



# HYDROLAB SERIES 5

## MS5 / DS5 / DS5X Multi-parameter Sondes

Series 5 multi-parameter water quality instruments are the premier family of Hydrolab sondes that include the DS5X (DataSonde 5X), DS5 (DataSonde 5), and MS5 (MiniSonde 5) for monitoring several water quality parameters simultaneously in situ.

The three platforms allow optimized combinations of sensors and accessories to suit water quality monitoring applications in all environmental water sources, such as rivers, streams, lakes, reservoirs, oceans, bays, estuaries, and groundwater aquifers.

Sensors are available to provide data for temperature, depth, conductivity, salinity, specific conductance, TDS, pH, ORP, dissolved oxygen, turbidity, chlorophyll a, blue-green algae, Rhodamine WT, ammonium, nitrate, chloride, ambient light (PAR), and total dissolved gas.

Qualitative  
Hydrology

# Series 5 Multi-parameter Sondes

## MiniSonde 5 – MS5

- Four built-in expansion ports configured to fit your specific needs
- Measures up to 12 parameters simultaneously
- Compact and lightweight 1.75" diameter housing fits into groundwater wells
- Used for attended or unattended monitoring

## DataSonde 5 – DS5

- Seven built-in expansion ports configured to fit your specific needs
- Measures up to 16 parameters simultaneously
- Capable of measurements using any of Hydrolab's 15 sensors
- Used for attended or unattended monitoring

## DataSonde 5X – DS5X

- Ideal for "X-tended" deployments in environments where fouling and sediment are abundant
- Central cleaning system wipes away fouling from adjacent sensors to reduce the maintenance frequency
- Seven built-in expansion ports configured to fit your specific needs
- Measures up to 16 parameters simultaneously



# Data Communications

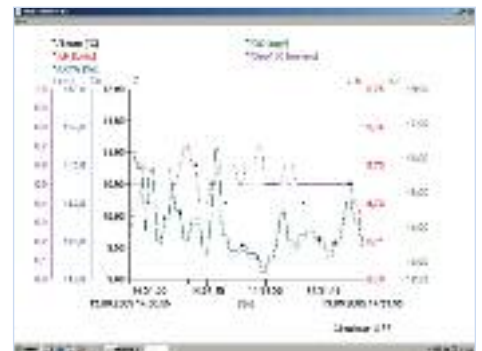
## Surveyor Field Unit

- Complete set-up capability allows users to leave their laptops in their offices
- Designed specifically for use in severe field conditions, the Surveyor can take a beating on land or in the water and still deliver your data
- Displays data in real-time or can store up to 375,000 measurements
- Oversize screen with backlight allows data to be viewed in any conditions
- Available with optional GPS and Barometric Pressure capabilities



## Hydras 3 LT

- Real-time, multi-parameter time series graphing and vertical profiling
- Simple, point and click calibration of any parameter
- One-click download for field data collection
- User-programmable stability check on each sensor
- Included free with every Series 5 sonde



# Sensor Overview

## Hach LDO®

- Longest lasting calibrations
- Features the best accuracy available for DO measurement
- No membranes so maintenance is simple
- Clark cell also available



## Conductivity

- Open cell allows reliable measurements in any environmental condition—sediment falls to the bottom and bubbles rise to the top



## pH

- Reference electrode is easily refilled in seconds— independent of the pH sensor
- pH sensor does not need replacement when reference electrode is depleted—simply refill the reference



## Turbidity: Self-Cleaning\*

- User-programmable self-cleaning system can perform up to 10 cleaning cycles before each reading
- 3000 NTU range allows Turbidity tracking even during rain storms or other events that could cause abnormally high readings



## Depth

- Optimized for depths down to 10m, 25m, 100m, or 200m



## Chlorophyll a\*

- Ultra-compact size designed by Turner Designs specifically for integration into Hydrolab sondes
- Provides the most accurate measurement of chlorophyll a because of electronic filtration of ambient light, efficient optical coupling, and quality optical components.



## Blue-Green Algae\*

- Real-time measurement identifies potential algal blooms before they become problematic, allowing time for corrective action
- Ultra-compact size designed by Turner Designs specifically for integration into Hydrolab sondes
- Provides the most accurate measurement of phycocyanin or phycoerythrin because of electronic filtration of ambient light, efficient optical coupling and quality optical components



## Ion-Selective Electrodes

- Available for monitoring ammonium, nitrate, or chloride



## ORP

- Uses a simple platinum band that donates or accepts electrons to monitor chemical reactions, quantify ion activity, or determine the oxidizing or reducing properties of a solution



## Total Dissolved Gas

- Real-time measurement indicates water supersaturated with atmospheric gases, which can cause gas bubble gill disease in aquatic organisms



