HI 769828 Multiparameter, Intelligent Probe

HANNA's HI 769828 multiparameter probe incorporates a built-in microprocessor and amplifier that convert the high impedance signals from the sensors of the probe to eliminate common problems such as cable length limitations and noise associated with high impedance signals. This allows the probe to have a reliable communication with the meter and also immediately warns the user of problems such as a broken cable. The standard cable lengths of the probe are 4, 10 and 20 meters (13, 32 and 64 feet) and custom lengths are also available.

The probe also features HANNA's Quick Calibration which allows the user to calibrate pH and conductivity with one solution in a single, simple step. Dissolved oxygen is also calibrated in one step in saturated air. The probe houses 5 of the 6 measured parameters: pH, ORP, EC, dissolved oxygen and temperature. The sensors are all independently replaceable and are easy to maintain and keep clean. The sensors are protected by an outer PVC/stainless steel sleeve and cap which is suitable for use in 2" wells. The probe housing complies with IP68 standard.

Sensor replacement is quick and easy with screw type connectors and color coded sensors.

The Galvanic DO sensor does not require polarization time so it's ready at a moment's notice.

The 4-ring conductivity system ensures stable conductivity readings that are immune to surface coating. Absolute conductivity, temperature corrected conductivity, salinity, specific gravity and TDS determinations are possible with measurements from this sensor.

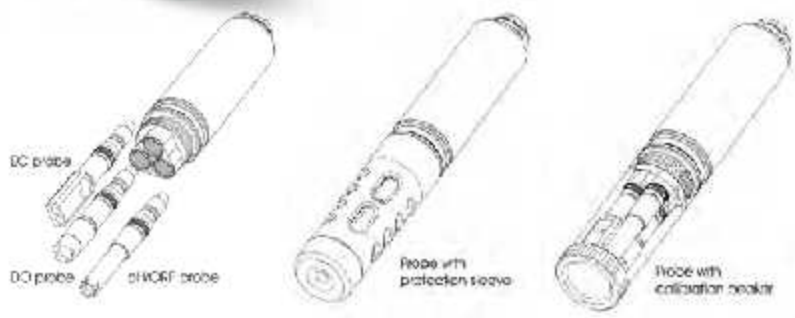
The HI 9828 automatically recognizes the presence of either the pH or pH/ORP sensor.

Both sensors have a cloth junction which allows greater sensitivity, and are gel filled for improved resistance to contamination.

The meter also displays pH in mV readings–ideal for troubleshooting.

HI 9828 is supplied complete with a probe maintenance kit.

This kit includes HI 70425 (electrolyte solution for DO sensor), (5) O-rings for DO sensor, a small brush, (5) O-rings for multiparameter probe and a syringe with grease to lubricate the O-rings.



PROBE REORDER INFORMATION

HI 769828 pH/ORP, EC, DO, temperature multisensor probe with cable.

Configure your HI 769828

HI 769828/4	DO/EC/°C probe with 4 m cable
HI 769828/10	DO/EC/°C probe with 10 m cable
HI 769828/20	DO/EC/°C probe with 20 m cable
HI 769828/30	DO/EC/°C probe with 30 m cable
HI 769828/40	DO/EC/°C probe with 40 m cable
HI 769828/50	DO/EC/°C probe with 50 m cable
HI 769828/60	DO/EC/°C probe with 60 m cable
HI 769828/70	DO/EC/°C probe with 70 m cable
HI 769828/80	DO/EC/°C probe with 80 m cable
HI 769828/90	DO/EC/°C probe with 90 m cable
HI 769828/100	DO/EC/°C probe with 100 m cable

Fully Configurable Measurement Screen

Intuitive Configuration, Measurement and Help

Pressure

Atmospheric pressure calibration and measurement can be made in a choice of units.

Graphing

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

Help

The context sensitive help screen is always accessible.

Quick Calibration

Quick calibration

In the field, the Quick Calibration feature verifies probe functionality and calibration with a single calibration solution (HI 9828-25). Simply screw the calibration beaker filled with solution onto the probe, select "Quick calibration" from the menu and press OK. Individual calibration may also be performed using multiple calibration points.

Field ready

For field calibration, our quick calibration solution allows users to standardize pH and conductivity with one solution.

HI 76407

Standard DO Probe

The HI 76407 dissolved oxygen probe is extremely rugged, making it perfect for both laboratory and field applications. Calibration is fast, simple and all DO readings are temperature compensated.

The pre-tensioned, ready-made PTFE membrane can be changed in a few seconds without the need to stretch and cut replacements.

The HI 76407 is offered with several cable lengths to meet your specific needs.

HI 76407

1. Shielded, waterproof cable
2. Protective sleeve
3. PEI probe for best field protection
4. Linearized and accurate thermistor temperature sensor protected behind a stainless steel cover
5. Silver wire anode element
6. Glass encapsulated platinum cathode
7. Potassium chloride electrolyte solution (HI 7041S)
8. Thin permeable PTFE membrane isolates the sensor elements from the testing solution, but allows oxygen to enter (HI 76407A/P)

PROBE	CABLE LENGTH	METER
HI 76407/2	2 m (6.6')	HI 4421 HI 2400
HI 76407/4	4 m (14')	
HI 76407/10	10 m (33')	
HI 76407/20	20 m (67')	
HI 76407/30	30 m (98.4')	
HI 76407/50	50 m (164')	
HI 76407/60	60 m (196.8')	

HI 76407A/P

Easy, Screw Cap DO Membranes

When the PTFE (PolyTetraFluoro-Ethylene) membrane of the protective cap wears, it is always good to have a back-up.

HI 76407A/P Contains 5 ready to use, replacement membranes.

HI 7041

Electrolyte Solution

It is crucial to the performance of your DO probe, to keep the sensor active with regular maintenance. For this purpose, HANNA has developed HI 7041 electrolyte solution to refill the membrane cap.

