



YSI *incorporated*

# aquaculture monitoring & control



*Continuous Monitoring & Control*





### Welcome

Whether you need a handheld instrument for spot sampling, a web-based early warning system for sea cages, or a land-based pond monitoring and control system, partnering with YSI provides you high quality data, less down time, and low maintenance costs.

Yet you may find the number one advantage in working with YSI is direct access to our employees– knowledgeable, customer-focused technical advisors that are committed to helping you find new and better ways to do your job.

Thank you for your interest in YSI products. Please contact us if you have any questions, comments or suggestions.

**Tim Grooms**  
Global Business Development Manager

### YSI Locations Worldwide

- 1 San Diego, California, USA
- 2 Baton Rouge, Louisiana, USA
- 3 Yellow Springs, Ohio, USA
- 4 Marion, Massachusetts, USA
- 5 St. Petersburg, Florida, USA
- 6 Logan, Utah, USA
- 7 Hertfordshire, England
- 8 Kingdom of Bahrain
- 9 Tokyo, Japan
- 10 Kawasaki City, Japan
- 11 Beijing, China
- 12 Hong Kong, China
- 13 Gurgaon, India
- 14 Queensland, Australia
- 15 Florianopolis, Brazil
- 16 Abu Dhabi, UAE

## Monitoring & Control

# aquaculture

### Monitors at a Glance

Monitoring and controlling with the 5200A and 5400 is managed locally by the instrument, not at a central PC or device. This provides security that an entire system won't fail.

**Scalability.** User-scalable as your facility needs change, unlike typical PLCs or DCPs. No engineers or programmers needed to change or add to the system!

**Multiparameter capability.** With the ability to measure multiple parameters, you can design a total facility solution.

**Feed management.** Feed Smart™ conditional feed timer software included. Very powerful feeding capabilities interfaces with most auto feeders.

Both instruments have the ability to control many other devices that the operation of your facility may need. In addition, you will have access to quality data (water quality parameters, event logs, etc.) to better manage your operation.

- 2-3 5400, 5200A Networking
- 4-7 Additional Benefits (included & optional)
- 8 Specifications
- 9 How to Order

Recirc, raceways, ponds, cages, livehaul, aquariums, tanks

### Parameters

Dissolved oxygen, pH, conductivity, temperature, ORP, salinity, total dissolved solids, miscellaneous

# Monitoring & control



## 5400

### Parameters

5400 - Dissolved oxygen, temperature, and configurable inputs

5200A - Dissolved oxygen, pH, conductivity, ORP, salinity, temperature, and configurable inputs

Monitor and control continuously

## 5400 Networking



The **5400** is perfectly suited for continuous DO monitoring of multiple locations. Up to 32 instruments per comm port can be configured on one local network with each instrument capable of controlling 4 DO channels plus additional inputs for temp, level, pressure, CO<sub>2</sub>, TGP sensors, and more. Relay outputs can control heaters, chillers, aerators, pumps, lights, feeders, etc. Alarming options include e-mail and SMS from 3 to 10 e-mail addresses depending on configuration.



Example of one 5400 controlling DO and feeding in four tanks.

The 5200A and 5400 are both designed for unattended monitoring situations that include harsh conditions. Both products can be mounted on a wall, a rail, or easily mounted with an outside enclosure.



Either product can be used with the very powerful AquaManager<sup>®</sup> desktop software allowing you to access data and manage system settings from anywhere in the world. In addition, you can receive instant notification on your cell phone if problems occur at your facility. However, each instrument is capable of data and event logging without the need for additional software.

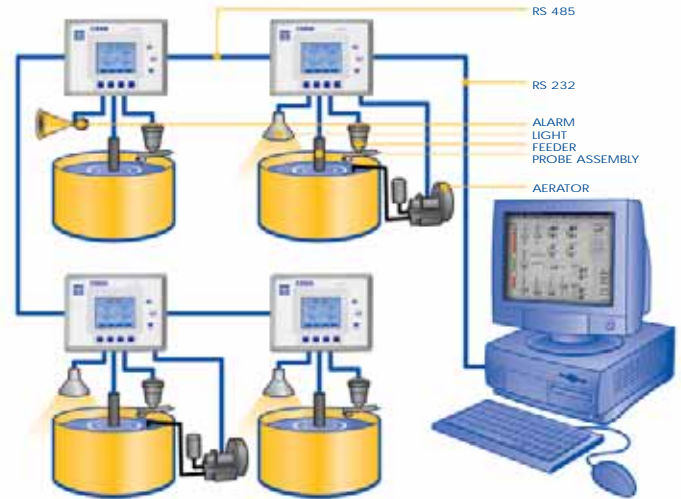
Rugged probes, cables, and connectors allow you to rely on your investment 24 hours a day to do it's job - protect your livestock.

