HI510

Universal Process Controller

- Waterproof IP65 (NEMA 4X) enclosure
- Large backlit LCD
- Multi-color LED status indicators
- Audible alarm
- Tactile rubberized keypad
- Universal mounting
- Universal Hanna digital probe

HI510 is an advanced universal process controller that can be configured for many applications requiring monitoring and/or control of process parameters. It features a digital probe input that will automatically detect and update the controller with the parameter that it measures. The HI510 offers wall, pipe and panel mounting options.

HI510 is designed to adapt to a user's unique process control requirements. The controller has a large backlit dot matrix display for easy viewing and provides for a intuitive interface for setup options. The controller utilizes multi-color LEDs for easy viewing of the instrument's status including relay activation, in alarm mode, or in hold status. All programming operations are done through the low profile vulcanized rubber keypad or with an RS485 connection to a PC running the HI92500 Windows compatible software.

Features Displayed on Screen

Control Modes

The control mode can be configured to be On/Off, Proportional, or PID types. The mode can be set high or low. High control mode is required if the process value is too high and needs to be decreased. Low control mode is required if the process value is too low and needs to be increased.

For On/Off control, the hysteresis band is adjustable, while in Proportional and PID modes, deviation, control period and other tuning parameters can be set to optimize control around a set point.

Hold Function

During calibration, cleaning and configuration the controller automatically goes into Hold mode. During Hold mode all control loops related are disabled. The analog outputs may be configured to go to a fixed value or remain at the last value.

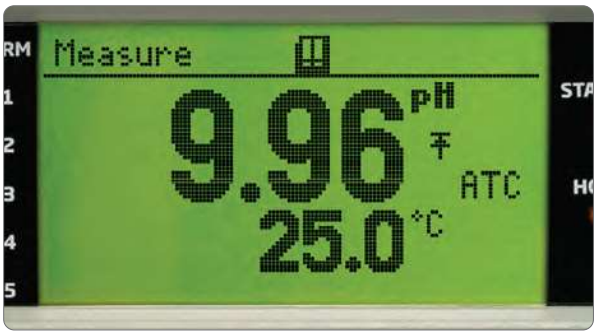
The Hold function can also be triggered manually, using an external digital input or by entering in Manual mode. This is useful for disabling control when performing maintenance.

Auto-cleaning cycle

Difficult applications often require an almost continuous maintenance of the probe. Processes with a high-suspended solids, fats, oils, pigments and microorganisms will coat the pH sensing glass, ORP sensors and the reference junction. The cleaning function allows the ability to program one or more wash cycles and uses the relays to activate valves, pumps or compressed air based on the type of washing that is required to maintain probes for reliable results.

Configurable Alarm System

The alarm system is configurable for measured parameters. The alarm can also be activated by event triggers or abnormal operation. For example, if a dosing relay remains closed for an excessive period of time or if temperature exceeds an upper limit during an exothermic neutralization reaction. During an alarm state, a highly visible red LED on the front of the instrument will blink. All relays configured for control are inactivated until the alarm state is resolved.



LCD Information

Local visual indicators of problems are displayed. The ? DIAG key provides details of the issue.

? DIAG - Help and Diagnostic Key

The help and diagnostic key (? DIAG) provides information related to errors; or in setup mode, information about settings.

Inputs and Outputs

Digital Inputs

- Two digital inputs are available for remotely triggering, cleaning and hold functions

Analog Outputs

- Available with up to four analog outputs and 5 relays used for control and for sending a signal to data loggers, PLC, SCADA and other remote monitoring systems
- 0-20 mA or 4-20 mA
- Scalable in selecting values for the range
- Can be used for control of pumps and valves
- On alarm state can output a 22 mA signal to the monitoring system

Digital Communications Output

- The Hanna HI92500 PC application supports communication between the controller and a PC.
  The following tasks may be accomplished remotely:
  - Monitoring using the virtual LCD (limited to a single remote control in the entire network)
  - Setup
  - Loading the Setup configuration file to a controller
- RS485 Digital output for PC and other device connectivity
- Daisy-chain up to 32 devices to a remote monitoring system

Relays

- Up to 5 control and 1 alarm electromechanical relays available
- Replaceable 5A fuses to protect all relays
- Extractable terminal blocks for easy wiring
- Relay options include single pole double throw (SPDT) and single pole single throw (SPST)
- Control relays can be programmed for On/Off, Proportional, or PID control as well as cleaning and Hold functions
- Configurable alarm relay
- Relays terminal blocks and their wires paths are separated from the low voltage section for additional safety

Data and Event Logging

Automatic Data-logging

HI510 has built-in data logging that stores data at selectable intervals along with relay control settings and calibration data.