HI 7041S	Refilling electrolyte solution (30 mL)
HI 7041M	Refilling electrolyte solution (230 mL)
HI 7041L	Refilling electrolyte solution (500 mL)

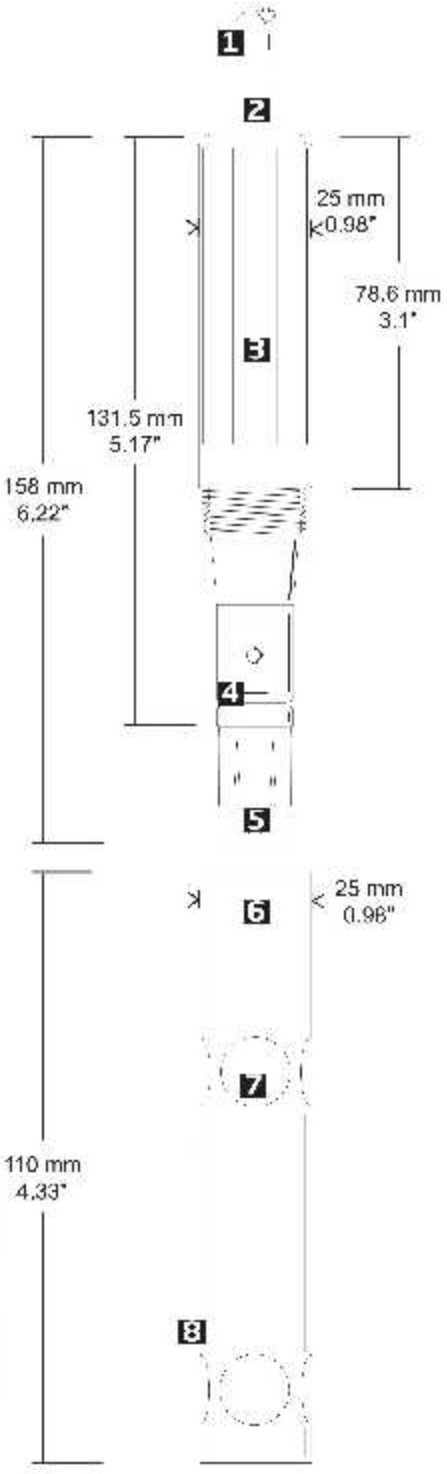
HI 7640/F Series

DO Probe with Protective Sleeve

Perfect for laboratory and field applications, HANNA HI 76407 F Series DO probes are extremely rugged with a screw on protective sleeve. Calibration is fast and simple, and measurements are temperature compensated. The sensitive PTFE membrane can be changed in a few seconds.

1. Shielded, waterproof cable
2. Protective sleeve
3. PEI probe for best field protection
4. Linearized and accurate thermistor temperature sensor protected behind a stainless steel cover
5. Permeable membrane
6. Glass encapsulated platinum cathode
7. Hole for solution cycling
8. Protective sleeve for field applications

PROBE	CABLE LENGTH	METER
HI 76407/4F	4 m (13')	HI 98186 HI 9145 HI 9147
HI 76407/10F	10 m (33')	
HI 76407/20F	20 m (65.6')	
HI 76407/30F	30 m (98.4')	
HI 76407/50F	50 m (164')	



HI 7040 • HI 7041

DO Solutions

It is crucial to the performance of your DO probe, to keep the sensor active with regular maintenance.

HI 7040M	Zero oxygen solution, 230 mL
HI 7040L	Zero oxygen solution, 500 mL
HI 7041S	Refilling electrolyte solution (30 mL)
HI 7041M	Refilling electrolyte solution (230 mL)
HI 7041L	Refilling electrolyte solution (500 mL)

HI 76407A/P

Easy, Screw Cap DO Membranes

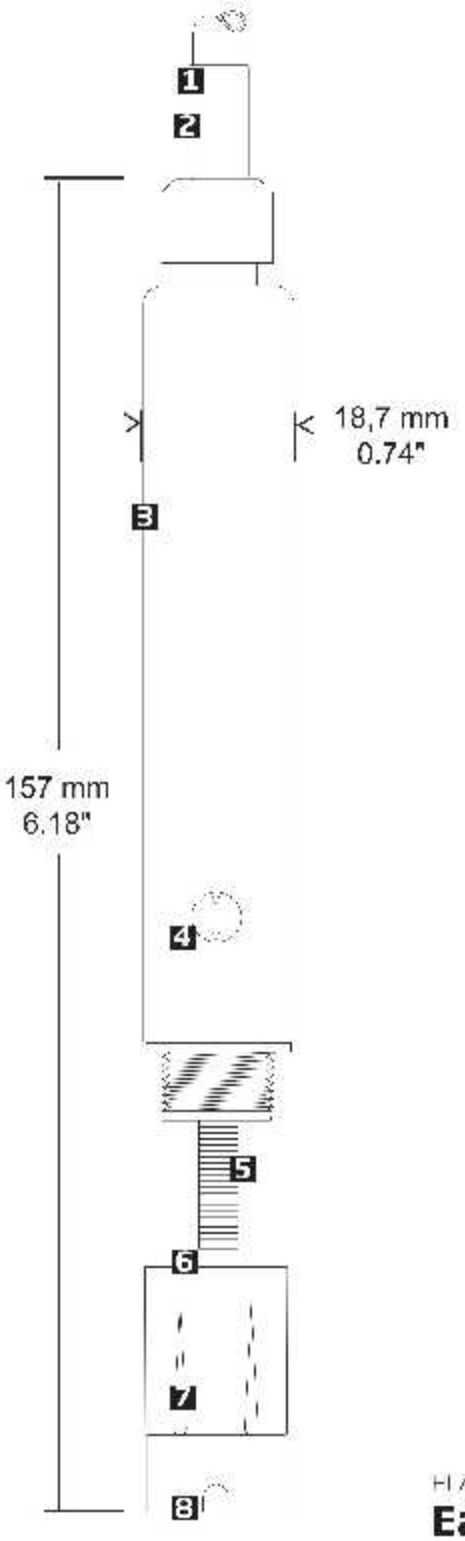
When the PTFE (PolyTetraFluoro-Ethylene) membrane of the protective cap wears, it is always good to have a back-up.

HI 76407A/P Contains 5 ready-to-use replacement membranes.

