Aquaculture

APPLICATIONS, CAPABILITIES & SOLUTIONS

YSI

a **xylem** brand

Applications

RAS (recirc systems)
Raceways
Ponds
Cages
Live Haul
Aquariums
Tanks
Research

Capabilities

Dissolved Oxygen
pH
Conductivity
Temperature
ORP
Salinity
Total Dissolved Solids
Velocity
Chlorophyll
Blue-green Algae
Nitrate
Ammonium
Chloride
Direction
Meteorological Sensors
and more

Solutions

Handheld
Continuous Monitoring
& Control
Unattended Buoyed
Systems
UV
Pumping
Ozonation

YSI AQUACULTURE
PROVEN. TRUSTED.

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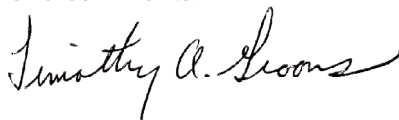
aquaculture

Welcome

Increased environmental regulations, decreasing clean water availability, and increasing costs (to name just a few) are impacting the sustainability of the aquaculture industry.

YSI is here to help. The brand you trust for world-class water quality sampling instrumentation and customer service has expanded its Aquaculture product line.

Our focus is to help you solve these challenges by giving you the innovative, cost-effective products and services that make your job easier and improve the efficiency of your facilities.

For those new to YSI, you may find that direct access to our employees — knowledgeable, customer-focused technical advisers who are here to help you find new and better ways to do your job — is a serious competitive advantage.

Thank you for your interest in YSI and for reviewing our catalog. We encourage you to contact us with any questions, concerns, and comments.

Tim Grooms
Director, Water Quality Products

Professional Plus

The YSI Pro Plus accommodates any combination of Pro Series sensor (parameter) and cable (parameter combination and length). This compact handheld includes simple calibrations, detailed GLP data, screen-specific Help instructions, auto-buffer recognition, mil-spec connectors, re-cal prompts, auto-stable indicators, and security passwords to help make your job easier.

Parameters
Temperature
Conductivity/
Specific conductance
Salinity
TDS
Dissolved oxygen
(electrochemical)
pH
ORP
Ammonium/Ammonia
Chloride
Nitrate

Tougher

- Rubber, over-molded IP-67 waterproof case (even without battery cover)
- 3-year instrument warranty
- 2-year cable warranty
- Rugged cables, sensors, and military-spec connectors
- Drop-tested 1 meter at all angles
- Scratch-resistant lens; viewable with polarized glasses
- Instrument floats
- Backlit display and keypad

Smarter

- 5,000 data sets in manual mode; up to 50,000 in continuous mode (depending on number of parameters)
- Search function filters user-defined data
- Interval or single-event logging
- 100 folder & site list data structure
- Detailed GLP data
- Auto-buffer recognition; up to 6-point cal

Free Data Manager Software

- Easy-to-use software to manage all data studies
- View, print, and export graphical and tabular data
- View and print GLP data
- Quickly configure one or multiple instruments
- Conduct real-time studies at your aquaculture facility

Quatro Cable (605790)
This multiparameter cable allows the measurement of temperature, conductivity, salinity, dissolved oxygen, and any two ISEs – pH, ORP, ammonium/ammonia, nitrate, or chloride.

Is Nitrate Nitrogen harmful?

Modest levels of nitrate nitrogen may be more harmful to aquaculture-raised rainbow trout than producers realize. A team of scientists at the Conservation Fund's Freshwater Institute led by John Davidson documented deformities and significant behavioral changes in rainbow trout (*Oncorhynchus mykiss*) raised in recirculating aquaculture systems (RAS) with nitrate nitrogen concentrations at levels less than one-tenth the recommended maximum nitrate nitrogen level of 1,000 mg/L. They believe the changes were spurred by chronic exposure to nitrate nitrogen. "If fish are stressed based on a water quality parameter that's present, that could impact performance in other ways, like feed conversion or growth rate," Davidson says.

