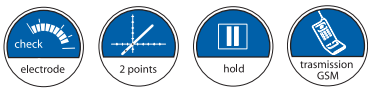


pH/ORP Controller with Tele-Control and Sensor Check

Direct Wire Connection or Tele-Control through an RS485 Port

The RS485 output is a versatile interface that can be used for connecting the HI 504 controller to many other devices.
The simplest configuration is a direct wire connection to a PC (with distances up to 1.2 km), or it is possible to use either a traditional or GSM modem.
The remote control can be managed with the HI 92500 Windows® compatible software. Once connected, the user can interact with the system, view parameters in real time, download process data relative to the last 100 events that have occurred and, if necessary, modify or reconfigure program settings (setpoints, alarms, cleaning cycles, stand-by times, etc.).
When a connection is kept active, it is possible to continuously download and automatically store the process data in Excel® format. This data, once saved, can be easily organized into tables and graphs, used for creating records and supervising process progression.

HI 504 introduces an innovation in the concept of pH and ORP control, that enhances the entire line of process controllers engineered by HANNA instruments®.

Our over 25 years of experience in the production of industrial controllers have enabled us to develop this series of high performance instruments, with our new tele-control technology.

This technology supplies the means to control, from whatever distance and in real time, one or more installations, allowing the user to optimize operations such as maintenance cycles.

Thanks to the two-way communication supplied by the RS485 output and Windows® compatible software, the user can control the complete regulation process from the comfort of his own PC or through his cellular phone with SMS.

Measurement reliability is guaranteed by many self-diagnostic and troubleshooting functions, such as our innovative "sensor check" feature, the result of advanced research and application know-how.

The universal BNC connector allows the use of any type of industrial probe chosen for a specific application, but at the same time renders probe replacement a simple and time saving operation.

The HI 504 family offers a wide range of models, designed to fit your individual needs, and is able to satisfy whatever application of monitoring and regulation you require.

pH/ORP Controller with Tele-Control and Sensor Check

Sensor Check pH/ORP

As part of the powerful self-diagnostic functions of this instrument series, the sensor check system provides continuous inspection of probe status.

The test is not limited to a simple signal that indicates an error in progress, but it reports the nature of the breakdown with a specific error code.

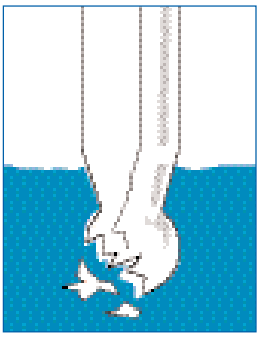
With the use of the HI 504900 GSM module, errors or alarms can be sent directly to the operator's mobile phone as SMS message.

Here are the types of breakdowns shown by sensor check:
- pH electrode broken
- reference electrode dirty
- reference electrode or matching pin not immersed
- electrode junction dirty or clogged
- short-circuit between cables of pH and reference electrodes
- signal problems from the cable or connector due to humid or dirty environments

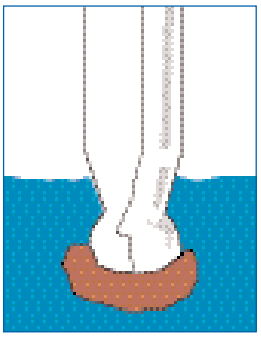
The internal circuit of the instrument executes two independent tests, one for the probe and one for the reference chamber, measuring the respective impedance values every 30 seconds.

These tests last for a very short period to avoid electrolysis and polarization, which can be caused by a prolonged exposure to an electric current.