HANNA instruments

With Great Products, Come Great Results™

Thinner, Lighter DO Probe for Laboratories



Thin and Light

The HANNA HI 76408 DO probe is rugged and perfect for both laboratory and field applications. Calibration is fast and simple, and measurements are temperature compensated. The sensitive PTFE membrane can be changed in a few seconds.

1. Shielded, waterproof cable
2. Protective sleeve
3. PEI probe for best field protection
4. Linearized and accurate thermistor temperature sensor protected behind a stainless steel cover
5. Silver wire anode element
6. Glass encapsulated platinum cathode
7. Potassium chloride electrolyte solution (HI 7041S)
8. Thin permeable PTFE membrane isolates the sensor elements from the testing solution, but allows oxygen to enter (HI 76407A/P)

PROBE	CABLE LENGTH	METER
HI 76408	1 m (3.3')	HI 4221 HI 4222

HI 7640/A/P

Easy, Screw Cap DO Membranes

When the PTFE (PolyTetraFluoro-Ethylene) membrane of the protective cap wears, it is always good to have a back-up.

HI 76407A/P Contains 5 ready-to-use, replacement membranes.

HI 7040 • HI 7041

DO Solutions

It is crucial to the performance of your DO probe, to keep the sensor active with regular maintenance.

HI 7040M	Zero oxygen solution, 230 mL
HI 7041S	Refilling electrolyte solution (30 mL)
HI 7041M	Refilling electrolyte solution (230 mL)
HI 7041L	Refilling electrolyte solution (500 mL)

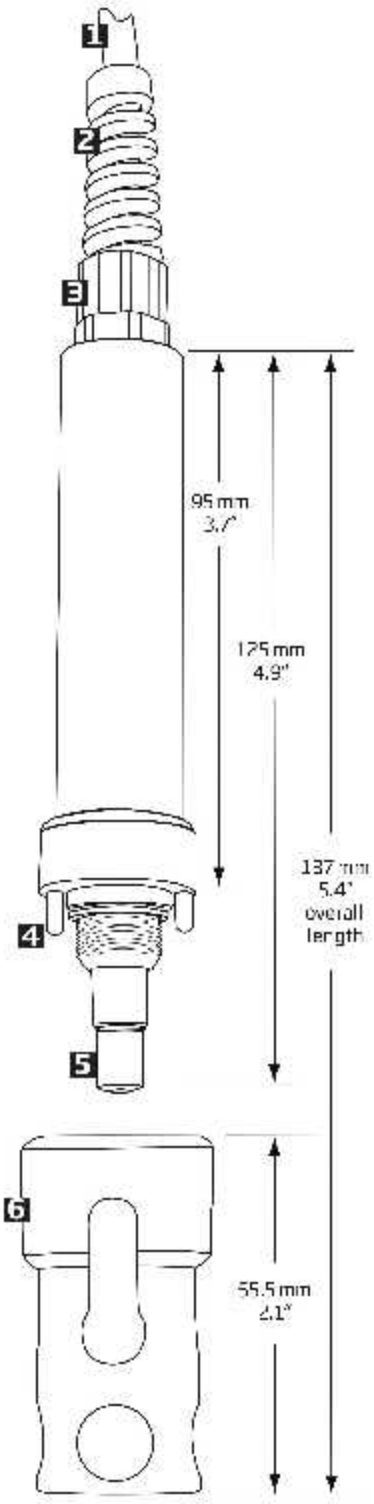
HI 76409

Galvanic DO Probe with Protective Cap

Unlike polarographic probes, galvanic DO probes require no conditioning time. When you need to measure multiple samples in a given period of time, pick it up and measure on demand.

1. Shielded, waterproof cable
2. Flex protect
3. Strain relief for cable
4. Temperature sensors
5. Cathode (3.5 mm), pure silver
6. Protective cap

PROBE	CABLE LENGTH	METER
HI 76409/4	4 m (13')	HI 9147 (meter specific, fixed probe)
HI 76409/10	10 m (33')	
HI 76409/15	15 m (49')	
HI 76409/20	20 m (65.6')	



HI 7040 • HI 7042

DO Solutions

It is crucial to the performance of your DO probe, to keep the sensor active with regular maintenance.

HI 7040M	Zero oxygen solution, 230 mL
HI 7040L	Zero oxygen solution, 500 mL
HI 7042S	Electrolyte solution for galvanic probes, 30 mL

HI 76409A/P

Easy, Screw Cap DO Membranes

When the PTFE (PolyTetraFluoro-Ethylene) membrane of the protective cap wears, it is always good to have a back-up.

HI 76409A/P Contains 5 ready to use, replacement membranes.

HANNA instruments

With Great Products, Come Great Results™

CONTENTS

Multiparameter Meters

Product Spotlights

HI 9829 • HI 98290

GPS Multiparameter Meter with Autonomously Logging Probes

8.4

- Field replaceable ISO 7027 compliant turbidity sensor
- Ammonium, chloride and nitrate ISE's
- Logging from probe or meter
- Display from 1 to 12 parameters with font dimension adjustment
- Track measurement locations with GPS (HI 98290)
- Field replaceable sensors
- Auto-recognition of all sensors
- pH/ORP or pH, four electrode EC or EC/Turbidity and galvanic DO sensors
- Graphic LCD with backlight
- Waterproof protection for meter (IP 67) and probes (IP 68)
- Fast Tracker™ - Tag I.D. System simplifies test logging

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 1 to 12 parameters simultaneously from up to 15 user selectable parameters. Combined with one of the HI 76x9829 series probes, the HI 9829 and HI 98290 can measure water quality parameters such as pH, ORP, conductivity, turbidity, temperature, ions ammonium, nitrate, chloride (as NH_4-N, NO_3-N or Cl^-), dissolved oxygen (as % saturation or concentration), resistivity, TDS, salinity, and seawater SG. 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.