## 5200A



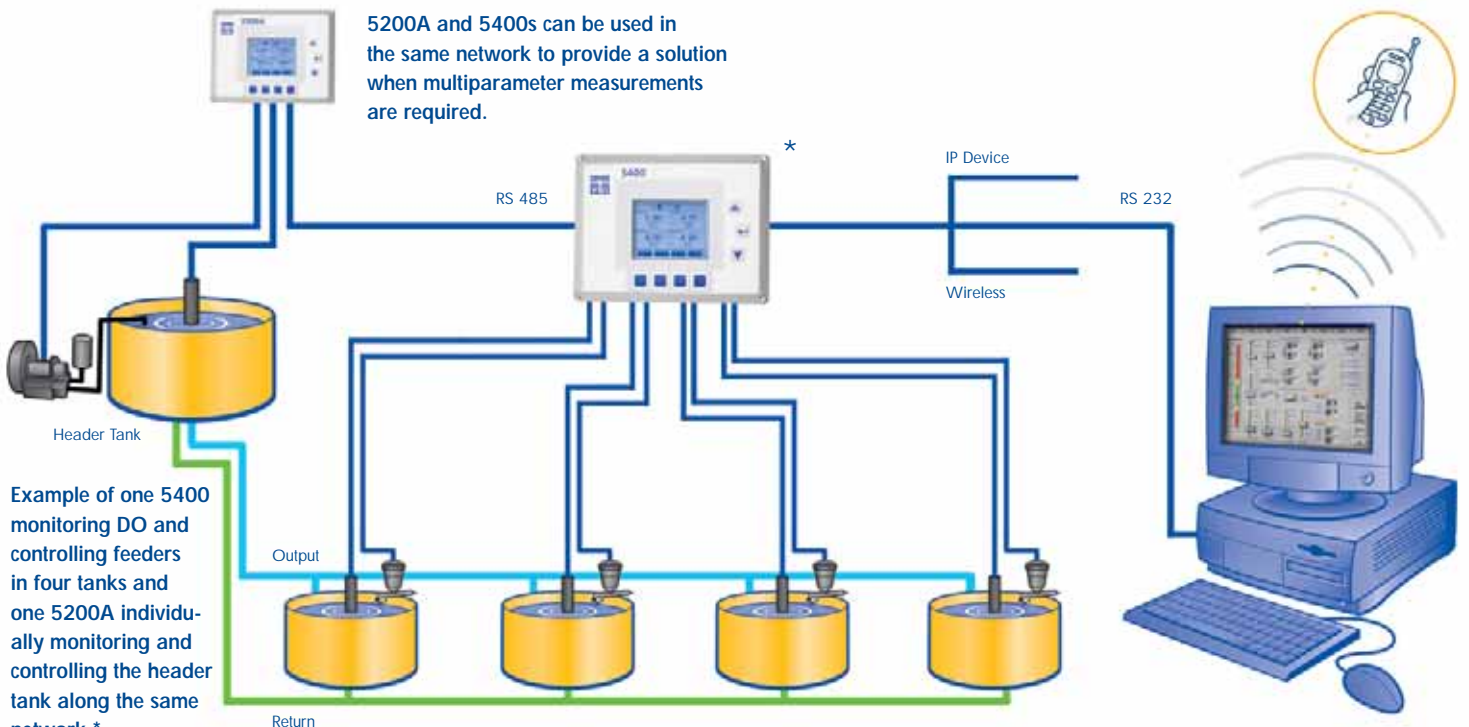
Designed specifically for aquaculture systems, the **5200A** integrates process control, feeding, alarming, and data management into one product. Multiparameter functionality for DO, temp, pH, ORP, conductivity and automatic salinity compensation. Plus, two configurable inputs for additional sensors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

## 5200A Networking



Example of four 5200As individually monitoring and controlling four tanks on the same network.\*