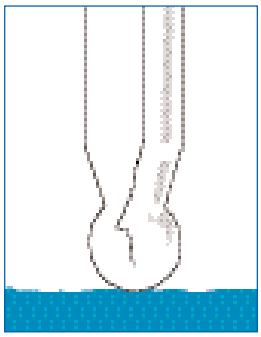
Some Problems Detected by the Sensor Check System



Broken Electrode



Dirty Electrode



Electrode not Immersed

Programmable Cleaning Cycles

Heavy-duty applications often require almost continuous probe maintenance. Elements such as suspended solids, fat, oils, pigments and microorganisms can quickly deposit and soil the glass bulb of a pH probe, the sensor of an ORP probe or the reference junction.
To solve these problems the HI 504 series has been equipped with an automatic cleaning system (simple or advanced, depending on model) with programmable cycles.
The Simple Cleaning is a simple wash with either water or detergent, programmed by setting the rinse time and the pause length.
The Advanced Cleaning uses both water and detergent, and allows the user to program three stages, with the possibility to vary the sequence, the time, and the number of cycles. The advanced mode can also be triggered at any time from a remote control or through the isolated digital input on the rear panel, which can be connected to an external switch.
The controllers can also automatically activate both cleaning modes whenever the sensor check reveals a soiled probe.
It is possible to set a delay time before restarting the reading after a cleaning cycle has taken place; this allows the probe to adjust to the new operating conditions.

RS485 Network

The RS485 output allows users to create a network composed up to 32 instruments using a simple double-wire cable. The communication speed (up to 19200 bps) allows the user to establish an RS485 network covering an area of up to 1.2 km between the two instruments at both extremities of the network.
The network can be created with HI 504 units or any other HANNA instruments®. industrial controllers with RS485 output (pH 502, mV 602, etc.).
The entire network can be managed by our HI 92500 software, using a simple wire connection to a PC, with the HI 504902 traditional modem or a GSM module (HI 504900 or HI 504901).

pH/ORP Controller with Tele-Control and Sensor Check

Specifications

	HI 504
Range	-2.00 to 16.00 pH; -2000 to 2000 mV; -30 to 130.0°C
Resolution	0.01 pH; 1 mV; 0.1°C (above -10 °C); 1°C (below -10°C)
Accuracy (@20°C/68°F)	±0.02 pH; ±2 mV; ±0.5°C (-9.9 to 130.0°C); ±1°C (-30 to -10°C)
Input Impedance	10^{12} Ohm
Digital Output	isolated output; contact closed upon Hold mode
Analog Output	1 or 2 independent outputs (configuring as 0-20 mA or 4-20 mA)
Dosing and Alarm Relay	electromechanical relay SPDT contact output ; 5A - 250 Vac, 5A - 30 Vdc (resistive load) fuse protected: 5A, 250V "Quick Blow" fuse
Temperature Compensation	automatic or manual, -30 to 130°C
Temperature Probe	Pt100/Pt1000 sensor (with automatic recognition and damage test)
Power Supply	24 Vdc/ac, 115 Vac ±10%, 230 Vac ±10%, 100 Vac ±10%; 50/60 Hz
Environment	0 to 50°C (32 to 122°F); RH max 85% non-condensing
Casing	IP54 (front panel)
Dimensions / Weight	panel cutout:140 x 140 mm, instrument: 144 x 144 x 170 mm / 1.6 kg (3.5 lb.)

Digital Transmitter Input

Many industrial applications require distances from the regulation system to the probe greater than the 15 meters provided by industrial probes. For these situations, the use of a transmitter is necessary.
All HI 504 models are supplied with a digital transmitter input.
Compared to a traditional analog transmitter, which has a maximum transmission length of 300 meters, our new digital transmitter, HI 504910 (see page T1.66) permits the connection with the controller at distances up to 1.2 km. The data transmitted can be pH, mV and temperature.
This digital transmitter is compatible with the sensor check function and therefore guarantees excellent precision with continuous probe inspection.

Fail Safe Alarm System

HANNA instruments® exclusive fail-safe alarm system protects against problems caused by power supply failure or signal interruption, which are typical risks in industrial environments. The system acts both on a hardware and a software level.
The alarm relay functions in a normally closed condition, and is tripped when there is a power failure if, for example, the power cable is accidentally cut. This function is very important in industrial plants where alarms are usually not activated if there is a power supply interruption, which can cause serious damage due to a loss of control of the process plant.
At the software level, the fail safe function activates an alarm in case of abnormal circumstances, for example if the dosing contacts remain closed for an excessive period.
The alarm condition is also signaled by a red LED, located directly on the front panel of the controller.

