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# HI 9829

Multiparameter w/ GPS



# Features

- Field replaceable sensors including
  - Ammonium, Nitrate, and Chloride ISE's
  - pH and pH/ORP
  - Four ring EC and EC/Turbidity (ISO 7027 compliant)
  - Galvanic DO
- Auto-recognition of sensors
- Built-in barometer for DO concentration compensation
- Quick calibration mode for pH, EC and DO or independent sensor calibration
- Good Laboratory Practices feature with last five calibration recorded
- Display from one to twelve parameters
- Log data with meter or with autonomously logging probe
- Logged data can be displayed as graphs
- Track measurements location with GPS (HI98290)
- Fast Tracker - Tag ID System for recording location without GPS signal
- USB to transfer data to a PC
- Waterproof protection for meter (IP 67) and probe (IP 68)
- Meter accepts both alkaline and rechargeable batteries
- Rugged probe with stainless steel tip has diameter under 2" for wells



## HI9829 The Perfect Monitoring Tool

Rugged, waterproof and easy to use, the HI 9829 and HI 98290 are the ideal meters for field measurements of lakes, rivers and seas. Both meters display one to twelve parameters simultaneously for up to fourteen user selectable parameters.

Combined with one of the HI 76x9829 series probes, the HI 9829 and HI 98290 with GPS can measure water quality parameters such as pH, ORP, conductivity, turbidity, temperature, ammonium ( $\text{NH}_4^+ - \text{N}$ ), nitrate ( $\text{NO}_3^- - \text{N}$ ), chloride ions ( $\text{Cl}^-$ ), dissolved oxygen (as % saturation or concentration), resistivity, TDS, salinity, and seawater sigma ( $\sigma$ ). Atmospheric pressure is measured for DO concentration compensation.

The HI 98290 with the GPS option incorporates a built-in GPS receiver and antenna that guarantees position accuracy. Measurements from specific locations are tracked with detailed coordinate information that can be viewed immediately on the display.

Both meters feature a graphic, backlit LCD that scales digits to fit up to twelve parameters from a choice of fourteen and allows full configuration of each parameter measured along with an on-screen graphing capability.

A HELP key displays context sensitive advice for troubleshooting. The alphanumeric keypad offers a user friendly way to complete the input fields. Water scientists and managers alike utilize data-collection programs as part of environmental monitoring. These programs are designed to reveal changes in water and surrounding the environment around it over time. Reliable, dependable measurements are required to monitor these changes and understand the contributions from seasonal fluctuations, weathering, as well as man made pollution.



# Intelligent Probes

The HI9829(0) uses a microprocessor based multiparameter intelligent probes for reliable data collection. The HI 76x9829 probes utilize field replaceable sensors that are automatically recognized by the probe. The electronics for the sensors are housed in a rugged probe that has a watertight cable connection. The HI 76909829 probe allows for conductivity, pH/ORP (or an ISE), and dissolved oxygen measurements. Other probe models allow turbidity and autonomous logging. The probes are available with cable lengths 4, 10, 20m (13, 33') and utilize a DIN connection to interface with the meters. Logging probes can be connected directly to a PC with the HI 76982910 USB adapter cable and the HI 929829 PC application software. The software allows for log files to be directly uploaded from the probes.

## Autonomous Logging

Probes with the logging function have a capacity that allows for the storage of up to 140,000 individual samples or 35,000 complete sample data sets with date and time stamp thus permitting up to a 70 day deployment with all channels logging at 10 minute intervals directly to the probe.

## pH/ORP

The pH and pH/ORP gel filled sensors feature a double junction design to increase resistance to contamination. These sensors incorporate the technology that has made Hanna so successful as a pH sensor manufacturer. Reliable pH measurements are one of the most important indicators of water chemistry. Hanna's pH sensors utilize a resilient PEI body to protect them from solid particulates found in water samples. Consistency and quality are the hallmarks of these sensors. Our differential measurement system further enhances the measurement reliability providing temperature corrected pH.