Nitrate nitrogen levels can build up in RAS systems rapidly as fish excrete ammonia nitrogen and biofiltration systems convert the ammonia nitrogen to nitrate and then to nitrate nitrogen. Davidson and his team monitored nitrate nitrogen levels carefully using two standard lab testing protocols, as well as with the YSI Pro Plus handheld, multiparameter meter. He says instant readings from the handheld meter will be important for staying on top of nitrate nitrogen levels in commercial settings.

bit.ly/RASnitrate

Cable options for field

Single port cable	Single port cable with conductivity	Dual port cable	4-port cable	Cable options for lab
60510 - ISE	6051030 - ISE/Cond	6051010 - ISE/ISE	605790 - ISE/ISE/DO/Cond	Lab grade ISE
60520 - DO	6052030 - DO/Cond	6051020 - ISE/DO		605107 - pH
60530 - Cond				605108 - ORP
				605109 - pH/ORP

Order instrument, cables, and sensors separately (kits also available).

ProODO®

WE KNOW™ D.O.°

The ProODO® is the best handheld optical dissolved oxygen instrument on the market. Its combination of versatility, field-worthy durability, and data management is second to none. The ProODO's rugged design is verified with an IP-67 waterproof rating (even without the battery cover); mil-spec connectors; and rigorous drop, cable flex, and strength tests.

Tougher

- Rubber, over-molded IP-67 waterproof case (even without battery cover)
- 3-year instrument warranty
- 2-year cable and probe warranty
- Drop-tested 1 meter at all angles
- Rugged cables and military-spec connectors
- Scratch-resistant lens; viewable with polarized glasses

Smarter

- Optical, luminescent technology eliminates membranes
- Low maintenance - no anode or cathode
- No flow requirement and no interference from hydrogen sulfide or other gases
- 5,000 data sets in manual mode; up to 50,000 in continuous mode
- Expanded DO range of 0-500%; 0-50 mg/L
- Fastest response times available
- 100 folder & site list data structure
- Interval or single-event logging

O·DO®
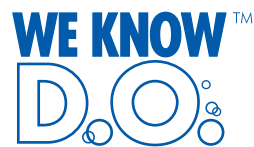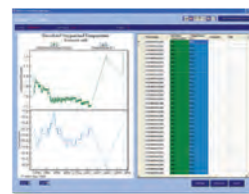
Optical DO

Optical technology eliminates stirring and interferences while reducing the need for calibration and maintenance – saving time and money.

Free Data Manager Software

- Easy-to-use software to manage all your data studies
- View, print, export graphical / tabular data
- View, print GLP data
- Quickly configure one or multiple instruments
- Conduct real-time studies at your aquaculture facility.

Pro2030
Pro1020 and Pro1030

The YSI Pro2030 dissolved oxygen/conductivity instrument provides DO readings automatically compensated for changes in salinity. The internal barometer, Quick Cal feature, and simple interface make getting accurate data extremely simple.

All products share:
- IP67 waterproof rating
- 3-year instrument warranty; 2-year cable
- Quick Cal allows calibrations within minutes
- 50 data-set memory ensures data integrity
- Graphic, backlit display and glow-in-the-dark keypad
- Languages - English, Spanish, French, German

Pro2030
- Proven, super stable conductivity electrode
- Choose either Galvanic or Polarographic DO sensors
- Quickest response times, PE cap membranes

Pro1020
- Choose either Galvanic or Polarographic DO sensors
- Quickest response times, PE cap membranes
- Auto-buffer recognition

Pro1030
- Proven, super-stable conductivity electrode
- Auto-buffer recognition

Pro 2030 Parameters
Temperature
Dissolved oxygen (electrochemical)
Conductivity/ Specific conductance
Salinity
TDS

Pro 1020 Parameters
Temperature
Dissolved oxygen (electrochemical)
pH
ORP
Nitrate
Ammonium/Ammonia
Chloride

Pro 1030 Parameters
Temperature
Conductivity/ Specific conductance
Salinity
TDS
pH
ORP
Nitrate
Ammonium/Ammonia
Chloride

ysi.com/pro2030
ysi.com/pro1020
ysi.com/pro1030

Pro20

The YSI Pro20 dissolved oxygen meter fits the need for a true aquaculture-ready field meter that's simple, easy-to-use, and rugged. Measure DO with the rugged handheld and durable cables within seconds.

