



# YSI Life Sciences

PRODUCTS & SOLUTIONS



a xylem brand

**Life Sciences**  
Data for Life.™



Thank you for your interest in YSI Life Sciences products. This catalogue provides a comprehensive overview of our laboratory and process instruments and accessories. From our gold standard biochemistry analyzers and online monitoring systems to our family of laboratory meters and sensors, YSI offers a wide range of analytical solutions to meet your laboratory and process analytical needs.

With over 40 years of providing rapid, accurate analytical instruments, YSI Life Sciences has established a legacy of expertise in various industrial applications, including bioprocess monitoring and control, food and beverage, biofuels and renewable energy and medical and physiological research. Our laboratory and process analytical solutions have been designed to help make your job easier through reliable, accurate and easy-to-use instruments.

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YSI Life Sciences is here to support you. Our knowledgeable customer service and technical support staff can help with any instrument or application questions you may have.

If you have any comments, questions or feedback, please let me know. Your input is highly valued.

*William Miller*

William Miller  
*YSI Life Sciences, Product Manager*

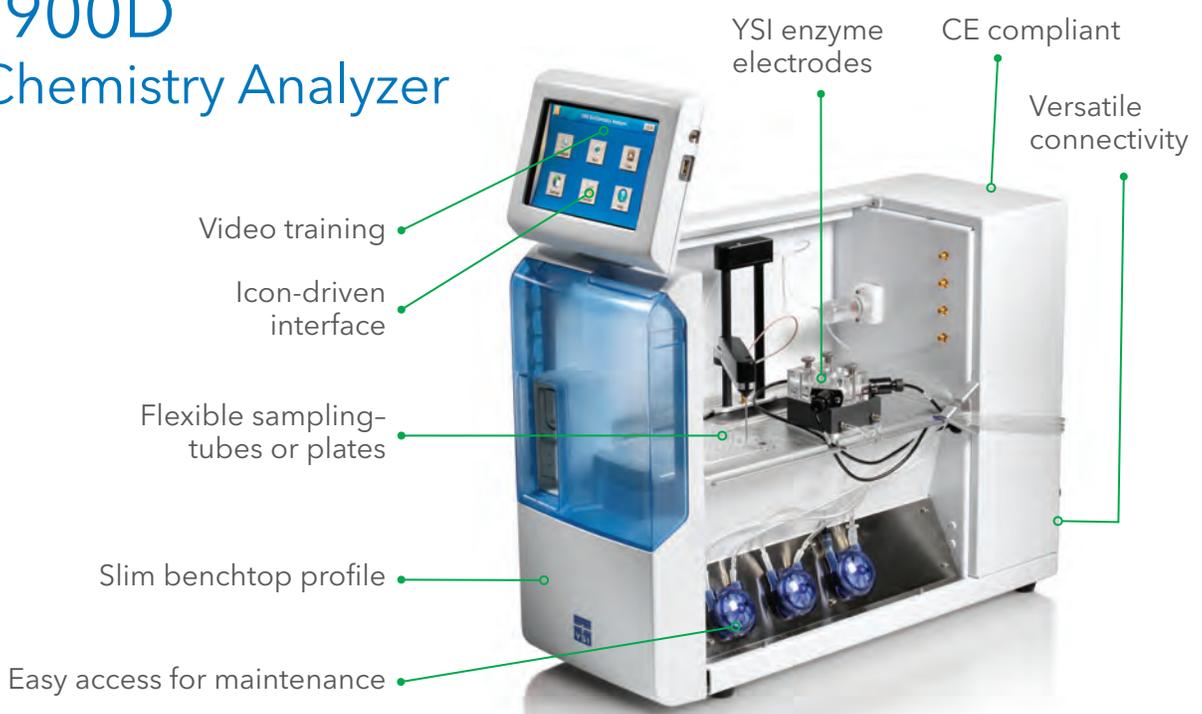
# YSI 2900 Series Biochemistry Analyzers

The key to generating analyte-specific results in 60 seconds or less is YSI's innovative biosensor technology. Using the inherent specificity of enzymes for a single target analyte, YSI's proprietary immobilized enzyme electrodes allow a rapid, accurate, and largely interference-free measurement to be made in about a minute. The unique fluidics and chamber design resist clogging - even at high cell densities.

Fully modular and with a range of upgrades available, the YSI 2900 and 2950 feature an intuitive graphical user interface and a touch screen display. This makes 2900 Series analyzers the easiest to use and most cost effective way to measure the following chemistries in a wide range of applications:

Glucose	Ammonium*	Methanol	Choline
Lactate	Potassium*	Sucrose	Glycerol
Glutamine	Xylose	Galactose	Hydrogen peroxide
Glutamate	Ethanol	Lactose	*YSI 2950

