Process Instrumentation: Controllers & Instruments

Process Instrumentation

See Inside!

- **sc1000 and sc100 Digital Controllers**
- **si792 2-Wire Transmitter**
- **Model 53 and 33 Controllers**
- **PRO Transmitter**

American Recovery and Reinvestment Act (ARRA) For additional information, visit: www.hach.com/arra

GSA Pricing is available on select Hach products, call 866-450-4248 for more information.

GSA Contract Holder
Contract GS-07F-9314S

HACH®

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Choosing Your Controller

	sc1000™	***sc100™***
	Multi-Parameter, Modular, Digital Controller w/ Touch Screen Interface	Multi-Parameter Digital Controller
Parameters	Multi-parameter: See pages 399-471 for details.	Multi-parameter: See pages 399-471 for details.
Display	Graphic Backlit LCD	Backlit LCD
User Interface	Touchscreen / Ethernet / Wireless	Keypad
Number of Plug-and-Play Digital Sensor Inputs	2 to 8 Sensors or up to 2 Analyzers; maximum of 8 digital sensor/analyzer combinations per sc1000 probe Module*	2 Sensors*
Number of 0/4-20 mA Analog Inputs	Expandable to 12	None
0/4-20 mA Isolated Outputs	Expandable to 12	2
Relays	Expandable to 4	3
PID Outputs	Expandable to 8	2
Available Communication Protocols	MODBUS® RS-485, PROFIBUS DP, Modbus TCP/IP	MODBUS® RS-232, MODBUS® RS-485, PROFIBUS DP
Wireless Telecommunications	GPRS, GSM, Where Available	None
Available Mounting	Panel, Surface, or Pipe	Panel, Surface, or Pipe
External Dimensions (W x H x D) **Weight**	31.5 x 25.0 x 14.2 cm (12.4 x 9.8 x 5.6 in) 6.5 kg (14.3 lbs)	14.4 x 14.4 x 15.0 cm (5.67 x 5.67 x 5.91 in) 1.6 kg (3.5 lbs)
Environmental Ratings	IP 65	NEMA 4 x
Ambient Operational Temperature Range	-20.0 to 60.0°C (-4.0 to 140.0°F)	-20.0 to 60.0°C (-4.0 to 140.0°F)
Power Requirements	100 - 230 Vac, 50/60 Hz or 24 Vdc	100 - 230 Vac, 50/60 Hz or 24 Vdc
Compliance Ratings	TUV Listed (cTUVus Marked) to UL and CSA General Safety Standards; CE Marked; FCC/IC Approved	ETL Listed (cETLus Marked) to Canadian and US General Safety Standards And Hazardous Locations; CE Marked
Hazardous Ratings	None	Class I, Div. 2
Event Logging Capability	Yes	Yes
Data Logging Capability	Yes	Yes
Diagnostics	Yes	Yes
Network Capability	sc1000 internal network	None
Warranty	2 Years	2 Years
To order, see:	page 390	page 392

**Analyzers: AMTAX sc and PHOSPHAX sc Sensors: Digital sensors exist for numerous parameters. See pages 399-471 for details.*

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800-227-4224
Outside the United States, call 970-669-3050

si792	***Model 53***	***Model 33***	***Pro Transmitter***
Full-featured, 2-wire Analog Transmitter	Robust Analog Controller	Panel Mounted Analog Controller	2, 3, or 4-Wire Analog Transmitter
pH, conductivity	pH, conductivity, DO, Flow	pH, conductivity, DO, Flow	pH, conductivity, DO, Flow
LCD	Backlit LCD	Backlit LCD	LCD
Keypad	Keypad	Keypad	Keypad
None	None	None	None
None	None	None	None
1	2	2	1
None	4	2	None
None	None	None	None
Hart®, PROFIBUS PA, Foundation FIELDBUS	Hart®	Hart®	None
None	None	None	None
Panel, Surface, or Pipe	Panel, Surface, or Pipe	Panel	Panel, Surface, Pipe, or Integral Sensor
14.4 x 14.4 x 10.5 cm (5.67 x 5.67 x 4.13 in) 1 kg (2.2 lbs)	14.4 x 14.4 x 15.0 cm (5.67 x 5.67 x 5.91 in) 1.6 kg (3.5 lbs)	10.5 x 9.0 x 12.5 cm (4.13 x 3.54 x 6.01 in) 0.8 kg (1.7 lbs)	9.5 x 9.5 x 6.0 cm (3.75 x 3.75 x 2.32 in) 280 g (10 oz)
IP65	NEMA 4 x	NEMA 4 x	NEMA 4 x
-20.0 to 55.0°C (-4.0 to 130.0°F)	-20.0 to 60.0°C (-4.0 to 140.0° F)	-20.0 to 60.0°C (-4.0 to 140.0° F)	-20.0 to 60.0°C (-4.0 to 140.0° F)
24 Vdc (14 to 30 Vdc)	90 - 130 Vac, 50/60 Hz or 180 - 260 Vac, 50/60 Hz	90 - 130 Vac, 50/60 Hz or 180 - 260 Vac, 50/60 Hz	16-30 Vdc (2-, 3-, or 4-Wire)
FM, CSA, ATEX, CE marked	ETL Listed (cETLus Marked) to Canadian and US General Safety Standards And Hazardous Locations	None	ETL Listed (cETLus Marked) to Canadian and US General Safety Standards And Hazardous Locations; CE Marked
FM, CSA: Class I, Div 2 or Class I, Div. 1; ATEX: Zone 1	Class I, Div 2	None	Class I, Div. 2
Yes (with Hart interface only)	None	None	None
None	None	None	None
Yes	Yes	Yes	Status check only
None	None	None	None
2 Years	2 Years	2 Years	2 Years
page 394	page 396	page 397	page 398

sc1000™ Digital Controller

Modular System

The Hach sc1000 Multi-parameter Universal Controller is a fully modular system consisting of a Display Module and one or more Probe Modules.