## ISE's

Nitrate, ammonium and chloride ion selective electrodes are available for constant reporting of common surface water contaminants. Each ISE is a combination electrode with a unique spiral reference design. This design provides for very stable reference critical for an accurate measurement. All probes feature a double junction and solid gelled reference. By utilizing ISE, the HI9829 and HI98290 can convert ion activity measurements to concentration units. The HI9829(0) displays these measurements as ammonium-nitrogen, chloride and nitrate-nitrogen in mg/L (ppm).

## Conductivity

The HI7609829-3 four-ring potentiometric conductivity sensor provides stable conductivity readings. Absolute conductivity, temperature corrected conductivity, salinity, seawater sigma( $\sigma$ ) and TDS measurements are determined through use of this sensor.

## Turbidity

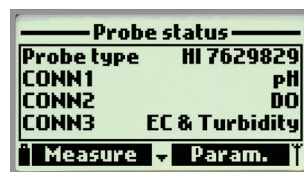
The HI 7609829-4 combined EC/turbidity sensor is a replaceable design for instantaneous conductivity and turbidity measurements that conform to ISO 7027 standards. It provides measurements from 0.0 to 1000 FNU. Conductivity measurement is the same as in the HI 7609829-3.

## Dissolved Oxygen

The HI7609829-2 Galvanic DO sensor does not require any polarization time so it is ready for measurement at a moment's notice. This sensor utilizes a replaceable membrane cap design and a safe non-toxic electrolyte for ease of maintenance. DO readings are compensated for the effects of temperature (using the probes built-in temperature sensor) and atmospheric pressure (using the HI 9829 and HI 98290's internal atmospheric pressure sensor). The DO measurement complies with standard method 4500-O G and EPA 360.1.

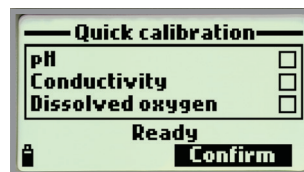
## Temperature

Reliable temperature measurements are a critical parameter of aquatic system monitoring. Changes in temperature can affect the ability of water to hold oxygen, as well as the ability of organisms to resist certain pollutants. The intelligent probes incorporate a thermistor that changes predictably with temperature fluctuations.



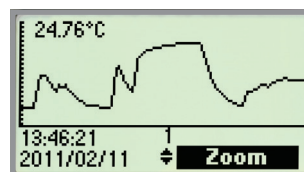
## Auto-Sensor Recognition

In this example, the HI 9829 is identifying the pH, dissolved oxygen and turbidity/EC sensors.



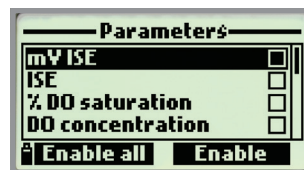
## Quick Calibration

Simply screw the calibration beaker filled with HI9828-25 solution onto the probe, select "Quick calibration" from the menu and press OK.



## Graphing

Trend graphing may be viewed on the display or transferred to a PC. The sample date and time stamp will also be displayed.



## Parameter Selection

Fully Configurable Measurement Screen to select which parameters to display.

# Sensors

Hanna offers a selection of eight sensors to be used on the intelligent probes. Sensor replacement is quick and easy with screw type connectors and color coded sensors. The HI9829 & HI98290 automatically detect the sensor presence and type.

The new HI7609829-4 EC/turbidity sensor is field replaceable and offers readings from both parameters at the same time.

All potentiometric sensors are gel filled and feature a double junction design to increase resistance to contamination. An ISE sensor can be used in place of the pH sensor and is automatically recognized. pH in mV readings are also displayed which is ideal for troubleshooting.

## Sensors Configurations

Both probes accommodate a multitude of sensor configurations. The long sensor cap fits all configurations while the short sensor cap fits configurations not requiring the turbidity/EC sensor.

Temperature



# Autonomously Logging Probes

After starting a log, the HI7629829 and HI7639829 logging probes can autonomously log parameters without further connection to the HI9829 or HI98290. Just connect the logging probe to the HI 9829, HI98290 or a PC to retrieve the logged measurements.

