ENVIRONMENTAL MONITORING & CONTROL

HLX-Sens

Measure,
Control and Log Data

HLX-Sens

- **TRANSMITTER**
- **DISPLAY**
- **METER**
- **CONTROLLER**

in one

HLXSens is a new line of modern industrial devices, which integrates transmitters, displays, meters and controllers functionalities. Using the latest miniaturisation technologies these compact devices are able to be equipped with two independent universal inputs, two binary or two analogue outputs, as well as communication port RS-485 with Modbus protocol.

Within the **HLXSens** range, models 200 and 400 have integrated temperature and relative humidity sensor. As well as an exceptionally wide working temperature range (-30 ÷ +120°C) they are also equipped with mathematical functions, which make it possible to transform measured values into others, e.g. to calculate dew point, sum or difference of two measured values.

A large built-in display and output signals mean that the **HLXSens** units find applications in control systems. There are many industrial applications, where **HLXSens** can act as stand-alone controller. It can also cooperate with master devices via Modbus protocol, being part of big network, which makes it perfect device for distributed monitoring system.

Applications

- **food processing industry**
- **building HVAC automation**
- **warehouses, cold rooms**
- **glasshouses, breeding**
- **factories and manufacturing**
- **museums, archives, galleries**
- **server rooms, air-conditioned rooms**
- **weather stations**

Measurement

The primary functionality of **HLXSens** is taking measurements. Depending on needs and requirements, this compact device is equipped with top quality, precise and stable temperature and humidity sensors and/or with universal inputs that are standard for industrial automation. Thanks to its equipment the device guarantees a very high level of measurement reliability. Both version of probes - integrated and cable ones - are made of stainless steel. The sensors are protected with a replaceable PTFE or stainless steel mesh filter. The filter type is adjusted to a particular version of the probe.
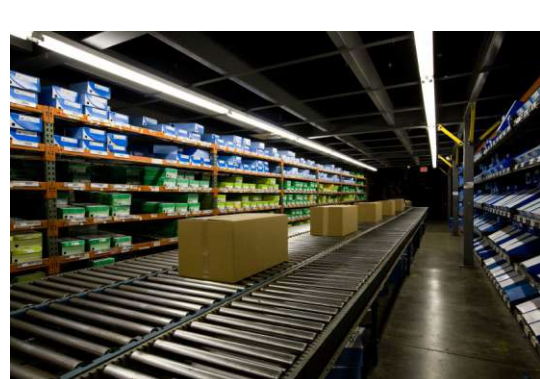
Control

