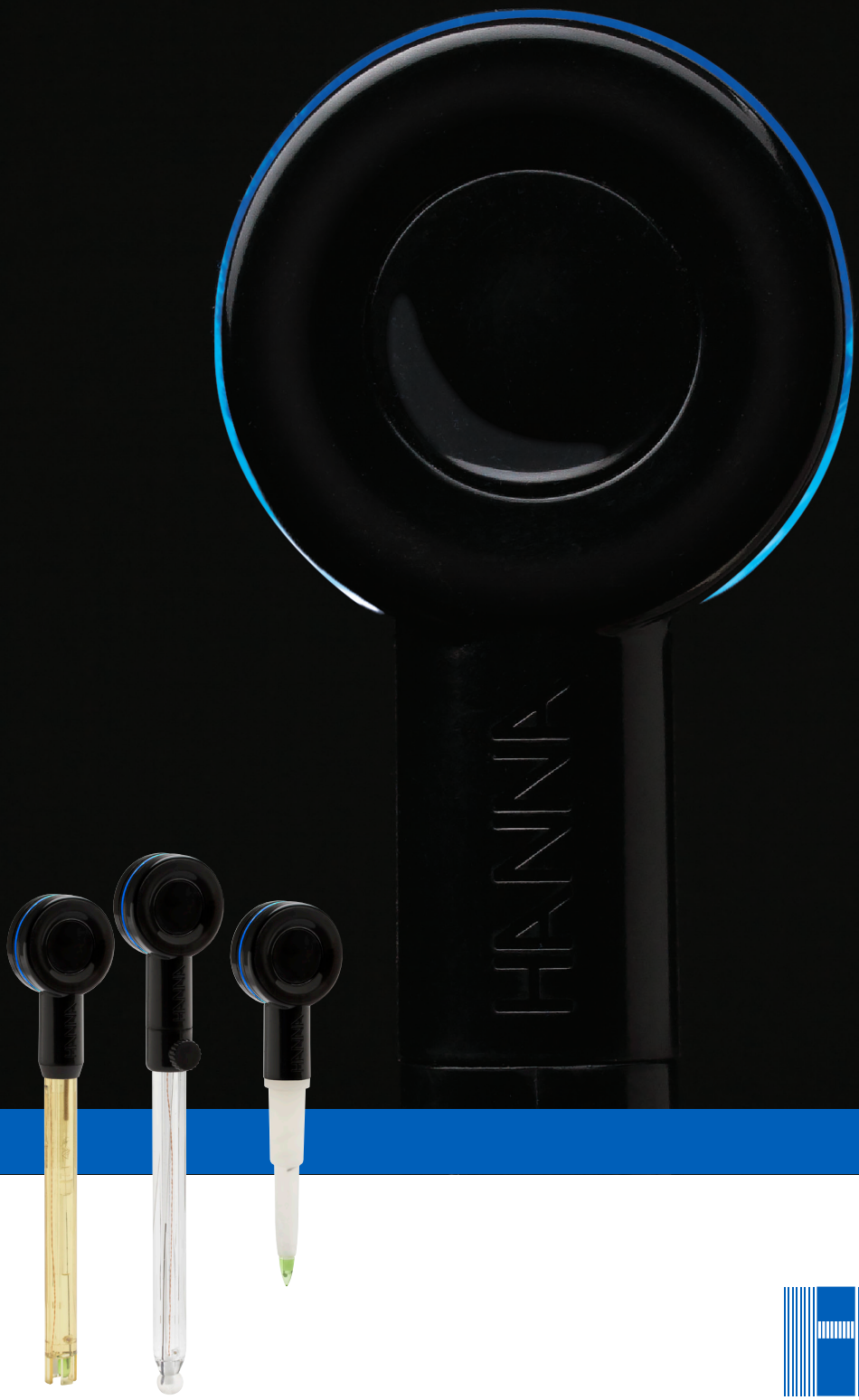
HALO™

pH Electrodes with Bluetooth® Smart Technology



HANNA® instruments

pH	mV	T (°F)	Date	Note	Status
9.99	-182.4	80.0	Oct 15, 2014, 3:23:33 PM		
9.95	-179.8	79.9	Oct 15, 2014, 3:23:34 PM		
9.81	-171.3	79.8	Oct 15, 2014, 3:23:35 PM		
9.61	-159.0	79.8	Oct 15, 2014, 3:23:36 PM		
9.31	-141.0	79.7	Oct 15, 2014, 3:23:37 PM		
9.09	-127.7	79.6	Oct 15, 2014, 3:23:38 PM		
8.91	-116.9	79.5	Oct 15, 2014, 3:23:39 PM		
8.67	-102.1	79.4	Oct 15, 2014, 3:23:40 PM		
8.38	-84.4	79.4	Oct 15, 2014, 3:23:41 PM		
8.08	-66.7	79.3	Oct 15, 2014, 3:23:42 PM		
7.41	-25.9	79.2	Oct 15, 2014, 3:23:43 PM		
7.11	-7.7	79.1	Oct 15, 2014, 3:23:44 PM		
7.06	-4.6	79.1	Oct 15, 2014, 3:23:45 PM		
7.04	-3.8	82.2	Oct 15, 2014, 3:23:46 PM		
7.04	-3.6	86.0	Oct 15, 2014, 3:23:47 PM		
7.03	-3.4	88.1	Oct 15, 2014, 3:23:48 PM		
7.03	-3.2	88.5	Oct 15, 2014, 3:23:49 PM		
7.03	-3.1	88.8	Oct 15, 2014, 3:23:50 PM		
7.03	-3.0	88.9	Oct 15, 2014, 3:23:51 PM		
6.43	33.9	88.9	Oct 15, 2014, 3:23:52 PM		
6.01	59.8	88.7	Oct 15, 2014, 3:23:53 PM		
5.26	105.6	88.4	Oct 15, 2014, 3:23:54 PM		
4.88	128.9	88.2	Oct 15, 2014, 3:23:55 PM		
4.80	134.0	87.9	Oct 15, 2014, 3:23:56 PM		
4.77	135.5	87.6	Oct 15, 2014, 3:23:57 PM		
4.76	136.1	87.3	Oct 15, 2014, 3:23:58 PM		

Hanna Lab App – Free from the App Store℠

Connecting a HALO™ probe to the Hanna Lab App is simple. Measurement and logging of pH and temperature at one second intervals start as soon as the probe is connected.

One press connect

Easily connect to the Hanna Lab App at the press of a button via Bluetooth® wireless technology (10 m range (33')).

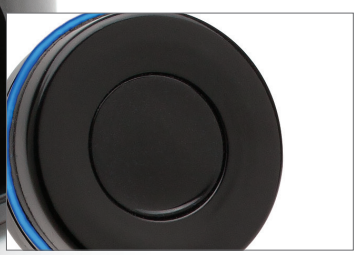
The world's first pH electrode with Bluetooth® Smart technology

HALO™ is the world's first professional pH probe with Bluetooth® Smart technology (Bluetooth® 4.0). These high quality, double junction pH probes feature a built-in temperature sensor and can be used virtually anywhere: in the field, laboratory or classroom. Its flexibility and ease of use will revolutionize the way pH is measured.

