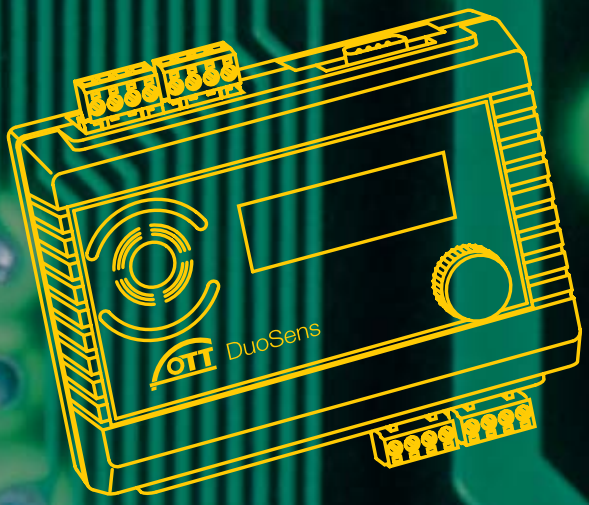
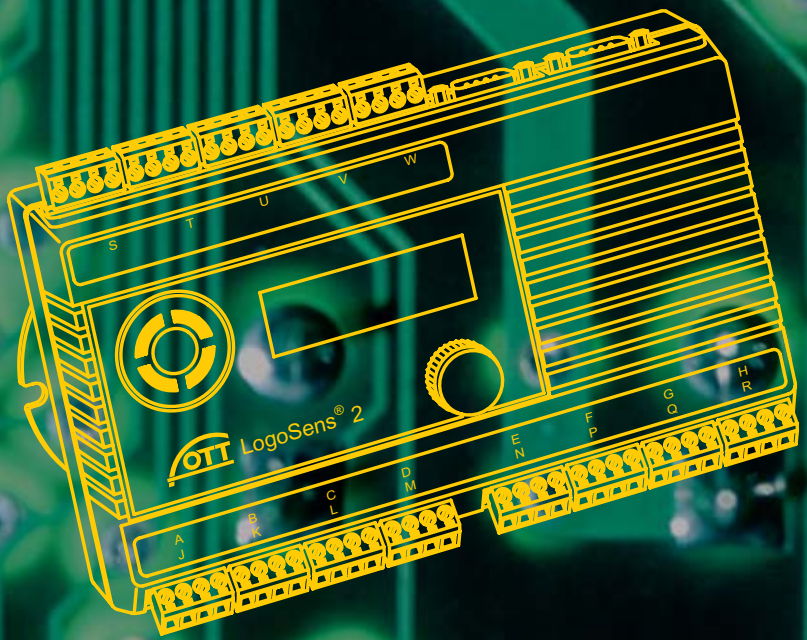
OTT Data Logger Overview

– Flexible data collection
– Advanced communications
– Comprehensive station management





Systematic Data Logging

OTT data loggers are specially designed station managers for hydrometric, meteorological, and environmental monitoring applications. The core functions include: collection and storage, processing, management, and transmission of data.

OTT has been successfully developing data logging systems since 1970. The Allgomatik and HydroSens models broke new ground in the field of data logging technology for water-management applications - renowned for their robustness, stability, and modular design. To this day, our clients still value these systems, which have often provided more than 20 years of reliable service.

Stemming from this vast experience, OTT can claim credit for its development of the data logger, adding particular value to its core features. The following advantages distinguish OTT data loggers from standard data logging systems:

Reliability

- A carefully selected range of component options are available (e.g. systems can be specified to –40°C)
- Reliable data communication on site through the infra-red interface (IrDA), eliminating the risk of corrosion and wear at the interface's connection point
- Advanced storage system: battery-backed ring memory
- Sophisticated readout concept: data are copied during readout, and permanently stored in memory
- Factory Acceptance Test (FAT) – each component will be automatically checked during the initialisation process, and a plausibility report will be generated
- Integrated protection against input overload reduces the likelihood of system faults
- Battery-backed real-time clock

Versatility

- Maximum flexibility thanks to the broad range of possible sensor connections: serial, analogue, digital
- The most modern data transmission system, employing economical data transmission methods
- An optimal data transmission solution can be created based on specific requirements
- Alarm management: a comprehensive range of control and alarm functions indicate for example; rapidly rising water levels, discharge and waste water flows, events exceeding pre-set limit values, or signal service alerts such as low battery conditions.

