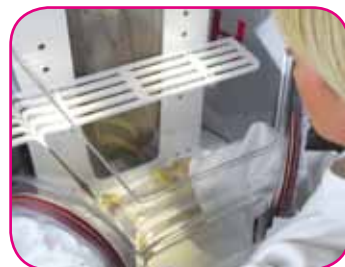


Fibre-Optic-Based Biosensors and Imaging



Colony Counting
• GelCount™

Hypoxia Workstation
• Hypoxy Lab™

Tissue Monitoring
• Oxygen Monitors
• Blood Flow Monitors

GelCount™

Automated Mammalian Cell Colony Counter for Adherent or Non-Adherent Mammalian Cell Colony Forming Assays

GelCount™ is an innovative, bench top system for counting both stained, adherent colonies and unstained, non-adherent colonies in 3-D media.



Proven results in :

- Radiation Biology
- Chemotherapy
- Drug Discovery
- Toxicology

Introduction

The Colony Forming Assay is universally recognized as the gold standard for measuring the effects of radiation, chemotherapeutic drugs and other agents on cell viability. However, manually counting the resulting cell colonies is a thankless and laborious task in which consistent objectivity is difficult to achieve.

Applications

Gelcount's inherent versatility enables automated colony counting in a wide range of assays including clonogenic, cell survival, tumour cloning and colony forming assays.



✔ Saves Time, Eliminates Doubt

- Dramatically reduces overall colony counting time.
- Eliminates the factor of human error which often arises from subjective interpretation, bias and fatigue—a particular problem when manually counting under microscopes.

✔ Powerful, 'Intelligent' Image Processing

- CHARM™—Distinguish overlapping colonies, and differentiate real colonies from cell debris.
- High resolution imaging (detect 30µm in diameter).

✔ Flexible and Versatile

- Detect both stained and unstained colonies growing in most types of 3-D media (soft agar, methylcellulose, traditional, and etc.).
- Process up to four multi-well culture plates and up to 24 Petri dishes in a single tray.

✔ Unlocking Powerful New Data

- Excel® compatible outputs include the means and SDs of colony diameter, area, volume, density and 'distance-to-nearest neighbour'. These, as well as actual raw data, are available for each detected colony, providing unparalleled data extraction from every plate.
- Histogram tool provides these data in the form of histograms; providing the user with hitherto unavailable information relating to colony size distribution, colony formation and more.

GelCount™ Specifications



PHYSICAL

Imaging method	High resolution 16-bit greyscale CCD line imager, visible light trans-illumination
Imaging resolution	300 dpi - 2,400 dpi, user selectable
Depth of field	0-5mm effective, above well base
Sample loading method	Removable loading tray, latching into a software-controlled motorized drawer
Plasticware supported	Multi-well plates (6, 12, 24, 48 and 96-well plates with / without lids ; 35, 50 / 60 and 100mm Petri dishes with / without lids ; selected T25 flasks.
Loading tray capacity	Up to 4 multi-well plates ; up to 24 Petri dishes ; up to 8 T25 flasks
PC Interface	USB 2.0 (x2)
Dimensions	155mm x 560mm x 450mm (H x W x D)
Weight	20 kg
Power requirements	100 - 240V ~ 1.5A, 50 - 60 Hz ; 2 x T1.6A fuse
Storage temperature	10 - 40°C
Operating temperature	15 - 30°C
Operating humidity	0 - 70% (non condensing)

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PERFORMANCE

Min. resolvable colony diameter	Approx. 30 µm (at 2,400 dpi image resolution)
Typical acquisition time	12 minutes (four 6-well plates at 1,200 dpi)
Colony detection	CHARM II™ (Compact Hough and Radial Map) image processing algorithm, proprietary to Oxford Optronix Ltd., dedicated to colony detection and size characterization.
Colony types supported	Adherent : stained (methyl blue, crystal violet, or equivalent). Non-adherent in soft agar, methylcellulose or other semi-solid media : unstained or stained (MTT or equivalent).
Counting variability	< 5% for repeated analysis of the same sample
Numerical data output	Automated exportation to Excel® of colony counts, mean colony diameter, area, volume and other 'statistics' per well / dish. Optional 'csv' output of per-colony data and / or statistics histograms.
Image output	Per well / dish or compound bitmap images for general purpose importation / printing. Per well / dish raw images for 'off-line' image analysis and / or archiving.