HALO™

HALO™ features

- Models for laboratory, field and food applications
- Double junction reference design
- Integrated temperature sensor
  - Ensures the calibration and measurement is automatically temperature compensated, thus eliminating error
- Wide pH and temperature range
- Clear the clutter
  - Data is wirelessly transmitted to an iPad® running the Hanna Lab App via Bluetooth® Smart technology. HALO™ provides up to 500 hours of battery life
- One button sample tagging
  - Pressing either the button on the HALO™ pH probe or the probe icon in the Hanna Lab App will tag sample data for easy reference
- Calibration is stored
  - HALO™ stores calibration information; no additional calibration is needed when switching to another iPad
- Battery condition
  - The measurement screen of the Hanna Lab App displays the name, battery life and condition of the HALO™ probe



Status indicator

Visible from a distance, the LED halo light indicates the probe is active and transmitting.

Easy to replace battery

The HALO's CR2032 lithium ion battery is easily replaceable and lasts for approximately 500 hours.

The first app that turns an iPad® into a full-featured pH meter!

iPad not included.

Settings

Tap the gear icon in the top-right corner of the measurement screen to access the Probe Settings menu for the following options:

- Measurement
  - Measurement mode: pH or mV
  - Measurement resolution
  - Temperature compensation: automatic or manual
  - Temperature units
- Display
  - Good Laboratory Practice (GLP): on screen calibration data
  - View: basic, table or graph
  - Graph display: pH (mV) and/or temperature
  - Stability criteria
- Calibration
  - Perform calibration
  - Calibration buffers: Hanna or NIST
  - Calibration reminder
- Logging
  - Save
  - Share
- Alarms
  - pH (mV) and temperature