HI7609829/x  
pH, ORP, ISE, EC, DO, Turbidity



## Autonomous Logging

HI7629829  
pH, ORP, ISE, EC, DO, Turbidity



## General Probe Specifications

<b>Temperature Sensor</b>	built-in	<b>Operating Temp.</b>	-5 to 55°C*	<b>Maximum Depth</b>	20 m (66')*
<b>Sample Environment</b>	fresh, brackish, seawater	<b>Waterproof Protection</b>	IP68		
<b>Cable Specification</b>	Multistrand-multiconductor shielded cable rated for 68 kg (150 lb.) intermittent use				
<b>Wetted Materials</b>	Body: ABS; Threads: nylon; Shield: ABS/316 SS; Temperature Probe: 316 SS; O-rings: EPDM				

### HI 7609829

<b>Supported Configuration</b>	Connector 1	pH, pH/ORP, ammonium ISE, chloride ISE, nitrate ISE			
	Connector 2	dissolved oxygen			
	Connector 3	EC	EC/Turbidity		
<b>Dimensions / Weight</b>	342 mm (13.5"), dia=46 mm (1.8") / 570 g (20.1 oz.)			382 mm (15.1"), dia 46 mm (1.8") / 650 g (22.9 oz.)	

### HI 7629829

<b>Supported Configuration</b>	Connector 1	pH, pH/ORP, ammonium ISE, chloride ISE, nitrate ISE			
	Connector 2	dissolved oxygen			
	Connector 3	EC	EC/Turbidity		
<b>Autonomous Logging</b>	yes				
<b>Logging Interval</b>	1 second to 3 hours				
<b>Computer Interface</b>	USB (HI 76982910)				
<b>Memory</b>	140,000 measurements (single parameter logged); 35,000 measurements (all parameters logged)				
<b>Logging Probe Internal Battery Type</b>	1.5V (4) AA alkaline				
<b>Logging Probe Battery Life**</b>	Interval: 1-5 seconds, 1 minute, 10 minutes; All channels logging (no averaging): 72 hours, 22 days, 70 days; All channels logging (10 samples averaging): 72 hours, 11 days, 66 days				
<b>Dimensions / Weight</b>	442 mm (17.4"), dia 46 mm (1.8") / 775 g (27.3 oz.)			482 mm (19.0"), dia 46 mm (1.8") / 819 g (28.9 oz.)	

\* Reduced for ISE sensors, \*\*Log space must be available for continuous logging

# GPS

## Monitoring and Tracking

The HI 98290 with GPS module can track measurement locations with detailed coordinate information. All models of the HI 9829 are equipped with the Fast Tracker™ TAG ID system which is an invaluable tool for associating measurements with their locations. These meters also incorporate a real-time clock which stamps all logged data with a time and date in addition to location information.

## GPS Tracking

The new HI 98290 features an internal 12 channel GPS receiver and antenna that calculates its position to track locations along with measurement data. The GPS tracks your location using satellites to within 30 ft (10 m) so you can be sure that you return to the same location for repeated measurements. The GPS coordinates can be displayed on the LCD together with up to 10 other measurement parameters and are recorded with logged data. Users can connect to GPS tracking software such as Google™ Maps\* to view locations where samples have been taken. Measurement information is shown right on the map.

- Basic GPS Features

GPS coordinates shown on the LCD with up to ten measurement parameters

GPS signal strength shown on LCD

Logged data is embedded with GPS coordinates

GPS status screen

- Advanced GPS Features

Users can associate GPS coordinates with alphanumeric locations

Distances between current location and predefined locations are displayed arranged by distance

Memorizes last location and time should signal be lost

- HI 929829 PC Application Software

Manages logged data from the meter and autonomously logging probe

Displays GPS coordinates with logged data

Automatically maps samples on your PC (internet connection required)

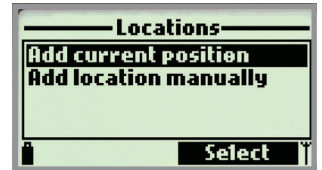
Shows location points on map with measurement data

## Fast Tracker™ Identification System

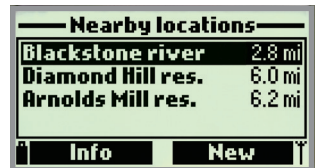
Hanna's Fast Tracker™-Tag Identification System simplifies test logging. iButton®s with a unique ID can be installed at various sampling sites. When the matching connector on the meter contacts the location button, measurements are logged and labeled with the alphanumeric user-entered location ID. Location, date, time and measurements are logged into the meter which can be transferred to a PC. The Fast Tracker™ system compliments the GPS for ultimate tracking when GPS signal is not available.