Programmable Hold System

The hold function allows the user to stop the regulating action of the controller for programmable time periods.
It is possible to activate the hold periods in correspondence to programmed operations, such as plant maintenance, cleaning procedures and instrument calibration.

pH/ORP Controller with Tele-Control and Sensor Check

Logging of the Last 100 Events

With the HI 504 series, it is possible to recall the sequence of last 100 occurred events at any time: errors, calibrations performed, set parameter changes and cleaning cycles.
Every code shown on the display corresponds to a certain type of event, error or operation. Errors that are still active are indicated by a flashing code, while operations and alarms recorded or already concluded appear with a fixed code on the display.

Analog Output: Data Logging or PID Dosage Control

Models are available with one or two analog outputs. These outputs can be connected to a recorder for the cataloging of process data (pH/mV and temperature), or can be used for controlling dosing systems (pumps or electrovalves) using PID control.

UL Certification

The HI 504 process controller series complies with the production standards required by the Underwriters Laboratories (UL), one of the most important international authorities for device safety, and has obtained the following UL certification.

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PROCESS CONTROL EQUIPMENT
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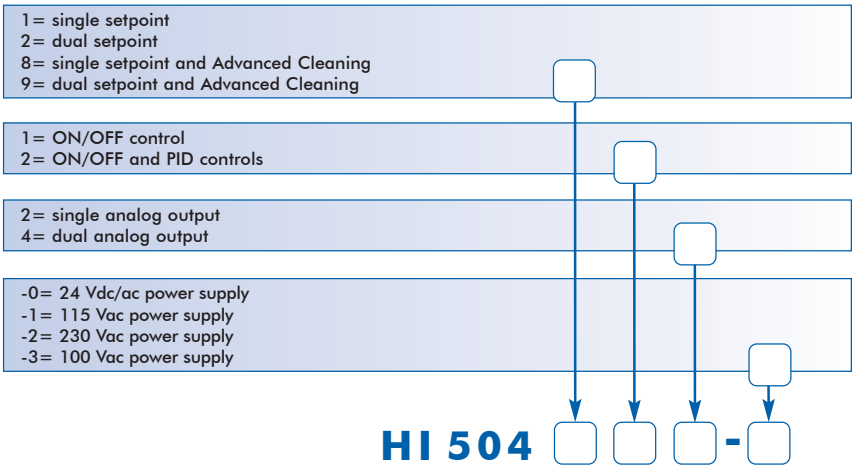
Ordering Information

Each HI 504 model is supplied complete with mounting brackets and instructions.



Example:

HI 504922-2

pH/ORP controller with dual setpoint, Advanced Cleaning, ON/OFF and PID controls, single analog output and 230 Vac power supply.

Accessories

HI 504900	GSM module
HI 504901	GSM supervisor
HI 504902	RS485 modem (PSTN)
HI 504910	Digital transmitter
HI 92500	Windows® compatible software
HI 7610	Stainless steel temperature probe with Pt100 sensor and 5 m cable
HI 7611	Stainless steel temperature probe with Pt1000 sensor and 5 m cable
HI 7004/1L	pH 4.01 buffer solution, 1 L bottle
HI 7006/1L	pH 6.86 buffer solution, 1 L bottle
HI 7007/1L	pH 7.01 buffer solution, 1 L bottle
HI 7009/1L	pH 9.18 buffer solution, 1 L bottle
HI 7010/1L	pH 10.01 buffer solution, 1 L bottle
HI 7020L	200-275 mV test solution, 500 mL bottle
HI 7091L	Reducing solution, 500 mL bottle
HI 7092L	Oxidizing solution, 500 mL bottle

For a complete range of process electrodes and probes, see section T2.