- Stores data in up to 100 lots with each holding 8600 records
- Selectable log interval from 10 seconds to 3 hours
- Logged Data includes:
  - pH, mV, temperature values; pH and temperature alarm (for pH probe only)
  - Calibration information including solutions used. For pH, the offset and slope is recorded.

Event Log

The Event Log file can hold a maximum of 100 events. It includes errors, alarms, warnings, calibration events, configuration changes and cleaning events.

Password protection

The HI510 features password protected calibration and setup.

Enclosure Features

NEMA 4X Enclosure

The HI510 is suitable for indoor or outdoor environments. The NEMA 4X enclosure ensures the electronics are protected against splashing and hose-directed water or windblown dirt, dust, rain or sleet. It also provides corrosion protection for use near salt water.

Cable Glands

To maintain the NEMA 4X enclosure rating during use, the conduit openings and connection cables are sealed against the environment using the provided cable glands, seals and plugs.

Spring Loaded Screws

The front panel is hinged at the front of the enclosure for easy access to wiring locations. It features spring loaded screws that won't fall out when accessed.

USB Type-C Port

Logged data can be transferred to a flash drive as a .csv file using the USB Type-C port. A rubberized plug helps protect the port against the ingress of water.

Panel-Mount

HI510-01 Panel-Mount Kit

The controller can be securely panel mounted through a ½ DIN opening using the HI510-01 Panel-Mount Kit. The kit includes a sealing gasket, dual zinc coated brackets, and associated hardware.

Wall-Mount

HI510-02 Wall-Mount Kit

The controller can be surface mounted using the HI510-02 Wall-Mount Kit. The kit includes a zinc coated mounting plate and associated hardware. The plate may be oriented vertically or horizontally.

Pipe-Mount

HI510-03 Pipe-Mount Kit

The controller can be mounted to a vertical or horizontal pipe using the HI510-03 Pipe-Mount Kit. The kit includes a zinc coated mounting plate, associated hardware, and U-bolts to accommodate a 1", 1 ½", or 2" pipe.

Specifications

HI510-0540

HI510-0320

Specifications	HI510	
Digital Probes	See the following pages	
Display	Graphic LCD, 128 x 64 pixel B/W with backlight	
Digital Inputs	2 independent, galvanically isolated inputs (configurable for Hold and Cleaning functions) On state: 5 to 24 Vdc, low or high level active	
Analog Outputs	2 or 4 independent, galvanically isolated outputs Configurable as 0-20mA or 4-20mA 22 mA as alarm signal option	
Analog Output Accuracy	±0.2% f.s.	
Digital Communication	RS485 serial port - Remote monitoring and control USB-C port - Retrieve log files and firmware upgrading	
Relays	Up to 5 relays (independently configurable for process variables, hold and cleaning functions) Electromechanical relay SPDT and SPST contact outputs 5A – 250 Vac; 5A – 30 Vdc (resistive load) Fuse protected: 5A, 250V slow blow fuse	
Alarm Relay for All Measurement Alarms	Electromechanical relay SPDT contact output 5A – 250 Vac; 5A – 30 Vdc (resistive load) Fuse protected: 5A, 250V slow blow fuse	
Data Logging	Interval log, up to 100 files, maximum 8600 records on each stored file. When the maximum limit of 100 stored files is reached, the most recent file will automatically erase the oldest one. Event log, maximum 100 records. When the maximum limit is reached, the last record overwrites the oldest one.	
Power Supply	100 – 240 Vac ±10%; 50/60 Hz; 15VA; fuse protected (2A, 250V slow blow fuse)	
Power Consumption	15VA	
Installation Category	II	
Environment	-20 to 50°C (-4 to 122°F); max. 100% RH non-condensing	
Enclosure*	Single case ½ DIN, type 4X, IP65 ingress protection	
Weight	Approximately 1.6 kg (3.5 lb.)	
Dimensions	Width 144.0 mm (5.7") Height 144.0 mm (5.7") Depth 151.3 mm (6.0")	
Ordering Information	**HI510-0540** universal process controller with 5 relays and 4 analog outputs is supplied with 3m power cable, cable gland set, instrument certificate, and instruction manual. **HI510-0320** universal process controller with 3 relays and 2 analog outputs is supplied with 3m power cable, cable gland set, instrument certificate, and instruction manual.	
Accessories	**HI510-01** panel-mount kit	**HI76510-10** Probe extension cable, 10 m (32'9") long
	HI510-02 wall-mount kit	**HI76510-15** Probe extension cable, 15 m (49'2") long
	HI510-03 pipe-mount kit	**HI76510-25** Probe extension cable, 25 m (82') long
	HI76510-05 Probe extension cable, 5 m (16'5") long	**HI76510-50** Probe extension cable, 50 m (164') long

* For a water tight seal: Gland seals need to be used over cables and the four screws on the front casing need to be tightened to 13.3 lbf-in (1.5 N-m, maximum 2.0 N-m), of torque.