Minimal energy consumption

- LPBD: Low Power Board Design – the careful selection of each component, and the energy-saving mode of operation combine to keep the power consumption of OTT data loggers to an absolute minimum
- Autonomous operation of remote measuring stations is catered for with the ability to integrate solar or battery power options

Equipment selection – at a glance

From the compact and economical OTT DuoSens Basic unit, through to the OTT LogoSens with voice announcements and redundant data logging for complex station applications, there is an OTT data logger to suit every type of measuring site. The OTT DuoSens and OTT LogoSens are based on differing architectures, allowing us to provide the optimal solution for any of the diverse requirements of our clients. Both systems possess a high degree of data logging flexibility. The OTT DuoSens achieves this with its modular hardware architecture, while the OTT LogoSens features intelligent multiplex operation, which allows the configuration of additional inputs through its internal software.

Data logging

The table on the right shows a brief overview of the various connection options for the OTT LogoSens and OTT DuoSens.

Jog-shuttle with menu display guarantees straightforward on-site operation

Data logging	OTT DuoSens (Basic/Standard)	OTT LogoSens
Pulse	✓	✓
Analogue sensors	✓ [1]	✓
Serial sensors:		
SDI-12/RS 485	✓	✓
OTT RS 232	✓ [2]	✓
OTT SLD	✓ [3]	✓
OTT Sonicflow		✓
Modbus	✓	✓
Max. number of inputs	2/4 [4]	8 (16)
Internal channels	30	30

[1] Analogue input expansion module; see also overleaf and in price list

[2] RS 232 expansion module; see also overleaf and in price list

[3] Sensor for flow velocity measurement

[4] 4 channels with analogue input expansion module or RS 232

Data communication

Different data transmission methods and services are supported by both data loggers. The main difference lies in the number of available COM ports and the voice announcement option.

Data communication	OTT DuoSens (Basic/Standard)	OTT LogoSens
Data ports		
Infrared (IrDA) for local data communication	1	1
Galvanised RS 232 for telecommunications	1	2
Data transmission systems		
Analogue and GSM Modem	✓	✓
ISDN Adapter, SAT-Transmitter	✓	✓
Data transmission services		
SMS Data transfer	✓	✓
GPRS Data communications	✓	✓
Internal data management		
Discharge calculation module		✓
Alarm management	✓	✓
Voice announcement		✓
Outputs	1 Relay 1 optoelect. coupler	2 Relays 4 … 20 mA SDI-12

OTT DuoSens –
Compact data logger with multiple expansion modules

The OTT DuoSens is available in two versions: OTT DuoSens Basic and OTT DuoSens Standard.
Both versions of the OTT DuoSens can be assembled using the expansion modules as building blocks, both versions offer an extensive range of sensor connection possibilities. The data logger is equipped with SDI-12 and RS 485 interfaces, a status input and a pulse input, e.g. for connecting a tipping bucket rain gauge.
The OTT DuoSens supports all the main data transmission systems and services, and features complete alarm management. The extended voltage input range (6 – 28 V) allows the DuoSens to operate with a simple battery pack (4 x LR14) or a 24 V electrical switchboard connection.

OTT DuoSens Basic
Data logger without display or jog-shuttle. All settings are made through the configuration software.

OTT DuoSens Standard
Data logger with display and jog-shuttle for monitoring gauge adjustments and offset configuration.

Advantage: Click-on installation

Quick and simple mounting on to a backing board using 'rail & clip' click-on fastening.

Expansion modules

The analogue module – for connecting analogue sensor equipment (current, voltage, resistance, ...) with two channels. The desired variable settings can be configured through the logger's configuration software.