Hanna Lab App

pH Meter Application for use with HALO™

- Connects to HALO™ via Bluetooth® 4.0
- Up to five-point pH calibration with seven standard pH buffers available
- Calibration reminder
  - Alerts you when HALO™ needs calibration
- Real-time data
  - Displays pH and temperature updated every second
- Basic GLP
  - Displays date and time of current calibration along with probe offset and average slope
- Full GLP
  - Displays date and time of current calibration, probe offset and average slope along with calibrated buffers, mV values, temperature and slopes between each buffer
- Fluid, dynamic graphing
  - Measurement can be displayed with tabulated data or as a graph. The graph axes may be expanded using the iPad's pinch and zoom technology for enhanced viewing
- Measurement alarms
  - Alerts you if the measurement threshold is exceeded
- One button sample tagging
  - Pressing either the probe icon in the Hanna Lab App or button on the HALO™ pH probe will tag sample data for easy reference
- Data-logging with custom annotations
  - Saved log files may be annotated with measurement specific information
  - Data is automatically saved every hour
- Four ways to save and share data:
  - All data since last auto save
  - Annotations only
  - All data within a timed interval
  - Annotations only within a timed interval
- Share data via email in CSV (comma-separated values) format
- Help and tutorials:
  - Demo probe mode to help explore features of the Hanna Lab App
  - General app information
  - General HALO™ information
  - pH tutorial
  - Maintenance tutorial
  - Contact information

The Hanna Lab App turns an iPad® into a full-featured pH meter when used with the Hanna HALO™ pH electrode with Bluetooth® Smart technology. Functions include calibration, measurement, data logging, graphing and data sharing. Measurement and logging of pH and temperature at one second intervals start as soon as the probe is connected. Measurements can be displayed alone on the display, with tabulated data or as a graph. The graph can be panned and zoomed with the iPad's pinch-to-zoom technology for enhanced viewing.

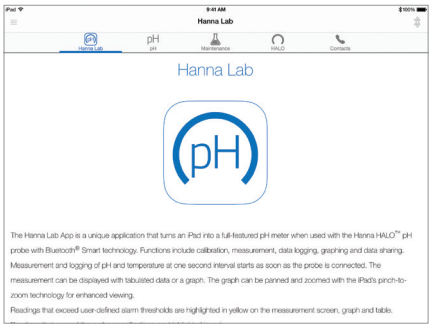
Readings that exceed user-defined alarm thresholds are highlighted in yellow on the measurement screen, graph and table. Readings that exceed the probe specifications are highlighted in red.

Readings are automatically saved to a history file every hour, limited only by the available memory on the iPad. Readings in specific time intervals can also be saved. Saved log files may be annotated with measurement specific information and also shared via email in CSV format.

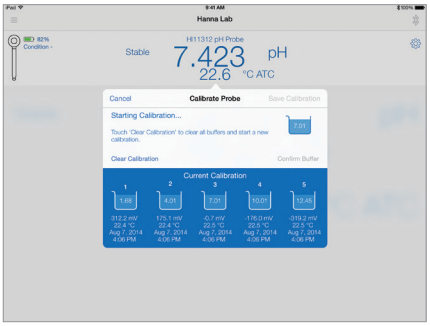
The Hanna Lab App incorporates a probe calibration using up to five pH buffers that are automatically recognized and temperature corrected to 25.0°C during calibration.

Connecting a HALO™ probe to the Hanna Lab App is simple. Tap the Bluetooth® icon in the top-right corner to view all available HALO™ probes then press the button on your HALO™ probe. The blue halo on the probe will start blinking indicating that it is in discovery mode. Select the newly discovered HALO™ probe from the list of available probes. If a previously associated probe is discoverable when the app is opened, it will connect to that probe automatically.

