

**INFORMATION**  
PROCESS MEASUREMENT TECHNOLOGY  
UNIVERSAL CONTROLLER  
SC 100 / SC 1000



## **SC controller: One for all**

**The standard platform for all probes and analysers**



UNITED FOR WATER QUALITY

# SC Controller: With cutting-edge technology – more versatile than ever

SC for Standard Controller – this is what HACH LANGE calls its universal controller concept for all probes and analysers. The controllers and the high quality digital sensors from HACH LANGE form a perfectly synchronised system, which can also include conventional analogue sensors easily. For either a stand-alone single-parameter solution or complex network: The SC platform is the ideal interface between user and plant – with simple handling, proven versatility and sustainable efficiency.

- **Cuts costs: standard controller for all sensors**
- **For use anywhere: stand-alone or in a network**
- **Future-safe: always expandable**
- **Individually configurable: up to eight sensors per measurement station**
- **Open system: for all existing measurement signals**



New sensors are automatically identified.

## Universal controller concept – the advantages

The standard layout for nearly all instrumentation is one sensor per controller, this means high investment costs. In contrast, modern sensors calculate their measured values themselves and can be used with standard controllers. The advantages are obvious. Any desired combination of sensors can be connected to just one controller. For spare parts administration is also much easier and less costly.

## Adaptable today – expandable any time

The SC concept makes it easy to get started. It can integrate existing measurement signals today and be easily expanded tomorrow to keep up with any changes in plant engineering. With new parameters, sensors and measuring stations, the system simply grows further. Your investment is therefore secure.



SC100 Controller for up to two sensors.

**Optimisation of process costs with efficient sensors:**

- Oxygen, pH, conductivity, redox potential
- Turbidity, solids, sludge parameters
- Nutrients
- Organic load
- Chlorine, ozone



The SC 1000 Controller communicates with up to eight sensors simultaneously.

**SC 100 and SC 1000 – two controllers for all eventualities**

HACH LANGE stands for decades of experience in the development and use of high quality sensors. SC controllers complement our range of probes and analysers. Together they can be configured to create application-specific systems. The **SC 100** Controller can be used with up to two sensors simultaneously for any combination of parameters, e.g. oxygen and solids concentration in the activated sludge stage of a sewage treatment plant. It is ideal for carrying out stand-alone metering tasks.

The **SC 1000** Controller consists of a display module and a probe module. As a traditional controller it can handle up to eight different sensors in parallel. In a network it can be expanded by additional probe modules if necessary. All the sensors in the network are operated through the portable display module, which simply has to be placed on a probe module. With an intuitively operable touchscreen and clearly organised graphics, the display module is characterised by excellent handling properties.

# SC controllers: cost optimisation through versatility – everywhere

For treating municipal and industrial wastewater or drinking water, for small, medium or large plants, for stand-alone solutions or networks – together with the universal SC data communications platform, the HACH LANGE process measurement technology is a perfect system. The wide range of applications, simple installation and highly economic operation of the SC Controller in practice are described on this and the following pages.

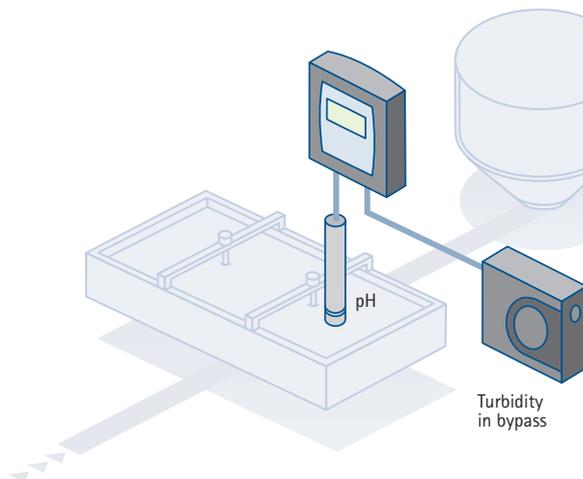
Also over long distances:  
reliable data transmission  
with a minimum of cabling.