## Combined 5200A and 5400 Networking



Example of one 5400 monitoring DO and controlling feeders in four tanks and one 5200A individually monitoring and controlling the header tank along the same network.\*

\* Multiple connectivity options include RS485, RS232, Ethernet, or wireless.

ysi.com/5200A  
ysi.com/5400



# Additional benefits

## 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)
- Calculates biomass
- Saves money on labor and is significantly less expensive than other automated feeding options

Tilapia Feeding

## Outputs/Timers (included)

### 5400

- 8 relays 10 amp 115 VAC (5 amp 230 VAC)
- 4 timers-10 events 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

### 5200A

- 4 each 10 amp 115 VAC relays (5 amp 230 VAC)
- 4 timers-10 events cascading events start/duration
- 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)

### 5400

- 4 DO probe inputs
- 4 user-configurable inputs for temp, (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)\*

### 5200A

- 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)\*

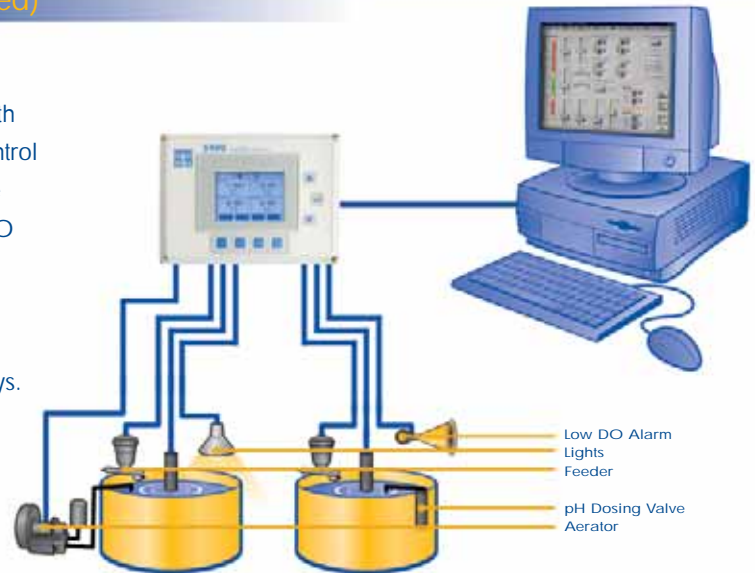
\*User-configurable inputs can be used for additional sensors like DO, pH, TGP, ORP, photo period, etc. Some sensors require an additional transmitter.

**Control**

Pumps, valves, feeders, alarms, lights, heaters, chillers, blowers, pure O<sub>2</sub>, etc

**Monitor and control continuously****Control Relays (included)**

The **5400** comes with 8 internal relays and the **5200A** comes with 4 internal relays available for control outputs. The relays are accessible through terminal blocks on the I/O panel inside the enclosure. The terminal blocks provide Normally Open, Normally Closed, and Common Connections to the relays.



The relays can control pumps, valves, feeders, alarms, lights, etc.

**Power (Options)****Option 1  
(12 VDC)**

Configuration for mobile live haul applications, or anytime AC power is not available.

**Option 2  
(100-240 VAC)**

The system will automatically switch to 12 VDC back-up operation and sound an alarm if primary voltage drops below safe operating range.\*



\*12 VDC back up power supply is optional. Contact YSI for more information.

# Additional benefits (cont.)

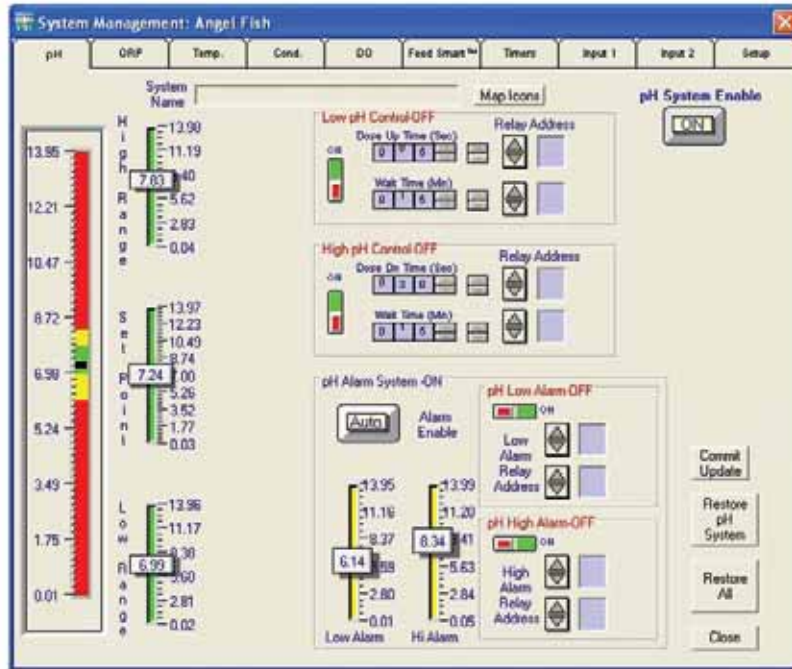
AquaManager® (optional)