Hypoxylab™

Precision, Hypoxia Workstation



Delivers Authentic,
Accurate Hypoxia in Minutes

✓ Replicating True Hypoxia

- The only system in the world that uses pO_2 -the absolute measurement of partial pressure of oxygen (mmHg or kPa) to regulate its environment.
- Oxford Optronix recognizes that cells 'see' and react to the partial pressure of oxygen. Implausible to express hypoxia in simple terms of % O_2 only.
- Eliminates significant errors that would otherwise arise from changes in atmospheric pressure and altitude.

✓ Incredibly Fast and Efficient

- Create a fully humidified, temperature and CO_2 controlled, stable Hypoxia environment (pO_2 of 10mmHg) in less than 20 minutes from switch-on.
- It can deliver stable, near-Anoxia conditions (pO_2 less than 1mmHg) in about an hour. (Other systems typically take many hours to days).
- Save time and consuming expensive gases.

✓ Oxygen Measurements From Within Cell Culture Media

- Measure oxygen availability in the microenvironment where cells are actually growing, thereby revealing the oxygen gradient between the chamber environment and the cell layer.
- The OxyLite sensor is a tiny, highly accurate, non-oxygen consuming sensor that can be accurately positioned anywhere within the cell culture to obtain continuous dissolved (partial pressure) oxygen measurements.
- Data are displayed on touchscreen along with chamber pO_2 , CO_2 , temperature and humidity.



✓ Staggering Performance

- Set point values of the partial pressure of oxygen (pO_2) as well as chamber CO_2 , temperature and humidity are controlled via touch-screen display and delivered using digital gas flow controllers and auto-calibrating, state-of-the-art sensors-controlling the partial pressure of Oxygen with an accuracy of 1 mmHg.

✓ Contamination Control

- Built-in HEPA filtration system-constantly scrubs the internal chamber atmosphere ensuring that cultures and media are protected from the risk of contamination.
- Internal humidification within the chamber is delivered using an ultrasound nebulizer rather than just a pan of water, reducing another potential source of contamination.

✓ Integrated Touch-screen

- Through integrated full colour touch-screen provides real-time data in both digital and graphical format.
- The display updates the user with vital information such as actual and set-point values for gas composition, humidity and temperature.
- Timely warnings alert-updates gas availability in each bottle providing the user with advance warning of a bottle change.

✓ Oxygen Profiling

- Automatically cycle through up to eight oxygen profiles.
- Adjust the hypoxia equilibrium in a matter of minutes (rather than hours or days) consuming minimal levels of gas consumption.

✓ Data Logging

- All HypoxyLab parameters are continuously recorded onto internal flash memory and can be exported to a USB flash drive via a port.
- Data files can be analyzed and played back retrospectively using the free LabChart® Reader by ADInstruments

✓ Easy-Entry System

- No need for expensive and complicated air locks and isolation hatches.
- As soon as items are passed through the hatch, sensors rapidly and automatically apply the precise gas composition necessary to maintain steady-state conditions.

HypoxoLab™ Specifications



GENERAL

Gas control	Microprocessor controlled, 3 channel Digital Electronic Flow Controller (DEFC)
Gases	Air, Nitrogen, CO ₂ (4 bar inlet pressure)
Contamination control method	Integrated HEPA filtration
Chamber volume	90L
Chamber working area	approx. 1,300 cm ² / 200 inch ²
Maximum gas flow rate	15L / minute / gas
Arm ports	Cuff and sleeve, gauntlet or bare-hand operation
Transfer hatch	Letterbox with internal flap
Power	Auto-switching 110 - 240V AC 50 / 60 Hz, 500W max
Enclosure	PET-G. Lightweight and easily removable
Colour touch-screen	Integrated
External USB port	Integrated. Supports data recording and firmware upgrades
Internal, powered USB port	Integrated
Physical dimensions	800 mm (H) x 590 mm (W) x 690 mm (D)
Weight	25 Kg / 55 lbs
Operating temperature range(external)	15 - 30°C

OXYGEN

Oxygen control method	Feedback algorithm with auto PID-using DEFC and optical O ₂ sensor
Oxygen control range	0 - 140 mmHg; user programmable via touch-screen
Oxygen calibration	None required
Oxygen accuracy	± 1 mmHg (0 - 20 mmHg) / ± 2 mmHg (20 - 50 mmHg) / ± 5 mmHg (50 - 140 mmHg)
Oxygen resolution	1 mmHg