Parameter Guide

Portable Meters

GUIDE	pH	ORP	EC	TDS	Resistivity	Salinity	Temperature	Ammonium	Chloride	Nitrate	Seawater SG	Seawater Specific Gravity	Turbidity	Dissolved Oxygen	Atm. Pressure	GPS	Fast Tracker™	Logging	Page
HI 9829	•	•	•	•	•	•	•	•	•	•	•		•	•	•		•	•	8.4
HI 98290	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	8.4
HI 9828	•	•	•	•	•	•	•					•		•	•	•	•	•	8.12
HI 991300	•		•	•			•												8.18
HI 991301	•		•	•			•												8.18
HI 9813-5	•		•	•			•												8.21
HI 9813-6	•		•	•			•												8.20
HI 9811-5	•		•	•			•												8.22
HI 9812-5	•		•	•			•												8.22

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Multiparameter Meters

Product Spotlights

HI 9813-5 • HI 9813-6

Portable Multiparameter Meters for Agriculture

8.20

HI 9813 5 and HI 9813 6 are versatile, water resistant portable meters specifically designed for agricultural applications such as hydroponics, greenhouses, farming and nurseries.

This series of instruments feature an extra large LCD that clearly displays the parameter being measured as well as calibration instructions. Calibration is fast and easy with knobs located on the front panel of the instrument.

HI 9811-5 • HI 9812-5

Portable Multiparameter Meters for Agriculture and Ground Water

8.22

HI 9811 5 and HI 9812 5 are pH/EC/TDS water resistant portable meters designed for simplicity in taking pH, µS/cm, ppm (mg/L) and temperature measurements. Both the HI 9811-5 and HI 9812-5 are ideal for hydroponics, greenhouses, farming and ground water applications.

Conductivity measurements are automatically compensated for temperature changes with a built-in temperature sensor. The temperature coefficient is fixed at 2%/°C.

HI 991300 • HI 991301

Slimline Multiparameter Meters

8.18

HI 991300 and HI 991301 have been designed to offer you pH, conductivity, total dissolved solids and temperature measurements all in a slim, lightweight, portable unit. For greater precision in your application, both models are available, each with different conductivity ranges. From purified to brine waters, just choose the model for your range of measurement.

The HI 1288 pre-amplified multiparameter probe features an easy to clean flat tip sensor and a cloth junction that can be pulled longer to increase the life of the probe. To ensure against interference from transient electrical noise, a solid-state amplifier is integrated into the HI 1288.

HI 9829 • HI 98290

GPS Multiparameter Meters

pH/ORP/ISE, EC/TDS/Resistivity/Salinity/Seawater σ, Turbidity, DO, Temperature and Atmospheric Pressure

- Field replaceable ISO 7027 compliant turbidity sensor
- Ammonium, chloride and nitrate ISE's
- Logging from probe or meter
- **Fully customizable instrument, probe, sensors and measurement specifications**
- **Display from 1 to 12 parameters with font dimension adjustment**
- **Field replaceable sensors**
- **pH/ORP or pH, four electrode EC or EC/Turbidity and galvanic DO sensors**
- **Auto-recognition of all sensors**
- **Rugged probe with stainless steel tip has a diameter under 2" for wells and pipes**
- **Track measurement locations with GPS (HI 98290)**
- **Fast Tracker™-Tag I.D. System simplifies periodic monitoring**
- **Features a built-in barometer for DO concentration compensation**
- **Quick or independent sensor calibration feature**
- **Measurement check eliminates erroneous readings**
- **Logged data can be displayed as graphs**
- **Graphic LCD with backlight**
- **USB for PC connectivity**
- **Good Laboratory Practice feature with last five parameter calibrations recorded**
- **Meter accepts both alkaline and rechargeable batteries**
- **Waterproof protection for meter (IP67) and probes (IP 68)**

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 1 to 12 parameters simultaneously from up to 15 user selectable parameters.

Combined with one of the HI 76x9829 series probes, the HI 9829 and HI 98290 can measure water quality parameters such as pH, ORP, conductivity, turbidity, temperature, ions ammonium, nitrate, chloride (as NH_4^+-N, NO_3^--N or Cl^-), dissolved oxygen (as % saturation or concentration), resistivity, TDS, salinity, and seawater σ. 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 12 parameters and allows full configuration of each parameter measured along with an on-screen graphing capability.

HELP key displays context sensitive help. The alpha-numeric keypad offers a user friendly way to complete the input fields.

The Perfect Monitoring Tool

Water scientists and managers alike utilize data-collection programs as part of environmental monitoring. These programs are designed to reveal changes in water and 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 manmade pollution.

HI 7609829
for pH/ORP, Dissolved Oxygen, EC

HI 7619829
for pH/ORP, Dissolved Oxygen, EC/turbidity

HI 7629829
for pH/ORP, Dissolved Oxygen, EC, Logging

HI 7639829
for pH/ORP, Dissolved Oxygen, EC/turbidity, Logging

Four probes to choose from. These **Digital** probes provide stable, noise-free sensor signal management without the need for pre-amplified pH sensors.

Autonomously Logging probes Available

After starting a log, the HI 7629829 and HI 7639829 logging probes can autonomously log parameters without further connection to the HI 9829 or HI 98290.

Just connect the logging probe to the HI 9829, HI 98290 or a PC to retrieve the logged measurements.

SPECIFICATIONS		HI 7609829	HI 7619829	HI 7629829	HI 7639829
Supported Configuration	Connector 1	pH, pH/ORP, ammonium ISE, chloride ISE, nitrate ISE			
	Connector 2	dissolved oxygen			
	Connector 3	EC	EC/turbidity	EC	EC/turbidity
Upgradeable		to HI 7619829, adding EC/turbidity sensor and long protective shield	–	to HI 7639829, adding EC/turbidity sensor and long protective shield	–
Temperature sensor		built-in			
Autonomous Logging				yes	yes
Logging Interval				1 second to 3 hours	
Computer Inteface		–	–	USB (HI 76982910)	
Memory		–	–	140,000 measurements (single parameter logged); 45,000 measurements (all parameters logged)	
Operating Temperature		-5 to 55°C*			
Maximum Depth		20 m (66')*			
Cable Specification		Multi-strand, multi-conductor shielded cable with internal strain member rated for 68 kg (150 lb) intermittent use			
Wetted Materials		Body: ABS; Threads: nylon; Shield: ABS/316 SS; Temperature Probe: 316 SS; O-rings: EPDM			
Logging Probe Internal Battery Type				1.5V (4) AA alkaline	
Logging Probe Battery Life [illegible]		–	–	see below	
Sample Environment		fresh, brackish, seawater			
Waterproof Protection		IP68			
Dimensions (without cable)		342 mm (13.5"), dia 46 mm (1.8")	382 mm (15.1"), dia 46 mm (1.8")	442 mm (17.4"), dia 46 mm (1.8")	482 mm (19.0"), dia 46 mm (1.8")
Weight (with batteries and sensors)		570 g (20.1 oz)	650 g (22.9 oz)	775 g (27.3 oz)	819 g (28.9 oz)

