



OXIGRAF

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Oxigraf Oxygen Analyzer Applications: Electrical Interface for OEM Sensors

- Contact Oxigraf about the new OxiMon06 monitor software for the [Oxigraf X2000](#) series sensors. For systems using Windows 2000 and XP, this software provides a clean and modern look and feel that lets you see right away just what's happening with your oxygen sensor.

- Use of the analog output from [Oxigraf X2000](#) series sensors requires special consideration due to potential errors introduced by power supply current variation. The analog output ground is common with the power supply ground, consequently the power supply current will cause a voltage difference between the analog signal ground and system ground. This voltage drop will add to the analog signal voltage if a single ended measurement is made referenced to the system ground.

- The magnitude of the voltage error is determined by the connection cable resistance and power supply current. The sensor ground current varies significantly on warm-up (from 2.5 amps to 0.3 amp) and a lesser amount with ambient temperature changes (0.3 to 0.7 amp). A typical cable ground resistance is about 0.011 ohm assuming 6 inches of #28 flat cable with all three ground conductors used. One amp of ground current will then introduce 0.011 volts of error, corresponding to 1.1% O₂.

- The voltage drop error can be eliminated by using a differential amplifier to measure the analog voltage right at the interface connector without interference due to cable voltage drop. The positive input to the amplifier is connected to the analog output (pin 10), and the negative input is connected to the analog signal ground (pin 9). The differential amplifier will measure the true analog signal voltage, rejecting the error due to cable voltage drop.

- Note that ground voltage drop must also be considered on the system controller PCB as well. The Oxigraf sensor's power supply ground should be connected to the system power supply through a dedicated conductor not shared by other devices. This will eliminate sensor ground current errors due to resistance in the system PCB ground plane.

- A typical oxygen analyzer application using an Analog Devices AD 620 instrumentation amplifier is shown in the [suggested interface schematic](#).

