

edge®

pH • EC • DO



Hanna Instruments is proud to introduce the world's most innovative pH, EC and DO meter... edge®

edge® is thin and lightweight, measuring just 1/2" (12 mm) thick and weighing less than 9 ounces (250 g). edge® has an incredibly wide viewing angle, 5.5" (14 cm) LCD and a sensitive capacitive touch keypad.

edge® measures pH, conductivity and dissolved oxygen through its unique digital electrodes. These digital electrodes are auto-recognized, providing sensor type, calibration data and a serial number when connected to edge® by an easy to plug-in 3.5mm connector. The versatile design of edge® enables it to be used as a handheld, benchtop or wall-mounted meter. edge® simplifies measurement, configuration, calibration, diagnostics, logging and transferring data directly to a computer or USB drive.

edge® features Hanna's exclusive pH CAL Check™ to warn you if the electrode you are using is not clean or if your buffers are contaminated during calibration. We have added Sensor Check™ for pH sensors with a matching pin. Our Sensor Check™ feature warns you if the pH bulb is cracked and/or the junction of the electrode is compromised.

edge® is the culmination of Hanna's vision, design capabilities, integrated production facilities, and world class R&D teams. With edge®, Hanna has set the new standard!



edge® Technical Features



- **Two USB ports**
edge® includes one standard USB for exporting data to a flash drive. edge® also includes one micro USB port for exporting files to your computer as well as charging edge® when the cradle is not available.



- **Clear, full text readout**
edge® features clear, full text guides displayed on the bottom of the screen. There is no need to decipher scrambled abbreviations or symbols; these helpful messages guide you through every process quickly and easily.



- **Data logging**
edge® allows you to store up to 1000 log records of data. Logging data sets include readings, GLP data, date and time.



- **GLP**
Data from the last calibration you perform is stored in the sensor including the electrode's offset, slope, date, time and standards. When any sensor (pH, EC, or DO) is connected to edge®, GLP data is automatically transferred.



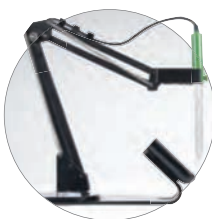
- **Basic mode**
You can use edge® in basic mode—ideal for routine measurements by offering a simplified screen and features.



- **CAL Check™**
(edge® pH measurement only)
edge® features Hanna's exclusive CAL Check™ technology to warn you if the electrode bulb is not clean or if the buffers are contaminated during calibration.

Accepts pH, EC and DO edge® compatible probes

edge® Design Features



- **Cradle and electrode holder**
edge® is equipped with a benchtop cradle that features an adjustable swivel electrode holder which can charge and hold edge® securely in place at the optimum viewing angle.



- **Capacitive touch keypad**
edge® features a capacitive touch keypad that gives a distinctive, modern look. Since the keypad is part of the screen, your buttons can never get clogged with sample residue. For faster scrolling, simply hold down the arrow keys.



- **Easy to read LCD**
edge® features a 5.5" (14 cm) LCD display that you can clearly view from over 5 m (16.4'). The large display, with its wide 150° viewing angle, provides one of the easiest to read LCDs in the industry.



- **Zero footprint**
Using the wall mount cradle (included), edge® can be placed on a wall, leaving zero footprint on the benchtop space. The cradle has a built-in connector to power edge® and charge its batteries.



- **3.5 mm probe input**
Plugging an electrode in has never been simpler; no alignments or broken pins, simply connect the 3.5 mm plug and begin. Digital SMART electrodes are automatically recognized.



- **Sleek design**
edge® is incredibly thin and lightweight, measuring just 1/2" (12 mm) thick and weighing just 8.8 ounces (250 g).



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edge pH Parameter and CAL Check™ Features

pH

- Resolution selectable from 0.01 and 0.001 pH
- Range -2.000 to 16.000 pH
- Accuracy ± 0.002 pH for 0.001 pH resolution; ± 0.01 for 0.01 resolution
- Data logging
 - Manual log-on-demand
 - Manual log-on-stability
 - Interval logging
- Temperature readout ($^{\circ}\text{C}$ or $^{\circ}\text{F}$)
- Automatic Temperature Compensation (ATC)
- CAL Check™ indicators:
 - Probe condition
 - Response time
 - Check buffer
 - Clean electrode
- Sensor Check™ indicators:
 - Broken electrode
 - Clogged junction
- GLP data
 - Records date, time, offset, slope and buffers used during calibration
- Five-point calibration
 - A choice of seven pre-programmed buffers plus two selectable custom buffers
- Calibration tag on screen
 - Identifies buffers used for current calibration
- Calibration expiration warning
 - Reminds users to calibrate to ensure accurate readings



CAL Check™

The edge® includes powerful algorithms to alert the user of potential problems during the pH calibration process. These indicators include when to clean the electrode, check the buffer, the response time, and the overall condition of the electrode.