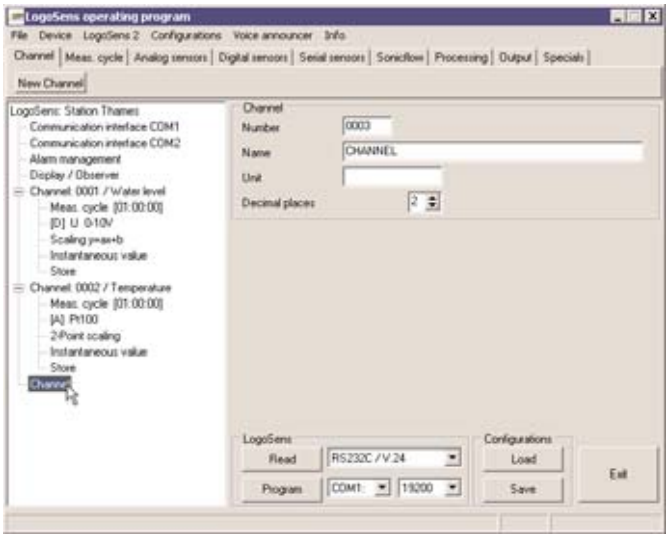
The serial module – for the connection of up to two OTT or other sensor types equipped with serial RS 232 outputs.
The desired variable settings can be configured through the logger's configuration software.

OTT LogoSens – A station manager featuring as standard 8 or an expanded 16 inputs

Features and benefits

The OTT LogoSens multi-channel data logger offers highly flexible sensor input capabilities. All inputs support a full range of common connector types and sizes – the software allows the input channels to be assigned particular physical input ports (multiplex operation).

A further innovation means that no hardware changes are needed – simply drag and drop to assign a new sensor.



Measured value announcer
An integrated speech module allows voice alarms to be enabled.

Discharge measurement
LogoSens features the option to connect the differential ultrasound transit-time (OTT Sonicflow) and acoustic Doppler (OTT SLD) technologies. The discharge value Q is calculated and stored based on a given (programmed) mathematical hydraulic model.

2 independent RS 232 interfaces
OTT LogoSens offers 2 independent RS 232 ports as standard to enable redundant transmission configurations.

4 - 20 mA output
Scaleable 4 - 20 mA output for forwarding data over a 4 – 20 mA analogue signal – e.g. when connecting an external display.

8 to 16 input channel expansion
An additional channel board allows the number of input channels to be increased from 8 to 16.

On-site data communications

For communication on site a variety of control and communications devices are available. The most suitable solution can be determined for those everyday field visits, based on user and application requirements.

PDA + OTT Hydras 3 Pocket

Small, lightweight, and simple to operate are the basic requirements for a portable data-handling instrument. The OTT Hydras 3 Pocket package combined with a PDA fulfils these requirements, as well as offering added flexibility and functionality.

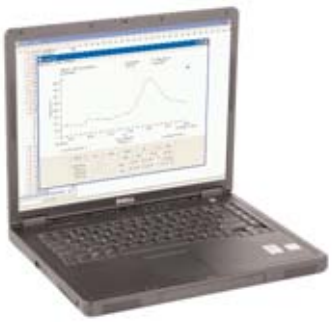
- Configuration and downloading of data can be done via the wireless infrared (IrDA) port or using a direct cable connection over the RS 232 port
- Downloaded data can immediately be displayed and visually verified
- USB PC synchronisation sends the collected data directly to the user's OTT Hydras 3 software, or it can be stored as a text file

OTT Vota 2

The multi-functional OTT Vota 2 is the smart alternative for those on-site visits where a laptop is not practical. Problems arising, for example, from poor light, adverse weather conditions, the lack of a power source, or the need for rugged equipment, all belong in the past with the OTT Vota 2. It is the perfect link between your monitoring site and the evaluation of data back at the office.