Install the optional TAGs near your sampling points for quick and easy iButton® readings. Each TAG contains a computer chip with a unique identification code encased in stainless steel. You can install a practically unlimited amount of TAGs. Additional TAGs can be ordered for all of your traceability requirements.

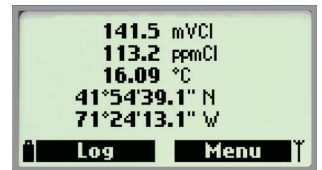
GPS data can be customized to meet specific requirements.



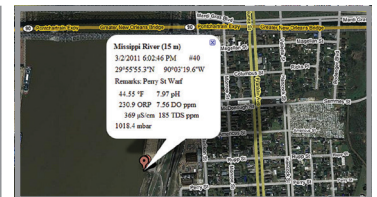
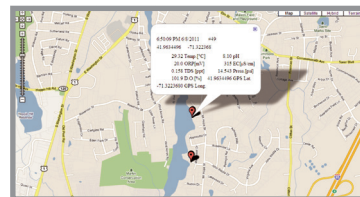
Displays distances between current and predefined locations.



Display current readings along with GPS coordinates



Shows current position and number of satellites.



# Specifications

<b>Temperature Compensation</b>	Automatic from -5 to 55°C (23 to 131°F)	<b>Waterproof Protection</b>	IP67
<b>Logging Memory from Meter</b>	44,000 records (continuous logging or log on demand of all parameters)	<b>Environment</b>	0 to 50°C (32 to 122°F); RH 100%
<b>Logging Interval</b>	1 second to 3 hours	<b>Power Supply</b>	1.5 alkaline C cells (4) / 1.2 V NiMH rechargeable C cells (4), 12 V power adapter
<b>Computer Interface</b>	USB (with HI 929829 software)	<b>Dimensions</b>	221 x 115 x 55 mm (8.7 x 4.5 x 2.2")
<b>FastTracker™ TAG ID</b>	Yes	<b>Weight</b>	750 g (26.5 oz.)

	pH / mV of Input	ORP mV	Ammonium-Nitrogen	Chloride	Nitrate-Nitrogen
<b>Range</b>	0.00 to 14.00 pH / ±600.0 mV	±2000.0 mV	0.02 to 200 ppm (as NH <sub>4</sub> <sup>+</sup> -N)	0.6 to 200 ppm	0.62 to 200 ppm (as NO <sub>3</sub> <sup>-</sup> -N)
<b>Resolution</b>	0.01 pH / 0.1 mV	0.1 mV	0.01 ppm to 1 ppm; 0.1 ppm to 200 ppm	0.01 ppm to 1 ppm; 0.1 ppm to 200 ppm	0.01 ppm to 1 ppm; 0.1 ppm to 200 ppm
<b>Accuracy</b>	±0.02 pH / ±0.5 mV	±1.0 mV	±5% of reading or 2 ppm, whichever is greater	±5% of reading or 2 ppm, whichever is greater	±5% of reading or 2 ppm, whichever is greater

