User Manual

BAR20-N

USB Precision Barometer with NMEA Output

Model name	Part number	Description
USB-BAR20-N	601027	USB precision barometer with NMEA output

HS code: 9025.80.15.00

Dracal TECHNOLOGIES

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

Compliance with Directives

RoHS3 Directive (2011/65/EU, 2015/863)
The USB Sensor Model BAR20-N 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-N 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. The BAR20-N is a high-precision digital barometer from 1 kPa to 120 kPa. It communicates through a virtual COM port and has a simple ASCII output. The XDR (transducer measurement) sentence provides pressure in bars. The MDA (meteorological composite) sentence outputs pressure in inches of mercury and bars.
It is supported by navigation software such as OpenCPN and Expedition™*.
Its unique USB key-like design allows seamless integration into various systems.

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Product Overview and Specifications

Product Overview

Experience unparalleled precision in atmospheric pressure measurement with the BAR20-N. This USB-connected barometer offers a wide measurement range (1 to 120 kPa) and boasts a high-resolution ADC (24-bit) that can detect the slightest atmospheric pressure changes. Transmitting data to your computer over USB, the BAR20-N appears as a serial port (Virtual COM port) and provides atmospheric pressure readings at 1-second intervals using MDA and XDR NMEA sentences. Its compact USB-Key form factor ensures easy integration, even in the most space-constrained applications.

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 85 °C.
- 2nd order compensation in temperature.
- Computes the altitude.
- NOT supported by our free DAQ tools

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

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. Connect the BAR20-N to a USB port on your computer.

2. Driver Installation
   a. Windows should automatically detect the BAR20-N as a Virtual COM Port and install the necessary drivers*.
   b. For Mac OS and Linux, no additional drivers are usually required as they have built-in USB Virtual COM Ports support.

   The BAR20-N should be recognized as a serial device (/dev/ttyUSB0 or similar) in the terminal.

3. Software Configuration
   a. Use terminal software (such as PuTTY on Windows or screen on Mac/Linux) to connect to the BAR20-N using the assigned serial port (e.g., COM3 on Windows or /dev/ttyUSB0 on Linux).
   b. Configure the terminal software to use the correct baud rate (usually 9600 bps).

* Microsoft Windows 7 does not support the virtual COM port and, therefore, does not recognize this product.

Usage Guidelines and Applications

Understanding the NMEA Output

The BAR20-N USB Precision Barometer provides atmospheric pressure readings in NMEA (National Marine Electronics Association) format. This standardized protocol is commonly used for GPS and other sensor data in marine and outdoor applications.

The BAR20-N outputs atmospheric pressure data in MDA (Meteorological Composite) and XDR (Transducer Measurements) NMEA sentences. These sentences include information such as atmospheric pressure, temperature, and altitude.

Integration with GPS Systems

The NMEA output of the BAR20-N makes it ideal for integration with GPS systems and other NMEA-compatible devices. It can provide real-time atmospheric pressure data to enhance the accuracy of location-based services and weather monitoring applications.

Industrial and Aerospace Applications

The BAR20-N can be used in industrial settings for pressure monitoring in controlled environments or as part of altitude measurement systems. It can provide crucial data for altitude control and aircraft instrumentation in aerospace applications.

Care, Storage, and Recalibration

Care

Use within the specifications available in the BAR20-N 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-N datasheet.

Recalibration

Dracal's measuring instruments are factory-calibrated. The BAR20-N semiconductor sensor chips are individually conditioned by their manufacturer in the best stable conditions, and their correction coefficients are recorded on each of them.

The long-term drift of the BAR20-N is minimal.

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 24 months (2 years) from the delivery date.

Accessories and Peripherals

To use Dracal Technologies' the user must have a computer or device with a powered USB port.

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
2024-03-21

Creation of the User Manual.

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TECHNOLOGIES

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