## YSI 2900D Dual Chemistry Analyzer

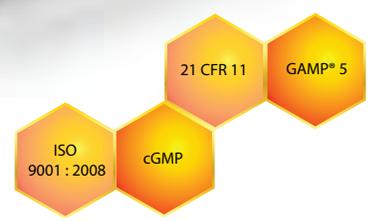


**Versatile**  
Configurable for > 10 chemistries - each in under 1 minute

**Analyte-specific results**  
Even in complex matrices

**Modular**  
Expandable from 2 to 6 chemistries with the YSI 2950

**Anti-clogging fluidics and chamber design**  
Measure high cell density samples with ease

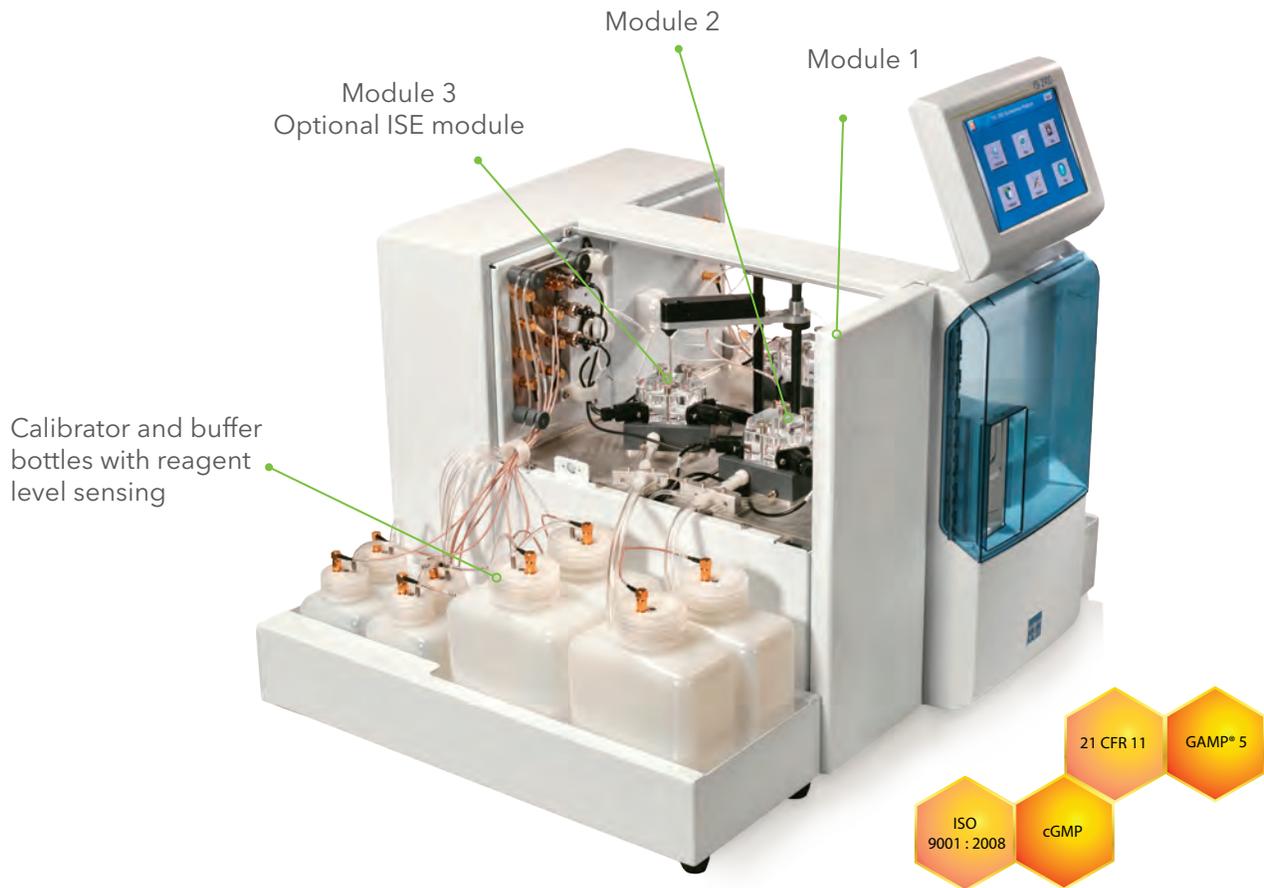


 [ysi.com/lifesciences](http://ysi.com/lifesciences)

# YSI 2900 Series Biochemistry Analyzers

The YSI 2900 Series is a flexible, modular platform with a range of configurations, options, and accessories to meet your lab needs. The base platform is the YSI 2900D. Also available is the YSI 2950 platform, configurable with up to 3 sensor modules capable of measuring up to 6 chemistries. Module 3 may be configured for biosensor or ISE measurements.

## YSI 2950D Multi-Chemistry Analyzer



### Printer Option

If you need a hard copy or printout of your results, an optional thermal printer is available. Of course, your data can also be retrieved electronically.

### Tube Holders

The 2900 Series can accept a wide range of sample holders including any standard 96 well, 4, 8 and 24 place test tube holders and microcentrifuge tubes.

### Plate Sealers

Evaporation of volatile analytes like methanol or ethanol is not a worry - the sipper needle is capable of piercing and sampling from a range of films available to seal 96 well plates.

## Features & Benefits

Features	Benefits
Icon-driven user interface with touchscreen	Easy to learn
Data download options	Save data on a memory stick, send it over the network, or access it in a database anytime
Onboard training videos	Minimizes operator learning curve
Multiple sample processing options	Simultaneous high-throughput analysis, stat sampling and online monitoring
Proprietary Enzyme Electrode	Fast, accurate, and analyte-specific results
Short, wide aspiration path with proprietary chamber measurement system	Highly resistant to clogging, handles the highest cell counts without pretreatment
Uses biological separation technology	No hazardous chromatography solvents to dispose of
Slim modular design	Easily expand analytes or chemistries, and multiple units use much less bench space
Connect with OPC, ethernet, USB, RS232 to computer or other instruments and systems	Ease and flexibility of connectivity
Results automatically saved in searchable database	Multiple convenient methods for data retrieval
21 CFR, Part 11 Compliant	Assures electronic records integrity for cGMP applications

## Configurations & Accessories

Instrument	Modules	Chemistries	Field Upgrade?
2900 D	X	2	No*
2950 D-0	X	2	Yes
2950 D-1	X X	4	Yes
2950 D-2	X X X	6	Yes
2950 D-3	X X X	6	Yes
2950 D-4	X X	4	Yes

X Biosensor Module X ISE Module

\*2900D to 2950 platform upgraded at an authorized service center



## Technical Specifications

Specifications	
Aspirated Sample Volume	User-defined from 10 to 50 µl
Analysis Time	60 seconds
Precision	Application specific, typical CV <2%
Linearity	+/- 5% Cal value to maximum
Dimensions	YSI 2900: 8"w x 20.5"d x 15.75"h 20.3cm w x 52.1cm d x 40cm h YSI 2950: 14"w x 20.5"d x 15.75"h 35.6cm w x 52.1cm d x 40cm h Bottle rack adds 9" (22.9cm)
Working Environment	15 to 35° C ambient temperature, 10 to 75% relative humidity (noncondensing)
Power Requirements	100-120 VAC or 220-240 VAC, 50-60 Hz, 50 Watts nominal
Regulatory Compliance	CE, RoHS
Automation	Up to 96 samples
Weight	YSI 2900: 28 lbs./12.7 kg YSI 2950: 39 lbs./17.7 kg Each without bottle rack

## Commonly Used Applications

Chemistries	Bioprocess Monitoring	Food and Beverage	Medical Research
Glucose	X	X	X
Lactate	X	X	X
Glutamine	X	x	x
Glutamate	X	X	x
Ammonium	X	x	
Potassium	X	x	x
Xylose	X		x
Ethanol	X	X	x
Methanol	X		x
Sucrose	x	X	x
Galactose	x		x
Lactose	x	X	x
Choline		X	x
Glycerol	X	x	x
Hydrogen peroxide		x	x

X Primary application    x Secondary application

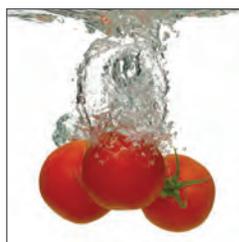
# Applications and Measurement Expertise

A wide range of application notes is available online for download.



