HI6221

Advanced pH/ORP Meter

pH/ORP and Temperature

HI6221 is a streamlined benchtop meter with a large touch screen display, comprised of a housing and an integrated pH / ORP measurement module.

Compact and easy to operate, the benchtop meter is delivered with Hanna Instruments HI1131B double junction combination pH electrode, together with HI7662-TW temperature probe.

HI1131B is a glass body, double junction, refillable pH electrode with an indicating sensor made of High Temperature (HT) glass. The double junction reference and HT glass design allow the HI1131B to be used in a wide variety of applications including samples with metals and elevated temperatures.

Probe connection to the unit is secured through a galvanically isolated BNC connection.

HI7662-TW stainless steel temperature probe allows the meter to automatically temperature compensate (ATC) pH measurements.

This system responds to a complex range of measurement and monitoring requirements, providing accuracy, reproducibility, and reliability.

HI6221 is supplied with an electrode holder that has a flexible arm. The holder can be mounted quickly and provides secure support for electrodes while taking measurements in sample containers.

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User interface

- 7-inch capacitive touch screen with multi-touch support

- Capacitive touch back, home and system menu keys

- User-friendly icons and symbols allow users to easily navigate and interpret the instrument functions.

- The user can select between five different views:
  - Basic measurement configuration
  - Simple GLP with calibration information
  - Full GLP with electrode status and calibration point details
  - Live updated, interactive graph
  - Tabulated data with date, time, and notes

Measurement

- Measure pH/mV (pH) or mV/Rel. mV (ORP) with temperature

- Application-specific profiles allow quick and direct measurement without the need to update the sensor and system settings

- Active log during measurement

- Measurement stability indicator (using the Stability Criteria setting)

- Reading modes: direct and direct/autohold

- Temperature compensation can be Automatic (using temperature probe) or set manually

- Audible and/or alarm messages for measurements outside of predefined limits

- Galvanic isolation for pH/ORP measurement

Calibration

- 5-point pH calibration with automatic recognition for standard buffers (Hanna and NIST buffers)

- Choice of standard or custom buffers for calibration

- Non-volatile memory saves data and settings

Logging

- Data log collection of at least 1,000,000 data points (with time and date stamp)

- Logging types: manual, automatic, autohold

- Sample ID for manual and Autohold data

Connectivity features & services

- Transfer logged data to a USB thumb drive

- Log files that include measurements and calibration data (as .csv file)

- FTP and email for log export via Ethernet and Wi-Fi connection

- USB type A for USB stick, keyboard, and printer

- USB type C for USB stick and PC connection

Help section for meter guidance

- Video support presentation of main functionalities

This system responds to a complex range of measurement and monitoring requirements, providing accuracy, reproducibility, and reliability.

1. Capacitive touch screen with multi-touch support

The benchtop unit has a 7-inch color display with 800 x 480p resolution. The capacitive, multi-touch screen supports video playback and data plotting.

2. Back key

3. Home key

4. System Menu key

This key will enter the system menu where User accounts, System Settings, and Logging can be configured. The Help menu is also accessed on the system menu screen.

5. Stability indicator

6. Current date

7. Current time

8. pH reading

9. mV reading

10. pH electrode icon

11. Calibration information: Electrode condition, Offset, Slope, Date and Time

12. Buffer trays

13. Temp. reading and Temp. compensation status

14. Measurement setup menu

Opens sensor setup parameters.

15. User name (default shown)

16. Direct/Autohold Readings

When Direct/Autohold is selected, measurement reading is held on display when measurement stability is reached. This option removes the subjective nature of stability as a measurement that has not reached equilibrium will not be used.