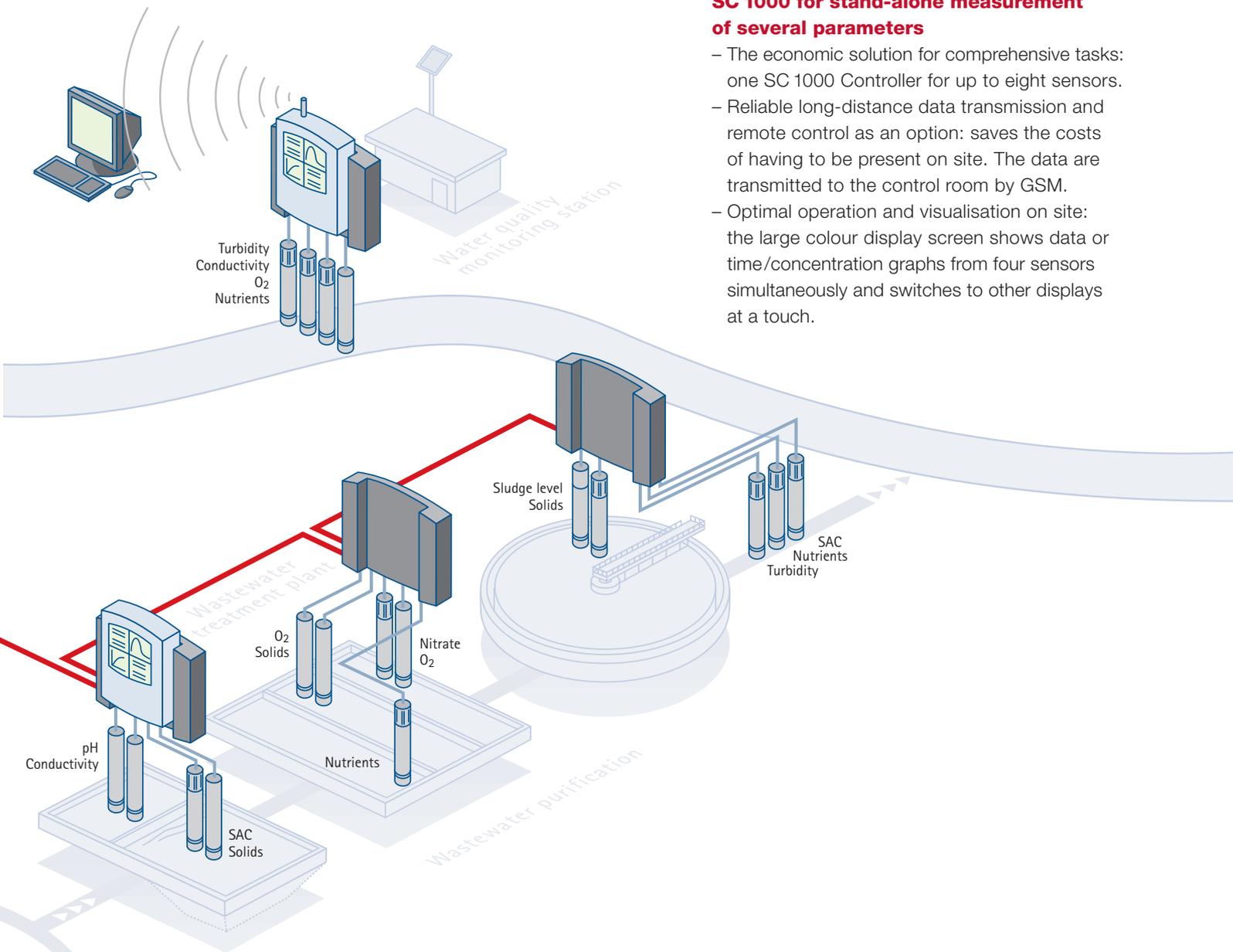


Control room

## SC 100 for stand-alone measurement of up to two parameters

- Attractively priced solution for smaller measurement applications. The SC 100 Controller can be used with up to two digital sensors. The measured values are displayed locally and can be transmitted in analogue form or, as an option, digitally to control systems.
- Integrated controller functions: two-position controllers, P, PI or PID controllers are preconfigured.
- Simple to operate: the connected sensors can be easily configured on site through the SC 100.