WRONG BUFFER—Displayed when the difference between the pH reading and the value of the selected buffer is too great.

WRONG OLD POINTS INCONSISTENCY—Displayed if the new calibration differs significantly from the last value of that sensor in that buffer.

CLEAN ELECTRODE—This message indicates poor electrode performance (offset out of accepted window, or slope under the accepted lower limit).

CHECK ELECTRODE CHECK BUFFER—Displayed when electrode slope exceeds the highest accepted slope limit.

BAD ELECTRODE—Displayed if the cleaning procedure performed as a result of the previous two messages is unsuccessful.

WRONG BUFFER TEMPERATURE—Displayed if the temperature of the buffer is outside the defined buffer temperature range.

CONTAMINATED BUFFER—Displayed when the buffer could be contaminated.

Broken Temperature Sensor—If the temperature sensor should malfunction or break at any time, a temperature of “25.0 $^{\circ}\text{C}$ ” will blink on the second LCD line and the message **BROKEN TEMPERATURE SENSOR** will appear after leaving calibration.

Response and condition gauges appear on the display for 24 hours after an electrode calibration. These five segment displays provide a visual image of the overall condition of the pH probe based on offset and slope characteristics and speed of response based upon how long it took to stabilize in buffers during calibration.



edge EC and DO Parameter Features

Conductivity

- Four-ring platinum probe
 - Covers all ranges from 0.00 $\mu\text{S}/\text{cm}$ to 500 mS/cm (absolute EC)
- Accuracy
 - $\pm 1\%$ of the reading $\pm (0.05 \mu\text{S}/\text{cm}$ or 1 digit, whichever is greater)
- Calibration
 - Offset (0 $\mu\text{S}/\text{cm}$) and cell factor calibration
 - Choice of five standards
- Auto-ranging or manual range selection
- EC, TDS and salinity reading modes
- Temperature compensation
 - Automatic
 - NoTC (absolute)
- GLP data
 - Records date, time, offset and cell constant value (K)
- Adjustable EC to TDS conversion factor
- Adjustable temperature correction coefficient

Dissolved Oxygen

- Clark type polarographic probe with easy-to-replace membrane cap
 - Covers all ranges from 0.00 to 45.00 mg/L (ppm); 0.0 to 300% air saturation
- Accuracy
 - $\pm 1.5\%$ full scale
- One or two-point calibration (HI7040); 0% (solution) and 100% (air)
- Automatic Temperature Compensation from 0 to 50 °C
- Altitude compensation from -500 to 4000 m (-1640 to 13,123')
- Salinity compensation 0 to 40 g/L
- GLP data
 - Records date, time, calibration standards, altitude value and salinity value



- Portable field unit
 - edge® is ideal for field use due to its lightweight, large screen and thin design. It can be easily slipped into a backpack or messenger bag.
- Wall mount cradle
 - The included wall mount cradle makes it easy to conserve space on the benchtop and can charge edge® with the AC adapter. Ideal for continuous monitoring applications.
- Electrode holder with built-in cradle
 - The electrode holder features a swivel, adjustable arm with a built-in cradle to hold edge® securely in place at the optimum viewing angle.



edge® Electrodes

pH

edge®

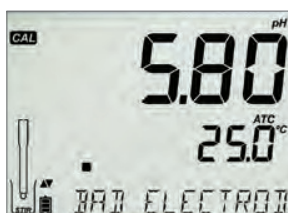


Digital SMART Electrodes

The electrodes used with edge® are nearly as advanced as edge® itself. They feature a built-in microchip that stores sensor type, ID, and calibration information that is automatically retrieved by edge® once the electrode is plugged in.