Display Module

The sc1000 Display Module is a full-featured controller with a large color touch-screen display. The intuitive, easy to use interface can be used for any number of parameters. One Display Module controls either a single Probe Module or a number of Probe Modules connected by a digital network. The Display Module is fully portable and can be disconnected and moved anywhere within the network.

Probe Module

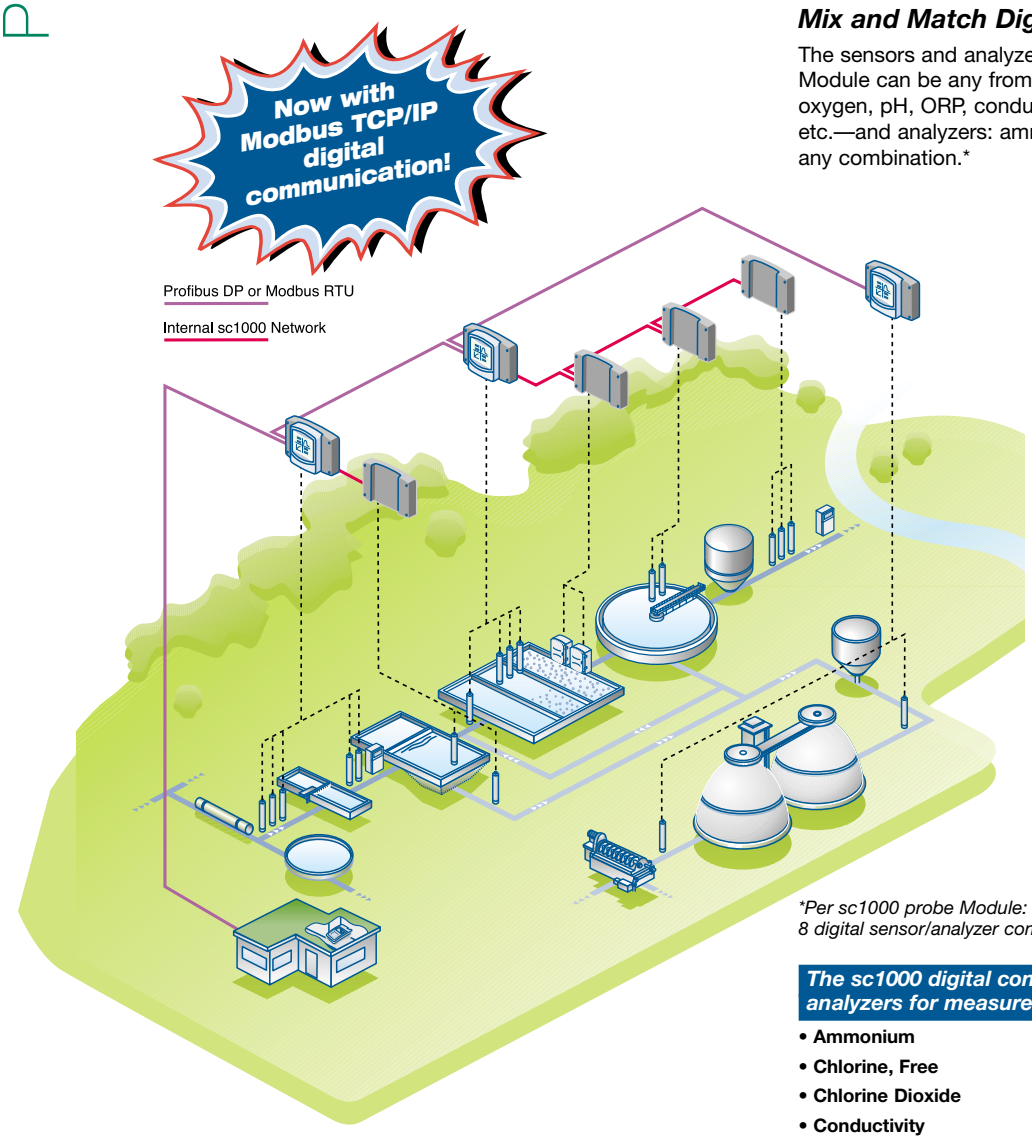
Each sc1000 Probe Module provides power to the system and can accept up to 8 digital sensors. Probe Modules can be networked together to accommodate many more sensors attached to the same network.

Plug-and-Play Operation

There's no complicated wiring or set up procedures with the sc1000 controller. Just plug the sensor into a Probe Module and it's ready for use without special ordering or software configuration.

Mix and Match Digital Sensors/Analyzers

The sensors and analyzers that can be plugged into the Probe Module can be any from Hach's line of digital sensors: dissolved oxygen, pH, ORP, conductivity, turbidity, suspended solids, nitrate, etc.—and analyzers: ammonium, phosphate, etc. Use them in any combination.*



Flexible Communication Options

Communication and relay options for the sc1000 controller can be configured to suit any situation. Standard configurations for a single Probe Module include:

- *Up to 4 potential free relay contacts for alarm and control functions*
- *Up to 12 analog outputs for measured values*
- *Up to 12 digital or analog inputs from instruments (i.e., flow or pressure measurements)*
- *Digital communication card to integrate with an external network (MODBUS® and PROFIBUS DPV1 are currently available)*

Modbus TCP/IP, Build-in webserver and VPN capabilities are available on the Display Module. Either wired via Ethernet LAN port or wireless via GPRS.