### SC 1000 for stand-alone measurement of several parameters

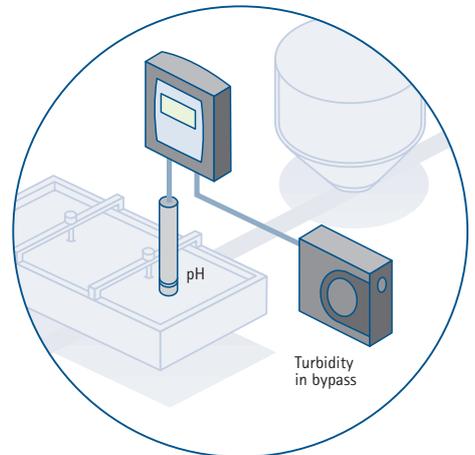
- The economic solution for comprehensive tasks: one SC 1000 Controller for up to eight sensors.
- Reliable long-distance data transmission and remote control as an option: saves the costs of having to be present on site. The data are transmitted to the control room by GSM.
- Optimal operation and visualisation on site: the large colour display screen shows data or time/concentration graphs from four sensors simultaneously and switches to other displays at a touch.

### SC 1000 network

- Flexibly compatible: At each measurement station, one SC 1000 probe module handles up to eight digital sensors simultaneously - in any application-specific combination.
- Economic connection: The SC 1000 network cable connects all probe modules. The network can also be connected to a field bus.
- Expandable at any time in the future: The controller identifies new sensors automatically. Plug in – configure – ready. For an additional measurement station, simply connect a new probe module to the network. No significant investment costs are incurred.
- Intuitive operation: The portable SC 1000 display module shows the data of all sensors in the network as measured values and graphics.
- Integratable: Existing measuring instruments – also analogue instruments and instruments from other manufacturers – can be integrated simply into the SC 1000 system using expansion cards.
- Detailed control and calculation functions: Different measured values can be converted into new variables, e.g. for loads.

# SC 100 for stand-alone measurement of up to two parameters

- Attractively priced controller for up to two sensors of any type
- Versatile controller functions
- Large measured value storage capacity
- Network-compatible using optional field bus connection



## Economic

The SC 100 Controller has two independent sensor connections which can be used for up to two different digital sensors. Both measured values are displayed on site.

The SC 100 is preconfigured with conventional control algorithms and a two-position controller, P, PI or PID controllers, which can be configured in the field. It can therefore carry out simple minor automation tasks locally and cost effectively – without additional external modules.

## Process control

The flexible SC 100 can be used for a wide and varied range of applications.

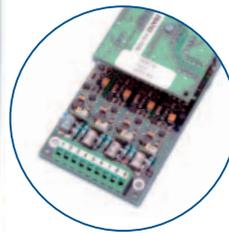
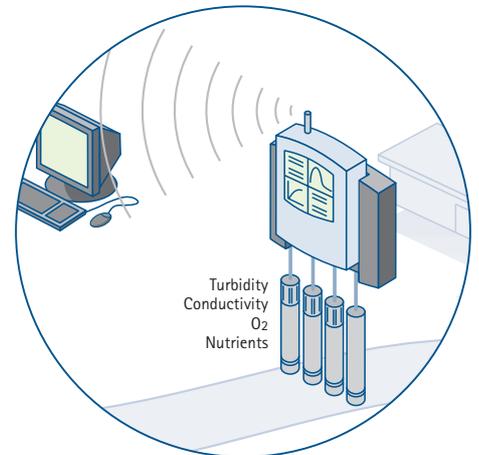
- In the wastewater sector it controls, for example, small intermittently operating plants. Using timer control, it regulates the aeration for nitrification / denitrification.
- In the industrial sector it controls, for example, the addition of acids and alkalis for pH correction.
- In the drinking water sector it monitors the efficiency of the treatment and, if necessary, sounds the alarm in good time.

## Data storage

The SC 100 saves the measured values of the connected sensors at customer programmable intervals. Its measured value storage can accommodate the values obtained over several months and also holds calibration data, alarm messages and changes to settings. When necessary, the data can be transferred to a PC for processing. Naturally a field bus connection is also possible.

# SC 1000 for the local measurement of several parameters

- **Economic:** one controller for up to eight sensors simultaneously
- **Flexible:** individually configurable
- **Future-safe:** always expandable
- **Cost-saving:** remote operation by GSM
- **Intuitive operation:** display with touchscreen



## The future is secure

Equipped for the tasks of today and prepared for the future – flexibility is the strongest feature of the SC 1000. A new sensor can be quickly and conveniently parameterised. The touchscreen and the intelligent operator guidance make this child's-play. Comprehensive built-in mathematical functions save users of small plants from incurring additional investment costs.