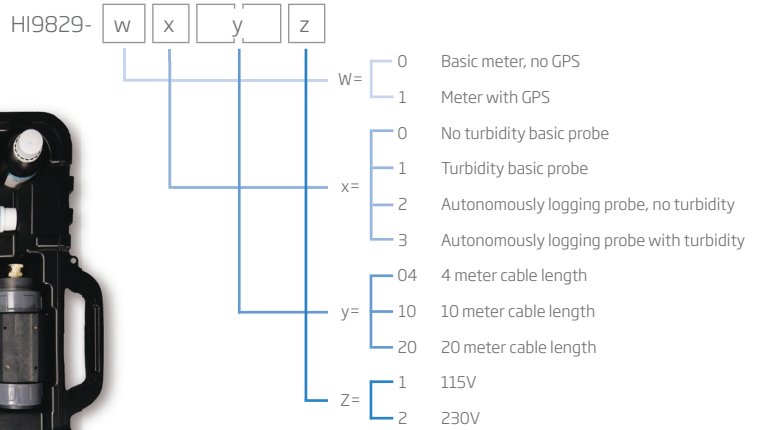
	Conductivity	TDS	Resistivity	Salinity	Seawater Sigma (σ)
<b>Range</b>	0 to 200 mS/cm (absolute EC up to 400 mS/cm)	0 to 400000 mg/L (ppm) (the maximum value depends on the TDS factor)	0 to 999999 Ω•cm; 0 to 1000.0 kΩ•cm; 0 to 1.0000 MΩ•cm	0.00 to 70.00 PSU	0 to 50.0 σ <sub>t</sub> , σ <sub>0</sub> , σ <sub>15</sub>

<b>Resolution</b>	<b>manual:</b> 1 μS/cm; 0.001 mS/cm; 0.01 mS/cm; 0.1 mS/cm; 1 mS/cm; <b>autorange scales:</b> 1 μS/cm from 0 to 9999 μS/cm; 0.01 mS/cm from 10.00 to 99.99 mS/cm; 0.1 mS/cm from 100.0 to 400.0 mS/cm; <b>autorange mS/cm scales:</b> 0.001 mS/cm from 0.000 to 9.999 mS/cm; 0.01 mS/cm from 10.00 to 99.99 mS/cm; 0.1 mS/cm from 100.0 to 400.0 mS/cm	<b>manual:</b> 1 mg/L (ppm); 0.001 g/L (ppt); 0.01 g/L (ppt); 0.1 g/L (ppt); 1 g/L (ppt); <b>autorange scales:</b> 1 mg/L (ppm) from 0 to 9999 mg/L (ppm); 0.01 g/L (ppt) from 10.00 to 99.99 g/L (ppt); 0.1 g/L (ppt) from 100.0 to 400.0 g/L (ppt); <b>autorange g/L (ppt) scales:</b> 0.001 g/L (ppt) from 0.000 to 9.999 g/L (ppt); 0.01 g/L (ppt) from 10.00 to 99.99 g/L (ppt); 0.1 g/L (ppt) from 100.0 to 400.0 g/L (ppt)	dependent on resistivity setting	0.01 PSU	0.1 σ <sub>t</sub> , σ <sub>0</sub> , σ <sub>15</sub>
<b>Accuracy</b>	±1% of reading or ±1 μS/cm, whichever is greater	±1% of reading or ±1 mg/L (ppm), whichever is greater		±2% of reading or ±0.01psu, whichever is greater	±1 σ <sub>t</sub> , σ <sub>0</sub> , σ <sub>15</sub>

	Turbidity	Dissolved Oxygen	Atm. Pressure	Temperature
<b>Range</b>	0.0 to 99.9 FNU; 100 to 1000 FNUw	0.0 to 500.0%; 0.00 to 50.00 ppm	450 to 850 mm Hg; 17.72 to 33.46 in Hg; 600.0 to 1133.2 mbar; 8.702 to 16.436 psi; 0.5921 to 1.1184 atm; 60.00 to 113.32 kPa	-5.00 to 55.00°C; 23.00 to 131.00°F; 268.15 to 328.15K
<b>Resolution</b>	0.1 FNU from 0.0 to 99.9 FNU; 1 FNU from 100 to 1000 FNU	0.1%; 0.01 ppm	0.1 mm Hg; 0.01 in Hg; 0.1 mbar; 0.001 psi; 0.0001 atm; 0.01 kPa	0.01°C; 0.01°F; 0.01K
<b>Accuracy</b>	±0.3 FNU or ±2% of reading, whichever is greater	0.0 to 300.0%: ±1.5% of reading or ±1.0% whichever is greater; 300.0 to 500.0%: ±3% of reading; 0.00 to 30.00 ppm: ±1.5% of reading or 0.10 ppm, whichever is greater; 30.00 ppm to 50.00 ppm: ±3% of reading	±3 mm Hg within ±15°C from the temperature during calibration	±0.15°C; ±0.27°F; ±0.15K

