

Four-Channel Free Radical Analyzer with Lab-Trax4/16



- Real-time detection using electrochemical microsensors
- Integrated system - includes sensors and start-up kit
- Measure up to 4 species in the same preparation
- Wide dynamic range for detection
 - **Details**
 - Current measurement range from 300 fA to 10 μ A (four ranges) permits wide dynamic range for detection * Wide bandwidth allows recording of fast events * Measure nitric oxide from < 0.3 nM to 100 μ M * Measure hydrogen peroxide < 10 nM to 100 mM * Measure hydrogen sulfide * Measure glucose * Measure oxygen from 0.1% to 100% * Isolated architecture allows Lab-Trax interface to simultaneously measure free radical and independent analog data (i.e., ECG, BP, etc.) data on any channel.
 - **Real-time detection**
 - Real-time detection and measurement of a variety of redox-reactive species is fast and easy using the electrochemical (amperometric) detection principle employed in the new TBR4100. This optically isolated four-channel free radical analyzer has ultra low noise and independently operated channels.
 - **Measure multiple species**
 - For use with WPI's wide range of nitric oxide, hydrogen peroxide, hydrogen sulfide and oxygen sensors, the TBR4100 can measure four different species simultaneously in the same preparation. Simply plug a sensor into any one of the input channels on the front panel and select the current range. Poise voltage can be

selected from a range of values tuned for optimal response from WPI sensors. An independent output for real-time monitoring of temperature is also included.

- **Data acquisition**

- The TBR4100 analyzer utilizes PC-based data acquisition via our Lab-Trax interface; data traces are displayed and recorded in real-time. The LabScribe software comes pre-configured for single or multiple electrode recording; filters, gains, and smoothing are all set for optimal results. Data can be viewed making adjustments to smoothing and filter settings without affecting the original stored raw data. Electrode calibration from multiple concentration readings can be input into the software's Multipoint Calibration utility quickly provides a plot and slope calculation for electrode sensitivity determination. Alternately, the Lab-Trax T series data interface can be used for providing simultaneous acquisition of Free Radical data along with other physiological data (ECG, HR, BP, etc.) as each of the four input channels has its own independent input amplifier, filters, and 24-bit converter.

- **Turnkey systems**

- TBR4100-416 includes [TBR4100 analyzer](#) and power cord, **Lab-Trax-4/16** data acquisition system and USB cable, 4 BNC cables, 3 electrode adapter cables, 1 temperature probe, 2 sensors of your choice, and sensor start-up kit(s), if applicable.
- For more information on Lab-Trax, including screen shots, [see the article](#). For more information on features available in the Data-Trax software for Lab-Trax (now called LabScribe), [see the article](#).

Power	100 ~ 240 VAC, 50-60 Hz,
Operating Temperature (ambient)	0 - 50°C (32 - 122°F)
Operating Humidity (ambient)	15 - 70% RH non-condensing
Warm up Time	
Dimensions	135 X 419 X 217 mm (5.25" X 16.5" X 8.16")
Weight	1.35 kg (3 lb)
Display Functions	18 mm (0.7") LCD readout, 4.5 digit Polarization Voltage (mV) Current input (nA, μ A)
Controls	Power (on/off) Current Input Range Polarization Voltage
Analog Output Range	+/- 10 V (continuous)
Analog Output Impedance	10 kohm
Channel to Channel Isolation	>10 Gohm
Channel to Output Isolation	>10 Gohm
Power Supply to AC Line Isolation	>100 Mohm
Analog Output Drift	
Temperature Input: Number of Channels	1
Temperature Input: Sensing Element	Platinum RTD, 1000 Ohm
Temperature Input: Range	0-100°C
Temperature Input: Accuracy	+/- 1°C
Temperature Input: Resolution	0.1°C
Temperature Input: Analog Output	31.25 mV/°C (continuous)
Amperometric Input: Number of Amperometric Channels	4
Amperometric Input: Signal Bandwidth	0-3 Hz
Amperometric Input: Polarization Voltage (selectable via rotary switch) Nitric Oxide	865 mV
Amperometric Input: Polarization Voltage (selectable via rotary switch) Hydrogen Sulfide	150 mV
Amperometric Input: Polarization Voltage (selectable via rotary switch) Hydrogen Peroxide	450 mV
Amperometric Input: Polarization Voltage (selectable via rotary switch) Glucose	600 mV
Amperometric Input: Polarization Voltage (selectable via rotary switch) Oxygen	700 mV
Amperometric Input: Polarization Voltage (selectable via rotary switch) ADJ (user adjustable)	+/- 2500 mV
Polarization Voltage Accuracy	+/- 5 mV

Polarization Voltage Display Resolution	+/- 1mV
Current measurement Performance: Range	+/- 10 Na, +/- 100 nA, +/- 1 ÅµA, +/- 10 ÅµA
Current measurement Performance: Analog Output	1 mV / 1 pA, 1 mV / 10pA, 1 mV / 100pA, 1 mV / 1ÅµA
Current measurement Performance: Noise @ 3Hz *	< 1 pA, < 7 pA, < 70 pA, < 700 pA
Current measurement Performance: Noise @ 0.3 Hz *	< 0.3 pA, < 3 pA, < 30 pA, < 300 pA
Notes:	*Instrument performance is measured as the (max-min) over 20 seconds period with open input. Typical values are given at 3 Hz and 0.3 Hz bandwidth.
Typical sensor performance with TBR4100: ISO-NOPF100 noise	0.2 nM NO (
Notes:	**Sensor noise is measured as the (max-min) over a 20 seconds period with the sensor immersed in 0.1 M CuCl2 solution.