

Příloha č. 1 ke Kupní smlouvě prodávajícího č. 001/2023 a kupujícího č. 173/2023  
Technická specifikace



## HYDROLAB HL Series

### Data you can trust

HYDROLAB water quality instruments and software help environmental scientists monitor the increasingly important changes in our water resources by providing continuous water quality data, reliability, and usability you can trust. The new HL7 and HL4 multiparameter sondes maximize deployment life, minimize maintenance, and provide software with unmatched ease of use producing traceable data sets supported by metadata.

#### Water Quality Monitoring Instruments for

- Lake and reservoir profiling
- River and stream surveys
- Coastal monitoring
- Groundwater studies
- Wetland management
- Harbor and port investigations
- Aquaculture protection
- Dredging management
- Effluent discharge regulation
- Agricultural run-off
- Ecosystem assessment programs

# NEW! HYDROLAB HL7

## Multiparameter sonde

The NEW HYDROLAB HL7 multiparameter sonde offers a versatile, durable and practical solution to the day to day needs of monitoring programs for both simple and complex deployments. The HL7 sonde with a large sensor suite is able to thrive in demanding environmental conditions for long term continuous monitoring.

Bio-fouling is minimized when equipped with the central cleaning brush and performance is maximized with an advanced power management system.

The HL7 sonde has a temperature sensor, seven external sensor ports and an optional internal depth sensor. It helps environmental scientists to correctly log data autonomously and easily integrate into real time telemetry systems.

The HYDROLAB Operating Software streamlines data collection and calibration tasks necessary to validate accurate data. Calibration logs and metadata are also available to help with QA/QC requirements.



### Features / Benefits

- Peace of mind - Ready to use for long deployments
- Self-monitoring system reports the status of the instrument
- Designed to withstand the heavy everyday use of demanding field deployments
- Typical battery life capable of greater than 90 days deployment helps ensure maximum performance
- Antifouling sensor cleaning brush significantly extends field use and decreases bio fouling

### Field proven sensor measurement technology for data continuity

- Durable sensor suite helps maintain a cost effective water quality monitor
- Long term stability and accuracy is achieved with the central wiper and brush
- Five optical sensor ports offer greater sensor choice for different monitoring applications
- Serviceable pH reference sensor helps reduce maintenance costs over time



### Sensor Options

- Temperature
- Conductivity
- pH /ORP
- Hach LDO (Luminescent Dissolved Oxygen)
- Turbidity with wiper and central cleaning brush
- Depth
- Chlorophyll a
- Blue-green algae
- Rhodamine
- Ammonium (Ion Selective Electrode)\*
- Nitrate (Ion Selective Electrode)\*
- Chloride (Ion Selective Electrode)\*
- Total Dissolved Gas\*

*\* Coming Soon*

# HYDROLAB HL7 maximizes deployment life, minimizes maintenance and provides traceable data you can trust

Practical and effective handling of instrument for field use

- Quick and simple battery cartridge removal
- Bail design aids instrument handling, transport and secure deployment options
- Color coded status indicators to know the battery power source is working properly

Traceability of measurements to boost confidence in results

- Guided calibration routines increase efficiencies
- Safeguard field measurements with smarter verification methods
- Sensor diagnostics and metadata information to validate measurements
- Reduced risk of errors with calibration history information

Durable construction that delivers all day every day operation

- Keyed cable connector design ensures alignment and connectivity
- Recessed bulkhead connectors protect pins in the event of impacts
- Independently sealed built-in battery compartment
- Kevlar reinforced deployment cable for demanding continued usage
- External power option

Faster integration to data loggers & data acquisition systems

- User configurable communication modules for simplified integration
- USB for quick data transfer to rugged tablets and field laptops
- SDI-12 and RS485 Modbus for reliable data transfer

Surveyor HL handheld for use with HL sondes

The Surveyor HL is a compact rugged handheld display for real time data viewing, storage, calibration and configuration of sondes. The color screen is visible in direct sunlight and a keypad with pronounced buttons aids system navigation. The Surveyor HL is powered by a rechargeable lithium-ion battery that holds enough energy to power a HYDROLAB HL4 for 10 continuous hours.