- 3-year instrument warranty; 2-year cable
- One Touch Cal allows calibrations within 3 seconds
- 50 data-set memory ensures data integrity
- Graphic, backlit display, and glow-in-the-dark keypad
- Choose either Galvanic or Polarographic sensors
- Quickest response times; easy to change PE cap membranes
- Languages – English, Spanish, French, German
- Internal barometer

Pro20 Parameters
Temperature
Dissolved oxygen (electrochemical)

Pro30 Parameters
Temperature
Conductivity/ Specific conductance
Salinity
TDS

Pro30

The YSI Pro30 conductivity instrument fits the need for an accurate, easy-to-use conductivity, specific conductance, and salinity instrument.

- 3-year instrument warranty; 2-year cable and sensor
- 50 data-set memory ensures data integrity
- Graphic, backlit display, and glow-in-the-dark keypad
- Proven, super-stable conductivity cell built into the cable
- Quick Cal recalls previous cal values
- Languages – English, Spanish, French, German

ysi.com/pro20
ysi.com/pro30

EcoSense

OK, we get it. Sometimes your budget won't allow for a higher priced instrument with more features. So you need a basic instrument to do your job without sacrificing data quality. Our EcoSense® line of products is simple, easy to use, and straight-forward.

pH100A

An economically priced, reliable instrument for the measurement of pH and temperature. Use with the standard pH electrode or with the flat glass electrode to prevent damage in harsh applications.

DO200A

Economical, fast dissolved oxygen measurements with screw-on cap PE membranes that require low stirring. Uses same electrochemical DO technology as other YSI models.

EC300A

Measures conductivity, salinity, TDS, and temperature in a simple, compact handheld.

pH10A

The perfect instrument for economical spot sampling of pH and temperature. Quickly calibrate with up to 3-point auto-cal.

ORP15A

Offers accurate, low-cost measurement of ORP (absolute and relative mV) and temperature.

EC30A

Measures conductivity, TDS, and temperature with an easy, user-replaceable electrode ensuring the instrument is always ready.

**Parameters
pH100A, DO200A
EC300A**

Temperature
Dissolved oxygen (electrochemical)
pH
ORP
Conductivity/
Specific conductance
Salinity
TDS

**Parameters
pH10A, ORP15A
EC30A**

Temperature
pH
ORP (absolute, relative)
Conductivity/
Specific conductance
Salinity
TDS

**Parameters
9300/9500**

Hardness
Ammonia
Nitrate
Nitrite
pH
Copper
Ozone
Chlorine
Alkalinity
Copper
... and more

9300 and 9500

The 9300 and the 9500 both feature a graphic, backlit display; on-screen instructions; a waterproof case; various-diameter sample tube holder; multiple languages; 100+ test options; and direct reading concentrations.

The 9500 has additional features that include a waterproof USB that can also be used for power, 500 data-set memory, and several user-selectable options.

ysi.com/EcoSense
ysi.com/photometers

556

A multiparameter instrument packed with features that make your work easier and more convenient; such as fast response times, simple calibration, waterproof case, large memory capacity, and rechargeable battery option.

- Simultaneously measure and display DO, pH, ORP, conductivity, temperature, salinity, TDS, and barometric pressure (optional)
- IP-67 water proof, impact-resistant case
- 49,000 data-set memory (date and time stamp)
- Compatible with EcoWatch® desktop software
- GLP conforming
- Available with 4-, 10-, or 20-meter cables

IP67 waterproof case

Large LCD with backlight

Longer cable lengths of 12, 25, 50, or 100 feet (3.7, 7.6, 15.2, or 30.5 meters)

Easy-to-use keypad

Adjustable handstrap

Improved cable durability

Expanded DO range of 0-50 mg/L and salinity range of 0-70 ppt

PE membranes for faster response and less stirring

550A

Waterproof, rugged, and reliable, the 550A is designed for the field with innovative field-replace-able DO electrodes, 2,000+ battery life, CE compliance, a 3-year instrument warranty, and 1-year electrode warranty. Uses easy-to-install cap membranes.

Long-term Monitoring with EXO

The EXO sonde platform can continuously monitor water quality with a payload of up to 6 sensors.
It can be used alone or as part of a larger system to provide users with high quality, repeatable data.

EXO's titanium-welded sensors can tolerate the most severe conditions and protect against low DO events and harmful algal blooms.