Logging Probe Battery Life (HI 7629829, HI 7639829):

Interval	All channels logging (no averaging)	All channels logging (20 sample averaging)
2 seconds	72 hours	72 hours
1 minute	22 days	11 days
10 minutes	70 days	65 days

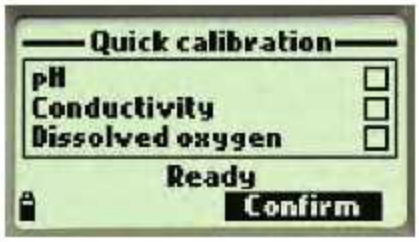
[illegible]

Sensors

Hanna offers a selection of 7 sensors to be used on the intelligent probes. Sensor replacement is quick and easy with screw type connectors and color coded sensors. The HI 9829 and HI 98290 automatically recognizes sensor presence.

The new HI 7609829-4 EC/turbidity sensor is field replaceable and offers readings from both parameters at the same time.

All potentiometric sensors feature a double junction design and are gel filled 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 – ideal for troubleshooting.



Field Ready

For field calibration, our quick calibration solution allows users to standardize pH and conductivity with one calibration solution.

Quick Calibration

Simply screw the calibration beaker filled with HI 9828-25 solution onto the probe, select "Quick calibration" from the menu and press OK. Individual calibration may also be performed using multiple calibration points.

Auto-sensor recognition

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

A Great Combination

The use of HANNA's microprocessor based multiparameter intelligent probes with HI 9829 and HI 98290 meters will provide reliable data collection that can lead to an improved scientific understanding of the interconnections between natural, chemical and geological processes and man made pollution to effectively evaluate applications for waste-discharge permits, remediate contaminated sites and to protect or restore biological resources.

The HI 76x9829 probes utilize field replaceable sensors with auto recognition. The sensors are housed with the probe electronics in a rugged housing with a water tight cable connection. The HI 76909829 probe allows conductivity, pH/ORP (or an ISE), and dissolved oxygen measurement. Other probe models allow turbidity and logging.

The probes are available with a choice of cable lengths such as 4 m and 10 m and 20 m (13, 33') that 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 HI 929829 PC application software to download log files directly from the probes.

Reliable temperature measurements are a critical parameter of aquatic system monitoring. Temperature and temperature changes due to water releases can affect the ability of water to hold oxygen as well as the ability of organisms to resist certain pollutants. The intelligent probes incorporate an accurate thermistor that changes predictably with temperature changes. Accurate temperature reading in degrees Celsius, Kelvin or Fahrenheit are displayed and utilized by other detectors for temperature correction.

The HI 7609829-0 and -1 features a double junction design and are gel filled to increase resistance to contamination. These pH or pH/ORP sensors incorporate the technology that has made HANNA so successful as a pH manufacturer. Reliable pH measurements are one of the most important indicators of water chemistry indicating the relative amount of free hydrogen and hydroxyl ions in the water. HANNA's pH sensors utilize a resilient PFI body to protect them from solid particulates found water samples. Consistency and quality are the hallmarks of these sensors. Our differential measurement system further enhances the measurement reliability providing temperature corrected pH.

A choice of 3 ion selective electrodes is available for constant reporting of common surface water contaminants. Nitrate,

Sensor Configurations

Both probes can 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.

Dissolved Oxygen
HI 7609829-2 DO

pH
HI 7609829-0 pH
HI 7609829-1 pH/ORP

ISE
HI 7609829-10 Ammonium ISE
HI 7609829-11 Chloride ISE
HI 7609829-12 Nitrate ISE

Conductivity
HI 7609829-3 EC

Conductivity and Turbidity
HI 7609829-4 EC/Turbidity

HI 7698295 Short cap for probes without EC/turbidity sensor

HI 7698296 Long cap for probes with EC/turbidity sensor

ammonium and chloride ISE's are available. Each ISE is a combination electrode incorporating an extremely constant reference spiral; all potentiometric probes feature a double junction and solid gelled reference design. By utilizing conductivity, the HI 9829 and HI 98290 can convert ion activity measurements to concentration units. The HI 9829(0) displays these measurements as ppm ammonium-nitrogen, ppm chloride and ppm nitrate-nitrogen.

The HI 7609829-3 4-electrode conductivity sensor using the polarographic measurement principal ensures stable conductivity readings. Electrolytic conductivity measures of the ability of water to conduct an electrical current. It is highly dependent on the amount of dissolved solids (such as salt) in the water. Absolute conductivity, temperature corrected conductivity, salinity, Seawater ρ and water hardness (TDS) determinations are possible with measurements from this sensor.

The oxygen dissolved in lakes, rivers, and oceans is crucial for the organisms and creatures living in it. If dissolved oxygen concentrations drop below normal levels in water bodies, the water quality degrades and the organisms begin to die off. The HI 7609829-2 galvanic DO sensor does not require long polarization times so is ready for measurement at a moment's notice. This sensor also utilizes a replaceable cap design for ease of maintenance and a safe non toxic electrolyte. 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 methods 4500-O G. and EPA article 360.1.

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. Turbidity is the amount of particulate matter that is suspended in water. Turbidity measures the scattering effect that suspended solids have on light: the higher the intensity of scattered light, the higher the turbidity. Material that causes water to be turbid include: clay, silt, finely divided organic and inorganic matter, soluble colored organic compounds, plankton and microscopic organisms. Conductivity measurement is the same as in the HI 7609829-3.