AquaManager desktop software allows you to control and setup any instrument on the network to view data, set-up alarming options, and change relays or setpoints depending on application conveniently from one central location.

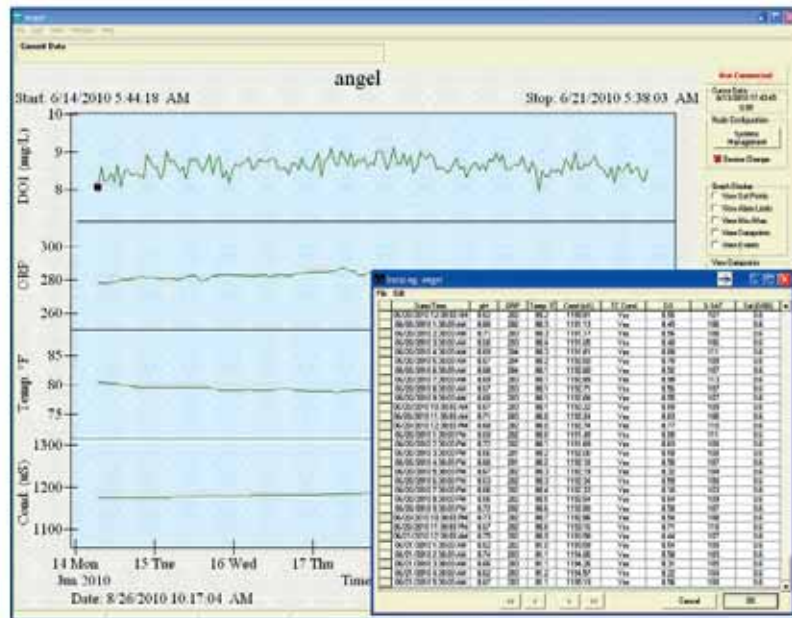
Instantly see an overview of your facility, manage parameter set points, and manage your data in order to make informed operational decisions in real-time. The browser-based format makes navigation and maintenance easy.

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

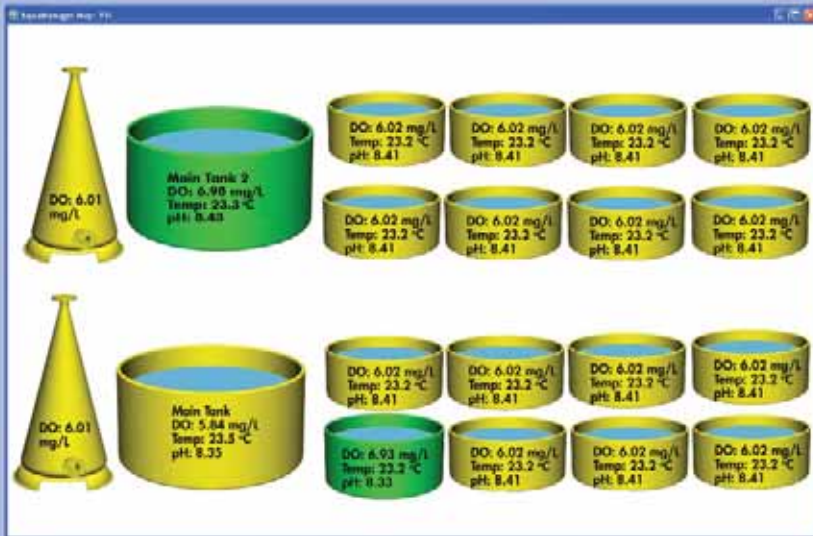
The powerful relay options can be used to control pumps, valves, feeders, alarms, etc. All parameter and system settings can be managed from the desktop with the AquaManager software.