Parameters
Dissolved oxygen
pH
ORP
Conductivity/ Specific conductance
Salinity
TDS
Blue-green algae
Turbidity
Chlorophyll
Nitrate
Chloride
Ammonium
Temperature
TSS
(total suspended solids)
fDOM

Due to its marine-grade construction and highly effective central wiper, EXO can extend monitoring deployments by up to 25% compared to YSI's legacy sondes.
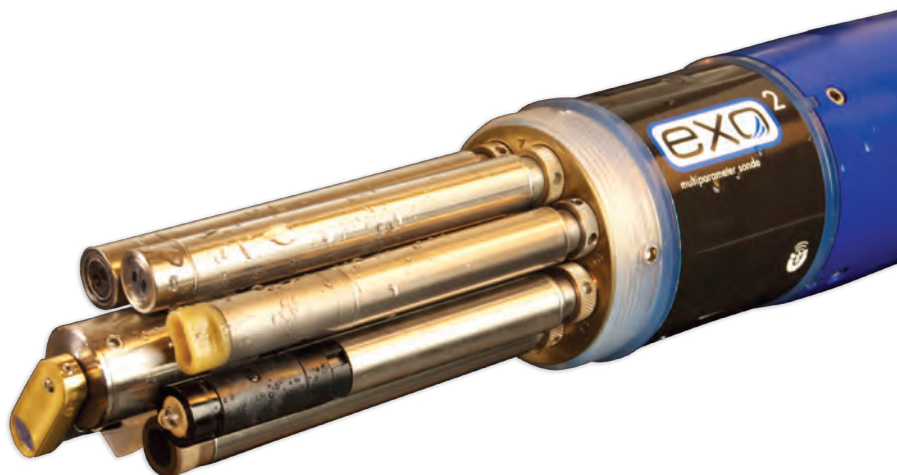
Calibration and Deployment are quick and easy using EXO's user friendly KOR Software.

EXO Optical Dissolved Oxygen - Offers improved accuracy and response time compared to YSI's previous generation of DO sensor technology.

exowater.com

5200A Multiparameter Monitor

Designed specifically for aquaculture systems, the **5200A** integrates process control, feeding, alarming, and data management into one product. Mulitparameter functionality for DO, temp, pH, ORP, conductivity, and automatic salinity compensation. Plus, two configurable inputs for additional sensors and management.

- Ethernet TCP/IP or wireless communications – optional
- Event logging records calibrations, high and low conditions, and more
- Conditional feed timer with Feed Smart™ software included
- Networking capability; can be integrated with 5400 and 5500D monitors
- Flexible dosing and control software
- SMS and e-mail alarming
- Graphic interface function for quick, reliable system-status checks
- Plug-and-play – easy to install, setup, and maintain
- Photo period management
- Control parameters with set points, dosing, or PID functions

Outputs/Timers (included)

- 4 each 10 amp 115 VAC relays (5 amp 230 VAC)
- 4 timers – 10 cascading events with start/duration setting
- 1 Feed Smart channel
- E-mail and/or SMS alarming up to 3 e-mails with Ethernet module or up to 10 e-mails with AquaManager
- Local alarm; configurable to relay

Inputs (included)

- DO, pH, ORP, conductivity, temp
- 2 user-configurable inputs, digital or analog (0 to 1.0 VDC, 0 to 5.0 VDC or 4-20 mA)*
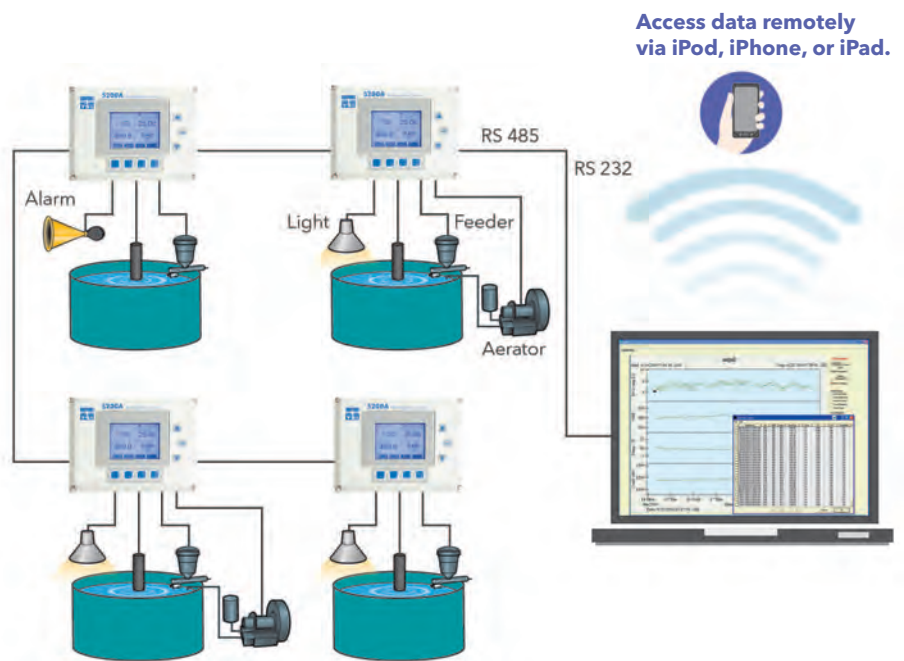
Access data remotely via iPod, iPhone, or iPad.