See compatible electrodes on the following pages.
Contact your local Hanna office for the latest information regarding additional compatible probes.

HI1006-18 Series • HI1006-38 Series • HI1006-48 Series
HI1016-18 Series • HI1016-38 Series • HI1016-48 Series

pH and Temperature Industrial Smart Probes

dedicated to the HI510 Universal Process Controller

These industrial pH probes are intended for industrial process control when paired with the HI510 Universal Process Controller.

- HI1006-18 and HI1016-18 series, designed for low conductivity or low-temperature process environments
- HI1006-38 and HI1016-38 series, designed for extended pH range or high-temperature process environments
- HI1006-48 and HI1016-48 series, designed for process environments where hydrofluoric acid is present

An integral temperature sensor measures the process temperature and adjusts the probe signal. The result is a reliable pH measurement at the temperature of measurement.

The flat tip on the low temperature probe eliminates deposits that can foul the sensor, significantly reducing necessary maintenance. The PVDF (Kynar®) body material is easy to clean and disinfect and resistant to most chemicals (e.g. solvents, sodium hypochlorite), ultraviolet light, and fungal growth.

The probes can be installed directly in-line, immersed in a tank (use HI60501 immersion holder), or in a flow cell. Several extension cable lengths are available to cover up to a 50 meter distance between probe and controller.

The probes are suited for continuous measurement of pH required in applications such as urban wastewater treatment, industrial effluent treatment, and surface water monitoring.

- Rugged, chemically-resistant PVDF (Kynar®) body
- Specialized glass sensor for fast stabilization and accurate results
- 3/4" NPT external thread for mounting
- 6 bar (87 psi) maximum pressure
- Built-in temperature sensor for measurement and compensation
- Matching pin helps avoid typical problems caused by grounding loop current
- Digital probe stores model, firmware, serial number, and calibration information

Ordering Information

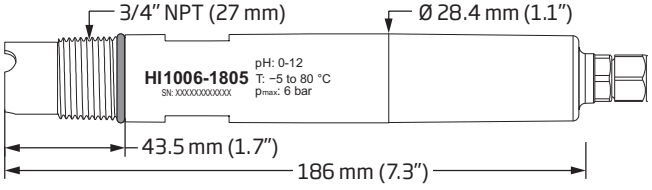
Each pH and temperature probe is supplied with probe quality certificate and instruction manual.

HI10 [x][x] – [y][8][z][z]

Choose your configuration:		
xx	**06**	PolyTetraFluoro-Ethylene (PTFE) junction
	16	Ceramic junction
y	**1**	Low Temperature (LT) glass sensor, titanium matching pin -5 to 80 °C (23 to 176 °F) Temperature compensation: 0 to 80 °C (32 to 176 °F) 0 to 12 pH
	3	High Temperature (HT) glass sensor, titanium matching pin 0 to 100 °C (32 to 212 °F) Temperature compensation: 0 to 100 °C (32 to 212 °F) 0 to 14 pH
	4	Fluoride-resistant (HF) glass sensor, titanium matching pin -5 to 60 °C (23 to 140 °F) Temperature compensation: 0 to 60 °C (32 to 140 °F) 0 to 10 pH
8	Smart probe, with RS485 connection	
zz	00, 05, 10, 15, 25, 50 attached cable length (meters) The HI10X6-Y800 models are supplied without cable. See Accessories section for extension cable ordering codes.	

Specifications	HI1006-1805 Configuration Example
Range	0.00 to 12.00 pH
Accuracy	±0.02 pH
Temperature	-5.0 to 80.0°C / 23 to 176°F
Temperature Accuracy	± 0.5°C / 1.0°F
Temperature compensation	automatic or manual 0.0 to 80.0°C (32.0 to 176.0°F)
Body	PVDF
Junction	PTFE
Sensor	Low temperature (LT) glass
Sensor Tip	flat
Maximum Pressure	6 bar
Threaded Connection	3/4" NPT external thread for insertion mounting
Probe Cable Length	5 m
Threaded Connection	3/4" NPT external thread for insertion mounting

Dimensions



See compatible probe extension cables on page page 15.56, see addtional mounting accessories on page 15.25, see probe holders on page 15.126 and 15.122.