Additional relays and analog inputs and outputs can be added by networking a second Probe Module or optional DIN-rail communication modules.

**Per sc1000 probe Module: 2 to 8 Sensors or up to 2 Analyzers—maximum of 8 digital sensor/analyzer combinations.*

The sc1000 digital controller is compatible with digital sensors/ analyzers for measurement of the following parameters:

- **Ammonium**
- **Chlorine, Free**
- **Chlorine Dioxide**
- **Conductivity**
- **Dissolved Oxygen**
- **Luminescent Dissolved Oxygen**
- **Nitrate**
- **Ozone**
- **pH/ORP**
- **Phosphate**
- **Sludge Level**
- **Suspended Solids**
- **Turbidity**
- **UV Absorbance**

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Outside the United States, call 970-669-3050

Trending

The sc1000 Display Module allows the user not only to list a measurement value but also to show a trendline of the measurement by day or week. Additionally, the Display Module has an interactive chart page for analyzing any number of trendlines.

Mathematics

The sc1000 is capable of advanced mathematical calculations. The result of these calculations can be used as a virtual sensor on the mA output board and carries the full set of capabilities that any other sensor can have, including being used as an input in another equation.

Process Control

The sc1000 provides a high level of control via programmable relays and outputs. Specific features include PID, PWM, and others. Combining the mathematical capabilities with the network and control features, the sc1000 becomes an extremely powerful tool to run portions or even entire processes of a plant.

Expandable and Upgradeable

The sc1000 controller can adapt to your needs. Change probes without changing the controller. Probe Modules can be added or removed depending on operational needs. Fully upgradeable software ensures that this system will not be obsolete.

BUS/Ethernet/Remote Connection

There are a number of ways to access the information from an sc1000 Network. The standard 0/4-20 mA and BUS networks are available through the sc1000 Probe Module. The sc1000 Display Module has a dedicated Ethernet LAN port for remote access or access via PC, laptop or smart phone, using any kind of internet browser. Wireless GSM GPRS communication capability is optional.

Wireless GSM GPRS Telecommunications

Remote GSM GPRS Telecommunications are available where GSM is available. Both the Ethernet and GSM GPRS connections allow access to the readings, most of the menus, data logs, and event logs. Additionally, the Display Module with GSM can send out an e-mail or SMS text message for any Errors, Warning, or Events. Call 866-450-4248 and speak with Technical Support to determine if GSM is available at your location.

Remote Access Partnership

By adding a Remote Access Partnership to your order, Hach can provide continuous Remote Monitoring of your sc1000 network and can provide technical support by communicating directly with your instrumentation.

Prod. No.	Description
PROBE MODULES*	
LXV400.99.10082	sc1000 Probe Module, 6 Sensors, 100-240 Vac
LXV400.99.1B572	sc1000 Probe Module, 4 Sensors, 4 mA IN, 4 mA Out, 4 Relays, RS-485 MODBUS, 100-240 Vac
LXV400.99.1F572	sc1000 Probe Module, 4 Sensors, 4 mA IN, 4 mA Out, 4 Relays, PROFIBUS DP, 100-240 Vac
LXV400.99.Z0042	sc1000 Probe Module, 8 Sensors, 24 Vdc
LXV400.99.ZB532	sc1000 Probe Module, 6 Sensors, 4 mA IN, 4 mA Out, 4 Relays, RS-485 MODBUS, 24 Vdc
DISPLAY MODULES	
LXV402.99.00002	sc1000 Display Module
LXV402.99.02002	sc1000 Display Module w/ GSM GPRS, US
LXV402.99.01002	sc1000 Display Module w/ GSM GPRS, outside US
LXV402.99.10002	sc1000 Display Module w/ Modbus TCP/IP
ACCESSORIES	
LZX958	sc1000 Sun Shield, Includes Hardware
6169900	sc1000 Panel Mount Kit
LZY598	Modbus TCP/IP License Kit for field upgrade
LZY553	Outdoor Ethernet Kit

**Many more combinations and components are available, please call 800-227-4224 or visit www.hach.com for more information.*

For more information, call to request Literature #2403, or visit www.hach.com

Specifications*

Ambient Conditions
Operation
-20 to 55°C (-4 to 131°F); 0 to 95% relative humidity, non-condensing
Storage
-20 to 70°C (-4 to 158°F); 0 to 95% relative humidity, non-condensing

Power Requirements
100 to 240 Vac, 50/60 Hz;
Power: 75W
Optional 24 Vdc

Display
1/4 VGA Graphical Backlit TFT Color touch screen
Resolution 320x240 pixels

Relays
Four SPDT, user-configurable contacts rated 100 to 250 Vac, 5 Amp resistive maximum.
Additional relays available via digital network connection

Outputs
Up to twelve analog 0/4-20 mA, maximum impedance 500 Ohms.
Additional analog outputs available via digital network connection.

Inputs
Up to twelve analog 0/4-20 mA, maximum impedance 500 Ohms,
Additional inputs available via digital network connection

Control
PID, PWM, High/low phasing, setpoint, deadband, overfeed timer, off delay, and on delay

Alarms
Low alarm point, low alarm point deadband, high alarm point, high alarm point deadband, off delay, and on delay

Communication (Optional)
RS-485 (MODBUS/PROFIBUS DPV1), LAN and GPRS (Modbus TCP/IP, webserver): Advanced communications/ networking with PLC or SCADA system directly from analyzer.
GSM GPRS cellular module

Memory Backup
All user settings are retained indefinitely in memory (non-volatile) (EEPROM)
SD memory card slot (1 GB)

Mounting Configurations
Surface, panel, and pipe (horizontal and vertical)

Enclosure
IP65; ABS (Display Module) and metal (Probe Module) enclosure with corrosion-resistant finish

Dimensions (probe and display)
315(w) x 250(h) x 142(d) mm (12.4 x 9.8 x 5.6 in.)