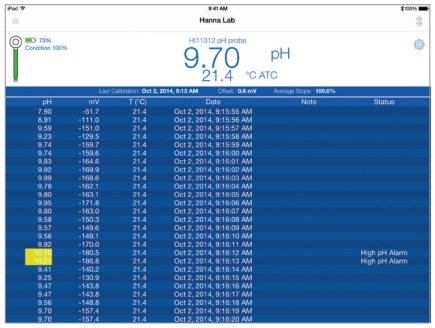
Screen features



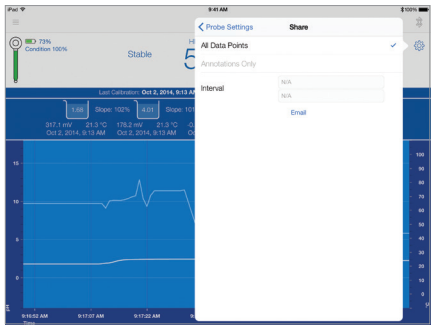
Easily accessible help menu



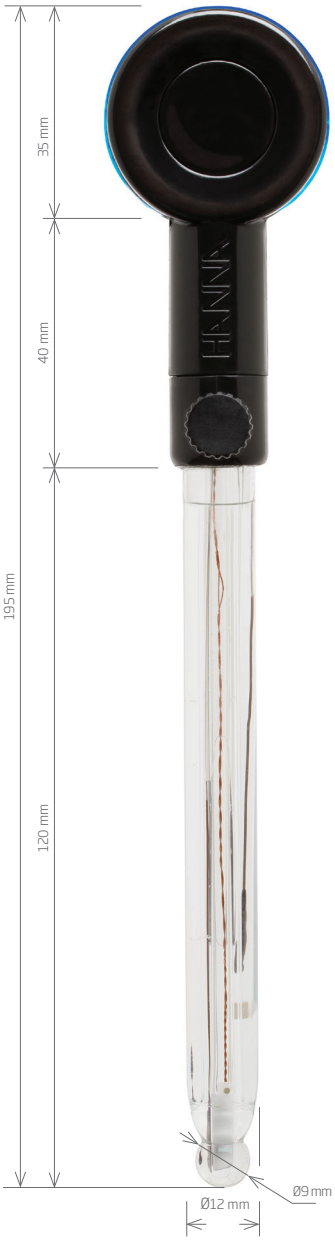
Clear and concise calibration screens



HALO™ continuously logs measurements and lets you retrieve the data you want, when you need it



Share data complete with custom annotations via email



HALO™ Specifications	HI11312	HI12302	FC2022
Reference	double, Ag/AgCl	double, Ag/AgCl	double, Ag/AgCl
Junction	ceramic	ceramic	open junction
Electrolyte	3.5M KCl	gel	viscolene
Range	0.00 to 13.00 pH ±420 mV -5.0 to 80.0°C (23.0 to 176.0°F)	0.00 to 13.00 pH ±420 mV -5.0 to 70.0°C (23.0 to 158.0°F)	0.00 to 12.00 pH ±420 mV 0.0 to 60.0°C (32.0 to 140.0°F)
Bulb Shape	spheric	dome	conical
Outer Diameter (glass)	12 mm (glass)	12 mm (plastic)	12 mm to 8 mm taper (plastic)
Overall Length	195 mm	167 mm	131 mm
Solution Temperature	-5.0 to 80.0°C (23.0 to 176.0°F)	-5.0 to 70.0°C (23.0 to 158.0°F)	0.0 to 60.0°C (32.0 to 140.0°F)
Environment	0.0 to 50.0°C (32.0 to 122.0°F), electronic module is not waterproof		
Temperature Sensor	integrated		
Body material	glass	PEI	PVDF
Connection	Bluetooth® Smart (Bluetooth® 4.0), 10 m (33') range		
Battery Type / Life	CR2032 3V lithium ion / approximately 500 hours		

HI11312 HALO™ includes:

HI11312 HALO™ glass body, refillable pH electrode with Bluetooth® Smart technology

pH 7.01 buffer solution sachets

pH 4.01 buffer solution sachets

electrode cleaning solution sachets

electrode storage solution

electrode refilling solution

electrode refilling pipette

battery

electrode storage cap

quality certificate and instruction sheet

HI12302 HALO™ includes:

HI12302 HALO™ plastic body pH electrode with Bluetooth® Smart technology

pH 7.01 buffer solution sachets

pH 4.01 buffer solution sachets

electrode cleaning solution sachets

electrode storage solution

battery

electrode storage cap

quality certificate and instruction sheet

FC2022 HALO™ includes:

FC2022 HALO™ PVDF body pH electrode with Bluetooth® Smart technology for food applications

pH 7.01 buffer solution sachets

pH 4.01 buffer solution sachets

electrode cleaning solution sachets

electrode storage solution

battery

quality certificate and instruction sheet

Hanna Lab App

iPad not included.

Download on the App Store

HALO™ accessories

HI180-1 black mini stirrer

HI76405 electrode holder with steel base

Electrode cleaning, storage, calibration and filling solutions

HI700601P General purpose cleaning solution, 20 mL sachets (25)

HI700641P Cleaning and disinfection solution for dairy products, 20 mL sachets (25)

HI70300M electrode storage solution, 230 mL bottle

HI7082 electrolyte refilling solution, 3.5M KCl, 30 mL bottle (4)

HI70004P pH 4.01 calibration solution, 20 mL sachets (25)

HI70007P pH 7.01 calibration solution, 20 mL sachets (25)

HI70010P pH 10.01 calibration solution, 20 mL sachets (25)

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