to record in the Sources tab (Optional).
6. Visualize data on GraphView.

Please refer to the RTD223 page for the complete guide, specifically the “Software & Documentation” tab.



7. Of note, to log data with DracalView, these are the remaining main steps of the Getting Started guide: Initiate the logging task in the Logging tab.  
Keep an eye on data with BigView.
8. Watch an introductory video for a quick overview of setting up and logging data in less than 3 minutes.



## Operation – Command-line interface

- The command-line tools are available with the download of DracalView. In the Getting Started guide, locate them and call the -h (help) argument, whether on a Windows, MacOS X, or Linux-based computer.
- For complete documentation on how to use dracal-usb-get or dracal-sens-gate-get, code examples, and integrating sensor data into LabVIEW™, click on the relevant link in the same Getting Started guide.
- Briefly, to log data to a file, here is the command line:
- `dracal-usb-get -s [serial number]`
- `-i [chosen channels] -L [location]`
- To redirect the output, give the argument -L the parameter “- ” to have a stdout output.

## Operation – COM Protocol

“VCP-” prefix: If present, the product is equipped with the virtual COM port (VCP) option, which allows it to be freely converted between USB and VCP modes. It is delivered in USB mode.

To convert the product from USB to VCP mode,

1. Open a command-line terminal.
2. Call “`dracal-usb-set -f set_protocol VCP`” and disconnect the product.

To reverse the product back to USB mode,

Send the “`PROTOCOL USB`” command and disconnect the product.

Please note that under Windows, once an instrument is converted to VCP, it is not recognizable by DracalView and the command-line tools.

For additional information, please click the relevant link in the Software & Documentation section of the RTD223 page.



## Software & documentation

### Calibration

“-CAL” suffix: If present, the product is equipped with a 3-point user-calibration mechanism.

The Getting Started guide for calibration is summarized as follows:

1. Determine the calibration points.
2. Perform the calibration using DracalView or dracal-usb-cal.

A comprehensive video tutorial on the best practices for calibrating instruments using DracalView can be found [here](#).

3. The Getting Started guide for successful calibration, mentioned in this section, provides many tips and complementary documentation.



4. Separate Casing: Gently separate the casing; be careful about damaging internal components. If resistance is encountered, recheck for any overlooked screws.
5. Document Component Positions: Before further disassembly, document the positions of internal components for ease of reassembly.
6. Handle Components with Care: Handle internal components carefully to avoid electrostatic discharge and damage. Use an ESD (Electrostatic Discharge) mat or wrist strap if available.
7. Follow Reverse Order for Reassembly: When reassembling the USB sensor, follow the disassembly steps in reverse order, ensuring components are correctly positioned and secured.

### Environmental Considerations

1. Recycling Recommendations: Dispose of components and packaging materials in accordance with local recycling regulations. Check with local authorities for proper e-waste disposal facilities.
2. Reuse Opportunities: Consider reusing components or donating functional parts to minimize environmental impact.
3. Minimize Energy Consumption: Power down or disconnect the USB sensor when not in use to minimize energy consumption.

### RoHS Compliance

Our USB sensors adhere to RoHS (Restriction of Hazardous Substances) directives, ensuring they are free from

harmful substances such as lead, mercury, and cadmium.

## **CE and REACH Compliance**

These USB sensors comply with CE (Conformité Européenne) and REACH (Registration, Evaluation, Authorization, and Restriction of Chemicals) regulations, meeting European safety and environmental impact standards.

### **Document Revision History**

Version 1.0

2024-02-08

Creation of the User Manual.

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## **Compliance Certification**

### **EU Declaration of Conformity**

This declaration of conformity is issued under the sole responsibility of the manufacturer:

- Dracal Technologies Inc.
- A204 – 7900 Taschereau Blvd
- Brossard (Quebec)
- J4X 1C2 Canada
- for the following product(s):
- Model: RTD223
- Type of Equipment: USB sensor
- CE Marking: Yes
- Compliance with Directives
- RoHS3 Directive (2011/65/EU, 2015/863)
- The USB Sensor Model RTD223 complies with the requirements of the RoHS Directive, restricting the use of hazardous substances in electrical and electronic equipment.
- EMC Directive (2014/30/EU)
- The USB Sensor Model RTD223 complies with the essential requirements of the EMC Directive for electromagnetic compatibility.

## **Technical Documentation**

- Dracal Technologies holds the technical documentation required by the relevant directives at the following address: [compliance@dracal.com](mailto:compliance@dracal.com)
- It is available upon request to the relevant authorities.
- Signed for and on behalf of:
- Dracal Technologies Inc., January 2024

## Frequently Asked Questions (FAQ)


- **Q: Can I use the USB adapter with a 4-wire RTD probe?**

A: No, the RTD223 USB adapter is specifically designed for use with 2/3-wire RTD probes.

- **Q: What is the typical accuracy of the USB adapter?**

A: The typical accuracy of the USB adapter (excluding the probe) is specified in the product documentation provided by Dracal Technologies.

## Documents / Resources

	<p><a href="#">Dracal TECHNOLOGIES RTD223 USB Adapter with Terminal Block</a> [pdf] User Manual USB-RTD223, USB-RTD223-CAL, VCP-RTD223, VCP-RTD223-CAL, RTD223 USB Adapter with Terminal Block, RTD223 USB, Adapter with Terminal Block, Terminal Block</p>
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## References

- [Home - Dracal Technologies](#)
- [Contact Us - Dracal Technologies](#)
- [The Most Frequently Asked Questions about Dracal - Dracal Technologies](#)
- [Succeeding in 3-Point Calibration of Dracal Sensors - Dracal Technologies](#)
- [Getting started with Dracal command-line tools - Dracal Technologies](#)
- [3-year warranty policy](#)
- [Free USB DAQ for data integration, visualization and automation](#)
- [Top challenges faced by Dracal users and solved - Dracal Technologies](#)
- [Guide on Dracal sensor calibration and its benefits - Dracal Technologies](#)
- [User Manual](#)

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