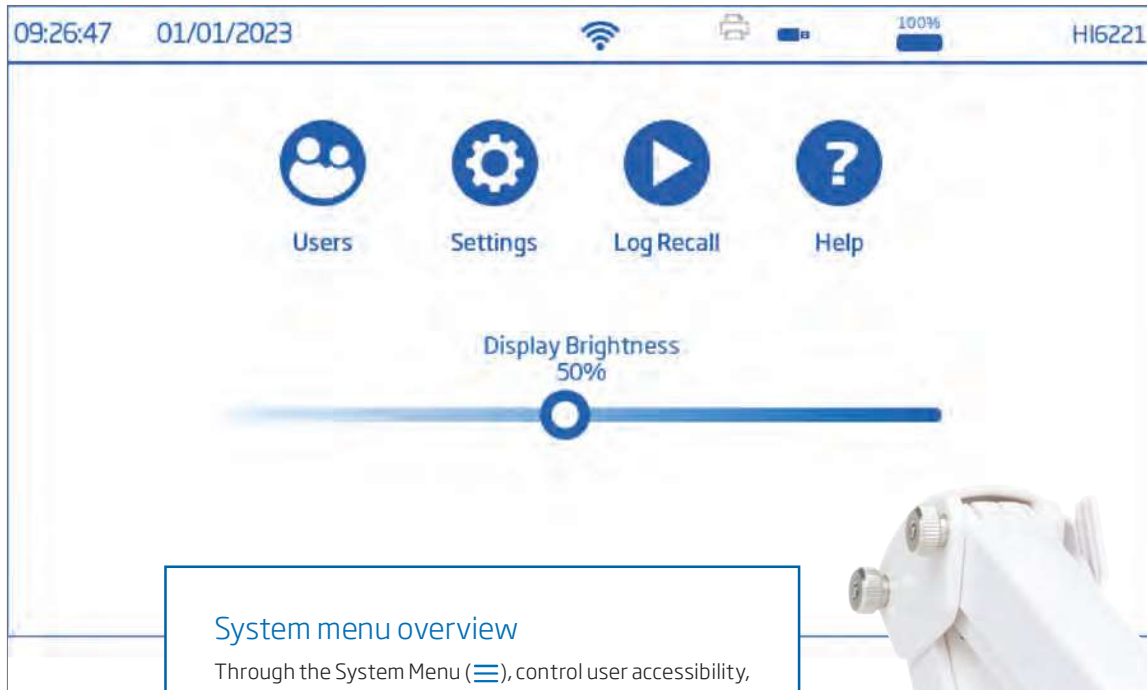When not selected, sample measurements are displayed continuously.

17. Logging space availability

18. Logging start

19. USB connection status

20. Peripheral connection status

21. Wireless network connection status

System Menu

09:26:47   01/01/2023   🛜   🖨   ▬ᴮ   100%   HI6221

👥 Users   ⚙ Settings   ▶ Log Recall   ❓ Help

Display Brightness
50%

System menu overview

Through the System Menu (≡), control user accessibility, system and connectivity configuration, access logged data and video-supported help.

- Add and delete user accounts through Users (👥).

- Access Network Connectivity, System and Info tabs through Settings (⚙)

- Log Recall (▶) recalls stored log sessions (Automatic continuous logging, Manual, or Autohold).

- Help (❓) guides users with video-supported help.

Users
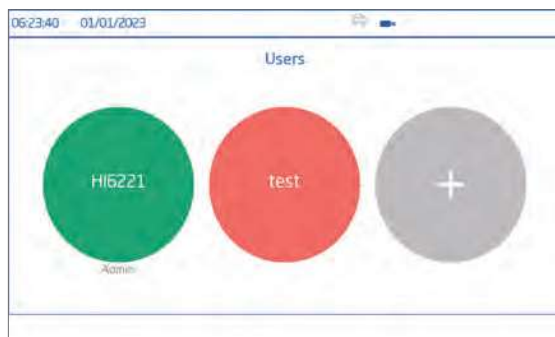
Custom Users

New administrator or standard user accounts can be created. Standard accounts can be configured for specific accessibility.
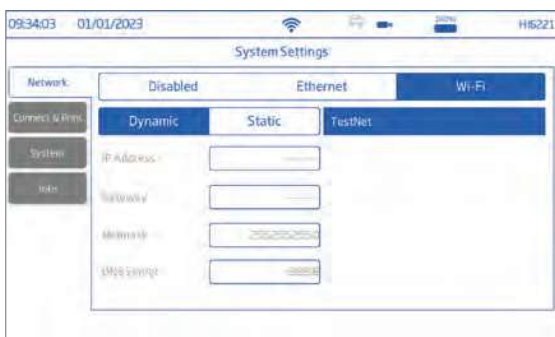
User Account Management