Weight (probe and display)
Approx. 6.5 kg (14.3 lbs.) (varies with options)

Certifications
ETL to UL 61010A-1 and CSA C22.2 No. 1010.1 FCC/IC Approved

**Subject to change without notice.*

The sc1000 digital controller is compatible with digital sensors for measurement of a wide variety of parameters. See pages 399-471 for Hach sc digital sensors.

sc100™ Digital Controller

Plug and play up to 2 Hach digital sensors

One Controller for One or Two Sensors

The Hach sc100 Controller receives data from up to two sensors. Use any of Hach's line of digital sensors for a wide variety of parameters.

One Controller for One or Two Parameters

Not only can the sc100 controller be used for up to two sensors, but the sensors need not be the same. Mix and match any combination of parameters.

Plug-and-Play Operation

There's no complicated wiring or set up procedures with the sc100 controller. Just plug the sensor in and it's ready for use without special ordering or software configuration.

Flexible Communication Options

Communications using RS-485/MODBUS®, RS-232/MODBUS®, or PROFIBUS DP protocols are available. (Contact your Hach representative for other communication protocols.)

Simple, Reliable Data Collection

A built-in data logger collects measurements at user selectable intervals, as well as calibration and verification points, alarm history, and instrument setup changes for up to 6 months. With a two-year warranty, the Hach sc100 Controller is built to last.

The sc100 is certified compliant for Class I, Division 2 hazardous locations. Note that compliance is only maintained with the appropriate compliant sensors.

For more information, call to request Literature #2463, or visit www.hach.com

The sc100 digital controller is compatible with digital sensors/analyzers for measurement of the following parameters:

- **Ammonium**
- **Chlorine, Free**
- **Chlorine Dioxide**
- **Conductivity**
- **Dissolved Oxygen**
- **Luminescent Dissolved Oxygen**
- **Nitrate**
- **Ozone**
- **pH/ORP**
- **Phosphate**
- **Sludge Level**
- **Suspended Solids**
- **Turbidity**
- **UV Absorbance**

The sc100 controller has a big and bright display and clearly arranged pushbuttons for simple operation.

sc100 with Aluminum Sun Shield, Prod. No. 1000G3088-001

HACH® Be Right™

800-227-4224
Outside the United States, call 970-669-3050

When combined with the Hach sc100™ and sc1000™ digital controllers, the Hach family of digital sensors/analyzers gives you reliable and accurate measurement for a wide variety of parameters.

Prod. No.	Description
LXV401.52.00002	sc100 Controller Standard
LXV401.52.01002	sc100 Controller with RS-232 (MODBUS)
LXV401.52.02002	sc100 Controller with RS-485 (MODBUS)
LXV401.52.03002	sc100 Controller with PROFIBUS DP
LXV401.52.70002	sc100 Controller 24 Vdc
POWER CORDS	
5448800	Power Cord with strain relief, 125 Vac
5448900	Power Cord with strain relief, 230 Vac, European-style plug
ACCESSORIES	
LZX961.54	Polycarbonate Protection Shield for sc100 controller, includes hardware
1000G3088-001	Aluminum Sun Shield for sc100 controller, includes hardware

Many more combinations are available, please call 800-227-4224 or visit www.hach.com for more information.

NEW!

Benchtop Stand for sc100 and Model 53 Controllers

Calibrate and test process instruments in the lab using an sc100 or model 53 controller utilizing our new Benchtop Stand. This Benchtop Stand offers convenient access to the controller's wiring, plugs, keypad and display.

Prod. No.	Description
6894000	Benchtop Stand

*Specifications**

Ambient Conditions
Operation
With less than 7 W sensor load:
-20 to 60°C (-4 to 140°F); 0 to 95% relative humidity, non-condensing
With up to 25 W sensor load:
-20 to 40°C (-4 to 104°F); 0 to 95% relative humidity, non-condensing
Storage
-20 to 70°C (-4 to 158°F); 0 to 95% relative humidity, non-condensing

Power Requirements
AC Powered sc100 model:
100-230 Vac ±10%, 50/60 Hz; Power 15 W with 7 W sensor/network card load, 37 W with 25 W sensor/network card load
24 Vdc Powered sc100 model:
24 Vdc-15%, +20%; Power 16 W with 7 W sensor/network card load, 34 W with 25 W sensor/network card load

Display
Graphic dot matrix LCD, 128 x 64 pixels with LED backlighting

Relays
Three SPDT, user-configurable contacts rated 100 to 230 Vac, 5 Amp resistive maximum

Outputs
Two analog 0/4-20 mA, maximum impedance 500 Ohms

Control
PID, PWM, High/low phasing, setpoint, deadband, overfeed timer, off delay, and on delay

Alarms
Low alarm point, low alarm point deadband, high alarm point, high alarm point deadband, off delay, and on delay

Communications (Standard)
Datalog access and software upgrade access via standard RS-232 service port and wireless infrared port

Communications (Optional)
RS-232 (MODBUS): Configure and retrieve measured data for one analyzer using IBM-compatible PC
RS-485 (MODBUS) or PROFIBUS DPV1: Advanced communications/networking with PLC or SCADA system directly from analyzer.