- Fully weather proof enclosure allows for field use in demanding conditions
- Positively buoyant in water aids easier retrieval in cases of temporary loss
- 4GB memory storage ensures ample capacity where intense monitoring is needed
- Barometric pressure built-in aids calibration of HACH LDO® Dissolved Oxygen sensor
- Raised keyboard helps with navigating menus for users wearing gloves





# HYDROLAB HL4

## Compact Multiparameter Sonde

The HYDROLAB HL4 is perfectly suited for spot monitoring or continuous deployments in a wide range of fresh-water applications. Lightweight, portable and flexible, this multi-parameter sonde helps you quickly monitor watershed conditions.

The field proven sensor options coupled with the robust construction and easy calibration delivers high quality reliable data. The HL4 sonde has a temperature sensor, four sensor ports and an optional internal depth sensor. The software allows for easy data retrieval and setup of logging files.

### Features / Benefits

Ease of portability between sites and installation

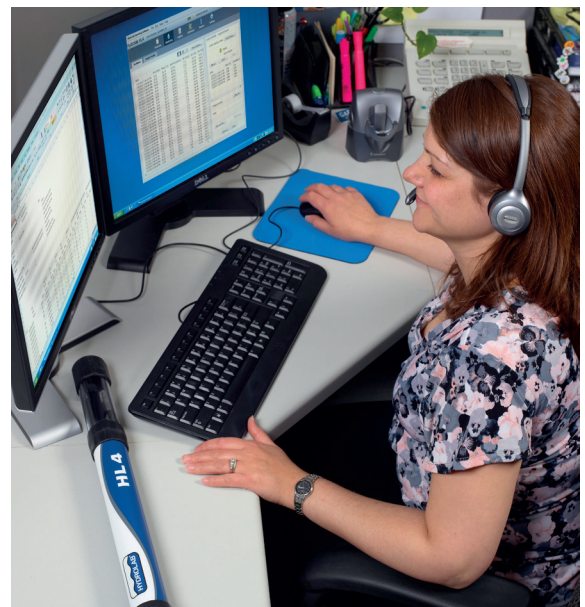
- Lightweight design readily accesses difficult locations
- Compact size easily fits inside protective housing e.g, 2" wells
- Durable design provides long term usage for a variety of applications

Perfect for spot monitoring and short term monitoring studies

- Internal memory of 4GB for logging data
- Optional internal battery pack
- Flexible sensor choice depending on application

Easy to use instrument management and control software

- Guided calibration tasks and instructions
- Real time measurements in graphical and tabular formats
- Define vertical profiling and sensor stability criteria



### Sensor Options

- Temperature
- Conductivity
- pH/ORP
- Hach LDO (Luminescent Dissolved Oxygen)
- Turbidity with wiper
- Depth
- Chlorophyll a
- Blue-green algae
- Rhodamine

# HYDROLAB Operating Software

## Simple and Intuitive

This powerful software tool helps to make better decisions, minimize errors, and increases efficiency in the lab and on the deployment site.



*Quickly View Trends*

Quickly view the current status of the instrument to ensure proper functionality

- Smart sonde platform and software provides color coded indicators of overall instrument health
- Dashboard provides clear guidance to active alerts and corrective action
- Immediately know when all user-defined maintenance and calibrations are due
- Automatic notifications of the latest updates

Maximize uptime with streamlined calibration tasks

- Guided calibration routines and instructions lead the user through the calibration process
- Calibration results are stored with date and time, calibration type, user identification and user notes
- Check calibration process allows the user to verify calibrations, check linearity and store the results

Plot current and historic data with multiple graphics and table formats options

- Choose multiple parameters to plot current conditions and view log file data
- Independently select auto scaling or fixed scale graphs (including custom colors and define ranges)
- Define the criteria for sensor stability and view with real time highlighted flags
- Simply drag and drop the parameters columns to optimize viewing preferences
- Simple data export to CSV Format

# Sensor Overview

## Temperature

- Provides compensation data for DO, conductivity, pH and for the depth sensors
- Temperature sensor integrated in every sonde
- 316 stainless steel for corrosion resistance



## Self-Cleaning Turbidity

- Self-cleaning system can be adjusted up to 5 cleaning cycles
- 3000 NTU measurement range permits turbidity measurement even during heavy rain or other events



## ORP

- Simple platinum strip discharges or absorbs electrons
- Chemical reactions are observed and ion activity is determined
- Identifies oxidizing or reducing properties of a solution



## Conductivity

- Reliable measurements with open cell design
- Sediment drops to bottom of cell and bubbles to rise to top
- Ideal for use under changing environmental conditions
- Easily cleaned with cotton swab