A proper reaction of a controller is triggered by measured values interpretation, which impacts the state of output signals. Users can choose between binary outputs and analogue outputs (current and voltage ones) to adjust their model to the requirements of a specific application. Due to that the device is characterised by a wide range of various outputs and the possibility of applying them in one unit. As a consequence, the **HLXSens** meters can be used for digital or proportional controlling, and for combining both functions in one device as well.
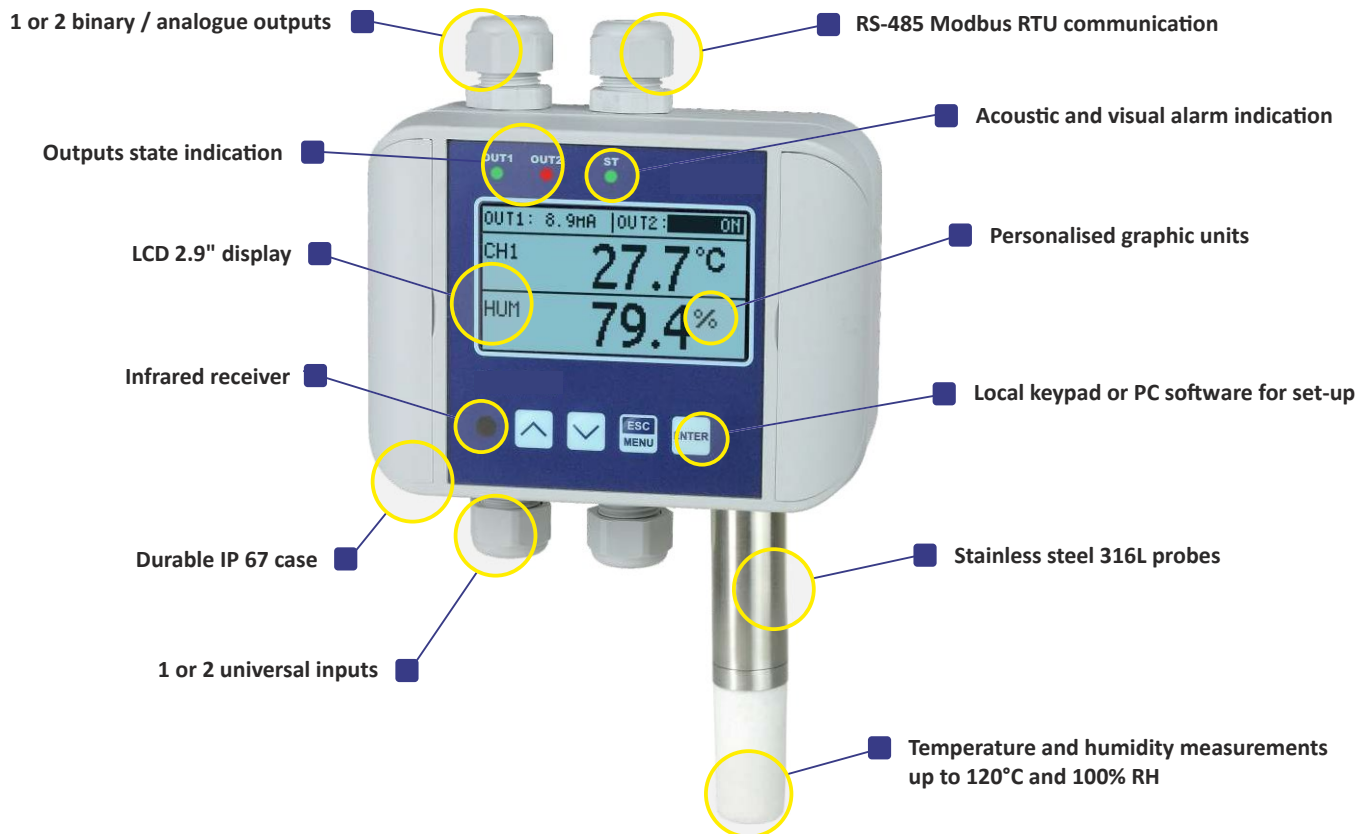
Communication

What is required in case of more advanced measuring and controlling networks is communication between devices. For such applications we offer the RS-485 interface which is standard equipment supporting the Modbus RTU protocol. The free S-Config software is used for communication functionalities that facilitate the device's remote configuration without the need to use a local keyboard. Measured values and output states are shared in the Slave mode. It concerns more advanced applications with existing or required central steering and visualisation systems for the devices in the **HLXSens** line.

Main features

1 or 2 binary / analogue outputs

RS-485 Modbus RTU communication

Outputs state indication

Acoustic and visual alarm indication

LCD 2.9" display

Personalised graphic units

Infrared receiver

Local keypad or PC software for set-up

Durable IP 67 case

Stainless steel 316L probes

1 or 2 universal inputs

Temperature and humidity measurements up to 120°C and 100% RH

OUT1: 8.9mA | OUT2: ON
CH1 27.7°C
HUM 79.4%

- 1 or 2 measuring channels available, with or without a probe
- Integrated, separable or cable probes made of 316L steel, used for temperature or temperature and humidity measurements
- Replaceable filter made of PTFE or 316L mesh, 25 µm
- Universal inputs of a very wide spectrum of analogue signal types (I, U, RTD, TC)
- Binary and analogue outputs for indicating and controlling (1 or 2 E REL, I, U)
- Very clear 2.9'' LCD display
- Indication of 1, 2, or 4 parameters on one screen
- Individual descriptions of measuring channels
- Optional elaboration of personalised graphic units, displayed at measurements (e.g.: m^3, l/h, kPa, °F, etc.)
- Standard equipment: RS-485 Modbus RTU interface for integration with superordinate visualisation or control systems
- Device configuration performed by means of local buttons, optional remote controller or free S-Config 2 software
- Operating temperature: -30°C ÷ +80°C
- IP rate protection: IP 67 (version without display), IP 65 (version with display)