Example of four monitors individually monitoring and controlling four tanks with direct PC connection. E-mail and SMS alarming is available from network-connected PC running AquaManager.

ysi.com/5200A
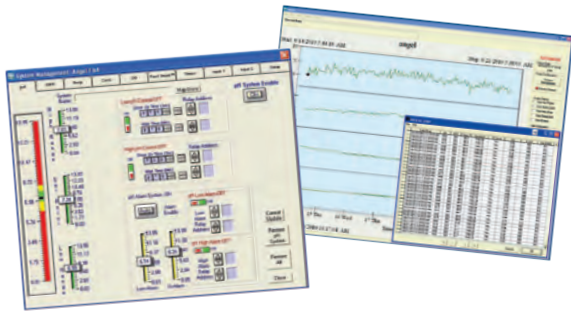
Example of the 5200A system management screen showing set points for pH. The 5400 and 5500D set points screen looks similar. You can view your data instantly in tabular or graphical formats.

AquaManager® Software*

AquaManager desktop software (optional) allows you to control and set up any instrument on the network to view data, set alarming options, and change relays or set points depending on application – conveniently from one central location.

Instantly see an overview of your facility, manage parameter set points, and manage your data in order to make informed operational decisions in real time.

The facility-mapping feature provides an immediate overview of all ponds or tanks indicating their current state.

All parameter and system settings can be managed from the desktop with the AquaManager software.

*Applies to the 5200A, 5400 and 5500D monitors

Feed Smart™ (included)*
Conditional feed timer around the clock

Feed Smart™ software can be used as a basic feed timer or conditional feed timer. Manages feed delivery based on user-selectable inputs for the number of daily feedings, daily feed weights, total biomass, and feed conversion ratios (FCRs) along with parameter control based on water quality values which reduces, or stops, feeding as water quality deteriorates.

- Saves money on feed
- Eliminates excess food deteriorating water quality
- Feed when fish want to eat
- Increase yields
- Interfaces with most auto feeders
- Increase feeding daily based on FCR
- Select when to feed – time periods and days of the week (up to 100 times daily)

In order for issues at your facility to be quickly identified, a visual map can be created to look like your facility. When displayed on a monitor, anyone can see where and when maintenance or action is needed. Real-time data is continually displayed.

5400/5500D MultiDO Monitors

Need a Continuous MultiDO Monitoring and Control instrument designed specifically

The YSI 5400 Continuous Monitor for dissolved oxygen – along with AquaManager software – integrates process control, feeding, alarming, and data management into one product.

5400 and 5500D   Access data remotely

- Ethernet TCP/IP or wireless communications – optional
- Event logging records calibrations, high/low conditions, and more
- Conditional feed timer with Feed Smart software included
- Networking capability up to 32 instruments per communications port or can be integrated with 5200A, 5400, or 5500Ds
- Graphic interface function for quick, reliable system status checks
- Plug-and-play – easy to install, setup, and maintain
- Flexible monitoring and control software
- E-mail and SMS alarming
- Photo period management
- Control parameters with set points, dosing, or PID functions

Outputs/Timers (included)

