



Polestar DSP4000 Optical Monitor for O₂, CO₂ and pH

KEY FEATURES

- Robust, compact design suitable for lab, plant, or external environments
- Free from calibration drift
- 4-Channels with any combination of O₂ (ppm/ppb), CO₂ or pH
- Single-channel data collection
- Easy switching between parameters
- Liquid or gas-phase measurement
- Internal sensor diagnostics continuously optimise performance
- Automatic temperature and pressure compensation or the highest measurement accuracy
- Multiple communication options
- User-friendly interface
- IP 65 Enclosure

Optical Sensing Technology

Depending upon sensor chemistry, the DSP4000 utilises either fluorescence lifetime (O₂) or ratiometric fluorescence analysis (pH, CO₂) to accurately measure. Because the sensors are inherently self-referencing, the DSP4000 eliminates the potential for measurement error that arises from changes in turbidity, refractive index, viscosity, or color. This ensures stable, drift-free calibration and hence reliable measurements throughout the lifespan of a sensing element.

More Robust Than Electrodes

Polestar's sensors, whether incorporated into stainless steel probe configurations, welded onto disposable bioprocess bags, or applied to shake flasks, are solid-state with no fragile membranes or filling solutions. Unlike electrodes, they contain no glass, exhibit no electromagnetic emissions and can be stored dry.

Designed for Use with Polestar's Patented Sensors

The Model DSP4000 Optical Process Monitor was designed specifically to operate with Polestar's oxygen, pH, and CO₂ sensors. The single-channel instrument can be configured to measure any of these parameters one at a time. Which parameter is being monitored can easily be changed over by the user.

Calibration Made Easy

All sensors are shipped factory calibrated. If users prefer, they may also perform a simple one- or two-point calibration. Either way, the calibration is stable through the life of the sensing element.

Reliable Measurement Performance

Polestar's measurement technology offers several significant advantages over conventional electrodes:

- Calibration stability throughout the sensor lifespan
- Immunity to low-flow conditions
- No polarisation time
- No sensitivity to electrical noise
- No electricity at the point of measurement meaning they are safe for flammable and/or explosive environments
- No fragile membrane, fluid filling or glass
- Sensing elements pre-calibrated
- Automatic Gain Control (AGC, patent pending) ensures optimal measurement and maximizes sensor lifespan
- Status LED indicates sensing tip status and remaining useful life.

Advantages relative to other optical sensor technologies

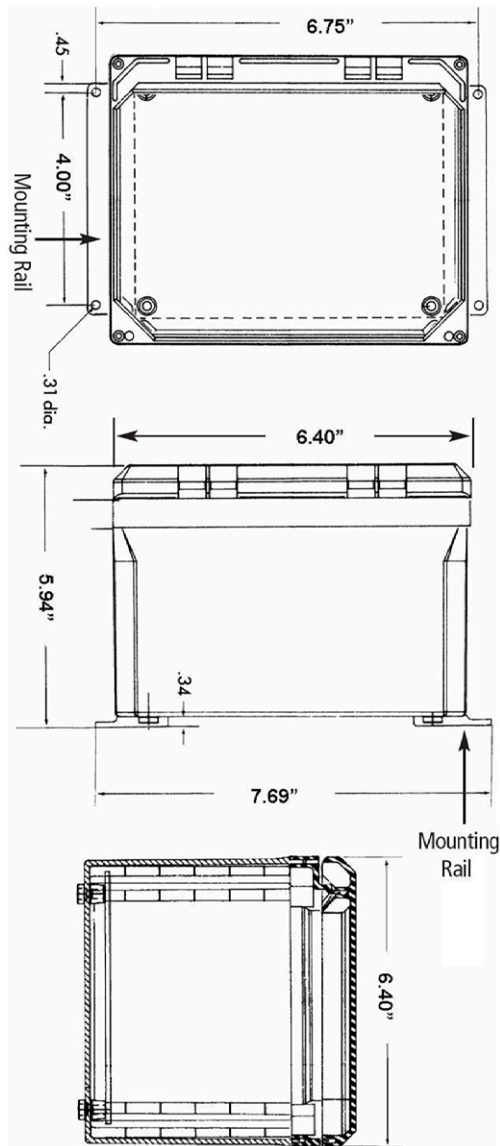
- Calibration stability throughout the sensor lifespan
- Immunity to low flow conditions
- No polarization time
- Able to detect 0-100% oxygen
- CIP compatible
- Sterilizable (SIP, autoclave, gamma)

Easy to Use

The DSP4000 is designed for easy installation and operation. It may be pipe-, surface-, or panel-mounted. It features a large, easy-to-read four-line VFD display and intuitive menu-driven software.

Suitable for Multiple Applications

The robustness and long-term measurement reliability of the DSP4000 system make it suitable for a number of applications where traditional sensors are poorly suited. Such applications include DO measurements in continuous perfusion bioreactors, O2 and CO2 headspace measurements in beverage filling operations, in-line pH monitoring of chromatography and media prep operations, continuous in-situ monitoring of dissolved oxygen concentrations in environmental waterways, etc.



Multiple Sensor Formats

For bioreactor applications, sensors may be incorporated into 316 stainless steel probes fully compatible with standard port fittings and sterilization procedures. For downstream bioprocess applications, sensors can be incorporated into flow cells and sanitary fittings. Peel-and-stick sensors increase the flexibility of the technology for many other applications, including in situ process monitoring of disposable bioprocess vessels. Custom configurations are also available; our technical experts are happy to discuss potential new formats for our versatile sensing technology.

Custom Configurations

The DSP4000 can be ordered pre-set for any of the available Polestar sensing elements. It may also be customised for use with other fluorescent and/or colorimetric chemistries, such as dual excitation fluorescence measurements, two-wavelength monitoring of optical adsorption and/or scattered light attenuation, or even multi-wavelength luminescent detection. Call PTI PACIFIC and talk with our design engineers about your custom application.

PRODUCT SPECIFICATIONS	
Enclosure/Power	
Operator Interface	4-line VFD Display, 8 tactile keys
¼ DIN Dimensions (HxWxD)	16 x 16 x 15 cm.
Max Depth – panel mounted	15 cm.
Mounting	Panel, Pipe, or Wall
Material	Polycarbonate, NEMA 12/4X, IP 65
Weight	2.2 kg.
Ratings/Approvals	CE compliant; NEMA 12/4X, IP 65
Power	240V, 0.8A 60 Hz
Environmental	
Storage Temperature	-40 to 70°C (-40 to 158°F)
Ambient Operating Range	-10 to 50°C (-14 to 122°F)
Relative Humidity	0 to 95%
Outputs	
Analogue output	16-bit isolated 4-20 mA. 10-300 V
Analogue output scaling	Used defined
Digital output protocols	RS232, Modbus, Profibus, Hart (4-20)
Inputs	
Sensor	1 channel (customer choice)
Temperature	PT100 RTD; 10K Thermistor; 4-20 mA signal; manual
Pressure	4-20 mA signal; manual