Typical measurements

for T or T+RH probes:

temperature   humidity   dew point

for universal inputs, e.g.:

CO_2 barometric pressure   flow   pH   redox   ... and many more

ORP

A wide range of possibilities

Thanks to the universal device construction it is possible to apply 1 or 2 independent measuring channels. The most common type equipped with a probe (integrated or cable one) measures temperature or temperature and humidity in the sensor area, or on the installation in case of choosing cable probes. Regardless of the above, in case of a two-channel device a user can connect an external sensor by means of another, universal measuring input. If there is no need to apply constructions equipped with probes, both measuring inputs in the device can be used to connect external sensors installed directly on external industrial installations.

Inputs configuration

- 1 x temp. or temp. + RH probe
- 1 x temp. or temp. + RH probe
- 1 x universal (U, I, RTD, TC)
- 1 x universal (U, I, RTD, TC)
- 2 x universal (U, I, RTD, TC)
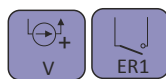

°C or °C + RH
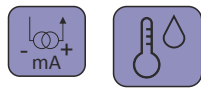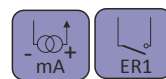
°C or °C + RH

HLXSens 200, 400, 600
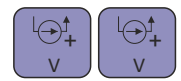
HLXSens 100

Exemplary outputs configuration

- 2 x E REL
- 1 x RS-485

- 1 x AO (0-10V)
- 1 x E REL
- 1 x RS-485

- 1 x AO (0/4-20 mA)
- 1 x E REL
- 1 x RS-485

- 2 x AO (0-10V) or
- 2 x AO (0/4-20 mA)
- 1 x RS-485

Wiring within available glands is customised depending on fitter's requirements.
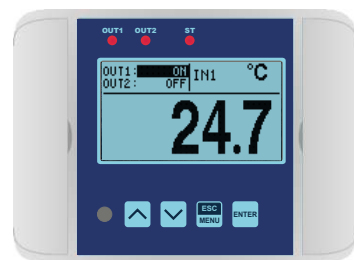
Technical data