Example of the 5200A system management screen showing set points for pH. The 5400 set points screen looks similar.



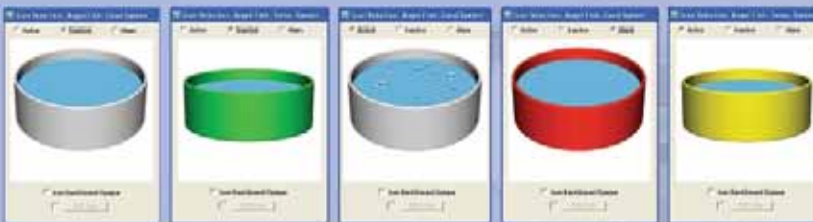
You can view your data instantly in tabular or graphical formats.



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. Additionally, a library of icons is provided to build your map.



The icon library includes raceways, tanks, lights, pumps, valves and much more in order to accurately depict what you need for your facility.



All tanks have options to show their state of activity from Inactive (operating normally), Active (some form of control is taking place) or Alarm (beyond the set point limit and control hasn't corrected it).

Quickly identify with visual cues how your facility is operating.

# Specifications

| 5400                      | Description  | Range  | Resolution   | Accuracy   |
|---------------------------|--|--|--|--|
| Dissolved Oxygen          | 4 DO channels; Polarographic or Galvanic<br>0 to 60 mg/L   | 0 to 500% air saturation                         | 0.1% or 0.01 mg/L (0-10 mg/L); 0.1 mg/L (10-60 mg/L)   | ±2% or ±0.2 mg/L whichever is greater (0-200%); ±6% of reading (200-500%)    |
| Timers                    | 4 each-10 events Cascading Events Start/Duration; 4 feed timer channels  |  |  |  |
| Communication Ports       | RS485 and RS232 standard; Ethernet and wireless optional   |  |  |  |
| Data Logger               | Non-volatile, 1000 data records, 1250 relay/alarm records, 1000 entries/change records, 500 GLP records  |  |  |  |
| Warranty                  | 2-year on instrument;1-year on probe/cable   |  |  |  |
| Auxiliary Inputs*         | 4 DO probe inputs; 4 user-configurable inputs for temp, (0 to 1.0 VDC, or 4-20 mA) or digital; 2 user-configurable inputs, digital (0 to 1.0 VDC, 0 to 5.0 VDC of 4-20 mA) |  |  |  |
| Ratings                   | CE, ULC, ETL, CUL, RoHS, IP-65, Made in USA  |  |  |  |
| Output Relays (not fused) | 8 internal relays 10 amp 115 VAC (5 amp 230 VAC) relays for parameter control and/or alarm   |  |  |  |
| Alarming                  | Local, e-mail and/or SMS alarming  |  |  |  |
| Power Requirements        | Option 1 – 12 VDC<br>Option 2 – 100/240 VDC  |  |  |  |
| Display                   | Graphic LCD; extended temp range LCD with backlight  |  |  |  |
| Size                      | Height: 6.5 inches (16.5 cent.)<br>Length: 8.5 inches (21.6 cent.)<br>Depth: 4.75 inches (12.1 cent.)  |  |  |  |
| Enclosure                 | NEMA 4X; lightning protection  |  |  |  |
| 5200A                     | Description  | Range  | Resolution   | Accuracy   |
| Conductivity              |  | 0-200 $\mu$ S, 0-2000 $\mu$ S, 0-20 mS, 0-200 mS | 0.1 $\mu$ S in 200 $\mu$ S range;<br>1 $\mu$ S in 2000 $\mu$ S range;<br>0.01 mS in 20 mS range;<br>0.1 mS in 200 mS range | ±0.5% of range (0-100 mS);<br>±1.0% of reading (100-200 mS)                  |
| Dissolved Oxygen          | Polarographic; automatic salinity compensation   | 0 to 500% air saturation<br>0 to 60 mg/L         | 0.1% or 0.01 mg/L (0-10mg/L);<br>0.1mg/L (10-60 mg/L)  | ±2% or ±0.2 mg/L whichever is greater (0-200%);<br>±6% of reading (200-500%) |
| ORP                       |  | -2000 mV to 2000 mV                              | 1 mV   | ±20 mV   |
| pH                        |  | 0.0 to 14.0 units                                | 0.01 units   | +0.2 pH  |
| Salinity (calculated)     |  | 0 to 80 ppt (0 to 50 manual input)               | 0.1 ppt  | ±2% or ±0.1 ppt  |
| Temperature               |  | 0 to 45°C (32 to 113°F)                          | 0.1°C  | ±0.2°C   |
| Timers                    | 4 each-10 events Cascading Events Start/Duration; 1 feed timer channel   |  |  |  |
| Communication Ports       | RS485 and RS232 standard; Ethernet and wireless optional   |  |  |  |
| Data Logger               | Non-volatile, 1000 data records, 1250 relay/alarm records, 1000 entries/change records, 500 GLP records  |  |  |  |
| Warranty                  | 2-year on instrument;1-year on probe/cable   |  |  |  |
| Auxiliary Inputs*         | 2 user-configurable inputs, digital (0 to 1.0 VDC or 0 to 5.0 VDC selectable)  |  |  |  |
| Ratings                   | CE, ULC, ETL, CUL, RoHS, IP-65, Made in USA  |  |  |  |
| Output Relays (not fused) | 4 internal 10 amp 115 VAC (5 amp 230 VAC) relays for parameter control and/or alarm  |  |  |  |
| Alarming                  | Local, e-mail and/or SMS alarming  |  |  |  |
| Power Requirements        | Option 1 – 12 VDC<br>Option 2 – 100/240 VDC  |  |  |  |
| Display                   | Graphic LCD; extended temp range LCD with backlight  |  |  |  |
| Size                      | Height: 6.5 inches (16.5 cent.)<br>Length: 8.5 inches (21.6 cent.)<br>Depth: 4.75 inches (12.1 cent.)  |  |  |  |
| Enclosure                 | NEMA 4X; lightning protection  |  |  |  |