- 8 relays 10 amp 115 VAC (5 amp 230 VAC)
- 4 timers – 10 cascading events with start/duration setting
- 4 Feed Smart channels
- E-mail and/or SMS alarming up to 3 e-mails with Ethernet module or up to 10 e-mails with AquaManager
- Local alarm; configurable to relay

Inputs (included)

- 4 DO probe inputs
- 4 user-configurable inputs for temp; analog (0 to 1.0 VDC, 0 to 5.0 VDC or 4-20 mA) or digital*
- 2 user-configurable inputs, digital or analog (0 to 1.0 VDC, 0 to 5.0 VDC or 4-20 mA)*

*User-configurable inputs can be used for additional sensors like DO, pH, TGP, ORP, photo period, etc. Some sensors require an additional transmitter.
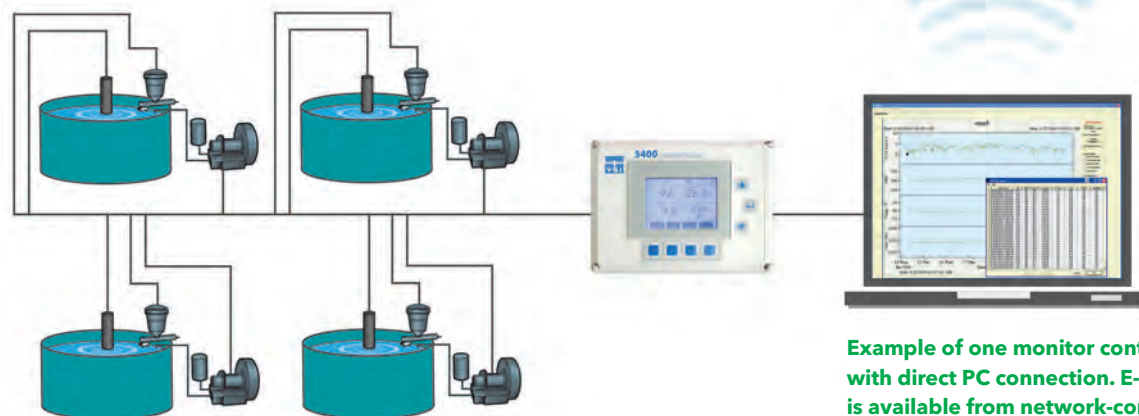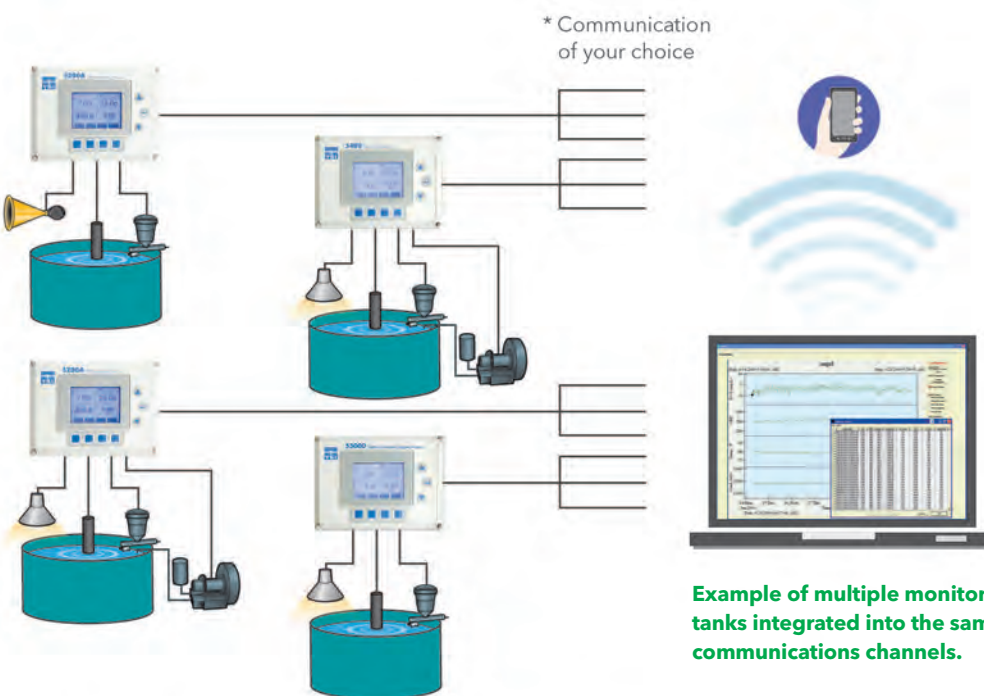

The YSI 5500D Optical DO Monitoring & Control instrument continuously monitors your farming operation's water quality for dissolved oxygen using optical DO technology. Choose 1, 2, or 4 DO channels.