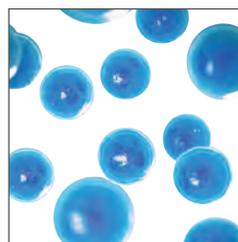
## Bioprocess Monitoring

Bioreactor glucose and lactate. YSI analyzers are an essential part of many stages of bioprocessing, including: R&D, process optimization, scale-up and production. Our analyzers provide critical off-line and on-line process analysis for biopharmaceutical, biofuel, and other industrial biotechnology manufacturing processes.



## Food and Beverage

For years, food technologists have trusted YSI Biochemistry Analyzers for ensuring food and beverage product quality through rapid, precise analysis of carbohydrates, alcohols, aminoacids, and electrolytes.



## Medical Research

From diabetes and cancer research to stem cell therapy and sports physiology applications, YSI's gold standard biosensor technology is recognized as the scientist's analytical technology of choice.

## Typical Results

 [ysi.com/lifesciences](https://www.ysi.com/lifesciences)

Application	Sample Preparation	Typical Results	Analysis Time
Bioreactor glucose	None	CV < 2% at cal pt.	< 1 min.
Lactate/ethanol in ketchup	Diluted 1:1 with reagent water	Lactate CV = 1.8% at 72.5 ppm Ethanol CV = 2.1% at 181.2 ppm	< 1 min.
Whole blood/serum glucose	None	Whole blood CV < 2% at 75 mg/dL  NIST Serum Controls 965A CV 0.5% - 1.1% for 34-292 mg/dL	< 1 min.

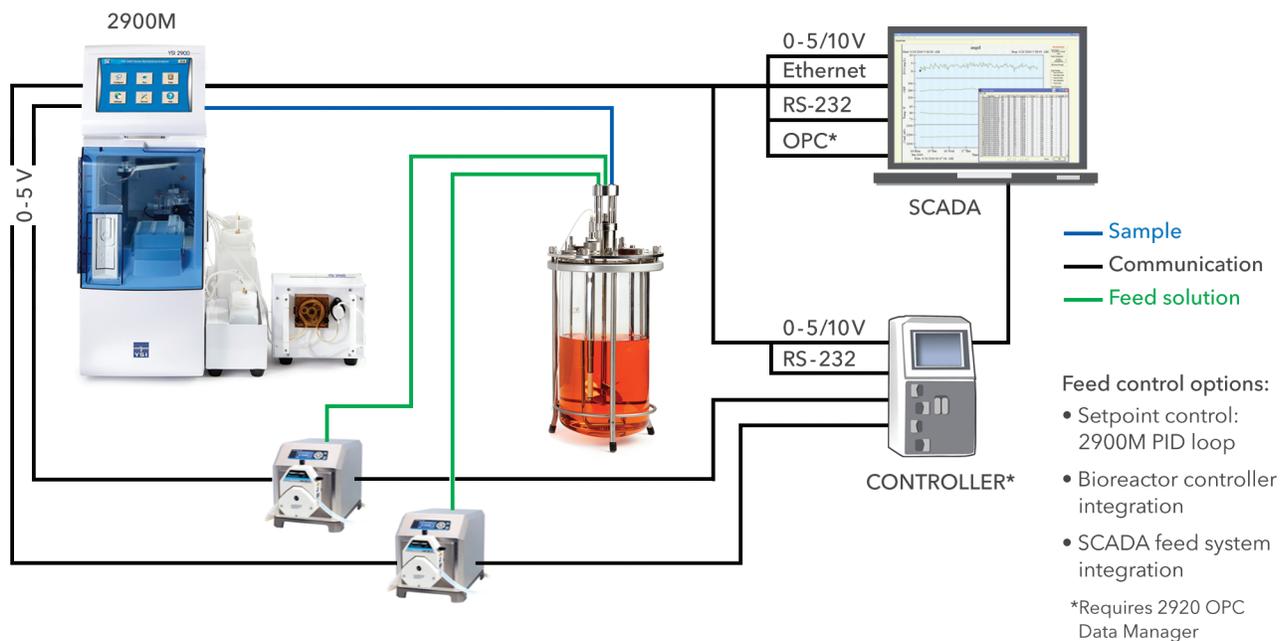
# 2900M/2950M Online Monitoring & Control Systems

Our single-vessel sampling systems are designed to provide simple and reliable online monitoring and control solutions for your bioreactor process. Closed-loop monitoring and control capability are easily achieved for any scale of operation or type of bioreactor.

## YSI 2900M/2950M

- Monitor up to 6 chemistries
- Analytical results in 60 seconds per chemistry
- Touchscreen, icon-driven HMI for easy viewing and menu navigation
- Simultaneous online monitoring and 96-well plate sampling
- Connectivity options for SCADA, DAS or LIMS
- Direct control of up to 2 feed pumps
- Automated cleaning cycle
- Autoclaveable components
- CIP and SIP compatible
- 21 CFR, Part 11 compliant
- GAMP® 5 compliant

Multiple Connectivity Options Include RS232, Analog (0-5V), Ethernet and OPC





## 2900M/2950M Specifications

**Aspirated Sample Volume:** User-defined from 10 to 50  $\mu$ l

**Analysis Time:** 60 seconds

**Precision:** Application specific, typical CV <2%

**Linearity:** +/- 5% Cal value to maximum

**Dimensions:** YSI 2900: 8" w x 20.5" d x 15.75" h | 20.3cm w x 52.1cm d x 40cm h  
 YSI 2950: 14" w x 20.5" d x 15.75" h | 35.6cm w x 52.1cm d x 40cm h  
 Bottle rack adds 9" (22.9cm)

