User Manual

BAR20
USB Precision Barometer

Model name	Part number	Description
USB-BAR20	601009	USB precision barometer
USB-BAR20-CAL	608009	USB precision barometer – calibratable
VCP-BAR20	603009	USB precision barometerr – with VCP mode
VCP-BAR20-CAL	605009	USB precision barometer – calibratable with VCP mode

HS code: 9025.80.15.00

Table of Contents

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: BAR20
Type of Equipment: USB sensor
CE Marking: Yes

Compliance with Directives

RoHS3 Directive (2011/65/EU, 2015/863)
The USB Sensor Model BAR20 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 BAR20 complies with the essential requirements of the EMC Directive for electromagnetic compatibility.
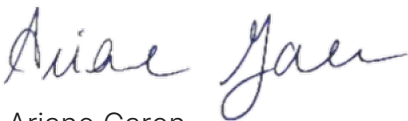
Technical Documentation

Dracal Technologies holds the technical documentation required by the relevant directives at the following address: compliance@dracal.com.

It is available upon request to the relevant authorities.

Signed for and on behalf of:
Dracal Technologies Inc., January 2024

Ariane Garon
President
Dracal Technologies Inc.

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-ine 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 BAR20 is a high-precision digital barometer from 1 kPa to 120 kPa. Its unique USB key-like design allows seamless integration into various systems.

Product Overview and Specifications

Product Overview

The BAR20 is your go-to USB barometer for accurately measuring atmospheric pressure (1 kPa to 120 kPa) and altitude. With its high-resolution ADC (24-bit), this compact device can detect even the smallest variations in air pressure, making it perfect for various applications. Whether monitoring atmospheric conditions or calculating altitude, the BAR20 delivers precise results with variations as low as 10 cm in altitude calculation. Its USB key form ensures easy integration into any setup, even in tight spaces.

Key specifications

Atmospheric pressure	
Operating range for full accuracy	45 to 110 kPa
Accuracy	±0.15 kPa at 25 °C
Resolution	0.0065 kPa
Digital resolution	24 bits
Altitude resolution	Approx. 10 cm
Internal factory-calibration coefficients	

Miscellaneous

- Supply: Powered by a USB port or a powered USB HUB.
- Operating temperature range (USB cable and housing): -40 °C* to 70 °C.
- Supported by the SensGate DAQ unit.
- Computes the altitude.
- Simultaneous operation of multiple Dracal sensors is supported.**

*   Only if the sensor housing is not moved while the temperature is below 0 °C.

** Only limited by allowable USB topologies and OS capacity.
Fifty simultaneous USB sensors have been tested under Windows 8.

TIP: The barometer is very sensitive to air pressure. A USB extension cable may increase the barometer precision if you intend to read slight pressure variations. If you directly plug the barometer into a PC, remember that a slight pressure or vacuum from the PC fan(s) through the USB connector may slightly deviate your readings.

TIP: Remember that airflow around the unit may cause a pressure variation. Avoid placing the unit in a windy environment. One solution may be to put the barometer in a ventilated housing to reduce the airflow.

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 BAR20 page for the complete guide, specifically the "Software & Documentation" tab.
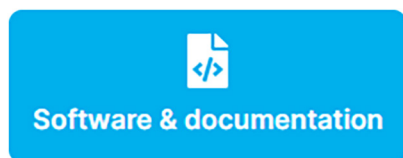
Of note, to log data with DracalView, these are the remaining main steps of the Getting Started guide:

(7)   Initiate the logging task in the Logging tab.

(8)   Keep an eye on data with BigView.

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 BAR20 page.
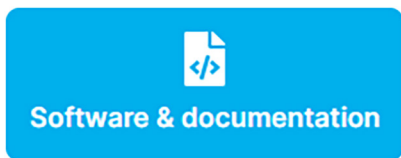
Calibration

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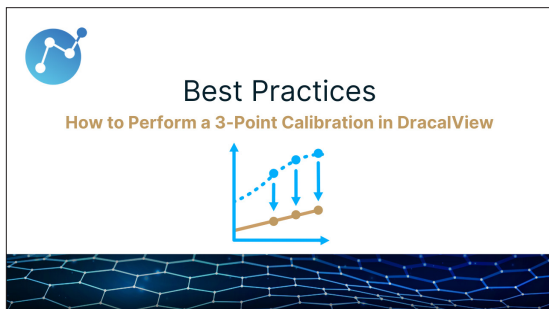
The Getting Started guide for successful calibration, mentioned in this section, provides many tips and complementary documentation.

Care, Storage, and Recalibration

Care

Use within the specifications available in the BAR20 datasheet.

NOTE: Note that this product is not waterproof and requires protection if contact with water is possible.

Storage

Store within the housing temperature and humidity ranges specified in the BAR20 datasheet.

Recalibration

Dracal's measuring instruments are factory-calibrated. It is possible to purchase a calibration certificate traceable to the SI along with the instrument and receive a calibrated instrument. An ISO17025-accredited laboratory performs this calibration.

If the instrument has a "-CAL" suffix, it can be adjusted for accuracy during the calibration.

The long-term drift of the BAR20 is less than 0.1 kPa per year.Therefore, depending on the user's application, an adjustment might be required more frequently.

Troubleshooting Guide and Support

Troubleshooting

TIP: Avoid installing the sensor in a location where strong vibration is likely to occur. Strong vibrations may cause slight inaccuracies in the reading.

Feel free to browse the website's Resources section for any supplementary information. Here are interesting articles:

- Most frequent questions about Dracal
- Top challenges and their solutions
- FAQs about calibration

Support

Dracal Technologies has a dedicated email address for support: support@dracal.com.

As customer satisfaction is a priority, someone (an actual human!) will respond within 24 hours.

Return Process and Warranty Information

Return Process

If a customer experiences issues with a Dracal sensor, they can contact support@dracal.com and explain their problem. In most cases, there will be an easy solution.

In the rare event of a faulty instrument under warranty, Dracal Technologies will proceed to a replacement upon evaluating the situation. The procedure will be explained through email once the customer advises support@dracal.com.

Warranty

The complete warranty can be found on Dracal Technologies' website here. Briefly, Dracal Technologies only warrants to the original product purchaser for 36 months (3 years) from the delivery date.

Accessories and Peripherals

To use Dracal Technologies' complete DAQ solution, the user must download the software on a computer with a USB port.

Aside from sensors, Dracal Technologies offers a remote data logging station: the SensGate. Both a Wi-Fi/Ethernet «gateway for Dracal's sensors and a data logger, it fulfills the needs of customers requiring a remote solution to precision data acquisition.

Disassembly and Environmental Considerations

Disassembly Instructions

1. Turn Off Power: Before disassembling the USB sensor, ensure it is disconnected from any USB port.
2. Remove External Connections: Unplug any cables connected to the USB sensor.
3. Identify Screws and Fasteners: Locate and identify any screws or fasteners securing the casing of the USB sensor.

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.

info@dracal.com

dracal.com

+1 450.812.8612

Dracal Technologies Inc.
A204 - 7900 Taschereau Blvd
Brossard (Quebec)
J4X 1C2 Canada