Memory Backup
All user settings are retained indefinitely in memory (non-volatile) (EEPROM)

Mounting Configurations
Surface, panel, and pipe (horizontal and vertical)

Enclosure
NEMA 4X/IP66; metal enclosure with corrosion-resistant finish

Dimensions
1/2 DIN; 144 x 144 x 150 mm (5.7 x 5.7 x 5.9 in.)

Weight
1.6 kg (3.5 lbs.)

Certifications
ETL listed (cETLus marked) to Canadian and US General Safety and Hazardous (Class I Div. 2) Locations

**Subject to change without notice.*

The sc100 digital controller is compatible with digital sensors for measurement of a wide variety of parameters. See pages 399-471 for Hach sc digital sensors.

si792 2-wire Transmitter

pH/ORP, Contacting Conductivity, and Inductive Conductivity —available for hazardous (EX) applications.

The Hach si792 2-wire electrochemistry transmitters are full-featured, intuitive to operate, and work with Hach's world-class pH and Conductivity sensors.* Rugged construction is designed for Class I, Division 2 (CI, D2) respectively Class I, Division 1 (CI, D1) hazardous locations. Digital communication capabilities are available.

The Right Sensors

The Hach si792 2-wire Transmitters are designed to operate with Hach's world-class electrochemistry sensors.*

- *Differential pH and ORP (pHD and LCP sensors)*
- *Contacting conductivity (3400 series)*
- *Inductive (Electrodeless) conductivity (3700 series)*

Beyond the Hach sensors other sensors can be connected to the si792 as well. For a complete list of approved sensor/transmitter combinations, please contact Hach.

Multiple Communications Protocols

The si792 transmitter is available with digital communication functionality to easily connect to a communication network of choice including HART®, PROFIBUS PA, or Foundation® Fieldbus.

Area Rated to Suit Your Needs

The si792 transmitters are available as Class I, Division 2 (CI, D2) with HART communications only or Class I, Division 1 (CI, D1) with HART, PROFIBUS PA, or Foundation Fieldbus. FM, CSA, and ATEX certified.

Easy-to-use Intuitive Interface

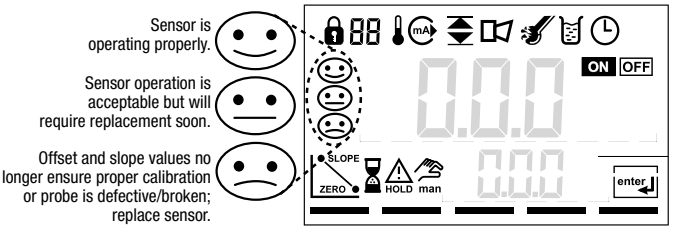
A logical menu structure, combined with icon based messages allows for intuitive operation. The large, clear liquid crystal display shows the measurement value, process temperature, and sensor and transmitter status. A transmitter or sensor error is indicated by a bright red LED and a message is displayed.

Sensor Diagnostics

The Hach si792 2-wire Transmitter performs self-diagnostics and sensor monitoring. Predictive diagnostics indicate end of sensor life. Reactive diagnostics alert operators to sensor failure such as glass breakage or coating, clogged junction, polarization of contacting conductivity electrodes, or integrity of inductive conductivity coils.

The si792 transmitter has all the features required to operate in the most demanding applications.

Sensor Diagnostics Icons as Shown on Display Screen



**Hach Digital Sensors are not compatible with the si792 transmitter series.*

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800-227-4224
Outside the United States, call 970-669-3050

Password-Protected Access

Separate passwords can be set for:

- *Sensor calibration*
- *Transmitter configuration*
- *Administrator functions*

Simple Installation

The transmitter's electronics are attached to a hinged door and are protected against aggressive environments. All terminals are easy to access and clearly described to ensure comfortable and error-free wiring.

The empty rear enclosure can be pre-mounted, and the hinged front door with the electronics can be easily attached afterwards. Plug-in terminals make wiring easy. Versatile mounting options include panel- pipe- or wallmount.

Easy-access, clearly-described terminals ensure comfortable and error-free wiring.

Prod. No.	Description
pH/ORP TRANSMITTERS	
LXV500.99.70012	si792 P; Class I, Division 2; HART
LXV500.99.70112	si792x P; Class I, Division 1; HART
LXV500.99.76112	si792x P-PA; Class I, Division 1; PROFIBUS PA
LXV500.99.77112	si792x P-FF; Class I, Division 1; Foundation Fieldbus
INDUCTIVE CONDUCTIVITY TRANSMITTERS	
LXV503.99.70002	si792 E; Class I, Division 2; HART
LXV503.99.70102	si792x E; Class I, Division 1; HART
LXV503.99.76102	si792x E-PA; Class I, Division 1; PROFIBUS PA
LXV503.99.77102	si792x E-FF; Class I, Division 1; Foundation Fieldbus
CONTACTING CONDUCTIVITY TRANSMITTERS	
LXV501.99.70012	si792 C; Class I, Division 2; HART
LXV501.99.70112	si792x C; Class I, Division 1; HART
LXV501.99.76112	si792x C-PA; Class I, Division 1; PROFIBUS PA
LXV501.99.77112	si792x C-FF; Class I, Division 1; Foundation Fieldbus
ACCESSORIES	
LZY483	Pipe-Mount Installation Kit
LZY484	Panel-Mount Installation Kit
LZY485	Protective Hood/Sunshield

For more information, call to request Literature #2480, #2605, #2606 or visit www.hach.com