**Weight:** YSI 2900: 28 lbs./12.7 kg | YSI 2950: 39 lbs./17.7 kg. (without bottle rack)

**Working Environment:** 15 to 35° C ambient temperature  
 10 to 75% relative humidity (noncondensing)

**Power Requirements:** 100-120 VAC or 220-240 VAC, 50-60 Hz, 50 Watts nominal

**Regulatory Compliance:** CE, RoHS

**Automation:** Up to 96 samples

21 CFR, Part 11: Compliant

## 2960 Online Monitor Specifications

**Vessel Inputs:** 1-channel Autosampler: 1 input

**Dimensions:** 6.25" l x 4.75" w x 5.50" h

**Weight:** 3.0 lbs

**Power Requirements:** 90 - 264 VAC, 1.5 A, 47 - 63 Hz, 30 Watts nominal

**Regulatory Compliance:** CE, RoHS

**Sample Flow Rate:** 0.1 - 2.5 ml/min (user defined)

**Sample Purge Time:** 30 seconds minimum recommended (user defined)

**Sample Interval:** Time unit: minutes (user defined)

**Vessel Tubing Length:** Maximum recommended length is 3.0 meters (10 feet)

**Antiseptic Cycle:** Time unit: minutes (user defined)

**Tubing ID:** Sample inlet: 0.020" / Peristaltic pump: 0.035" / Pinch valve: 0.03" / Waste: 0.10"

**Tubing Wetted Materials:** Pharmed® tubing (peristaltic pump)  
 C-flex® tubing (pinch valve)  
 Silicone (sample inlet and waste lines)

## I/O Communication Interface Specifications

**Ethernet (FTP):** 1 port

**OPC:** 1 port (2920 OPC Data Manager Module required)

**Serial Communication (RS-232):** 1 port

**Analog (0-5/10V):** Selectable: +10.0 VDC or +5.0 VDC  
 Capable of communicating up to 2 chemistries/vessel

**USB:** 1 port

## Parameters

Glucose  
 Lactate  
 Glutamate  
 Glutamine  
 Galactose  
 Lactose  
 Sucrose  
 Xylose  
 Choline  
 Ethanol  
 Methanol  
 Hydrogen Peroxide  
 Ammonium\*  
 Potassium\*  
 \*2950M only

# 2940/2980

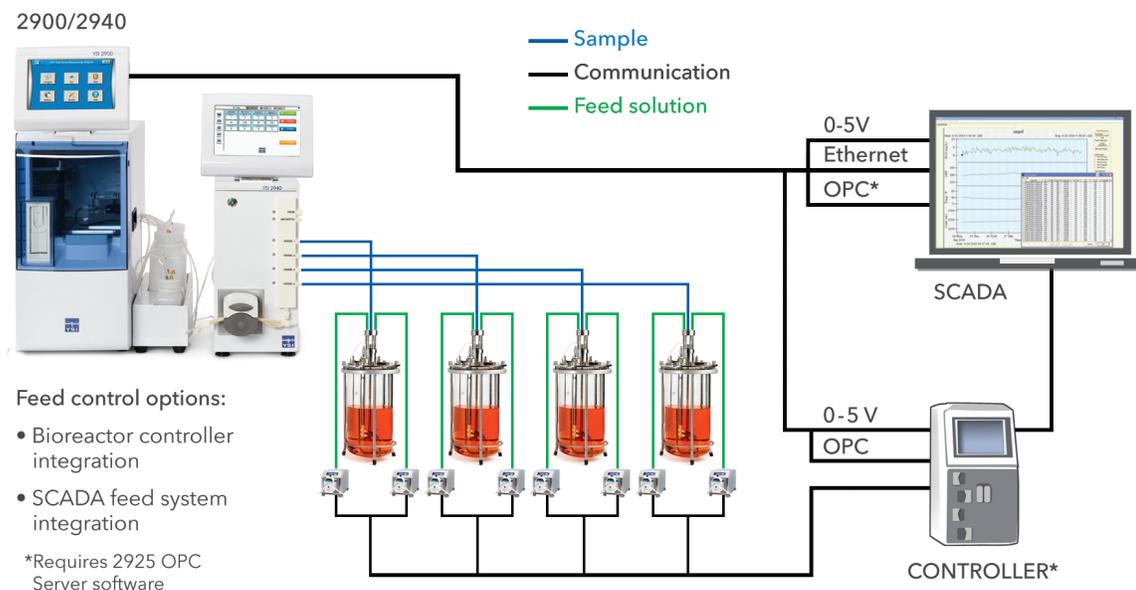
## Multi-Channel Online Monitoring Systems

For multiple and parallel bioreactor systems, our 4-channel and 8-channel sampling systems provide many simple and reliable online monitoring and control solutions for your bioreactor processes. Closed-loop monitoring and control capabilities are easily achieved for any scale of operation or type of bioreactor, including single-use systems.

### YSI 2940/YSI 2980

- Automated, aseptic sampling of up to 8 vessels
- Monitor up to 6 chemistries
- Analytical results in 60 seconds for each chemistry
- Simultaneous online monitoring and 96-well plate sampling
- Automated cleaning cycle
- Autoclaveable components
- CIP and SIP compatible
- Touchscreen, icon-driven HMI for easy viewing and menu navigation
- Connectivity options for SCADA, DAS, LIMS and feed-control systems
- Remote access and control via web-based server
- OPC server option
- 21 CFR, Part 11 compliant

### Multiple Connectivity Options Include Analog (0-5V), Ethernet and OPC





## 2900/2950 Biochemistry Analyzer Specifications

**Aspirated Sample Volume:** User-defined from 10 to 50  $\mu$ l

**Analysis Time:** 60 seconds

**Precision:** Application specific, typical CV <2%

**Linearity:** +/- 5% Cal value to maximum

**Dimensions:** YSI 2900: 8" w x 20.5" d x 15.75" h | 20.3cm w x 52.1cm d x 40cm h  
 YSI 2950: 14" w x 20.5" d x 15.75" h | 35.6cm w x 52.1cm d x 40cm h  
 Bottle rack adds 9" (22.9cm)