## Tailor-made

Thanks to the modular design of the SC 1000, it can be configured individually to requirements in the field.

- Analogue 0/4–20 mA outputs and inputs,
- relays and
- a field bus card

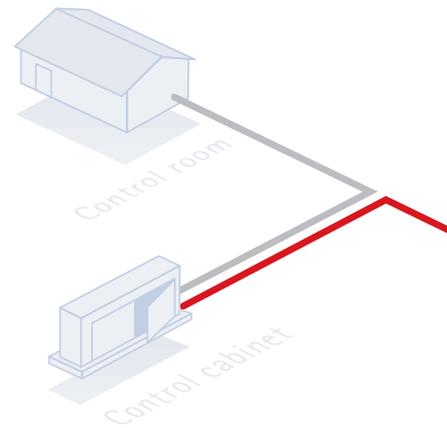
are available and can be used to transmit data, integrate analogue instruments, handle any types of signals or connect to an existing field bus system.

## Remote operation

The display module of the SC 1000 has as an option a built-in modem. All functions can therefore be carried out without having to be present on site. Protection against unauthorised access is of course assured. Event messages arrive by SMS and email. Configuration, data transmission from storage (measured values and results), uploading of new software and error diagnosis can all be carried out remotely. This saves travel and labour costs.

# SC 1000 network with different sensors and measurement stations

- Easy realisation of the network
- Cost-effectively expandable with more sensors and measurement stations
- Integration of all existing measurement signals
- Comprehensive control and calculation functions



Each SC 1000 network needs only one display module, which can simply be transported as necessary.



In the field, simply plug into the permanently installed probe module.



A new sensor can be installed without difficulty.