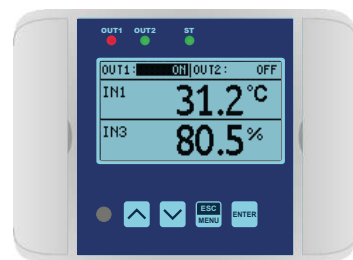| Line	HLXSens 100	HLXSens 200			HLXSens 400	HLXSens 600	
Model	**QM-100**	**QM-211**	**QM-212**	**QM-213**	**QM-421 / QM-422**	**QM-612**	**QM-621 / QM-622**
Power supply	24V DC (11 ÷ 36V DC), power consumption: 2.5 W max.						
Display	none or graphic LCD, 128 x 64 points, with backlight						
Type of probe	none	radial integrated, length 40 mm, Ø 18 mm, stainless steel 316L, PTFE filter cap	radial integrated, length 90 mm, Ø 18 mm, stainless steel 316L, PTFE filter cap	radial integrated, length 145 mm, Ø 18 mm, stainless steel 316L, PTFE filter cap	axial integrated, L=200 or 300 mm, Ø 12 mm, stainless steel 316L probe and filter cap	cable probe L=90 mm, Ø 18 mm, stainless steel 316L, PTFE filter cap	cable probe L=200 or 300 mm, Ø 12 mm, stainless steel 316L probe and filter cap
Probe parameters	none	**temp.:** measuring range -30 ÷ 80°C, typ.err. ±0.5°C @ -10 ÷ 80°C **temp. & humidity:** measuring range -30 ÷ 80°C, typ.err. ±0.2°C @ 10 ÷ 60°C (±0.4°C @ -30°C; ±0.7°C @ 120°C); 0 ÷ 100% RH; typ.err. ±1.8% RH (10 ÷ 90% @ 25°C)	**temp.:** measuring range -30 ÷ 105°C; typ.err. ±0.5°C @ -10 ÷ 85°C **temp. & humidity:** measuring range -30 ÷ 105°C; typ.err. ±0.2°C @ 10 ÷ 60°C (±0.4°C @ -30°C, ±0.7°C @ 120°C); 0 ÷ 100% RH; typ.err. ±1.8% RH (10 ÷ 90% @ 25°C)	**temp.:** measuring range -50 ÷ 120°C; typ.err. ±0.5°C @ -10 ÷ 85°C **temp. & humidity:** measuring range -40 ÷ 120°C; typ.err. ±0.2°C @ 10 ÷ 60°C (±0.4°C @ -30°C, ±0.7°C @ 120°C); 0 ÷ 100% RH; typ.err. ±1.8% RH (10 ÷ 90% @ 25°C)	**temp.:** measuring range -50 ÷ 120°C; typ.err. ±0.5°C @ -10 ÷ 80°C **temp. & humidity:** temp. measuring range -40 ÷ 120°C; typ.err. ±0.2°C @ 10 ÷ 60°C (±0.4°C @ -30°C, ±0.7°C @ 120°C); humidity measuring range 0 ÷ 100% RH; typ.err. ±1.8% RH (10 ÷ 90% @ 25°C)		
Connector & cable type	none					gland or 4 pin M12 connector, cable, PUR or TPU covered (operating temp. -30 ÷ +80°C) or TPE covered (operating temp. -30 ÷ +120°C)	gland, cable 3m max., PUR covered, operating temp. -30 ÷ +80°C or TPE covered, operating temp. -30 ÷ +120°C
Number of inputs	1 or 2 universal	0 or 1 universal					
Type of universal inputs	**current:** 0/4-20 mA; **voltage:** 0/1-5 V, 0/2-10V, 0-60 mV, 0-75 mV, 0-100 mV, 0-150 mV; **RTD:** Pt100, Pt500, Pt1000, measuring range: -100°C ÷ 600°C; **thermocouple:** type K, S, J, T, N, R, B, E; measuring ranges: -200°C ÷ +1370°C (**K**); -50°C ÷ +1768°C (**S**); -210°C ÷ +1200°C (**J**); -200°C ÷ +400°C (**T**); -200°C ÷ +1300°C (**N**); -50°C ÷ +1768°C (**R**); +250°C ÷ +1820°C (**B**); -200°C ÷ +1000°C (**E**) **accuracy:** 0.1% @25°C ± one digit (inputs: current, voltage, milivoltage, thermoresistance, thermocouple K, J, E); 0.2%@ 25°C (thermocouple N), 0.5%@25°C (thermocouple S, T, R, B)						
Binary outputs	0, 1 or 2 electronic NO relays, 24V AC/35V DC, max. 200 mA						
Analogue outputs	0, 1 or 2: **active current:** operating range 0/4-20 mA (0-24 mA max.); **passive current:** isolated, operating range 4-20 mA (2.8-24 mA max.); **active voltage:** operating range 0/1-5V, 0/2-10V (0-11V max.)						
Communication interface	RS-485, 8N1 and 8N2, 1200 bit/s ÷ 115200 bit/s, Modbus RTU, not galvanically isolated						
Operating temperature	-30°C ÷ +80°C, case with electronics (out of range -20 ÷ +70°C LCD and IR receiver turn off)						
Protection class	IP 67 (version without display); IP 65 (version with display)						
Case	wall mounted, 120 x 90 x 50 mm, material: ASA LURAN + polycarbonate						

Data presentation

No display version, LED signalling

One measurement display mode

Two measurements display mode
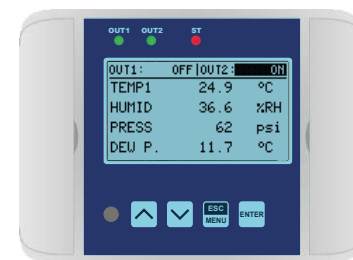
Four measurements display mode

Menu display mode

Device status information

SimCorder Soft

SimCorder Soft communicates with external devices using the RS-485 interface with the Modbus RTU protocol and reads measurement data from the above devices. A computer may be connected directly to the network of devices or via the internet. In case of the latter, an RS-485 Ethernet converter is necessary. This software enables sound and visual alerts (e.g. in case the temperature is too high in the cooler, excessive humidity, insufficient flow etc.). The system can be configured so that each alert evokes a particular response of selected signalling modules. Any changes in the device settings as well as reading of measurements is completed remotely at one station.