## Depth

- Measures absolute hydrostatic pressure from an internal diaphragm
- Optimized for depths down to 25m, 100m, or 200m



## Rhodamine WT

- Available with solid Secondary Standards to provide a quick and simple method to verify the sensor's stability over time



## Hach LDO® Dissolved Oxygen

- Extremely high precision with the optical Luminescent Dissolved Oxygen measurement method
- Calibrations last up to 1 year
- Easy to maintain



## Chlorophyll a

- Excellent turbidity rejection due to small sample volume design
- Very precise, selective measurement through electronic filtering of ambient light and by using high quality optical components



## TDG (total dissolved gases)

- Real-time measurement indicates if water is supersaturated with atmospheric gases, which can lead to gill disease



## pH

- Independent reference electrode can be quickly and easily refilled
- pH sensor doesn't have to be replaced when the reference electrode is empty
- Choice of standard or integrated refillable reference allows flexibility in sonde configuration



## Cyanobacteria (Blue-green algae)

- Real-time, insitu measurement
- Recognize potential algae bloom
- Adjustable Secondary Standard to correlate to a known dye concentration
- Available in two forms, one for detecting phycocyanin (fresh water), and one for detecting phycoerythrin (marine water)



## Ion-Selective Electrodes

- Available for the measurement of ammonium, nitrate or chloride





# Sensor Specifications

Sensor / Parameter	Range	Accuracy	Resolution	Comments
Temperature	-5 to 50 °C	±0.1°C	0.01°C	Installed with every sonde
Conductivity	0 to 100 mS/cm	±0.5% of reading + 0.001 mS/cm	0.001 mS/cm	Open cell design with graphite electrodes
Dissolved Oxygen - mg/L, % Sat	0 to 60 mg/L	±0.1 mg/L for 0–8 mg/L ±0.2 mg/L for more than 8 mg/L ±10% reading for more than 20mg/L	0.01 mg/L	Optical Sensor HACH LDO® Luminescent Dissolved Oxygen
pH	0 to 14 pH	±0.2 pH	0.01 pH	Glass bulb with a user refillable reference with PTFE junction
Turbidity	0 to 3000 NTU	0 to 100 NTU: ±1% 100 to 400 NTU: ±3% 400 to 3000 NTU: ±5% - Requires 4 point calibration	0 to 400 NTU: 0.1 400 to 3000 NTU: 1.0	Self-Cleaning Wiper and central cleaning brush
Depth	0 to 25m 0 to 100m 0 to 200m	±0.05 meters ±0.05 meters ±0.1 meters	0.01 meters 0.01 meters 0.01 meters	
Chlorophyll a	0 to 500 ug/L	Linearity: 0.998R <sup>2</sup> Serial dilution of Rhodamine WT	0.01 ug/L	Turner Designs Optical Sensor
Blue Green Algae (Freshwater Cyanobacteria)	0 to 40,000 ppb	Linearity: 0.999R <sup>2</sup> Serial dilution of Phycocyanin pigment from Prozyme diluted in deionized water	0.02 ppb	Turner Designs Optical Sensor
Blue Green Algae (Marine Cyanobacteria)	0 to 750 ppb	Linearity: 0.999R <sup>2</sup> Serial dilution of Phycoerythrin pigment from Prozyme diluted in deionized water	0.01 ppb	Turner Designs Optical Sensor
Salinity	0-70 psu	±0.2 psu	0.01 psu	Calculated parameter from Conductivity and Temperature
Specific Conductance	0 to 100 mS/cm	±0.5% of reading + 0.001 mS/cm	0.001 mS/cm	Calculated parameter from Conductivity and Temperature
TDS (Total Dissolved Solids)	0 to 64 g/l	N/A	0.01 g/l	Calculated parameter from Conductivity, Temperature and defined constant
ORP	-999 to 999 mV	±20 mV	1 mV	Platinum band
Rhodamine	0 to 1000 ppb	Linearity: 0.999R <sup>2</sup>	0.01 ppb	Turner Designs Optical Sensor
TDG ( Total Dissolved Gas)*	400 to 1400 mmHg	± 1.5 mmHg	1.0 mmHg	Max Depth: 60meters
Ion Selective Electrodes* - Ammonia - Nitrate - Chloride	0 to 100 mg/L-N 0 to 100 mg/L-N 0.5 to 18000 mg/	Greater of ±5% reading , or ±2 mg/L-N Greater of ±5% reading , or ±2 mg/L-N Greater of ±5% reading , or ±2 mg/L	0.01 mg/L-N 0.01 mg/L-N 0.0001 units	Max Depth: 15meters