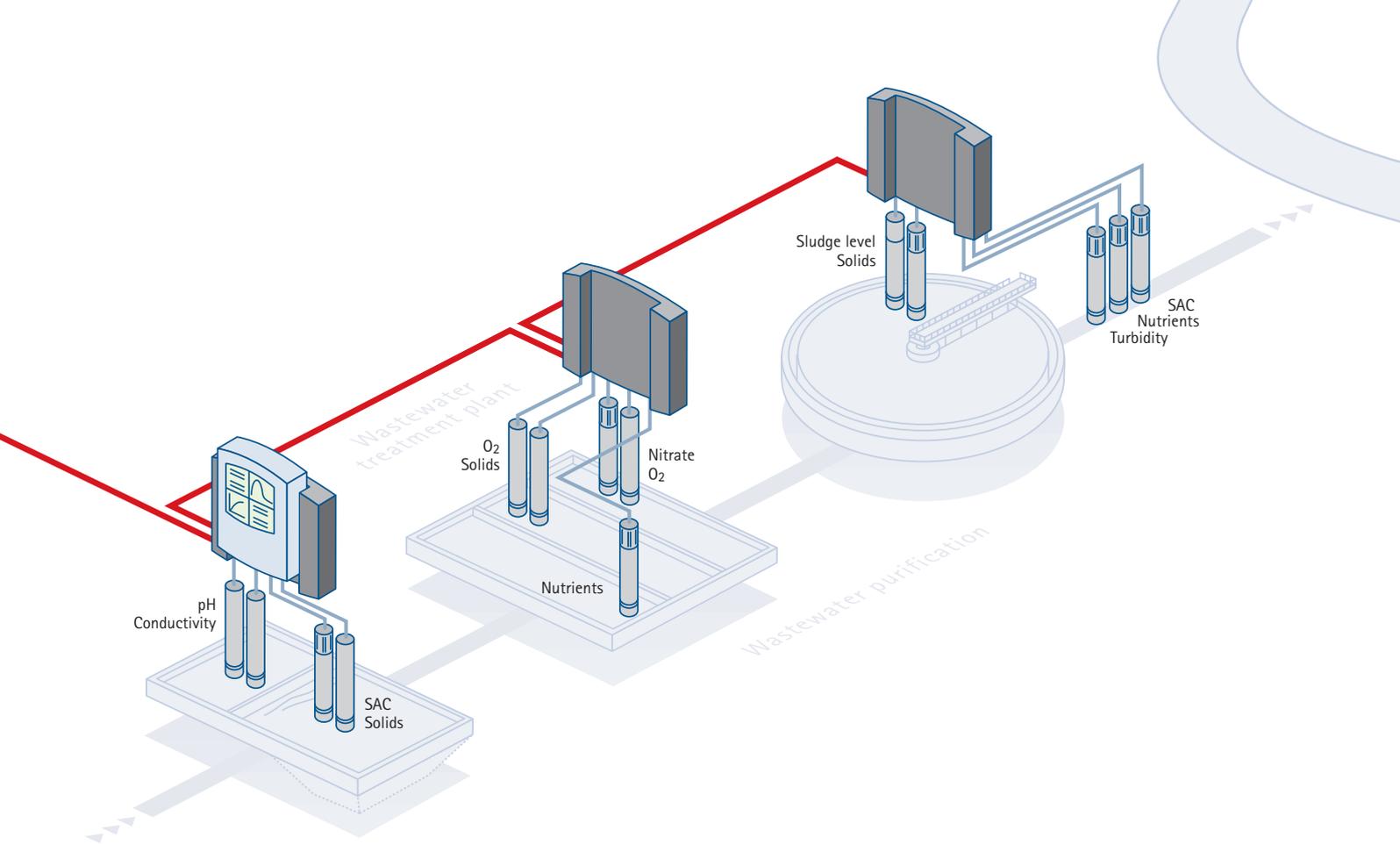
## The SC 1000 network

The intelligent solution for several measurement stations with one or more sensors is the SC 1000 network. A display module suffices as the user interface for all measurement stations. It can be connected conveniently to any probe module. The system is reliable; even if a probe module or the display module drops out, the system continues to function.

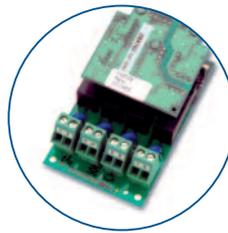
## Measure, calculate, save

A PC is not essential; all basic methods of calculation, logic and indices are easy for the SC 1000. For example, the ammonium and nitrate loads in the outflow of a sewage treatment plant can be calculated using an external flow signal. In the activated sludge stage, the SC 1000 analyses the signals from several sensors, regulates the oxygen concentration and contributes to energy savings. In drinking water treatment plants, several filters are monitored with turbidity sensors. The SC 1000 sounds the

alarm as soon as a filter failure threatens. At the point of transfer to the drinking water network, it checks that the quality requirements for turbidity, nitrate, pH and conductivity are satisfied. No measurement task is too great for the SC 1000. Its possibilities are unlimited. In combination with the precise probes and analysers from HACH LANGE, operational safety and optimal operation are guaranteed.



SC 1000 network plug



Plug-in card for probe module



Expansion module (top-hat rail)

### Economic connection

A built-in field bus card enables the SC 1000 to be integrated easily into existing field bus systems. Modbus and Profibus DP are available, and the system is open for future field bus protocols. As an alternative to plug-in cards for the probe module there are extensions for the standard top-hat rail in the switch cabinet:

- 0/4–20 mA outputs for measured values.
- Potential-free relay contacts for alarms and control functions.

– Digital and analogue inputs bring the signals of other measuring instruments into the system, e.g. flow or hydrostatic pressure measurements as the basis for calculations. Pump status and collection malfunctions are recorded.

A single cable suffices for transmitting the data of the connected sensors to the control room.

# Technical data: SC 1000



## Display module for SC 1000 Controller system

A controller system to which SC sensors can be connected and from which they can be controlled consists of a single SC1000 display module (model LXV402) and one or more SC 1000 probe modules (model LXV400). The system is configured modularly in line with customer-specific requirements and can be expanded at any time with additional measurement stations, sensors, inputs, outputs and bus interfaces.

<b>Model No.</b>	LXV402
<b>Display</b>	Colour graphics display, QVGA 320x240 pixels, 256 colours
<b>Operation</b>	Touchscreen with intuitive operator guidance and time-course graphs
<b>Protection class</b>	IP 65
<b>Ambient temperature</b>	-20 to +55 °C (-4 to 131 °F)
<b>Dimensions</b>	200x230x50 mm (WxHxD)
<b>Weight</b>	Approx. 1,2 kg
<b>Special characteristics</b>	Service interface; slot for multimedia card (MMC)
<b>Optional</b>	Triband data telephone to the GSM standard (GSM900, EGSM900, GSM1800, GSM1900) for remote data transmission and remote operation with built-in antenna. A SIM card (to ISO 7816-3 IC, GSM 11.11) is needed to enable the data telephone to be used.