Stored pH calibration information includes: calibrated buffers, date, time, offset and slope characteristics of the electrode. Conductivity calibration information includes: calibrated conductivity standards, date, time, and cell constant of the sensor. Dissolved oxygen calibration information includes: standards used for calibration, date, time, altitude and salinity correction.

These digital electrodes also feature an easy to plug in 3.5 mm connector so you never have to worry about the right angle or aligning pins.



Sensor Check™ (HI12301 and HI11311 only)

When used with edge® compatible electrodes equipped with a matching pin, edge® checks the impedance of the pH measuring electrode in real-time to notify you in the event of glass breakage. During calibration, Sensor Check™ technology checks the state of the junction. The reference junction is also evaluated and reported on the display.

pH Electrodes



HI11310

Single ceramic, double junction, glass body, refillable pH electrode with temperature sensor
Recommended for laboratory and general purpose



HI12300

Single ceramic, double junction, gel filled, PEI body, pH electrode with temperature sensor
Recommended for field applications



HI10530

Triple ceramic, double junction, glass body, refillable pH electrode with conical tip and temperature sensor
Recommended for fats and creams, and soil samples



HI10480

Double reference, open junction, Clogging Prevention System (CPS), glass body pH electrode with temperature sensor
Recommended for wine analysis



FC2100

Double reference, open junction, viscolene electrolyte, glass body pH electrode with conical tip and temperature sensor
Recommended for dairy analysis



HI11311

Single ceramic, double junction, glass body, refillable pH electrode with temperature sensor and matching pin
Recommended for laboratory and general purpose



HI12301

Single ceramic, double junction, gel filled, PEI body, pH electrode with temperature sensor and matching pin
Recommended for field applications



HI10430

Triple ceramic, double junction, glass body, refillable pH electrode with temperature sensor
Recommended for paints, solvents, strong acids and bases, high conductivity samples, and Tris buffer



FC2320

Double reference, open junction, viscolene electrolyte, PVDF body pH electrode with conical tip and temperature sensor
Recommended for meat applications



FC2020

Double reference, open junction, viscolene electrolyte, PVDF body pH electrode with conical tip and temperature sensor
Recommended for dairy analysis

Conductivity Probe



HI763100

Conductivity probe with temperature sensor
Recommended for general purpose

Dissolved Oxygen Electrode



HI764080

Dissolved oxygen electrode with temperature sensor
Recommended for general purpose



- Simply connect each probe via the 3.5 mm jack, digital SMART Electrodes are automatically recognized