Monitoring from anywhere

A computer with **SimCorder Soft** installed in the **Network SERVER** version may share recorded data and system information such as emergency states via the internet. The data can be viewed as tables or diagrams or exported to various file formats on a computer with the **Network TERMINAL** version installed. The **Network TERMINAL** version also allows to print reports based on the above data. An insight into the entire system is possible from anywhere and at any time.

SimCorder
SERVER

SimCorder
TERMINAL

TCP/IP

MODBUS RTU MASTER

33.1

27.7 °C
57.1 %

28.7
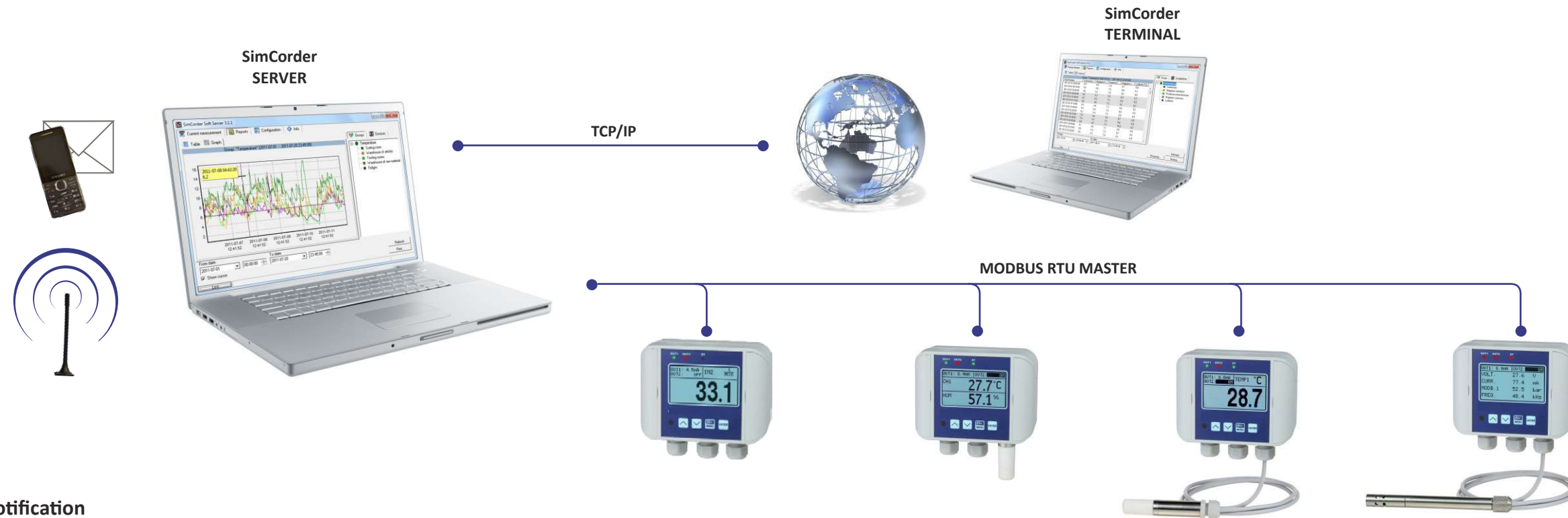
Immediate notification

After detecting emergency states, **SimCorder Soft** in the Alarm or Network versions generates text messages (an external GSM modem is required) and e-mails about the same and sends them to applicable telephone numbers (max. 5 numbers) and e-mail addresses. This enables to immediately respond in case of such situations as system failure or exceeding the permissible measuring parameters.

Depends on needs there are following versions of SimCorder Software:

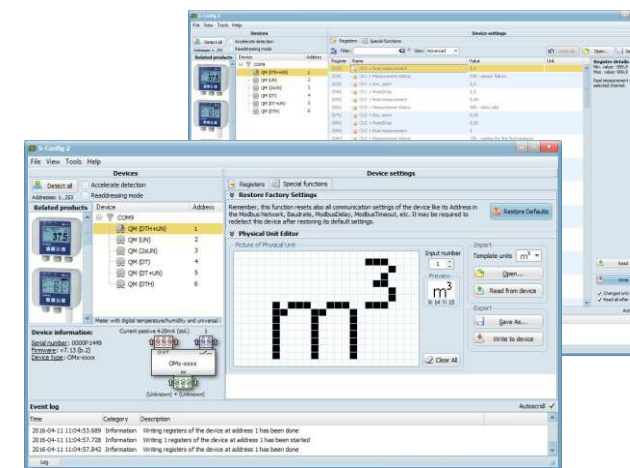| Features	BASIC	ALARM	NETWORK	
			SERVER	TERMINAL
USB dongle key with license required	✓	✓	✓	
semiSCADA	✓ *	✓ *	✓ *	
Data measurement on demand	✓	✓	✓	
Direct cooperation with data loggers	✓	✓	✓	
Easy devices reconfiguration	✓	✓	✓	
Alarm state signalization	✓	✓	✓	✓
Alarm forwarding to external devices		✓	✓	
GSM and e-mail notification		✓	✓	
Remote network			✓	✓