# Ordering Information

Meter and Probe with Rugged Carrying Case



## All HI 9829 Kits Include:

- HI 9829 or HI 98290 (GPS Model) Meter
- HI 710140 Hard carrying case
- HI 710005/8 (115V) or HI710006/8 (230V) Multiparameter Probe (see table)
- HI 7692892 Probe Maintenance Kit
- HI 929829 Application Software
- HI 7698291 USB cable (PC to meter)
- HI 710045 Power supply cable
- HI 710046 Cigarette lighter cable
- HI 7609829-1 pH/ORP sensor
- HI 7609829-2 Galvanic DO Sensor
- HI 920005 iButton® with holder (5 pcs)
- HI 9828-25 Calibration solution
- Instruction Manual

## Optional Kit Components:

- HI 7609829-12 Nitrate sensor
- HI 7619829-11 Chloride ISE sensor
- HI 7609829-10 Ammonium ISE sensor
- HI 7698297 Long quick release flow cell
- Spare Solution (see below)

HI9829-10	25 sachets 10ppm ammonia-nitrogen calibration solution
HI9829-10/11	10 sachets each of 10ppm and 100ppm ammonia-nitrogen calibration solution
HI9829-11	25 sachets 100ppm ammonia-nitrogen calibration solution
HI9829-12	25 sachets 10ppm chloride calibration solution
HI9829-12/13	10 sachets each of 10ppm and 100ppm chloride calibration solution
HI9829-13	25 sachets 100ppm chloride calibration solution
HI9829-14	25 sachets 10ppm nitrate-nitrogen calibration solution
HI9829-14/15	10 sachets each of 10ppm and 100ppm nitrate-nitrogen calibration solution
HI9829-15	25 sachets 100ppm nitrate-nitrogen calibration solution

## Kit Specific Components:

Kit Number	Multiparameter Probe	HI7609829-3 EC Sensor	HI7698290 Short calibration beaker	HI7609829-4 EC/Turbidity Sensor	HI7698293 Long calibration beaker	HI9829-16 0 FNU calibration solution	HI9829-17 20 FNU calibration solution	HI9829-18 200 FNU calibration solution	HI76982910 USB cable (PC to Probe)	HI7698295 Short protective sleeve	HI7698296 long protective sleeve
HI9829-0004Z	HI7609829/4	•	•						•		
HI9829-0010Z	HI7609829/10	•	•						•		
HI9829-0020Z	HI7609829/20	•	•						•		
HI9829-0104Z	HI7609829/4			•	•	•	•	•			•
HI9829-0110Z	HI7609829/10			•	•	•	•	•			•
HI9829-0120Z	HI7609829/20			•	•	•	•	•			•
HI9829-0204Z	HI7629829/4	•	•						•	•	
HI9829-0210Z	HI7629829/10	•	•						•	•	
HI9829-0220Z	HI7629829/20	•	•						•	•	
HI9829-0304Z	HI7629829/4			•	•	•	•	•	•		•
HI9829-0310Z	HI7629829/10			•	•	•	•	•	•		•
HI9829-0320Z	HI7629829/20			•	•	•	•	•	•		•
HI9829-1004Z	HI7609829/4	•	•						•		
HI9829-1010Z	HI7609829/10	•	•						•		
HI9829-1020Z	HI7609829/20	•	•						•		
HI9829-1104Z	HI7609829/4			•	•	•	•	•			•
HI9829-1110Z	HI7609829/10			•	•	•	•	•			•
HI9829-1120Z	HI7609829/20			•	•	•	•	•			•
HI9829-1204Z	HI7629829/4	•	•						•	•	
HI9829-1210Z	HI7629829/10	•	•						•	•	
HI9829-1220Z	HI7629829/20	•	•						•	•	
HI9829-1304Z	HI7629829/4			•	•	•	•	•	•		•
HI9829-1310Z	HI7629829/10			•	•	•	•	•	•		•
HI9829-1320Z	HI7629829/20			•	•	•	•	•	•		•

z=1 is supplied with 115V AC to 12V DC Adapter  
z=2 is supplied with 230V AC to 12V DC Adapter