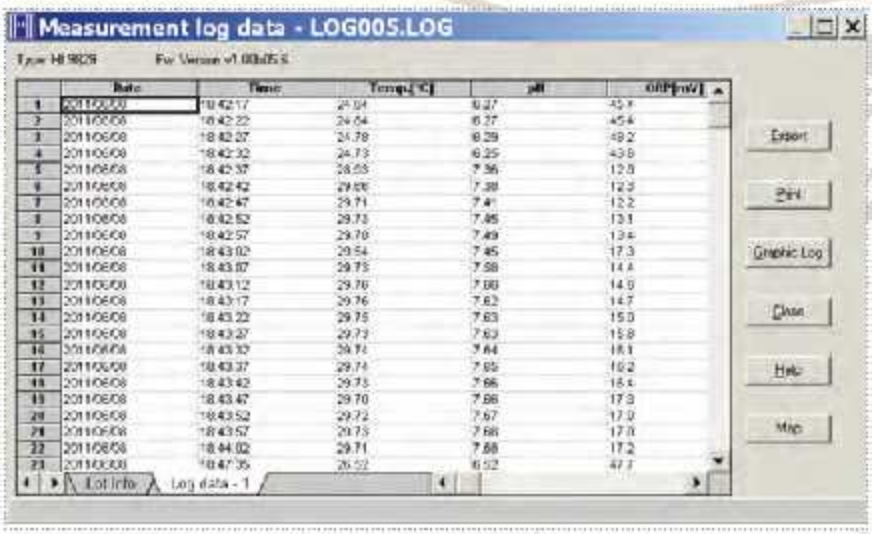
Probes with the logging function have a logging memory that allows storage of up to 140,000 individual samples or 35,000 complete sample data sets with date and time stamp thus permitting up to a 70 day deployment with all channels logging at 10 minute intervals. The probe incorporates a temperature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

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. HI 9829(0) meters also incorporate a real-time clock which stamps all logged data with a time and date in addition to location information.

GPS (Global Positioning System)

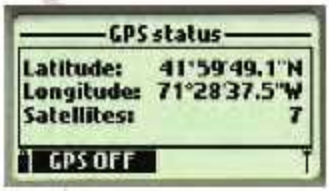
The new HI 98290 features an internal 12 channel GPS receiver and antenna that calculates its position to track locations along with measurement data. The GPS tracks your location using satellites to within 30 ft (10 m) so you can be sure that you return to the same location for repeated measurements. The GPS coordinates can be shown on the LCD together with up to 10 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.



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.

Basic GPS Features

- GPS coordinates shown on the LCD with up to 10 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

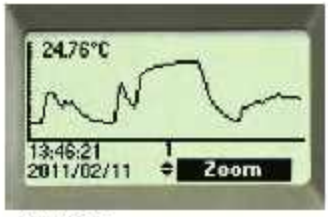
- Manages logged data from the HI 9829
- Displays GPS coordinates with logged data
- Automatically maps samples on your PC (internet connection required)
- Shows location points on map with measurement data

*Google™ is a registered trademark of Google™ Inc. ©2010 Hanna Instruments. Hanna Instruments is not affiliated with Google™.

Intuitive Configuration, Measurement and Help

Calibration

Calibration with the HI 9829(0) is easy and intuitive.



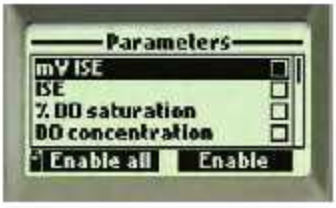
Graphing

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

Help

The context sensitive help screen is always accessible.

Fully Configurable Measurement Screen



Fast Tracker™–Tag Identification System

HANNA's Fact 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 complements the GPS for ultimate tracking.

FastTracker

iButton® Tags are Easy to Install

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.

SPECIFICATIONS	HI 9829	HI 98290 with GPS
Temperature Compensation	automatic from -5 to 55°C (23 to 131°F)	
GPS	-	12 channel receiver
Logging Memory from Meter	44,000 records	
Logging Interval	1 second to 3 hours	
Computer Interface	USB (to HI 92829 software)	
FastTracker™ TAG ID	Yes	
Waterproof Protection	IP67	
Environment	0 to 50°C (32 to 122°F); RH 100%	
Power Supply	1.5V alkaline C cells (4) / 1.2V NiMH rechargeable C cells (4); USB; 12V power adapter	
Dimensions	221 x 115 x 66 mm (8.7 x 4.6 x 2.2")	
Weight	750g (26.5 oz)	

SPECIFICATIONS	HI 9829 and HI 98290 PARAMETERS				
	pH / mV of pH input		ORP mV	Ammonium-Nitrogen	Chloride	Nitrate-Nitrogen
Range	0.00 to 14.00 pH / ±600.0 mV		±2000.0 mV	0.02 to 200 ppm (as N)	0.0 to 200.0 ppm	0.02 to 200 ppm (as N)
Resolution	0.01 pH / 0.1 mV		0.1 mV	0.01 ppm to 1 ppm, 0.1 ppm to 200 ppm		
Accuracy	±0.02 pH / ±0.5 mV		±1.0 mV	±5% of reading or 2 ppm, whichever is greater		
	Conductivity	TDS	Resistivity	Salinity	Seawater σ	
Range	0 to 200 mS/cm (absolute EC up to 400 mS/cm)	0 to 400000 mg/L or ppm (the maximum value depends on the TDS factor)	0 to 999999 Ω•cm, 0 to 1000.0 kΩ•cm, 0 to 10000 MΩ•cm	0.00 to 70.00 PSU	0 to 50.0 σt, σ0, σ25	
Resolution	manual: 1 µS/cm (0.001 mS/cm); 0.01 mS/cm; 0.1 mS/cm; 1 mS/cm; automatic: 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; automatic mS/cm: 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	manual: 1 mg/L (ppm); 0.001 g/L (ppt); 0.01 g/L (ppt); 0.1 g/L (ppt); 1 g/L (ppt); autorange scales: 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); autorange g/L (ppt) scales: 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 reading	0.01 PSU	0.1 σt, σ0, σ25	
Accuracy	±1% of reading or ±1 µS/cm, whichever is greater	±1% of reading or ±1 mg/L, whichever is greater		±2% of reading or ±0.02 PSU, whichever is greater	±1 σt, σ0, σ25	
	Turbidity	Dissolved Oxygen	Atm. Pressure	Temperature		
Range	0.0 to 99.9 FNU; 100 to 1000 FNU	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, 0.593 to 1.118 atm, 60.00 to 113.32 kPa	-5.00 to 55.00°C, 23.00 to 131.00°F, 268.15 to 328.15K		
Resolution	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		
Accuracy	±0.3 FNU or ±3% 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 calibration temperature during calibration	0.15°C; 0.27°F; 0.15K		