* functionality resulting from the license

S-Config 2

S-Config 2 is free software used for configuring the HLXSens line devices.

The software is used for a simultaneous detection of devices in multiple Modbus RTU networks and provides users with a possibility of changing the configuration of most of the devices. There is a list of registers presented for each detected device. The registers can be modified by users. The lists also include additional information concerning device parameters, such as: type, address, baud rate, etc.

The HLXSens line devices can provide detailed information concerning their properties. In particular, the information includes:

- device type,
- serial number,
- firmware version,
- inputs type,
- outputs type and number.

Additional functionality available for HLXSens line within the software is elaboration of personalised graphic units, displayed at measurements (e.g.: m^3, l/h, kPa, °F, etc.)

S-Config 2 software can be downloaded free

Accessories

◼ Cable probes

PPQ-612-00-X-X
Cable probe Ø18, L=90 mm, w/o cable, housing SS 316L, filter FPQ-P350

PPQ-612-XX-X-X
Cable probe Ø18, L=90 mm, housing SS 316L, filter FPQ-P350

PPQ-621-XX-X-X
Cable probe Ø12, L=200 mm, housing SS 316L, filter from SS mesh 25 μm

PPQ-622-XX-X-X
Cable probe Ø12, L=300 mm, housing SS 316L, filter from SS mesh 25 μm

Ordering:
PPQ-612-00-X-X

measurement of:
2 : temperature
3 : temperature & humidity

connector type:
2 : connector, operating temp. -30 ÷ +80°C
4 : connector, operating temp. -30 ÷ +120°C
(only for cable connections)

Ordering:
PPQ-612-XX-X-X
PPQ-621-XX-X-X
PPQ-622-XX-X-X

measurement of:
2 : temperature
3 : temperature & humidity

connector & cable type:
1 : gland, PUR covered,
operating temp. -30 ÷ +80°C
3 : gland, TPE covered,
operating temp. -30 ÷ +120°C

cable length:
05 (0,5m), **10** (1m), **15** (1,5m),
20 (2m), **25** (2,5m), **30** (3m)

◼ Filters

FPQ-P350
Teflon filter (PTFE) with increased resistance against splashing water,
non-absorbent surface, does not rust, operating temperature -30 ÷ +120°C

◼ Mounting accessories

HPQ-FS12
Flat circular flange for Ø12 probes, SS 316L

HPQ-TS12
Thread bracket for Ø12 probes, SS 316L, M20x1,5

HPQ-W1218
Wall mounting bracket for Ø12 and Ø18 probes, SS 316L

HPQ-CGS18
Thread bracket for Ø18 probes, M25x1,5

Accessories

Connection accessories

CPQ-00

M12 connector, 4-pin, w/o cable
for PPQ-612 probes,
operating temp. -30 ÷ +80°C

CPX-30

M12 connector, 4-pin, cable 3 m, for PPQ-612 probes

Ordering:

CPX-30

operating temp.:
Q : standard: -30 ÷ +80°C, cable TPU covered
T : expanded: -30 ÷ +120°C, cable TPE covered

Additional accessories

SIR-15

InfraRed remote controllers may be used as external programming keyboard for all SIMEX devices equipped with IR receivers and remote programming functions. Pressing of any local IR controller key, causes transmission of it's code to the device. Functions of particular keys depend on devices features.