*Specifications**

Measurement
pH/(ORP)
–2.00 to +16.00 pH/
(–1500 to +1500 mV)
Contacting Conductivity
µS/cm: 0.000 to 9.999 or
00.00 to 99.99 or 000.0 to 999.9
mS/cm: 0.000 to 9.999 or
00.00 to 99.99 or 000.0 to 999.9
Resistivity: 00.00 to 99.99
Mohms * cm
Salinity: 0.0 to 45.0‰ (0 to 35°C)
Inductive Conductivity
mS/cm: 00.00 to 99.99 or
000.0 to 999.9 or 0000 to 1999
Concentration: 0.00 to 9.99%
10.0 to 100.0%
Salinity: 0.0 to 45.0‰ (0 to 35°C)

Accuracy
pH/(ORP)
<0.02 TC: 0.002 pH/K/
(<1 mV TC: 0.1 mV/K)
Contacting Conductivity
< 1% measured value + 0.4 µS * c
Inductive Conductivity
<1 % measured value ±0.02 mS/cm

Ambient Temperature
–20 to 55°C (-4.0 to 131.0°F)

Transport/Storage
–20 to 70°C (-4.0 to 158.0°F)

Power Requirements
HART: 14-30 Vdc (30 Vdc Max);
Foundation Fieldbus, PROFIBUS:
FISCO Bus Supply 9 to 17.5 Vdc

Display
LC display, 7-segment
Measured value display: pH or Conductivity measurement value, temperature
Main display
Character height 17 mm, unit symbols 10 mm
Secondary display
Character height 10 mm, unit symbols 7 mm

Outputs
4-20 mA output / bus connection galvanically separated

Alarm indication
Red LED with alarm or HOLD

Communication
Loop HART (standard)
Foundation Fieldbus H1 (option)
PROFIBUS PA (option)

Memory Backup
Parameters and calibration data >10 years (EEPROM)

Mounting Configurations
Wall, Panel or Pipe (horizontal and vertical)

Enclosure
IP 65, PBT (polybutylene terephthalate)

Dimensions
1/2 DIN 144 x 144 x 105 mm
(5.7 x 5.7 x 4.1 in.)

Weight
Approx. 1 kg (2.2 lbs.)

Hazard Location Certifications
FM, CSA, ATEX

Immunity
EN 61 626
(industrial levels)

**Subject to change without notice.*

The si792 transmitter is compatible with Hach analog pH, ORP, and conductivity sensors. See pages 407-410 and pages 437-444 for details.

Model 53 Controller

pH/ORP, Conductivity, Dissolved Oxygen, Flow, Turbidity

- *1/2 inch Graphic Dot Matrix Backlit LCD With Multiple Language Capabilities*
- *Menu-Guided Operation*
- *Simple Interactive Diagnostics*
- *Password-Protected Access*
- *Universal Mounted, Epoxy Coated Aluminum 1/2 DIN, NEMA 4X Enclosure*
- *(2) 0/4-20 mA Outputs and (4) Relays*

The Model 53 Controllers are best suited for applications requiring environmental ratings, high level of control, and multiple 0/4-20 mA and relay outputs. The Model 53 features a easy to follow clear text driven menu and is equipped with four electromechanical relays; SPDT (Form C) contacts; UL rated 5A 115/230 Vac, 5A @ 30 Vdc resistive. The controllers are housed in a 1/2 DIN, NEMA 4X enclosure and include hardware for panel, surface or pipe mounting.

Prod. No.	Description
P53A4A1N	pH/ORP analyzer
C53A4A1N	Contacting conductivity/ resistivity analyzer
E53A4A1N	Electrodeless conductivity analyzer (also measures % concentration or TDS)
D53A4A2N	Dissolved Oxygen analyzer for use with Hach/GLI membrane D.O. sensors. Two inputs (no sensor quick-disconnect receptacles)
F53A4A1N	Flow monitor/ totalizer (with four sensor inputs, four relays, and two pulsed outputs)

Prod. No.	Description
U53A4A1N	Ultrasonic flow analyzer for use with Hach/GLI U53S flow sensor
T53A4A2N	Turbidity analyzer (For use with 50Hz line power)

ACCESSORIES

1000G3088-001	Aluminum sun shield for 53 controller includes hardware
LZX961.54	Polycarbonate Sun Shield for 53 controller, includes hardware

Popular models shown. For other model configurations, call 800-227-4224 or visit www.hach.com.

*Specifications**

Ambient Conditions
Operational: -4 to 140°F (-20 to 60°C);
0 to 95% relative humidity, non-condensing
Storage: -22 to 158°F (-30 to 70°C);
0 to 95% relative humidity, non-condensing

Power Requirements
90-130 Vac, 50/60 Hz. (10 VA max.)
or 180-260 Vac, 50/60 Hz. (10 VA max)

Display
Graphic dot matrix LCD, 128 x 64 pixels with LED backlighting; 1/2 inch (13 mm) main character height; 1/8 inch (3 mm) auxiliary information character height; menu screens contain up to six text lines

Outputs
Two isolated 0/4 – 20 mA outputs; each with 0.004 mA (12 bit) resolution and drive capability of 600Ω load

Control
High/low phasing, setpoint, deadband, overfeed timer, off/on delay

Alarms
Low/high alarm point and low/high alarm point deadband, off/on delay

Communication (Optional)
HART Protocol: Configure and measure data for multiple analyzers using HART enabled data system or hardware

Memory Backup (non-volatile)
All user settings are retained indefinitely in memory (EEPROM)

Mounting Configurations
Surface, panel, and pipe (horizontal and vertical)

Enclosure
NEMA 4X/IP66; metal enclosure with corrosion-resistant finish

Dimensions
1/2 DIN; 144 x 144 x 150 mm (5.7 x 5.7 x 5.9 in.)