Administrators can create and manage accounts from the Account Management Screen.
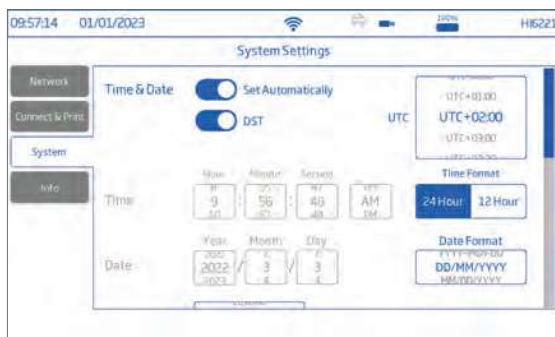
Settings

Network Screen

Determine how measurement logs are shared though network settings. Users can select network to be connected via Ethernet or Wi-Fi, or Disabled.

Connect and Print Screen

Activate connectivity options to allow the meter to connect to other devices.

- FTP access to meter, permits log file transfer to a FTP site and to connect the meter FTP server to a client for log download.
- Meter web server, permits log file download to a web client.
- Sending emails, permits log files to be transferred by email.

System Screen

The system screen enables users to configure options such as: Time, Date, Language, Meter ID, Decimal Separator, Backlight Saver, Audible signals, Startup Tutorial, and Factory Settings restore.

Info Screen

Displays information on meter, channel serial number, and Wi-Fi firmware version.

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Log Recall

Log History and Sharing

The item allows users access and management (selection, deletion, and sharing) of measurement data. Only the user who generated the data has access to the logs created by that user.

Data can be viewed tabulated (complete with date, time, and notes), or plotted (as graph).

Log files can be shared via USB, FTP, web server and email.

Table View

Graph View

Log Detail

Tapping the information icon displays log details such as user and profile name, instrument name and serial number, channel, lot information, as well as GLP data.

Help

On-board Help

The HELP menu supports users with a brief overview of the system's main functionalities through text and video tutorials.

**Measurement
Setup
Configuration**

Calibration

Customize calibration options such as Last Calibration, Automatic, semi-automtic or manual calibration, First Calibration Point, daily or periodic Calibration Reminder, and buffer Groups.

Buffer groups

This option allows the user to select Buffers in Use for calibrating a pH electrode when using the Automatic calibration type.

Custom Buffers

Custom buffers can be created.

Reading

Customize measurement options such as Parameter, Resolution, Stability Criteria, Reading Mode

Temperature

Customize temperature options such as Automatic or manual temperature Source, °C, °F, or K temperature Unit, Manual Temperature input, Isopotential Point.

Alarm configuration

Alarm configuration allows users to set the high and low threshold limits for the measured parameters. When the parameter is enabled and the the measurement exceeds the high-limit value or drops below the low-limit value, the alarm is triggered and will appear on the message banner along with an audible alarm (if Alarm Beepers is enabled).

Logging

Logging Type Automatic, Manual or Autohold), Sampling Period (Automatic), File Name (Manual and Autohold), and Sample ID (Manual and Autohold) can be configured under this option menu.

Profiles

A profile is a sensor setup complete with required measurement unit, temperature unit, display preference, and alarm threshold options.

Once saved the profile can be loaded for applications that require similar configurations.

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Views
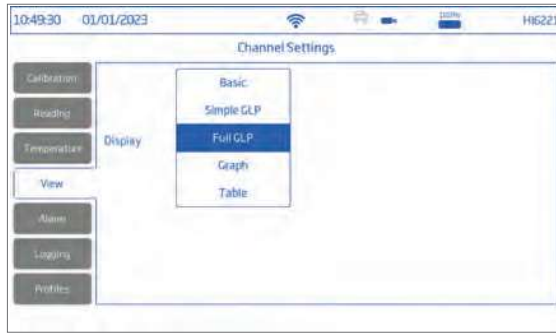
View Configuration

This screen allows users to select the preferred display configuration.

pH options: Basic, Simple GLP, Full GLP, Graph, Table
mV options: Basic, Graph, Table
Rel. mV options: Simple GLP, Basic, Graph, Table

Basic View

Basic screen displays the measured value, measurement unit as well as temperature source.

Simple GLP View

In addition to data displayed when Basic option is selected, Simple GLP screen also displays: last calibration date and time, Offset value, average slope (Avg. Slope), and electrode condition (Condition).

