

DD103 DrDAQ Oxygen Sensor

User's Guide



1 Introduction

The DD103 Oxygen Sensor is used to measure the percentage of oxygen in a gas. The sensor plugs into the external sensor sockets of DrDAQ using the supplied cable.

2 Specification

Sensor type	Galvanic Cell (lead-oxygen with weak acid electrolyte)
Input range	0 - 100% oxygen
Accuracy (calibrated)	±3.0% over operating conditions range
Response times	< 15 seconds for 90% response < 25 seconds for 97% response
Max. humidity	0 - 95% Non-condensing
Operating temperature	5 °C to 40 °C
Storage temperature	-15 °C to 50 °C

3 Setting up the oxygen sensor

Since the Oxygen Sensor has an output of 0 mV at 0% oxygen, a single point calibration can be carried out. The procedures below guide you through setting up the oxygen sensor to work with PicoLog and calibrating it using the oxygen in the atmosphere as a reference point (calibration is necessary to use the sensor with ±3% accuracy).

If you have not yet set up DrDAQ with PicoLog, do so now using the DrDAQ instructions or the DrDAQ help file in the "Start | Programs | Pico Technology" menu once the software has been installed.

1. **Connect** the **Oxygen Sensor** to the socket labelled **Ext1** on the DrDAQ unit.
2. From the **File** menu, select **New settings**.
3. Click **OK**.
4. Check that **DrDAQ** is selected as the **Converter type** and that the correct **port** is selected (usually LPT1).
5. Click **OK**.
6. Click **Add**.
7. Under **Channel**: select **External 1** (The Scaling type will automatically change to **oxygen**).
8. Go back to the main monitor view by clicking **OK** on the two dialog boxes.

DrDAQ should be receiving information from the oxygen sensor. You should now calibrate the sensor using the procedure on the following page.

4 Calibrating the oxygen sensor

Both PicoLog and PicoScope provide the facility to enter look-up tables. These instructions will concentrate on doing so in PicoLog (for instructions on Custom Ranges in PicoScope, see the PicoScope manual from the Help menu within the application).

This is the information known so far:

Raw values (%)	Calibrated values known to be true (%)
0	0
	20.9 (known oxygen in air at sea level)

Only one more value is needed to complete the look-up table; if you are measuring the normal atmosphere then this reading is currently displayed on the PicoLog monitor view. Complete the table above with this value and follow the instructions below:

1. Select the **Settings | Input channels** menu item and click **OK**.
2. Select the **oxygen sensor** from the list then click **Edit**.
3. Click on **Options**, then **Scaling**.
4. From the drop down **Scaling method** menu, select **Table lookup**.
5. From the look-up table you completed above, enter these values in the following format (**replace 19.9** with whichever value you read from the monitor view):
0 0
19.9 20.9
(Separate the values above with spaces)
6. Close all of the dialogs by clicking **OK** in each one.

PicoLog's monitor view should now display 20.9% (or very close) for the oxygen content in air. If so, you've successfully calibrated your DrDAQ oxygen sensor. Save your new calibrated settings for future use:

1. Open **File | Save as...**
2. Change the **Save file as type**: drop down menu to **Settings files (*.pls)**
3. Click **OK** to save the settings into a file name of your choice

5 Looking after the oxygen sensor

Ensure that the storage temperature and humidity ranges in the specification are not exceeded. The sensor is not designed for use in liquids and using it in this way will damage the sensor.

The sensor has a lifetime of $>1,200,000 \text{ O}_2 \text{ \% hrs}$; in air at sea level the sensor will operate effectively for over 4 years (this will decrease if the sensor is exposed to high oxygen concentrations for prolonged periods).

The lifetime of the sensor can be affected by exceeding the storage / operating ranges and exposure to some gaseous chemicals in high concentrations; please avoid the following: sodium hydroxide, acetone, MEK.



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