**Weight:** YSI 2900: 28 lbs./12.7 kg | YSI 2950: 39 lbs./17.7 kg. (without bottle rack)

**Working Environment:** 15 to 35° C ambient temperature  
 10 to 75% relative humidity (noncondensing)

**Power Requirements:** 100-120 VAC or 220-240 VAC, 50-60 Hz, 50 Watts nominal

**Regulatory Compliance:** CE, RoHS

**Automation:** Up to 96 samples

21 CFR, Part 11: Compliant

## 2940/2980 Online Monitor Systems Specifications

**Vessel Inputs:** 2940: 4 vessel inputs 2980: 8 vessel inputs

**Dimensions:** 2940: 6.0" w x 18.2" h x 11.0" l 2980: 15.2cm w x 46.2cm h x 27.9cm l

**Weight:** 7.26kg (16.0 lbs)

**External Power Requirements:** Auto-sensing power adapter: 100 - 120 VAC/220 - 240 VAC,  
 1.5 A (50/60 Hz  $\pm$  5%)

**Regulatory Compliance:** CE, ETL, UL, RoHS

**Sample Size:** 0.5 - 2.0ml (user defined)

**Sample Flow Rate:** 0.1 - 2.5ml/min (user defined)

**Sample Interval:** Time unit: minutes (user defined)

**Antiseptic Cycle:** User defined flow rate (ml/minute) and time (minutes)

**Vessel Tubing Length:** 1.5 meters (5 ft) (autoclavable and gamma irradiated options)  
 3.0 meters (10 ft) (autoclavable and gamma irradiated options)

**Tubing ID:** Sample inlet: 0.030" / Peristaltic pump: 0.030" / Waste: 0.0625"

**Wetted Materials:** Pharmed® tubing (peristaltic pump)  
 C-flex® and C-flex Ultra® tubing (sample inlet and waste lines)  
 PBT (Sample Manifold)  
 Nylon (connectors)

## I/O Communication Interface Specifications

**Ethernet (TCP/IP):** 2 ports (additional ports if Ethernet hub is used)

**OPC:** 2 ports (additional ports if Ethernet hub is used)

**Analog (+5.0 VDC):** 2940 - 4 ports (1 port per vessel)  
 2940 - 8 ports (1 port per vessel)  
 Each port capable of communicating up to 2 chemistries

**USB:** 4 ports

## Parameters

Glucose  
 Lactate  
 Glutamate  
 Glutamine  
 Galactose  
 Lactose  
 Sucrose  
 Xylose  
 Choline  
 Ethanol  
 Methanol  
 Hydrogen Peroxide  
 Ammonium\*  
 Potassium\*

\*2950 only

# FISP®

## Bioreactor Sampling Probes

YSI proudly offers Flownamics FISP® *in-situ* Sampling Probes as part of our online monitoring systems. FISP sampling probes have been the standard *in-situ* bioreactor and vessel sampling device for over 20 years. Employing ceramic microfiltration technology, FISP sampling probes provide simple, cell-free sampling while ensuring bioreactor or fermentor sterility. FISP sampling probes are available in a variety of sizes to fit most types of bioreactors, including single-use vessels.



### FISP Features

- Aseptic, cell-free vessel sampling
- 0.2 micron filter assures vessel sterile barrier
- Wetted materials provide excellent chemical resistance
- SIP/CIP/Autoclave compatible
- Minimal dead volume provides consistent, accurate sampling
- Resistant to temperatures, pressures, viscosities and shear forces
- For use in lab, pilot and industrial scale vessels
- Compatible with bacterial, yeast, fungal, algal and mammalian cell culture processes
- Animal-derived component free (ADCF) wetted materials
- Membrane meets ISO 10993:5, *in vitro* Cell Cytotoxicity, requirements



### F-series FISP Probe

- Fits 12 & 19mm headplate ports
- Dead volume 0.24 - 0.44 ml, depending on probe length
- Immersion lengths (mm): 120, 200, 310, 410
- Can be used with single-use bioreactors
- Can be used with 1.5 and 2.0 inch sanitary fitting ports (adapter required)



### D-Series FISP Probe

- Fits standard and safety 25mm Ingold ports
- Dead volume 0.24 - 0.44 ml, depending on probe length
- Immersion lengths (mm): 90(standard) and 115 (safety port)

 [ysi.com/fisp-bioreactor-sampling-probes](https://www.ysi.com/fisp-bioreactor-sampling-probes)

# 2920 OPC Data Manager

# 2925 OPC Server



YSI's OPC data management technology seamlessly acquires data from both off-line and on-line YSI analyzers and exports your data into any OPC-enabled SCADA, bioprocess management system or data historian. Our OPC Data Manager and OPC-enabled online monitoring systems feature an internal web server, which allows easy remote access using a web browser. Whether you are networking a single bioreactor system, an entire PD lab or multiple labs or suites, YSI's OPC data management options provide simple connectivity and data management solutions for your process systems.

## 2920 OPC Data Manager

- Add-on module for off-line YSI 2900 Series biochemistry analyzers or YSI 2900M/2950M Online Monitoring & Control Systems
- Fully compliant OPC UA and DA, v. 2.0
- Exports data into any OPC-enabled system
- Internal web server
- Remote access using IP address and web browser
- Performs extensive error tracking and management
- Sleek, modular design
- YSI 2925 OPC Server purchased separately