Specifications		edge®		
pH (using pH kit)	Range	basic mode: -2.00 to 16.00 pH; ± 1000.0 mV for pH standard mode: -2.00 to 16.00 pH; -2.000 to 16.000 pH; ± 1000.0 mV for pH		
	Resolution	0.01 pH; 0.001 pH; 0.1 mV		
	Accuracy (@25°C/77°F)	± 0.01 pH; ± 0.002 pH; ± 0.2 mV		
	Calibration	Automatic, up to three points (five points [†]) calibration, 5 standard (7 standard [†]) buffers available (1.68 [†] , 4.01 or 3.00, 6.86, 7.01, 9.18, 10.01, 12.45 [†]) and two custom buffers [†]		
	Temperature Compensation*	automatic, -5.0 to 100.0°C (23.0 to 212.0°F) (using integral temperature sensor)		
	Electrode Diagnostics	standard mode: probe condition, response time and out of calibration range		
EC (using EC kit)		EC	TDS	Salinity [†]
	Range	0.00 to 29.99 μ S/cm; 30.0 to 299.9 μ S/cm; 300 to 2999 μ S/cm; 30.0 to 200.0 mS/cm; up to 500.0 mS/cm (absolute EC)**	0.00 to 14.99 mg/L (ppm); 15.0 to 149.9 mg/L (ppm); 150 to 1499 mg/L (ppm); 1.50 to 14.99 g/L; 15.0 to 100.0 g/L; up to 400.0 g/L (absolute TDS)**, with 0.80 conversion factor	0.0 to 400.0 ‰ NaCl; 2.00 to 42.00 PSU; 0.0 to 80.0 g/L
	Resolution	0.01 μ S/cm; 0.1 μ S/cm; 1 μ S/cm; 0.01 mS/cm; 0.1 mS/cm	0.01 ppm; 0.1 ppm; 1 ppm; 0.01 g/L; 0.1 g/L (0.80 TDS factor)	0.1 ‰ NaCl; 0.01 PSU; 0.01 g/L
	Accuracy (@25°C/77°F)	$\pm 1\%$ of reading $\pm (0.5 \mu$ S or 1 digit, whichever is greater)	$\pm 1\%$ of reading $\pm (0.03$ ppm or 1 digit, whichever is greater)	$\pm 1\%$ of reading
	Calibration	single cell factor calibration; six standards available: 84 μ S/cm, 1413 μ S/cm, 5.00 mS/cm, 12.88 mS/cm, 80.0 mS/cm, 118.8 mS/cm, one point offset: 0.00 μ S/cm	through EC calibration	one-point with HI7037 100% NaCl sea water standard
	Conductivity Temperature Coefficient	0.00 to 6.00%/°C (for EC and TDS only), default value is 1.90%/°C		
	Temperature Compensation*	automatic -5.0 to 100.0°C (23.0 to 212.0°F); NoTC – none, absolute conductivity.		
	TDS Factor	0.40 to 0.80 (default value is 0.50)		
DO (using DO kit)	Range	0.00 to 45.00 ppm (mg/L); 0.0 to 300.0 % saturation		
	Resolution	0.01 ppm (mg/L); 0.1 % saturation		
	Accuracy	$\pm 1.5\%$ of reading ± 1 digit		
	Calibration	one or two-point at 0% (HI7040 solution) and 100% (in air)		
	Temperature Compensation*	0 to 50°C; 32.0 to 122.0°F		
	Salinity Compensation	0 to 40 g/L (with 1 g/L resolution)		
	Altitude Compensation	-500 to 4000 m (with 100 m resolution)		
Temperature	Range*	-20.0 to 120.0°C; -4.0 to 248.0°F		
	Resolution	0.1°C; 0.1°F		
	Accuracy	± 0.2 °C; ± 0.4 °F		
Additional Specifications	Logging	up to 1000 [†] (400 for basic mode) records organized in: manual log-on-demand (max. 200 logs), manual log-on-stability (max. 200 logs), interval logging [†] (max. 600 samples; 100 lots)		
	Connectivity	one USB port for storage; one micro USB port for charging and PC connectivity		
	pH Electrode (included in pH kit)	HI11310 digital glass body pH electrode with 1/8" (3.5mm) connector and 1 m (3.3') cable		
	EC Electrode (included in EC kit)	HI763100 digital four-ring conductivity probe with 1/8" (3.5mm) connector and 1 m (3.3') cable		
	DO Electrode (included in DO kit)	HI764080 digital dissolved oxygen electrode with 1/8" (3.5mm) connector and 1 m (3.3') cable		
	Environment	0 to 50°C (32 to 122°F); RH max 95% non-condensing		
	Power Supply	5 VDC adapter (included)		
	Dimensions	202 x 140 x 12 mm (7.9" x 5.5" x 0.5")		
	Weight	250 g (8.82 oz.)		
Ordering Information		edge® is available in 3 kit configurations: pH, EC and DO		
		All kits include: edge®, benchtop docking station with electrode holder, wall-mount cradle, USB cable, 5 VDC power adapter, quality certificate and instruction manual. HI2020-01 (115V) and HI2020-02 (230V) pH kit also includes: HI11310 glass body, refillable pH electrode with temperature sensor, pH 4 buffer solution sachets (2), pH 7 buffer solution sachets (2), pH 10 buffer solution sachets (2) and electrode cleaning solution sachets (2). HI2030-01 (115V) and HI2030-02 (230V) EC kit also includes: HI763100 EC probe, 1413 μS/cm conductivity standard sachets (3) and 12880 μS/cm conductivity standard sachets (3). HI2040-01 (115V) and HI2040-02 (230V) DO kit also includes: HI764080 dissolved oxygen electrode, HI7041S refill electrolyte solution, DO membrane caps (2) and o-rings (2). All probes on the opposite page are interchangeable with edge® and can be ordered separately.		

edge® compatible electrodes begin on page 3.91; pH solutions begin on page 3.100;
DO solutions begin on page 7.21; EC and TDS solutions begin on page 6.42

* temperature limits will be reduced to actual probe/sensor limits
** with temperature compensation function disabled
† standard mode only