## Probe module for SC 1000 Controller system

The probe module is used to connect SC sensors to a measurement station.  
Several probe modules can be networked to create a SC 1000 network.

<b>Model No.</b>	LXV400
<b>Sensor inputs</b>	For SC sensors with SC digital technology, optional 4, 6 or 8 sensors. All parameters are easily configurable and combinable.
<b>Measuring range</b>	Depends on the connected sensor
<b>Optional plug-in cards for expanding the probe module</b>	- Analogue outputs: each with 4x0/4-20 mA output, max. 500 Ohm - Analogue/digital inputs: each with 4, optional programmable as 0/4-20 mA input or digital input - Relay contacts: max. four potential-free break contacts SPST-NC (normally closed), 250V AC max. 5A, 125V AC max. 5A, 125V DC max. 0,15A, 30V DC max. 5A, programmable as alarm, status or timer - Field bus connection: Modbus RS485, Profibus DP, others on request
<b>Optional expansion modules</b>	For the switch cabinet; see the following page
<b>Protection class</b>	IP 65
<b>Ambient temperature</b>	-20 to +55 °C (-4 to 131 °F)
<b>Mains power connection</b>	100 - 240V AC, 50/60 Hz, max. 75 VA, Optional: 24V DC, 75 watt
<b>Dimensions</b>	315x255x150 mm (WxHxD) Probe module with mounted display module
<b>Weight</b>	Approx. 5 kg, depending on the configuration

Subject to change without notice.

## Basic module for expansion in switch cabinet

The basic module is needed to enable any combination of expansion modules to be accommodated in one switch cabinet.	
<b>Functions</b>	- 24 V DC supply to the expansion module and connection with the SC 1000 network - Option of connecting a SC 1000 display module (model LXV402) for configuring the system
<b>Mounting</b>	First module left on 35 mm top-hat rail to DIN EN 50022 in switch cabinet
<b>Mains power connection</b>	24 V DC from the switch cabinet
<b>Current consumption</b>	Max. 2000 mA
<b>Dimensions</b>	33 x 99 x 125 mm (W x H x D)
<b>FOR ALL EXTERNAL EXPANSIONS</b>	
<b>Status indicator</b>	LED
<b>Protection class</b>	IP 20
<b>Ambient temperature</b>	+4 to +40 °C (39 to 104 °F)
<b>Material</b>	Polyamide, flammability class V0 (UL94)

## Expansion modules

	RELAY MODULE (LZX920) 4 changeover contacts, SPDT-CO	OUTPUT MODULE (LZX919) 2 x 0/4 – 20 mA	INPUT MODULE (LZX921) 2 analogue/digital inputs
<b>Mounting</b>	Right of basic module on 35 mm top-hat rail to DIN EN 50022 in the switch cabinet, combinable		
<b>Mains power connection</b>	24 V DC from basis module		
<b>Number</b>	4 relay contacts: potential-free changeover contacts, SPDT-CO (changeover)	Outputs: 2 x 0/4 – 20 mA, max. 500 Ohm	Inputs: 2 x analogue/digital, optionally programmable as 0/4 – 20 mA input or digital input
<b>Functions</b>	Programmable as limit value, status or timer	Analogue 0/4 – 20 mA signals for transmission of measured values	Integration of analogue 0/4 – 20 mA signals or digital signals
<b>Special characteristics</b>	<b>Breaking capacity</b> 250 V AC max. 5 A, 125 V AC max. 5 A, 125 V DC max. 0,15 A, 30 V DC max. 5 A		<b>Internal resistance</b> 180 Ohm
<b>Current consumption</b>	100 mA	150 mA	100 mA
<b>Dimensions</b>	45 x 99 x 115 mm (W x H x D)	22,5 x 99 x 115 mm (W x H x D)	22,5 x 99 x 115 mm (W x H x D)

Subject to change without notice.