WE KNOW ™
D.O.

Example of one monitor controlling four tanks with direct PC connection. E-mail and SMS alarming is available from network-connected PC running AquaManager.

App

Look for the AquaViewer app in the Apple store. Access data remotely on your iPod, iPhone, or iPad from anywhere. Never be unsure of your operation's success.

* Communication of your choice

Example of multiple monitors individually controlling tanks integrated into the same network with various communications channels.

* IP Network, Wireless, Ethernet, E-mail, SMS Alarm, RS 232

ysi.com/5400
ysi.com/5500D

Offshore Monitoring
and Early Warning Systems

Farming in offshore and open-sea environments requires rugged equipment to withstand the impacts of the harsh natural surroundings.

It also requires robust systems for sending ashore the data you need to keep your fish healthy and protected.
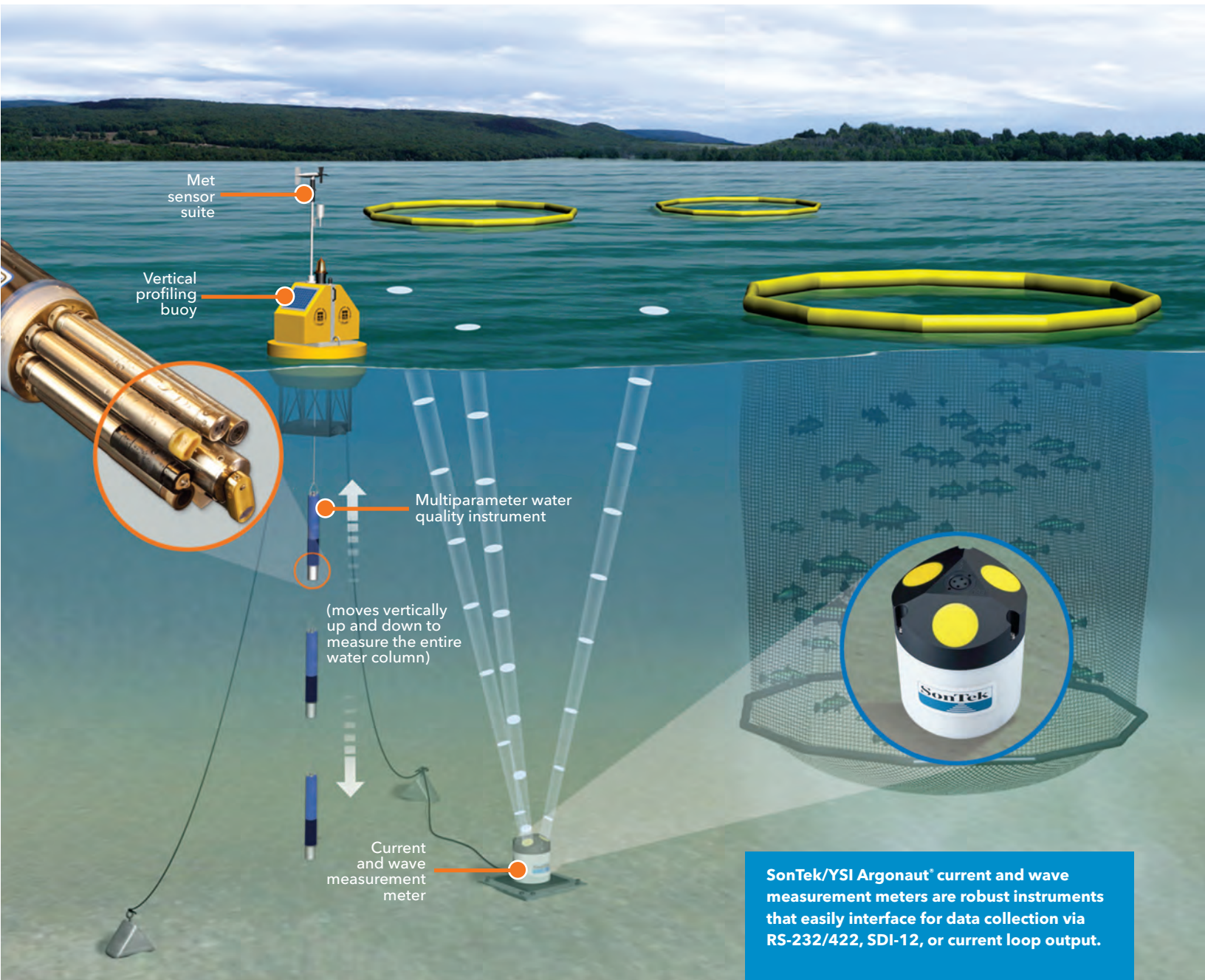
For off-shore or near-shore fish farming, YSI provides a complete monitoring solution. Our systems collect and send vital data to alert against potentially hazardous water quality conditions and continually monitor currents and meteorological conditions.