ORDERING INFORMATION

Sensors for all meter and probe configurations are sold separately. Choose your configuration below:

METER ONLY, CARTON BOX PACKAGING

HI 9829-01	Meter only, charging adapter and instruction manual, 115VAC
HI 9829-02	Same as HI 9829-01, for 230VAC
HI 98290-01	Meter only with GPS, charging adapter and instruction manual, 115VAC
HI 98290-02	Same as HI 98290-01, for 230VAC

METER AND PROBE ONLY, NO SENSORS, CARRYING CASE PACKAGING

HI 98291-01	HI 9829 and HI 7629829/4 logging probe for pH/pH+ORP/ISE, DO, EC, temperature, with 4 m (13.1') cable, probe maintenance kit, charging adapter, instruction manual and hard carrying case, 115VAC
HI 98291-02	Same as HI 98291-01, for 230VAC
HI 98292-01	HI 9829 and HI 7639829/4 logging probe for pH/pH+ORP/ISE, DO, EC+turbidity, temperature, with 4 m (13.1') cable, probe maintenance kit, charging adapter, instruction manual and hard carrying case, 115VAC
HI 98292-02	Same as HI 98292-01, for 230VAC
HI 98293-01	HI 9829 and HI 7629829/10 logging probe for pH/pH+ORP/ISE, DO, EC, temperature, with 10 m (33') cable, probe maintenance kit, charging adapter, instruction manual and hard carrying case, 115VAC
HI 98293-02	Same as HI 98293-01, for 230VAC
HI 98294-01	HI 9829 and HI 7639829/10 logging probe for pH/pH+ORP/ISE, DO, EC+turbidity, temperature, with 10 m (33') cable, probe maintenance kit, charging adapter, instruction manual and hard carrying case, 115VAC
HI 98294-02	Same as HI 98294-01, for 230VAC
HI 98295-01	HI 98290 with GPS and HI 7629829/4 logging probe for pH/pH+ORP/ISE, DO, EC, temperature, with 4 m (13.1') cable, probe maintenance kit, charging adapter, instruction manual and hard carrying case, 115VAC
HI 98295-02	Same as HI 98295-01, for 230VAC
HI 98296-01	HI 98290 with GPS and HI 7639829/4 logging probe for pH/pH+ORP/ISE, DO, EC+turbidity, temperature, with 4 m (13.1') cable, probe maintenance kit, charging adapter, instruction manual and hard carrying case, 115VAC
HI 98296-02	Same as HI 98296-01, for 230VAC
HI 98297-01	HI 98290 with GPS and HI 7629829/10 logging probe for pH/pH+ORP/ISE, DO, EC, temperature, with 10 m (33') cable, probe maintenance kit, charging adapter, instruction manual and hard carrying case, 115VAC
HI 98297-02	Same as HI 98297-01, for 230VAC
HI 98298-01	HI 98290 with GPS and HI 7639829/10 logging probe for pH/pH+ORP/ISE, DO, EC+turbidity, temperature, with 10 m (33') cable, probe maintenance kit, charging adapter, instruction manual and hard carrying case, 115VAC
HI 98298-02	Same as HI 98298-01, for 230VAC

PROBE ONLY, NO SENSORS, CARTON BOX PACKAGING

HI 7609829/4	Probe for pH/pH+ORP/ISE, DO, EC, temperature with HI 7698295 short protective shield and 4 m (13.1') cable
HI 7609829/10	Probe for pH/pH+ORP/ISE, DO, EC, temperature with HI 7698295 short protective shield and 10 m (33') cable
HI 7619829/4	Probe for pH/pH+ORP/ISE, DO, EC+turbidity, temperature, with HI 7698296 long protective shield and 4 m (13.1') cable
HI 7619829/10	Probe for pH/pH+ORP/ISE, DO, EC+turbidity, temperature, with HI 7698296 long protective shield and 10 m (33') cable
HI 7629829/4	Logging probe for pH/pH+ORP/ISE, DO, EC, temperature with HI 7698295 short protective shield and 4 m (13.1') cable
HI 7629829/10	Logging probe for pH/pH+ORP/ISE, DO, EC, temperature with HI 7698295 short protective shield and 10 m (33') cable
HI 7639829/4	Logging probe for pH/pH+ORP/ISE, DO, EC+turbidity, temperature, with HI 7698296 long protective shield, and 4 m (13.1') cable
HI 7639829/10	Logging probe for pH/pH+ORP/ISE, DO, EC+turbidity, temperature, with HI 7698296 long protective shield, and 10 m (33') cable

SENSORS WITH O-RING

HI 7609829-0	pH
HI 7609829-1	pH/ORP
HI 7609829-2	Dissolved oxygen
HI 7609829-3	EC
HI 7609829-4	EC/Turbidity
HI 7609829-10	Ammonium ISE
HI 7609829-11	Chloride ISE
HI 7609829-12	Nitrate ISE

QUICK CALIBRATION SOLUTIONS

HI 9828-25	Quick calibration solution, 500 mL
HI 9828-27	Quick calibration solution, 1 gal.

pH CALIBRATION SOLUTIONS

HI 7004L	pH 4.01 buffer solution, 500 mL
HI 7007L	pH 7.01 buffer solution, 500 mL
HI 7010L	pH 10.01 buffer solution, 500 mL