Weight
1.6 kg (3.5 lbs.)

Certifications
ETL listed (cETLus marked) to Canadian and US General Safety and Hazardous (Class I Div. 2) Locations

Measurement
pH/ (ORP), P53
-2.0 to 14.0 pH/(-2100 to +2100 mV)
Contacting Conductivity, C53
µS/cm: 0-2.000 or 0-20.0, 0-200.0 or 0-2000;
mS/cm: 0-2.000, 0-20.00, 0-200.0
Resistivity: 0-19.99 MΩ·cm or 0-999.9 KΩ·cm
TDS: 0-9999 ppm or 0-9999 ppb
Inductive Conductivity, E53
µS/cm: 0-200.0 or 0-2000; mS/cm: 0-2.000, 0-20.00, or 0-2000; S/cm: 0-2.000
% Concentration: 0-99.99% or 0-200.0%
TDS: 0-9999 ppm
Dissolved Oxygen, D53
0-99.99 ppm, 0-99.99 mg/L
or 0-999.9% saturation
Paddle Wheel Flow, F53
Flow rate: 0-9999, 0-999.9 or 0-99.99 with selectable flow rate units and multiplier
Volume: 0-999,999,999 with selectable volume units
Ultrasonic Flow, U53
Flow rate: 0-9999, 0-999.9 or 0-99.99 with selectable flow rate units and multiplier
Volume: 0-9,999,999 with selectable volume units
Depth: 0-1200.0 inches, 0-100.0 feet, 0-30,000 mm, or 0-30.00 meters
Turbidity, T53
0.000-1.000, 0.00-10.00, and 0.0-100.0 NTU with auto ranging

Accuracy (Controller)
P53, C53, F53: 0.1% of span
D53: ±0.1% of span
E53, U53: 0.5% of span
T53: ±2% of reading, all ranges

Stability
P53, C53 0.05% of span per 24 hours., non-cumulative
E53 0.2% of span per 24 hours., non-cumulative

Repeatability
P53, C53, E53, T53, U53: 0.1% of span or better
D53, F53: ±0.05% of span

Temperature Drift
P53, C53 Zero & Span: < 0.03% of span per °C
E53: Zero & Span: 0.02% of span per °C
T53: Zero & Span: 0.01% of span per °C
D53, F53: Zero & Span: ±0.02% of span per °C

**Subject to change without notice.*

HACH® Be Right™

800-227-4224
Outside the United States, call 970-669-3050

pH/ORP, Conductivity, Dissolved Oxygen, Flow

- *Backlit LCD with multiple language capabilities*
- *Menu-guided operation*
- *Simple interactive diagnostics*
- *Password-protected access*
- *Panel mounted, polycarbonate 1/4 DIN enclosure (NEMA 4X when panel mounted)*
- *(2) 0/4-20 mA outputs and (2) relays*

The Model 33 Controllers are best suited for panel mounted installations where high level control, 0/4-20 mA outputs, and relay output options are desired. The Model 33 is a 1/4 DIN design to allow for minimum space utilization on panels. All controllers are equipped with two electromechanical relays; SPDT (Form C) contacts; UL rated 5A 115/230 Vac, 5A @ 30 Vdc resistive.

HART® FIELD COMMUNICATIONS PROTOCOL

Prod. No.	Description
P33A1NN	pH/ORP analyzer
C33A1NN	Contacting conductivity/ resistivity analyzer
E33A1NN	Electrodeless conductivity analyzer (also measures % concentration or TDS)
D33A1NN	Dissolved Oxygen analyzer for use with Hach/GLI membrane D.O. sensors
F33A1NN	Flow monitor/ totalizer (with four sensor inputs, two relays, and two pulsed outputs)

Popular models shown. For other model configurations, call 800-227-4224 or visit www.hach.com.

*Specifications**

Ambient Conditions
Operational: -4 to 140ºF (-20 to 60ºC); 0 to 95% relative humidity, non-condensing
Storage: -22 to 158ºF (-30 to + 70º C); 0 to 95% relative humidity, non-condensing

Power Requirements
90-130 Vac, 50/60 Hz. (10 VA max.)
or 190-260 Vac, 50/60 Hz. (10 VA max)

Display
Two-line by 16 character backlit LCD

Outputs
Two isolated 0/4 – 20 mA outputs; each with 0.004 mA (12 bit) resolution and drive capability of 600Ω load

Control
High/low phasing, setpoint, deadband, overfeed timer, off/on delay

Alarms
Low/high alarm point and low/high alarm point deadband, off/on delay

Communication (Optional)
HART Protocol: Configure and measure data for multiple analyzers using HART enabled data system or hardware

Memory Backup (non-volatile)
All user settings are retained indefinitely in memory (EEPROM)

Mounting configurations
Panel mounting

Enclosure
Polycarbonate enclosure with IP65 front panel; general purpose; two brackets for panel mounting

Dimensions
1/4 DIN; 94 x 94 x 142 mm (3.7 x 3.7 x 5.6 in.)

Weight
0.8 kg (1.7 lbs.)