## Rhodamine WT\*

- Ultra-compact size designed by Turner Designs specifically for integration into Hydrolab sondes
- Provides the most accurate measurement of Rhodamine WT because of electronic filtration of ambient light, efficient optical coupling, and quality optical components



## PAR

- Provides a real-time measurement of sunlight intensity, which influences biota that rely on photosynthesis for nutrition



## Temperature

- Provides critical compensation for dissolved oxygen, conductivity, pH, and nutrient sensors
- Included with every sonde



*\*Available corrosion-resistant housings must be used in saline water.*



# Specifications



## Sondes

<b>Size</b> <i>DataSonde:</i> Outer diameter – 3.5"/8.9 cm Length – 23"/58.4 cm <i>MiniSonde:</i> Outer diameter – 1.75"/4.4 cm Length – 29.5"/74.9 cm (with battery pack)	<b>Weight</b> <i>DataSonde:</i> 7.4 lbs/3.35 kg (typical) <i>MiniSonde:</i> 2.9 lbs/1.3 kg (typical with battery pack)	<b>Communication Interface</b> RS-232, SDI-12, RS-485 <b>Memory</b> Up to 120,000 measurements <b>Battery Supply</b> <i>DataSonde:</i> 8 C batteries <i>MiniSonde:</i> 8 AA batteries	<b>Operating Temperature</b> -5 to 50°C <b>Maximum Depth</b> 200 m
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## Sensors

	Range	Accuracy	Resolution
Hach LDO™	0 to 60* mg/L *Exceeds maximum natural concentrations	± 0.1 mg/L @ ≤ 8 mg/L ± 0.2 mg/L @ > 8 mg/L ± 10% reading > 20 mg/L	0.01 mg/L
Polarographic DO	0 to 50 mg/L	± 0.2 mg/L @ ≤ 20 mg/L ± 0.6 mg/L @ > 20 mg/L	0.01 mg/L
Conductivity	0 to 100 mS/cm	± (0.5% of reading + 0.001 mS/cm)	
Salinity	0 to 70 ppt	± 0.2 ppt	0.01 ppt
pH	0 to 14 pH units	± 0.2 units	0.01 units
Turbidity, Self-Cleaning	0-3000 NTU	<i>Compared to StablCal</i> ± 1% up to 100 NTU ± 3% from 100-400 NTU ± 5% from 400-3000 NTU	0.1 NTU from 0-400 NTU; 1 NTU for >400 NTU
Turbidity, 4-Beam	0-1000 NTU	± (5% of reading + 1 NTU)	0.1 NTU from 0-100 NTU; 1 NTU for >100 NTU
Depth	0 to 10m (Vented Level) 0 to 25m 0 to 100m 0 to 200m	± 0.003 meters ± 0.05 meters ± 0.05 meters ± 0.1 meters	0.001 meters 0.01 meters 0.01 meters 0.1 meters
Chlorophyll a	<i>Dynamic Range</i> Low sensitivity: 0.03-500 µg/L Med. sensitivity: 0.03-50 µg/L High sensitivity: 0.03-5 µg/L	± 3% using Rhodamine WT dye as a standard at ≥ 400 ppb	0.01 µg/L
Blue-Green Algae (fresh water or marine)	<i>Dynamic Range</i> Low sensitivity: 150-2,000,000 cells/mL Med. sensitivity: 150-200,000 cells/mL High sensitivity: 150-20,000 cells/mL	± 3% using Rhodamine WT dye as a standard at ≥ 400 ppb	20 cells/mL
Rhodamine WT	<i>Dynamic Range</i> Low sensitivity: 0.04-1000 ppb Med. sensitivity: 0.04-100 ppb High sensitivity: 0.04-10 ppb	± 3% for 1 ppb Rhodamine WT or higher	0.01 ppb
<b>Ion Selective Electrodes</b>			
<i>Ammonia</i> Max Depth: 15 meters	0 to 100 mg/L-N	Greater of ± 5% of reading, or ± 2 mg/L-N	0.01 mg/L-N
<i>Nitrate</i> Max Depth: 15 meters	0 to 100 mg/L-N	Greater of ± 5% of reading, or ± 2 mg/L-N	0.01 mg/L-N
<i>Chloride</i> Max Depth: 15 meters	0.5 to 18000 mg/L	Greater of ± 5% of reading, or ± 2 mg/L	4 digits
TDG (Total Dissolved Gas)	400 to 1400 mmHg	± 1.5 mmHg	1.0 mmHg
ORP	-999 to 999 mV	± 20 mV	1 mV
PAR	0 to 10,000 µmol s <sup>-1</sup> m <sup>-2</sup>	± 5% of reading	1 µmol s <sup>-1</sup> m <sup>-2</sup>
Temperature	-5 to 50°C	± 0.10°C	0.01°C



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