ORP CALIBRATION SOLUTIONS

HI 7021L	ORP test solution @240 mV, 500 mL
HI 7022L	ORP test solution @470 mV, 500 mL

CONDUCTIVITY CALIBRATION SOLUTIONS

HI 7030L	12880 µS/cm cal. sol., 500 mL
HI 7031L	1413 µS/cm cal. sol., 500 mL
HI 7033L	84 µS/cm cal. sol., 500 mL
HI 7034L	80000 µS/cm cal. sol., 500 ml
HI 7035L	111800 µS/cm cal. sol., 500 mL
HI 7039L	5000 µS/cm cal. sol., 500 mL

DISSOLVED OXYGEN SOLUTIONS

HI 7040L	Zero oxygen solution, 500 mL
HI 7042S	Electrolyte solution, 30 mL

TURBIDITY CALIBRATION SOLUTIONS

HI 9829-16	0 FNU calibration solution, 230 mL
HI 9829-17	20 FNU calibration solution, 230 mL
HI 9829-18	200 FNU calibration solution, 230 ml

ISE STANDARDS

HI 9829-10/11	Kit containing 10 sachets each of 10 ppm and 100 ppm standard for HI 7609829-10 ammonium ISE
HI 9829-10	10 ppm standard sachet for HI 7609829-10 ammonium ISE, 25 mL (25)
HI 9829-11	100 ppm standard sachet for HI 7609829-10 ammonium ISE, 25 mL (25)
HI 9829-12/13	Kit containing 10 sachets each of 10 ppm and 100 ppm standard for HI 7609829-11 chloride ISE
HI 9829-12	10 ppm standard sachet for HI 7609829-11 chloride ISE, 25 mL (25)
HI 9829-13	100 ppm standard sachet for HI 7609829-11 chloride ISE, 25 mL (25)
HI 9829-14/15	Kit containing 10 sachets each of 10 ppm and 100 ppm standard for HI 7609829-12 nitrate ISE
HI 9829-14	10 ppm standard sachet for HI 7609829-12 nitrate ISE, 25 mL (25)
HI 9829-15	100 ppm standard sachet for HI 7609829-12 nitrate ISE, 25 mL (25)

PROBE MAINTENANCE KIT

HI 7698292	Probe maintenance kit consisting of HI 7042S (electrolyte solution for DO sensor), O-rings for DO sensor (5), small brush, O-rings for probe (5), and syringe with grease to lubricate the O-rings.

pH/ORP CLEANING AND STORAGE SOLUTIONS

HI 70300L	pH/ORP electrode storage sol., 500 ml
HI 7061L	pH/ORP electrode cleaning sol, 500 mL

ACCESSORIES

HI 929829	PC application software
HI 7698291	USB cable, PC to meter
HI 76982910	USB cable, PC to probe
HI 710046	Cigarette lighter cable
HI 7698290	Short calibration beaker
HI 7698293	Long calibration beaker
HI 7698294	Short flow cell
HI 7698297	Long, quick release flow cell
HI 7698295	Short protective shield
HI 7698296	Long protective shield
HI 920005	iButton® with holder (5 pcs)
HI 710140	Hard carrying case
HI 710045	Power supply cable

For a complete list of Solutions, see the end of pH *Section 3*, ISE *Section 4*, Conductivity *Section 6*, Dissolved Oxygen *Section 7* and Turbidity *Section 12*.

HI 9828

GPS Multiparameter Meter

- **Display up to 12 parameters**
- **Track measurement locations with GPS**
- **Waterproof protection for meter** (IP67) **and probe** (IP68)
- **Fast Tracker™–Tag I.D. System simplifies test logging**
- **Graphic LCD with backlight**
- **Built-in barometer for DO compensation**
- **Quick calibration feature**
- **Measurement check eliminates erroneous readings**
- **Auto recognition of pH and pH/ORP probe**
- **Logger function records the data of all connected sensors**
- **Log on demand and automatic logging** (up to 60,000 samples)
- **Logged data can be displayed as graphs**
- **USB for PC connectivity**
- **Autorange of EC and TDS readings**
- **Good Laboratory Practice feature with last 5 calibrations recorded**
- **Field replaceable sensors**
- **Meter accepts both alkaline and rechargeable batteries**
- **Rugged probe with stainless steel tip has a diameter under 2" for wells and pipes**

Measure pH, pH/mV, ORP, % saturation DO, mg/L DO, EC, absolute EC, resistivity, TDS, salinity, seawater specific gravity, atmospheric pressure and temperature

The HI 9828 multiparameter meter with GPS receiver monitors up to 13 different water quality parameters (6 measured, 7 calculated). Measurements include pH, pH/mV, ORP, % saturation DO, mg/L DO, EC, absolute EC, resistivity, TDS, salinity, seawater specific gravity, atmospheric pressure and temperature.

Measurements from specific locations are tracked with detailed coordinate information that can be viewed immediately on the display. GPS information can be transferred to a PC using HANNA's HI 929828 software. GPS information can also be viewed by GPS mapping software such as Google™ maps*. Clicking on visited locations using mapping software such as Google™ Maps displays measurement information. The built-in 12 channel GPS receiver and antenna guarantees a position accuracy of 30 ft (10 m).

For measuring points within a 30 ft range or where GPS signals are not available, HI 9828's Fast Tracker™ is invaluable for associating measurements with their locations.

HANNA's exclusive Fast Tracker™–Tag I.D. System monitors and records data using iButton®s that can be installed at any number of sampling sites.

The HI 9828 has a graphic, backlit LCD that automatically sizes the digits to fit the screen and allows full configuration of each parameter measured along with on screen graphing capability. The meter incorporates comprehensive GLP features and the downloading of data via USB connection.

Each parameter is supported by on-screen context sensitive help, both in the calibration mode and during measurement.

Designed for outdoor environments, the meter is impact resistant and waterproof meeting IP67 standards (30 minutes immersion under 1 m of water). The multi-sensor probe can be left underwater in accordance with IP68 standards.

HANNA instruments

With Great Products, Come Great Results™