# Examples of configurations SC 1000

ART. NO.	DESCRIPTION
<b>SC 1000 FOR 4 SENSORS, WITH CURRENT OUTPUTS AND RELAY – ALTERNATIVELY WITH 24 V DC</b>	
LXV402.99.00001	SC 1000 display module
LXV400.99.2R121	SC 1000 probe module for connecting up to 4 SC sensors, with one analogue output card with 4 x 0/4 – 20 mA outputs, with one relay card with 4 break contacts (NC), with 100–240 V AC power supply with EU power cord
Alternative LXV400.99.ZR121	SC 1000 probe module as above but with 24 V DC power supply
<b>SC 1000 WITH GSM AND FOR 6 SENSORS, WITH CURRENT OUTPUTS AND RELAY – ALTERNATIVELY WITH PROFIBUS DP</b>	
LXV402.99.01001	SC 1000 display module with GSM for remote data interrogation and remote operation
LXV400.99.2R331	SC 1000 probe module for connecting up to 6 SC sensors, with two analogue output cards with a total of 8 x 0/4 – 20 mA outputs, with one relay card with 4 break contacts (NC), with 100–240 V AC power supply with EU power cord
Alternative LXV400.99.2E031	SC 1000 probe module as above but with Profibus-DP network card instead of mA outputs and relay
<b>SC 1000 FOR 8 SENSORS WITH 8 CURRENT OUTPUTS AND 8 RELAYS AS EXPANSION MODULES</b>	
LXV402.99.00001	SC 1000 display module
LXV400.99.20041	SC 1000 probe module for connecting up to 8 SC sensors, with 100–240 V AC power supply with EU power cord
LZX915 (1x)	Basic module top-hat rail mounting
LZX919 (4x)	Top-hat rail mounting output module, each with two 20 mA outputs
LZX921 (1x)	Top-hat rail mounting input module each with 2 x 0/4 – 20 mA/digital input
LZX920 (2x)	Top-hat rail mounting relay module, each with four relays, max. 240 V

### Unlimited possibilities

With the SC1000 Configurator, tailor-made variants can be individually configured.

The configurator is available on CD-ROM and on the Internet under → [www.hach-lange.com](http://www.hach-lange.com)

## Technical data: SC 100

Model No.	LXV401
Display	Backlit graphic display 128 x 64 pixels
Protection class	IP 65
Measurement input	2 digital sensors, all parameters freely configurable
Ambient temperature	-20 to +60 °C (-4 to 140 °F)
Analogue outputs	2 x 0/4–20 mA, programmable, also as PID controller
Relay	3 potential free changeover switches, 5 A 115/230V AC, 5 A 30V DC, programmable as alarm, status, P controller or timer
Interfaces	Optional: RS232 Modbus, RS485 Modbus, Profibus DP
Power supply	90–125V AC, 200–240V AC, 50/60Hz; optional 24 V DC
Dimensions	1/2 DIN 144 x 144 x 150 mm (W x H x D)
Weight	1,6 kg

## SC-Accessories

DESCRIPTION	ART. NO.
SC 1000 network plug	LZX 918
Mounting for SC 1000 with sun shield	LZX 957
Mounting for SC 100 with sun shield	LZX 997
SC extension cord 5 m für SC 100 / SC 1000	LZX 848
SC extension cord 10 m für SC 100 / SC 1000	LZX 849
SC extension cord 15 m für SC 100 / SC 1000	LZX 850
SC extension cord 20 m für SC 100 / SC 1000	LZX 851
SC extension cord 30 m für SC 100 / SC 1000	LZX 852
SC extension cord 50 m für SC 100 / SC 1000	LZX 853

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## HACH LANGE Services



Ordering, information and advice:  
UK: +44 (0) 12 56 333 403  
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On-site support by our technical field staff.



Cost-saving process optimisation with the HACH LANGE trailer.



Extended warranty with inspection contract.



[www.hach-lange.com](http://www.hach-lange.com)  
up to date and secure, with downloads, information and shop.



Regular customer information by post and email.

## HACH LANGE – the specialists for water analysis

### Everything from a single supplier

Whether field or laboratory analysis, samplers or process measurement technology, HACH LANGE stands for the total spectrum of water analysis – from visual methods to comprehensive systems of reagents, measurement technology and accessories.

### For every application

Solutions from HACH LANGE are tailor-made for wastewater, drinking water or process water – for reliable control of operational processes and monitoring of legally prescribed limit values.

### Parameters from A to Z

From ammonium to zinc – consistently user friendly and proven in daily practice. Regulatory bodies and industry know they can rely on HACH LANGE solutions for everything from sample preparation to quality control.

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