- Protect your investment with email alarms delivered directly to personnel
- Limit service trips by delivering real-time data back to your office
- Minimize installation and infrastructure costs with a system designed for autonomous operation (generates its own power)

YSI can configure a system to include any number of buoys, weather stations, or fixed mounted stations along with data acquisition via cellular and radio telemetry or web-enabled via EcoNet.

Met sensor suite

Vertical profiling buoy

Multiparameter water quality instrument

(moves vertically up and down to measure the entire water column)

Current and wave measurement meter

SonTek/YSI Argonaut® current and wave measurement meters are robust instruments that easily interface for data collection via RS-232/422, SDI-12, or current loop output.

Watch this system in action at: bit.ly/seacages

Other Xylem Partners
in Aquaculture

AANDERAA — a **xylem** brand

AADI offers real-time monitoring systems for aquaculture.
• monitor growth conditions
• oxygen levels in fish cages
• reference conditions inside cage vs. outside
• monitor cage's flow-through capacity
• integrate data with local control systems
aanderaa.com

WEDECO — a **xylem** brand

Wedeco is a leader in disinfection with ultraviolet light
and water oxidation utilizing ozone.
wedeco.com

FLYGT — a **xylem** brand

Flygt pumps are an ideal solution to facility water circulation,
fish waste removal, and pumps suitable for seawater applications.
flygt.com

GOULDS WATER TECHNOLOGY — a **xylem** brand

Goulds is a leading manufacturer of pumps for a wide range of
applications spanning more than 160 years.
gouldspumps.com

Media

YSI Blog blog.ysi.com

Enter to win a ProODO
Optical Dissolved Oxygen Handheld ysi.com/win

Download The Dissolved Oxygen Handbook –
the definitive guide on DO ysi.com/DOhandbook

Application Notes
ysi.com/applications

WE KNOW D.O.™

ysi.com/weknowDO
View Dissolved Oxygen technology webinars,
videos, selection guides, product spec sheets,
and more at our dissolved oxygen resource page.

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scoop.it/aquaculture

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YouTube
youtube.com/ysiinc

Tumblr
myysi.tumblr.com

Pinterest
pinterest.com/myYSI

What can Xylem do for you?

We're 12,500 people unified in a common purpose: creating innovative solutions to meet our world's water needs. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. We move, treat, analyze, and return water to the environment, and we help people use water efficiently, in their homes, buildings, factories, and farms. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise, backed by a legacy of innovation.

For more information on how Xylem can help you, go to www.xyleminc.com
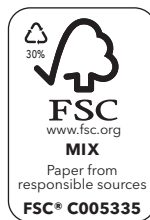
xylem
Let's Solve Water

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responsible sources
FSC® C005335

ECO CALCULATIONS REPORT
YSI, Inc. saved the following resources by selecting U2:XG paper with 30% post-consumer recovered fiber.

trees	energy	greenhouse gas	waste water	solid waste
3	0.9 million BTUs	749 lbs CO_2	1090 gal	69 lbs

U2:XG is FSC-certified, contains 30% post consumer recovered fiber, and is manufactured with electricity in the form of renewable energy.
U2:XG is manufactured by Appleton Coated   www.appletoncoated.com