\* Contact your local representative for availability

# Instruments Specifications

## HL7

Dimensions	Diameter: 8.9 cm (3.5 in.) without rubber bumpers; 9.8 cm (3.85 in.) with rubber bumpers Length: 66.4 cm (26.1 in.)
Weights	4.5 kg (10 lb) with four D-cell batteries, storage/calibration cup with no liquid
Sensor Ports	9 sensor ports available 2 fixed sensor ports for temperature and optional depth sensor only 7 ports for integrating other sensor options Parameters available depends on sensor installed Maximum of 5 ports available for optical dissolved oxygen and 4 another optical sensors
Power Requirements	6–24 VDC (12 VDC nominal) applied to the communications module, 12 VDC: 2.0 W average, 24 W peak
Battery Life*	90 days

## HL4

Dimensions	Diameter: 4.44 cm (1.75 in.) without rubber bumpers; 5.33 cm (2.1 in.) with rubber bumpers Length: 51.43 cm (20.25 in.) with no internal battery pack and standard sensor guard Length: 66.36 cm (26.125 in.) with no internal battery pack and extended sensor guard Length: 62.23 cm (24.5 in.) with internal battery pack and standard sensor guard Length: 77.787 cm (30.625 in.) with internal battery pack and extended sensor guard
Weight	2.2 kg (5 lb) with internal battery pack, one D-cell battery
Sensor Ports	6 sensor ports available 2 fixed sensor ports for temperature and optional depth sensor only 4 ports for integrating other sensor options Parameters available depends on sensor installed Maximum of 2 ports available for optical dissolved oxygen and another optical sensor
Power Requirements	6–24 VDC (12 VDC nominal) applied to the communications module, 12 VDC: 250 mW average, 18 W peak
Battery Life**	75 days

## Sonde

Operating Temperature	–5 to 50 °C (23 to 122 °F), non-freezing
Storage Temperature	1 to 50 °C (34 to 122 °F)
Depth	200 m (656 ft) maximum
Data Memory	4GB
Tensile strength (Maximum)	Mooring cap: 68 kg (150 lb); deployment cable: 227 kg (500 lb)
Communications	Communications module: USB, SDI-12, RS232 Modbus, RS485 Modbus and RS232 TTY
Sampling Rate	1 Hz minimum, (once per second)

## Surveyor HL Handheld

Dimensions (L x W x H)	21.8 x 9.4 x 5.3 cm (8.6 x 3.7 x 2.1 in.)
Enclosure rating	IP67; floats in water, waterproof to 1 m (3.3 ft) when covers are installed
Weight	0.68 kg (1.5 lbs)
Display	Color, LCD, 89 mm (3.5 in.), QVGA, transfective (readable in direct sunlight)
Operating temperature	–5 to 50 °C (23 to 122 °F)
Storage temperature	–20 to 60 °C (–4 to 140 °F)
Battery life***	10 hours at 20 °C (68 °F) with continuous use and backlight on
Drop resistant	A maximum of 0.9 m (3 ft) drop on to concrete
Barometric pressure	Range: 225 to 825 mmHg : Resolution: 0.01 mmHg : Accuracy: ±3 mmHg
Data Memory	4 GB

\*HL7 Battery Life – Four internal alkaline D-cell batteries, non-rechargeable. Approximately 90 days of use with a 15-minute logging interval and the default warm-up time with temperature, conductivity, pH, LDO, chlorophyll a, blue green algae (fresh water) and turbidity sensors installed, a central cleaning brush set to do one revolution and the sensors at room temperature.

\*\*HL4 Battery Life – One internal alkaline D-cell battery, non-rechargeable. Approximately 75 days of use with a 15-minute logging interval and the default warm-up time with depth, temperature, conductivity, pH and LDO sensors installed at room temperature

\*\*\*Surveyor HL Battery Life – Up to 10 hours of continued use with a HL4 with the depth, temperature, conductivity, pH and LDO sensors installed at room temperature

HYDROLAB Operating Program and user manuals available in multiple languages English, German, Chinese, French, Italian, Spanish, Portuguese and Japanese

Specification of accuracy can be achieved immediately following correct calibration procedures and using extreme care in specially controlled conditions