Full GLP View

In addition to data displayed when Simple GLP option is selected, Full GLP screen also displays: electrode symbol, used buffers trays together with calibration date, time, and temperature probe status.

Graph View

When Graph is selected, the measured value is plotted as a graph.

Table

When Table is selected, the measured values are displayed tabulated (complete with date, time, and notes made during logging). The newest data is displayed on the top of the table.

Electrode Holder

HI6221 is supplied with the HI764060 electrode holder featuring a flexible arm. The holder can be mounted on either side quickly and provides secure support for electrodes while taking measurements in sample containers.

Rear Ports

Input for USB-C flash or PC cable

Input for USB-A flash (x2) or keyboard

Temperature probe connection port

pH/ORP probe connection port

Power button

Input for power cable

Peripherals port

Ethernet port

Reference electrode socket

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Specifications		HI6221
pH	Range	-2.0 to 20.0 pH; -2.00 to 20.00 pH; -2.000 to 20.000 pH
	Resolution	0.1 pH; 0.01 pH; 0.001 pH
	Accuracy	±0.1 pH; ±0.01 pH; ±0.002 pH (±1 last significant digit)
mV	Range	±2000.0 mV
	Resolution	1 mV; 0.1 mV
	Accuracy	±0.2 mV ±1 last significant digit
Temperature	Range	-20.0 to 120.0 °C; -4.0 to 248.0 °F; 253.0 to 393.0 K
	Resolution	0.1 °C / 0.1 °F / 0.1 K
	Accuracy	±0.2 °C / ±0.4 °F / ±0.2 K
Relative mV offset range		±2000.0 mV
pH Calibration	Calibration points	Up to 5
	Type	Automatic; Semiautomatic; Manual
	Standard buffers	Hanna and NIST pH 1.68, 3.00, 4.01, 6.86, 7.01, 9.18, 10.01, 12.45
	Custom buffers	Up to 5
	Custom group	Up to 5
	1st calibration point	Offset or Points (user setting)
	Reminder	Disabled Daily: 0 min. to 23 hours and 59 min. Periodic: 1 min. to 500 days, 23 hours and 59 min.
Temperature Compensation		Automatic or Manual
Reading	Modes	Direct; Direct/Autohold
	Stability criteria	Accurate; Medium; Fast
	Isopotential	7.000 or 4.010
	Sampling rate	1000 ms
pH Views	Basic	Measurement (pH, mV, Rel.mV, Abs.mV) Temperature, Stability status
	Simple GLP	Basic view information Last calibration date, electrode offset, average slope, and electrode condition
	Full GLP	Simple GLP information and calibration point details
	Table	Measurements updated every second are displayed in table
	Graph (Plot)	pH (or mV) and temperature versus time graph can be panned or zoomed (pinch-to-zoom technology)
Logging	Type	Automatic, Manual, Autohold
	Number of records	50 000 maximum per file Stores at least 1 000 000 data points per user
	Automatic interval	1, 2, 5, 10, 30 seconds 1, 2, 5, 10, 15, 30, 60, 120, 150, 180 minutes
	Sample ID	Incremental mode
	Export option	.csv file format
Users		Up to 9 users and admin. account (default)
Connectivity	USB-A	2 ports for keyboard input or USB thumb drive
	USB-C	1 port for PC connectivity and USB-C type thumb drive
	Wi-Fi & Ethernet	FTP Web server Log transfer and download Email
	RS232	Connecting peripherals
Power supply		DC adapter 100-240AC to 24VDC 2.5A
Environment		0 - 50 °C / 32 - 122 °F / 273 - 323 K maximum 95% RH non-condensing
Dimensions		205 x 160 x 77 mm (8.0 x 6.2 x 3.0 ")
Weight		Approximately 1.2 kg (26.5 lbs.)

Ordering Information

HI6221 is supplied with HI1131B pH electrode; HI7662-TW temperature probe; pH calibration starter kit consisting of: pH 4.01 buffer solution sachet (2 pcs.); pH 7.01 buffer solution sachet (4 pcs.); pH 10.01 buffer solution sachet (2 pcs.); HI700601 electrode cleaning solution sachet (2 pcs.); HI7082 3.5M KCl electrolyte solution (30 mL); HI764060 electrode holder; capillary pipette; 24 VDC power adapter; USB-C to USB-A cable; quick reference guide with instrument quality certificate.