Certifications
cETL (pending)

Measurement
pH/ (ORP), P33
-2.0 to 14.0 pH/(-2100 to +2100 mV)
Contacting Conductivity, C33
µS/cm: 0-2.000 or 0-20.0, 0-200.0 or 0-2000; mS/cm: 0-2.000, 0-20.00, 0-200.0
Resistivity: 0-19.99 MΩ·cm or 0-999.9 K Ω·cm
TDS: 0-9999 ppm or 0-9999 ppb
Inductive Conductivity, E33
µS/cm: 0-200.0 or 0-2000; mS/cm: 0-2.000, 0-20.00, or 0-2000; S/cm: 0-2.000
% Concentration: 0-99.99% or 0-200.0%
TDS: 0-9999 ppm
Dissolved Oxygen, D33
0-99.99 ppm, 0-99.99 mg/L or 0-999.9% saturation
Paddle Wheel Flow, F33
Flow rate: 0-9999, 0-999.9 or 0-99.99 with selectable flow rate units and multiplier
Volume: 0-999,999,999 with selectable volume units

Accuracy (Controller)
P33, C33, F33: 0.1% of span
D33: ±0.1% of span
E33: 0.5% of span

Stability
P33, C33: 0.05% of span per 24 hours., non-cumulative
E33: 0.2% of span per 24 hours., non-cumulative

Repeatability
P33, C33, E33: 0.1% of span or better
D33, F33: ±0.05% of span

Temperature Drift
P33, C33: Zero & Span: < 0.03% of span per ºC
E33: Zero & Span: 0.02% of span per ºC
F33: Zero & Span: ±0.02% of span per ºC

**Subject to change without notice.*

Pro-Series 2-Wire Transmitter

pH/ORP, Conductivity, Dissolved Oxygen, Flow

- *LCD with multiple language capabilities*
- *Menu-guided operation*
- *Sensor and transmitter status check*
- *Password-protected access*
- *Universal mounted, 1/4 DIN, NEMA 4X enclosure*
- *Versatile 2-, 3-, or 4-wire hookup*
- *(1) 0/4-20 mA output*

The Pro-Series Transmitters are best suited in applications where a minimal interface, only one 0/4-20 mA output, and no control functions are desired. The Pro-Series Transmitters are Class I Division 2 certified dependent on the selected probes. The Pro-Series Transmitter is a 1/4 DIN design to allow for numerous mounting options, including integral probe mounting.

Prod. No.	Description
PRO-P3A1N	pH/ORP analyzer
PRO-C3A1N	Contacting conductivity/resistivity analyzer
PRO-E3A1N	Electrodeless conductivity analyzer (also measures % concentration or TDS)
PRO-D3A1N	Dissolved Oxygen analyzer for use with Hach/GLI membrane D.O. sensors
PRO-F3A1N	Flow monitor/ totalizer

Popular models shown. For other model configurations, call 800-227-4224 or visit www.hach.com.

*Specifications**

Ambient Conditions
Operational: -4 to 140°F (-20 to 60°C);
0 to 95% relative humidity, non-condensing
Storage: -22 to 158°F (-30 to 70°C);
0 to 95% relative humidity, non-condensing

Power Requirements
Two-wire hook-up: 16-30 Vdc
Three-wire hook-up: 14-30 Vdc
(16 Vdc minimum with RS-485 serial communication)
Four-wire hook-up: 12-30 Vdc
(16 Vdc minimum with RS-485 serial communication)

Display
Two-line by 16 character backlit LCD

Outputs
Isolated 4 – 20 mA output with 0.004 mA (12 bit) resolution

Memory Backup (non-volatile)
All user settings are retained indefinitely in memory without battery backup

Mounting Configurations
Wall, pipe, panel, or integral mounted sensor

Enclosure
Polycarbonate, NEMA 4X general purpose

Dimensions
With Back Cover:
3.75 in. W x 3.75 in. H x 2.32 in. D
(95 mm W x 95 mm H x 60 mm D)
Without Back Cover for Panel Mount:
3.75 in. W x 3.75 in. H x 0.75 in. D
(95 mm W x 95 mm H x 19 mm D)

Weight
10 oz. (280 g) approximately

Certifications
CE, Class I Div II Class A, B, C, D Hazardous locations

Measurement
pH/ (ORP), PRO-P3
-2.0 to 14.0 pH/(-2100 to +2100 mV)
Contacting Conductivity, PRO-C3
µS/cm: 0-2.000 or 0-20.0, 0-200.0 or 0-2000;
mS/cm: 0-2.000, 0-20.00, 0-200.0
Resistivity: 0-19.99 MΩ·cm or 0-999.9 K Ω·cm
TDS: 0-9999 ppm or 0-9999 ppb
Inductive Conductivity, PRO-E3
µS/cm: 0-200.0 or 0-2000; mS/cm: 0-2.000, 0-20.00, or 0-2000; S/cm: 0-2.000
% Concentration: 0-99.99% or 0-200.0%
TDS: 0-9999 ppm
Dissolved Oxygen, PRO-D3
0-99.99 ppm, 0-99.99 mg/L or 0-999.9% saturation
Paddle Wheel Flow, PRO-F3
Flow rate: 0-9999, 0-999.9 or 0-99.99 with selectable flow rate units and multiplier
Volume: 0-999,999,999 with selectable volume units

Accuracy (Transmitter)
PRO-P3, PRO-C3, PRO-F3: 0.1% of span
PRO-D3: ±0.1% of span
PRO-E3: 0.5% of span

Stability
PRO-P3, PRO-C3:
0.05% of span per 24 hours., non-cumulative
PRO-E3:
0.2% of span per 24 hours., non-cumulative

Repeatability
PRO-P3, PRO-C3, PRO-E3:
0.1% of span or better
PRO-D3, PRO-F3:
±0.05% of span

Temperature Drift
PRO-P3, PRO-C3:
Zero & Span: < 0.03% of span per ° C
PRO-E3:
Zero & Span: 0.02% of span per ° C
PRO-F3:
Zero & Span: ±0.02% of span per ° C

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