CARBON DIOXIDE

CO ₂ control method	Feedback algorithm with Auto PID _ using DEFC and IR CO ₂ sensor
CO ₂ control range	0.0 _ 20.0%; user programmable via touch-screen
CO ₂ calibration	Auto
CO ₂ accuracy	± 0.2%
CO ₂ resolution	0.1%

TEMPERATURE

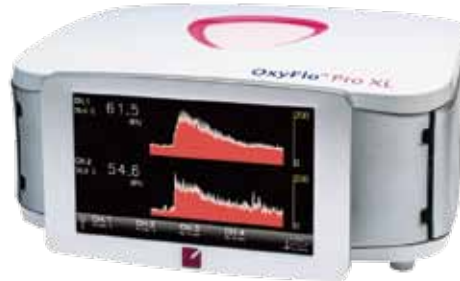
Temp control method	Feedback Auto PID-using Class A Pt sensor
Temp control range	Ambient + 5°C - 42°C ; user programmable via touch-screen
Temp calibration	Auto
Temp accuracy at point of sense	± 0.1°C
Temp resolution	0.05°C
Temp gradient across chamber	± 0.5°C

RELATIVE HUMIDITY

Humidity control method	Nebuliser with auto PID using pre-calibrated capacitive sensor.
Humidity calibration	Pre-calibrated
Humidity control range	Ambient - 85% RH (ambient T = 22°C) ; user programmable via touch-screen
Humidity accuracy	± 2% RH
Humidity resolution	1% RH

OxyFlo™ / OxyFlo™ Pro

Tissue Blood Flow Monitoring



- MCAO / Stroke
- Free Flap / Pedicle Flap Monitoring
- Peripheral Vascular Disorders

✓ Real Time

Continuous measurement of blood flow, ideal for temporal measurements of changing tissue perfusion in acute experimental models.

✓ Art

Intelligent Artefact Rejection filtering enables blood flow measurements to be obtained in dynamic 'moving tissue' applications.

✓ Plug and Play

No calibration procedures or configuration required following one-time probe calibration.

✓ Non-Invasive

In many applications perfusion measurements can be made noninvasively.

✓ Extensible

Add our counterpart OxyLite™ tissue oxygen monitor for multi-parameter in vivo monitoring from a single sensor.

✓ Analogue Data Output

For compatibility with virtually any data recording solution for continuous recording of data traces to PC or Mac platforms.

+ Only for Pro

Touch-Screen Display and Interface

Displays real-time data in both digital and graphical (trace) formats, and provides access to instrument settings.

Multi-Channel Productivity

Available in dual or 4-channel models to support the simultaneous monitoring of blood flow from multiple probes and from multiple tissue sites.

Upgradeable

Dual-channel model can be factory upgraded to a 4-channel device.

Specifications

OxyFlo™		OxyFlo™ Pro
GENERAL		
Dimensions	95mm (H) x 290mm (W) x 260mm (D)	150mm (H) x 310mm (W)x 280mm (D)
Weight	2kg / 4.51lbs	4kg / 9lbs
Operating temperature	10 - 30°C	
Operating humidity	0 - 70% (non-condensing)	
Power requirements	VAC 100 - 240V, 50 - 60Hz, 30W max	External PSU (100-240V/50-60Hz), 40W max
Fuse rating	2 x T1.6A	Not applicable
Number of sensors supported / Number of channels	1	2
Display	40 character alphanumeric OLED	High contrast 800 x 480 LCD touch-screen
Instrument configuration	Via function button at rear	Via touch-screen display
Analogue voltage outputs	2 x male BNC connectors (2 outputs)	1 x 15 - pin D-type (4 outputs)
Laser type	Temperature-stabilized semi-conductor laser diode	
Laser wavelength	830 ± 10nm	
Laser classification	Class 1 (EN 60825-1 : 1994, 21 CFR 1040.10 and 1040.11)	
PERFORMANCE		
Mode of operation	Laser Doppler flowmetry	
Measurement units (displayed)	0 - 9999 BPU (blood perfusion units)	
Stability of reading	± 5%	
Sampling rate	200Hz	
Measurement averaging	200ms (Flow) ; 5ms (Raw) ; 5s (ART) ; 200ms (Backscatter), rolling	
Display update interval (numerical)	2s (5s rolling averaged)	
Probe identification	Automatic ; monitor stores one-time calibration	
Probe calibration	Factory or user-calibrated using Oxford Optronix motility standard	
Probe shelf-life	Unlimited	
Zeroing	Automatic, controlled	
Default analogue data output range	0 - 5V (= 0-5000 BPU or 0-100% Backscatter)	
Analogue data output rate	65Hz	