## 2925 OPC Server Software

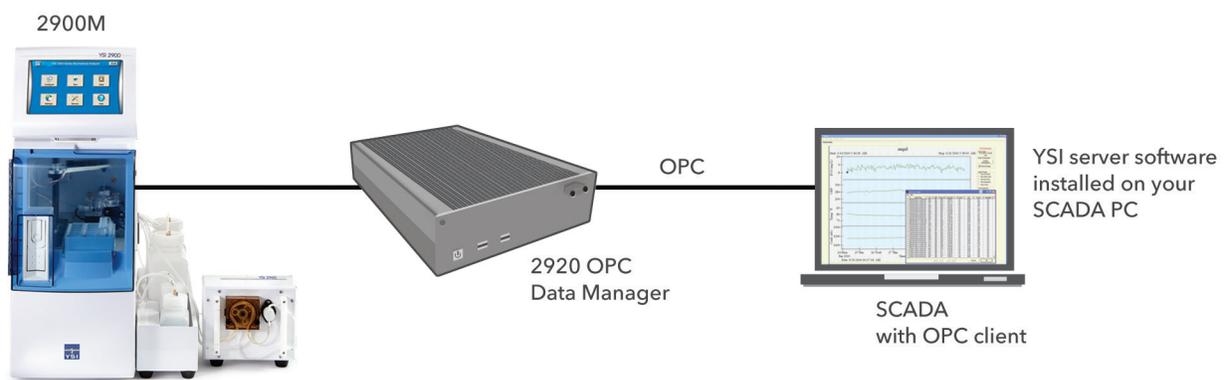
- Software option for YSI 2940 and YSI 2980 only
- Required for YSI 2920 OPC Data Manager
- Allows up to 16 analyzer inputs

## YSI OPC Server System Requirements

- OS: Windows 7/10, 32/64 bit
- Ethernet connectivity
- 512 MB RAM
- 10 MB of available hard disk space
- CD-ROM driver
- Mouse pointing device

Online Monitoring & Control

## YSI OPC Connectivity and Systems Integration



# MultiLab



**MultiLab 4010-3**  
Three channel

## Parameters

### 4010 - 2/3

pH  
ORP  
DO/BOD (optical)  
Conductivity  
Temperature  
ISEs:\*  
Ammonia  
Ammonium  
Bromide  
Cadmium  
Calcium  
Chloride  
Copper  
Cyanide  
Fluoride  
Iodide  
Lead  
Nitrate  
Potassium  
Silver/Sulfide  
Sodium

\*Only with BNC adapter

The YSI MultiLab line includes the 4010-1 (single channel), 4010-2 (dual channel) and 4010-3 (three channel) instruments that provide easy-to-use and -calibrate menu-driven operation ideal for the laboratory.



A BNC adapter is available that covers one of the digital inputs on the 4010-2/3 instruments. This allows for connection of pH electrodes and other ion selective electrodes (ISEs) that feature BNC connection

## 4010-2/3

- Two (4010-2) or three (4010-3) channel input for pH, ORP, DO/BOD, ISEs, or conductivity
- Intelligent digital sensors (IDS) - plug and play sensors
- Use non-IDS (other manufacturer's) pH, ORP or ISE sensors with a simple BNC adapter
- Data storage - 500 data sets in manual mode and 10,000 data sets in automatic logging mode
- Large, easy-to-read graphic color displays
- GLP traceability (smart sensors store serial # and calibration data)
- Antibacterial keypad
- USB connectivity to manage data
- MultiLab Importer (Excel® add-in) included
- 3-year warranty



[ysi.com/4010-2](https://www.ysi.com/4010-2)



[ysi.com/4010-3](https://www.ysi.com/4010-3)



**MultiLab 4010-1**  
Single channel

**Parameters**

**4010 - 1**

- pH
- ORP
- DO/BOD (optical)
- Conductivity
- Temperature

## 4010(P)-1

- One-channel input for pH, ORP, DO/BOD, or conductivity
- Data storage - 500 data sets in manual mode and 5,000 data sets in automatic logging mode
- Large, easy-to-read graphic display
- Intelligent digital sensors (IDS) – plug and play sensors
- GLP traceability (sensors store serial # and calibration data)
- USB connectivity to manage data
- MultiLab Importer (Excel® add-in) included
- 3-year warranty
- Optional integrated printer for increased documentation capability



**ProOBOD Probe**

 [ysi.com/4010-1](https://www.ysi.com/4010-1)



## IDS

The IDS (intelligent digital sensors) automatically store their unique serial number and calibration data. In addition, they also digitally process the measurement signal. The sensors can be moved from instrument to instrument and maintain their calibration data and transmit this information to the new instrument.

- IDS sensors store their own unique ID with serial number and calibration data
- Digital sensor recognition, processing and data transfer
- Includes pH, ORP, conductivity and self-stirring BOD sensors
- BOD probe uses optical dissolved oxygen technology and includes a guarded sensor tip

## Parameters

### 1110, 1310P & 1310

pH  
mV (ORP/Redox)  
Temperature



TruLab 1310

## 1110 and 1310/1310P Single Channel Benchtop Meters

Ideal laboratory instruments for basic, routine pH/mV measurements in the lab. The pH 1110 is an accurate, easy-to-use instrument for repeatable pH or mV measurements in the laboratory. The 1310/1310P offers pH/mV measurements with automatic documentation for GLP compliance.



TruLab 1110

## TruLab pH 1110

- Single channel measurement of pH or mV (ORP) and temperature
- AutoRead function improves repeatability
- Easy-to-read, segmented display
- Easy calibration / adjustable calibration timer
- 1, 2 or 3-point calibration for pH
- BNC input; connect any pH/ORP electrode featuring BNC connection
- 3-year warranty
- Wide selection of electrodes - pH, ORP and temperature probes

## TruLab pH 1310/1310P

- Single channel measurement of pH or mV (ORP) and temperature.
- Easy-to-read backlit graphic display with text menu for easy operation
- Fast data transfer via USB in .csv or ASCII format; optional integrated printer
- MultiLab Importer (Excel® add-in) included
- Continuous Monitoring Control (CMC) function for monitoring the ideal measuring range for pH measurements based on the last calibration
- 1, 2, 3, 4 or 5 point calibration for pH
- 22 stored buffer sets for auto-buffer recognition and easy calibration
- BNC input; connect any pH/ORP electrode featuring BNC connection
- 3-year warranty
- GLP/AQA compliant
- Wide selection of electrodes - pH, ORP and temperature probes

[ysi.com/1110](https://www.ysi.com/1110)

[ysi.com/1310](https://www.ysi.com/1310)



TruLab 1320



TruLab 1320P

## 1320/1320P Dual Channel Benchtop Meter

The 1320 benchtop is an accurate, easy-to-use solution for the measurement of pH/mV/ISE in the laboratory. The 1320 has internal memory and stored data can be sent to a PC via USB. An optional built-in printer is available with the 1320P.