Power supply voltage:	6V DC - 4 alkaline batteries type LR44
Operation range:	from 0,5 to 5 m (depend on programmed device features)

SCL-QM

Case lock - access is safeguarded by means of insert lock

SRS-U4

Converter is designed to connect a USB host to slave devices equipped with RS-485 interface. The PC with special software can be used as a host. The **SRS-U4** unit guarantees full galvanic isolation between USB and RS-485 circuits. The converter can work with any devices equipped with RS-485 interface and contains integrated circuit which supports USB 1.1 and USB 2.0 standards. The main purpose is connection of PC host computer with industrial data acquisition and visualisation systems based on RS-485 interface. The **SRS-U4** can be also manufactured with DIN mounting adaptor.

LSQkit
Lid supports (2 pcs)

Calibration certificates

Standard calibration certificate, in 1 point, issued by Simex laboratory, free of charge	
SCCI-T	1 temperature channel (1 point: 25°C)
SCCI-TH	1 temperature channel (1 point) + 1 relative humidity channel (2 points: 20%/70% RH@25°C)

Paid calibration certificate, in 3 points, issued on request by Simex laboratory:	
SCCP-T	1 temperature channel (3 points: 15°C, 25°C, 35°C)
SCCP-TH	1 temperature channel (3 points) + 1 relative humidity channel (3 points: 50% RH@15°C, 70% RH@25°C, 50% RH@35°C)

Paid calibration certificate, in 3 points, issued on request by accredited laboratory:	
ACCP-T	1 temperature channel (3 points: 15°C, 25°C, 35°C)
ACCP-TH	1 temperature channel (3 points) + 1 relative humidity channel (5 points: 50% RH@15°C, 30%/50%/70% RH@25°C, 50% RH@35°C)

CALIBRATION CERTIFICATE

CALIBRATION CERTIFICATE

QM-XXX-XX-X-X-X-XX-X-10-3-X

probe version:
100-00-0 : without probe
211-00-0 : radial, Ø 18 mm, L=40 mm
212-00-0 : radial, Ø 18 mm, L=90 mm
213-00-0 : radial, Ø 18 mm, L=145 mm
421-00-0 : axial, Ø 12 mm, L=200 mm
422-00-0 : axial, Ø 12 mm, L=300 mm
612-00-2 : radial connector, no cable, Ø 18 mm, L=90 mm
612-XX-X : cable, Ø 18 mm, L=90 mm
621-XX-X : cable, Ø 12 mm, L=200 mm
622-XX-X : cable, Ø 12 mm, L=300 mm

connector & cable type:
1 : gland, PUR covered, operating temp. -30 ÷ +80°C
2 : connector for Ø 18 mm probe, TPU covered, operating temp. -30 ÷ +80°C
3 : gland, TPE covered, operating temp. -30 ÷ +120°C
4 : connector for Ø 18 mm probe, TPE covered, operating temp. -30 ÷ +120°C

cable length:
05 : L=0,5 m
10 : L=1 m
15 : L=1,5 m
20 : L=2 m
25 : L=2,5 m
30 : L=3 m

number of available glands:
2 : 2 pcs
3 : 3 pcs
4 : 4 pcs
5 : 5 pcs (does not apply to radial & axial probes)

display:
0 : none
1 : LCD, 128 x 64 pixels

outputs:
00 : none
11 : 2 x E REL
21 : 1 x AO *(0/4-20 mA, active, non-isolated)* + 1 x E REL
31 : 1 x AO *(4-20 mA, passive, isolated)* + 1 x E REL
41 : 1 x AO *(0-10V, active, non-isolated)* + 1 x E REL
22 : 2 x AO *(0/4-20 mA, active, non-isolated)*
33 : 2 x AO *(4-20 mA, passive, isolated)*
44 : 2 x AO *(0-10V, active, non-isolated)*

measurement 2:
0 : none
1 : universal input *(I, U, RTD, TC)*

measurement 1:
1 : universal input *(I, U, RTD, TC)* - without probe
2 : temperature probe
3 : temperature & humidity probe

Probe version:

HLXSens 400 axial probe

HLXSens 200 radial probe

HLXSens 600 cable probe

HLXSens 600 radial connector probe no cable

circular connector

Easy to assemble ...
Easy to replace ...

Glands configuration:

- for HLXSens 100 and 400

2 pcs

3 pcs

4 pcs

5 pcs

- for HLXSens 200 and 600

2 pcs

3 pcs

4 pcs

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