OxyLite™ / OxyLite™ Pro

In vivo and In vitro Oxygen Monitoring



- Hypoxic Tissue Culture
- Tissue Engineering
- Hypoxia / Ischemia in Tissues

✓ Outstanding Sensitivity

optical fluorescence technology provides superior sensitivity across the physiologically relevant pO_2 range (0-200 mmHg).

✓ Zero Oxygen Consumption

innately suitable for continuous oxygen measurements even under conditions of hypoxia.

✓ Absolute Units

pO_2 data are provided in units of mmHg or kPa.

✓ Real Time

20-30s response time for real-time oxygen environment information.

✓ In vivo and In vitro Applications

equally well suited to in vitro or in vivo applications for dissolved oxygen / pO_2 monitoring.

✓ Temperature Compensation

automatic compensation of pO_2 measurement when using combined oxygen / temp sensors.

✓ Analogue Data Output

for compatibility with virtually any data recording solution for continuous recording of data traces to PC or Mac platforms.

+ Only for Pro

Touch-Screen Display and Interface

Displays real-time data in both digital and graphical (trace) formats, and provides access to instrument settings.

Built-in Temperature Compensation

Automatic temperature compensation of the pO_2 measurement through optional, integrated temperature sensors.

Multi-Channel Productivity

Available in dual or 4-channel models to suit all needs including the simultaneous monitoring of oxygen from multiple tissue sites or multiple in vitro samples.

Upgradeable

The OxyLite™ Pro dual-channel model can be factory upgraded to a 4-channel device.

Specifications

	OxyLite™	OxyLite™ Pro
GENERAL		
Dimensions	95mm (H) x 290mm (W) x 260mm (D)	150mm (H) x 310mm (W) x 280mm (D)
Weight	2kg / 4.51lbs	4kg / 9lbs
Operating temperature	10 - 30°C	
Operating humidity	0 - 70% (non-condensing)	
Power requirements	VAC 100 - 240V, 50 - 60Hz, 30W max	External PSU (100 - 240V / 50-60Hz), 40W max
Fuse rating	2 x T1.6A	Not applicable
Number of sensors supported / Number of channels	1	2
Display	40 character alphanumeric OLED	High contrast 800 x 480 LCD touch-screen
Instrument configuration	Via function button at rear	Via touch-screen display
Analogue voltage outputs	2 x male BNC connectors (2 outputs)	1 x 15-pin D-type (4 outputs)
LED excitation wavelength	525nm	
Luminescence wavelength	650nm	
PERFORMANCE		
Mode of operation	Luminescence decay lifetime (pO ₂) / T-type thermocouple or manual user input (temperature)	
Measurement units (displayed)	mmHg or kPa / °C	
Measurement range	0 - 200mmHg ; 0 - 26.6kPa / 0 - 50°C	
Measurement resolution	0.1mmHg / 0.1°C	
Measurement averaging	Oxygen: ± 0.7mmHg (0 - 7mmHg) ± 10% of reading (7 - 150mmHg) ± 15% of reading (150 - 200mmHg) Temp: ± 0.2°C	
Measurement response time	< 20s (standard oxygen sensor) / < 2s (temperature)	
Measurement sampling rate	1Hz (user definable on OxyLite Pro models)	
Measurement acquisition time	1s	
Measurement averaging	5s, rolling	
Display update interval (numerical)	2s (5s rolling averaged)	
Validated temp compensation range	10 - 45°C	
Sensor identification	Automatic; integrated connector EEPROM	
Sensor calibration	Factory pre-calibration (unique per sensor); valid 6 months	
Sensor shelf-life	2 years from factory calibration (used or unused)	
Sensor longevity	48 hours accumulated usage at default sampling rate	
Sensor data output range	0 - 5V (0 - 200mmHg / 0 - 50°C) (default)	
Analogue data output rate	1Hz	



(주)바이오디

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