- Simultaneous dual measurement of pH, mV (ORP) or ISE and temperature (2-channel benchtop meter)
- Easy-to-read backlit display with text menu for easy operation
- Fast data transfer via USB in .csv or ASCII format; optional integrated printer
- MultiLab Importer (Excel® add-in) included
- Continuous Monitoring Control (CMC) function for monitoring the ideal measuring range for pH measurements based on the last calibration
- 1, 2, 3, 4 or 5 point calibration for pH
- 2, 3, 4, 5, 6 or 7 point calibration for ISE, also non-linear
- Built-in ISE measurement methods (standard addition, standard subtraction, and others)
- BNC input; connect any pH/ORP/ISE electrode featuring BNC connection
- Direct readout of effective ion concentration
- 3-year warranty
- GLP/AQA compliant
- Wide selection of electrodes - pH, ORP, temperature, and ISEs

### Electrode Information

Multiple electrodes are available as part of the TruLine, Science, and IoLine family of sensors. In addition, the 1320 and 1320P instruments can use any of the 15 accurate, lab-grade TruLine ISEs.

### Parameters

#### 1320P & 1320

- pH
- mV (ORP/Redox)
- Temperature
- ISEs:
  - Ammonia
  - Ammonium
  - Bromide
  - Cadmium
  - Calcium
  - Chloride
  - Copper
  - Cyanide
  - Fluoride
  - Iodide
  - Lead
  - Nitrate
  - Potassium
  - Silver/Sulfide
  - Sodium

 [ysi.com/1320](https://www.ysi.com/1320)

# TruLine ISEs

## Parameters

Ammonia  
Ammonium  
Bromide  
Cadmium  
Calcium  
Chloride  
Copper  
Cyanide  
Fluoride  
Iodide  
Lead  
Nitrate  
Potassium  
Silver/Sulfide  
Sodium



TruLine Family of ISEs



Ammonia ISE

The TruLine series of combination ISEs is designed to meet the most demanding challenges of determining effective ion concentration in the laboratory setting. The TruLine ISEs can be connected to the YSI TruLab 1320(P), the YSI MultiLab 4010-2/3 (with BNC adapter) and other ISE instruments that feature BNC connection. The TruLine ISEs are refillable and feature a built-in double-junction reference system, allowing for a long electrode life and optimum performance in the lab.

- Wide selection of 15 electrodes for 16 different parameters
- 4 sensor technologies - gas sensing, polymer/PVC membrane, solid state, glass sensor
- Integrated reference (i.e. combination ISE)
- BNC connection, 3 ft cable
- Made in the USA
- Reference/electrode fill solution, ISAs, and standards available
- 12 month warranty for solid state, glass sensor, & gas-sensing ISEs
- 9 month warranty for ISEs with polymer/PVC membrane

# pH Electrodes



**TruLine Electrodes**

## TruLine

- Designed for use in typical laboratory applications
- Single-junction electrodes with Ag/AgCl reference system
- Integrated temperature sensor option
- Durable electrodes with gel electrolyte for general use; liquid electrolyte sensors for more critical measurements
- Electrodes with special membranes for unique applications
- BNC connector; compatible with any pH meter that has a BNC input



**IoLine Electrodes**

## IoLine

- Designed for use in Tris Buffer and protein solutions - unique iodine/iodide reference system prevents clogging of the junction
- Reference system and the platinum junction provide excellent stability, fast response times, and high accuracy
- Triple junction design increases measurement security
- Available in a micro version for small sample sizes
- Useful in nearly any application and at a wide-range of temperatures
- BNC connector; compatible with any pH meter that has a BNC input



**Science Electrodes**

## Science

- Designed for use in unique applications that require a particular junction
- Features the Silamid reference system, a unique construction of the Ag/AgCl reference system resulting in a more stable and longer lasting electrode with a fast response
- Double-junction reference and integrated temperature sensor
- Ground-joint junction with a fast electrolyte outflow is specifically designed for samples high in solids or with low ionic strength
- Platinum junction for applications that do not require a rate of electrolyte outflow as fast as the ground-joint
- BNC connector; compatible with any pH meter that has a BNC input

# YSI 5010-W | Wine Bottle Oxygen Probe

Monitoring oxygen levels is crucial during the wine making process and is a key component to maximize wine quality. The YSI 5010-W wine bottle oxygen probe makes it easy to get accurate measurements during bottling. Measuring oxygen ensures minimal oxygen introduction, reassuring the quality of the final product.

The 5010-W is a 6-inch tapered probe designed specifically to fit directly into the neck of a wine bottle. The probe's self-powered stirrer ensures optimal wine sample mixture and flow past the membrane within the small confines of the bottle.



YSI 5010-W and 5100 dissolved oxygen instrument shown measuring wine directly in the bottle.

- Easily replaceable screw-on cap membranes
- 5010-W connects directly to the YSI 5000 and 5100 laboratory DO meters
- Probe length: 6 inches (152.4 mm)
- Probe body tapered to fit into the neck of a wine bottle
- Self-stirring probe eliminates need for stir plates

## 5000 and 5100 Laboratory Benchtop Meters

Ease of use, data integrity, expanded range, enhanced digital capabilities - the YSI 5000 Series is engineered to meet the need of highly accurate and reliable dissolved oxygen measurements.

- Large graphic display and keyboard profile
- Stores 100 data sets
- PC interface
- Built-in barometer for auto-calibration\*
- Bar code compatible\*
- Auto-stabilization, with visual and audio alerts, indicates when the measurement has met user-defined stability criteria

The 5100 instrument makes calibration and measurements easy. With its internal barometer, the 5100 can be accurately calibrated with the push of a button.

\* Only available on the YSI 5100



## YSI 5010-W Probe Specifications

<b>Accuracy</b>	mg/L	±0.1 mg/L or ±2% of reading, whichever is greater
	% air	±2% of the reading or ±2% air saturation, whichever is greater
	temperature	±0.2° C
<b>Range</b>	mg/L	0-20 mg/L or 0-60 mg/L, instrument dependent
	% air	0-200% or 0-600%, instrument dependent
	temperature	-5 to 50°C, operating temperature 0 to 45°C
<b>Resolution</b>	mg/L	0.01 mg/L
	% air	0.1%
	temperature	0.1°C
<b>Response</b>	Typical response at 20°C is 95% of the change within 20 seconds.	