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

# How to order

## 5400

|                       |  |
|-----------------------|--|
| 5400-DC               | 5400-DC (12 VDC)   |
| 5400-AC               | 5400-AC (100-240 VAC, with 115 VAC US cord)              |
| 5420-4, 10, 20, or 30 | 4, 10, 20, 30-meter cable with galvanic DO probe/no Temp |
| 5421-4, 10, 20, or 30 | 4, 10, 20, 30-meter cable with galvanic DO probe/Temp    |

## 5200A

|                       |   |
|-----------------------|---|
| 5200A-DC              | 5200A-DC (12 VDC)   |
| 5200A-AC              | 5200A-AC (100-240 VAC, with 115 VAC US cord)  |
| 5561-4, 10, 20, or 30 | 4, 10, 20, 30-meter cable with polarographic DO probe/Temp                                  |
| 5562-4, 10, or 20     | 4, 10, 20-meter cable with polarographic DO probe/Temp/Cond (order 5564 or 5565 separately) |
| 5564                  | pH Sensor   |
| 5565                  | pH/ORP Combination Sensor   |

## Accessories

|         |  |
|---------|--|
| 5402    | Serial to Ethernet Module  |
| 5204    | DO Membrane Kit, 2 Mil Teflon for polarographic (6 membranes with electrolyte) |
| 5405-5  | DO Membrane Kit, 2 Mil Teflon for galvanic                                     |
| 5405-25 | DO membrane kit, 2 Mil Teflon for galvanic (25 membranes with electrolyte)     |
| 5406    | DO Probe Solution, 1 Pint (473 mL) for galvanic (5 membranes with electrolyte) |
| 5205    | Probe Mounting Kit   |
| 5909    | DO Cap membrane Kit, 2 Mil PE for polarographic (6 caps and solution)          |
| 6505    | Weather Shield   |
| 5209A   | AquaManager Desktop Software   |
| 6506    | Desiccant Kit  |
| 6509    | Rail Mount Kit   |
| 6510    | Panel Mount Kit  |
| 606100  | 230 VAC cord, European   |
| 606101  | 230 VAC cord, UK   |
| 606102  | 230 VAC cord, Australia  |



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**ISO 9001**

**ISO 14001**

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YSI, Inc. saved the following resources by using Neenah Environment made with 30% post-consumer recovered fiber.

| trees | energy           | greenhouse gas             | waste water | solid waste |
|-------|------------------|----------------------------|-------------|-------------|
| 2     | 1.5 million BTUs | 765.05 lbs CO <sub>2</sub> | 816 gal     | 135 lbs     |

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