## YSI 5000/5100 Information

Features	Benefits
Menu-driven operation	Ease of use
Compatible with YSI wine bottle and BOD probes	Less investment needed; User-replaceable parts
Large LCD	Easy-to-read from 10 feet
Internal memory for 100 data sets	No manual transcribing
RS-232 interface	Ability to transfer data to a PC
Probe and stir motor powered through instrument	Fewer cables in workspace
Audio & tactile keyboard response	Keystroke confirmation reduces errors
Autostabilization	Alerts to predetermined stable condition
User-upgradable internal software	Ensures upgrade without downtime
Real-time clock	Date-stamped stored data

## Additional YSI 5100-only Features

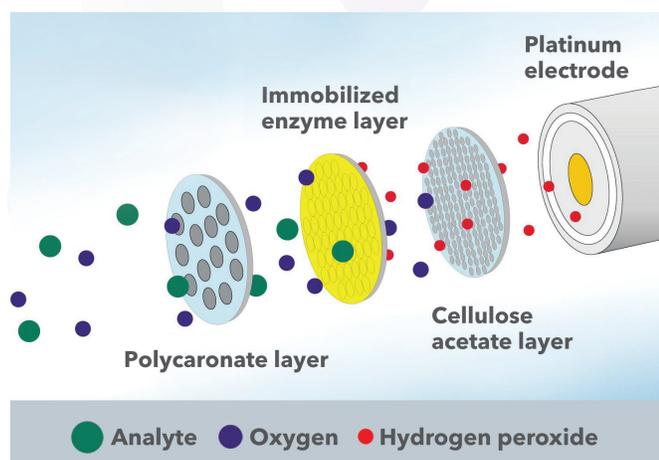
Features	Benefits
Built-in OUR/SOUR software	Eases use with USEPA 503 regulations & for operational control
Internal barometer	No external barometer or look-up charts required for calibration
Automated calibration	Reduces manual steps; saves time
Barcode compatibility	Automatic bottle numbering
Port for computer keyboard	Quick data entry from keyboard

## YSI 5000 & 5100 Specifications (Instrument Only)

<b>Accuracy</b>	mg/L	±0.1% + 1 lsd	<b>Resolution</b>	mg/L	0.01 mg/L
	% air	±0.1% + 1 lsd		% air	0.1%
	temperature	±0.1°C		temperature	0.1°C
<b>Range</b>	mg/L	0-60 mg/L	<b>Power</b>	(4) C-size alkaline batteries or AC	
	% air	0-600%			
	temperature	-5 to +50°C			

# The YSI Biosensor Technology

**...this occurs in a matter of seconds, which results in a sample analysis cycle of 60 seconds or less per chemistry analyzed.**



**Figure 1**

YSI Enzyme Electrode Technology. Enzyme specificity and proprietary membrane attributes allow for rapid, precise and essentially interference-free analysis.

YSI's innovative enzyme electrode technology harnesses the power of enzymatic specificity and catalysis to provide a rapid, precise analytical tool. Enzymes, which are powerful biological catalysts, can accelerate reactions by factors of at least one million. Additionally, enzymes are highly specific for both the reaction catalyzed as well as their choice of substrate. YSI immobilizes substrate-specific enzymes between two selective, interfering membranes and couples the membrane component to a platinum electrode, which results in a highly specific measurement for a given substrate.

To better explain how the enzyme electrode technology works, an example of a common ingredient analysis, i.e., dextrose (D-glucose), will be used. An enzyme probe is fitted with a three-layer membrane containing immobilized glucose oxidase enzyme in the middle layer. The face of the probe, covered by the membrane, is situated in a buffer-filled sample module into which the dextrose sample is injected by the instrument. The dextrose diffuses through the first membrane. When it contacts the immobilized glucose oxidase, it is rapidly oxidized, producing hydrogen peroxide ( $H_2O_2$ ).

$H_2O_2$ , in turn, passes through the inner membrane and is oxidized at the platinum anode, producing electrons. A dynamic equilibrium is achieved when the rate of  $H_2O_2$  production and the rate at which  $H_2O_2$  leaves the immobilized enzyme layer are constant and is indicated by a steady state response. The electron flow is linearly proportional to the steady state  $H_2O_2$  concentration and, therefore, to the concentration of the substrate. All of this occurs in a matter of seconds, which results in a sample analysis cycle of 60 seconds or less per chemistry analyzed (Figure 1).



**Figure 2**

The YSI 2950 Biochemistry Analyzer can simultaneously measure up to six chemistries for raw materials, R&D, in-process and final product sample analysis.

Sample analysis requires little or no preparation due to the YSI Biochemistry Analyzer's unique sample chamber design and membrane characteristics, which makes the enzyme electrode impervious to sample color, pH, turbidity, cell concentrations, salts, proteins, detergents and other low molecular weight interferences. Additionally, only small sample volumes are needed, ranging between 10-50  $\mu\text{l}$ . The YSI 2900 Series Biochemistry Analyzers are highly flexible, modular platforms with a range of configurations, options and accessories to meet the needs of various industry applications and scale of operations (Figure 2).

Up to six different chemistries can be measured simultaneously using automated, high-throughput options, i.e., 96-well plates, stat mode for immediate process sample checks and automated on-line sample analysis. Each analyzer offers an intuitive graphic user interface, onboard training videos and multiple data management options. As compared to other conventional methods, such as HPLC, YSI Biochemistry Analyzers offer a low-cost alternative for both initial capital investment and cost per chemistry test (\$0.10 - \$0.70 USD/sample). Other features include low maintenance requirements and easy product changeover.



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YSI Life Sciences develops and manufactures scientific instruments, sensors and systems that serve a variety of scientific and industrial markets worldwide. YSI has a long history in the life sciences and bioanalytical markets, most notably with our introduction of the world's first commercial whole blood glucose analyzer in 1975. Today there are over 10,000 YSI instruments installed around the world, trusted in critical situations to provide the most accurate data in the shortest time.

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