- No specialist computer knowledge is necessary to operate the OTT Vota 2
- Downloaded data can immediately be displayed and visually verified
- PC synchronisation sends your data directly to your OTT Hydras 3 software

OTT Hydras 3 Basic + Laptop



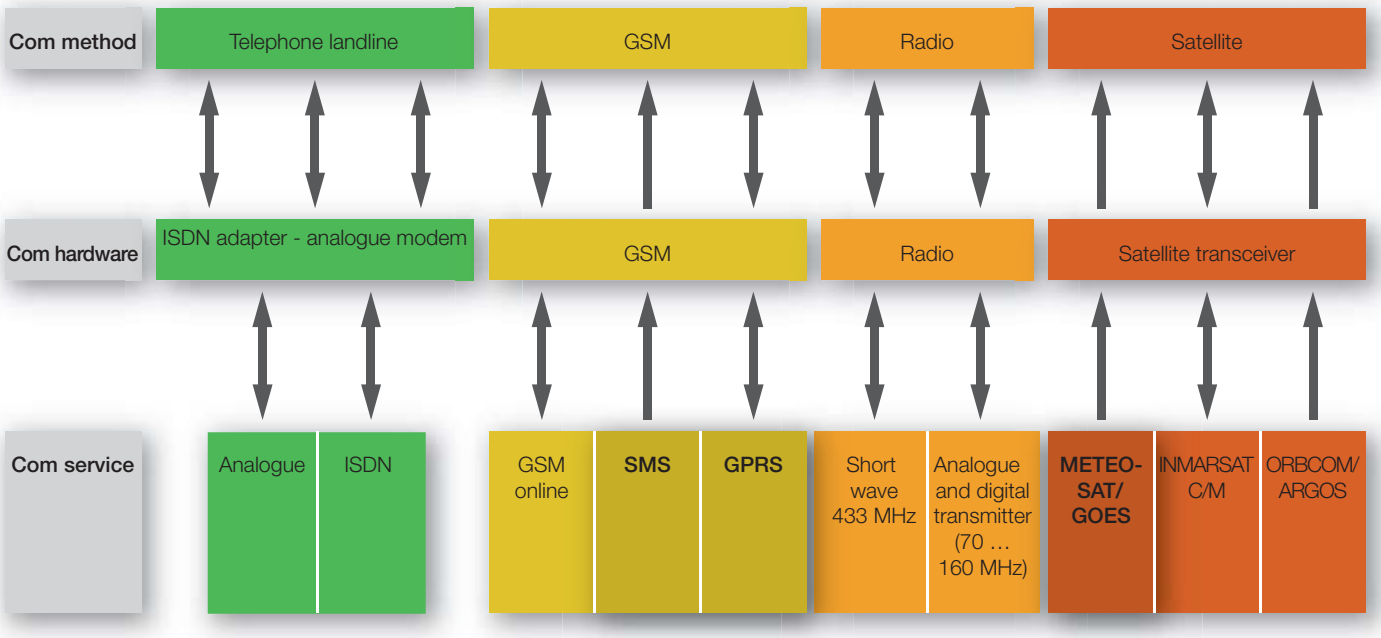
OTT data loggers can be configured and data downloaded on site via RS 232 and infrared interfaces, or remotely through telecommunication services over a modem, ISDN or GSM connection, thanks to the OTT Hydras 3 Basic user software. OTT Hydras 3 Basic offers a multitude of functions to simplify the management of your instruments and measurement sites:

- Instrument configuration on-site or via modem
- Database of measured values and measurement site management
- Creation and printing of graphs and tables based on measured data
- Manual import and export of data in various formats

Data communication – a range of technologies to choose from

The OTT data loggers support various data transmission technologies – landline, GSM, radio, and satellite, with active or passive data polling; the optimal data transmission solution can be selected based on the application requirements and the available infrastructure.

Overview of data transmission pathways



The latest data transmission services – SMS, GPRS

In today's technologically advanced society the latest live data needs to be available on demand. Modern data transmission technologies and communication services support this and open up new possibilities for keeping your data up to date.

The particular features of these services are:

- data transmissions occur in exact pre-defined data packets
- the transfer of data is accounted for based on volume, which means costs are incurred only for the amount data transferred and not for the time to connect or the duration of the connection

The active components for this type of data transmission are a principal part of the data logger (or Station manager) at a measuring site. These new concepts for data transfer from the measuring site to a central point no longer require a direct connection to be established. The transmission of data and its reception at the central measurement network software – i.e. the database – are separated. Data from multiple measuring sites can thereby be transmitted simultaneously. Critical or lengthy connection sequences, which arose with direct modem links in larger networks, are now a thing of the past.

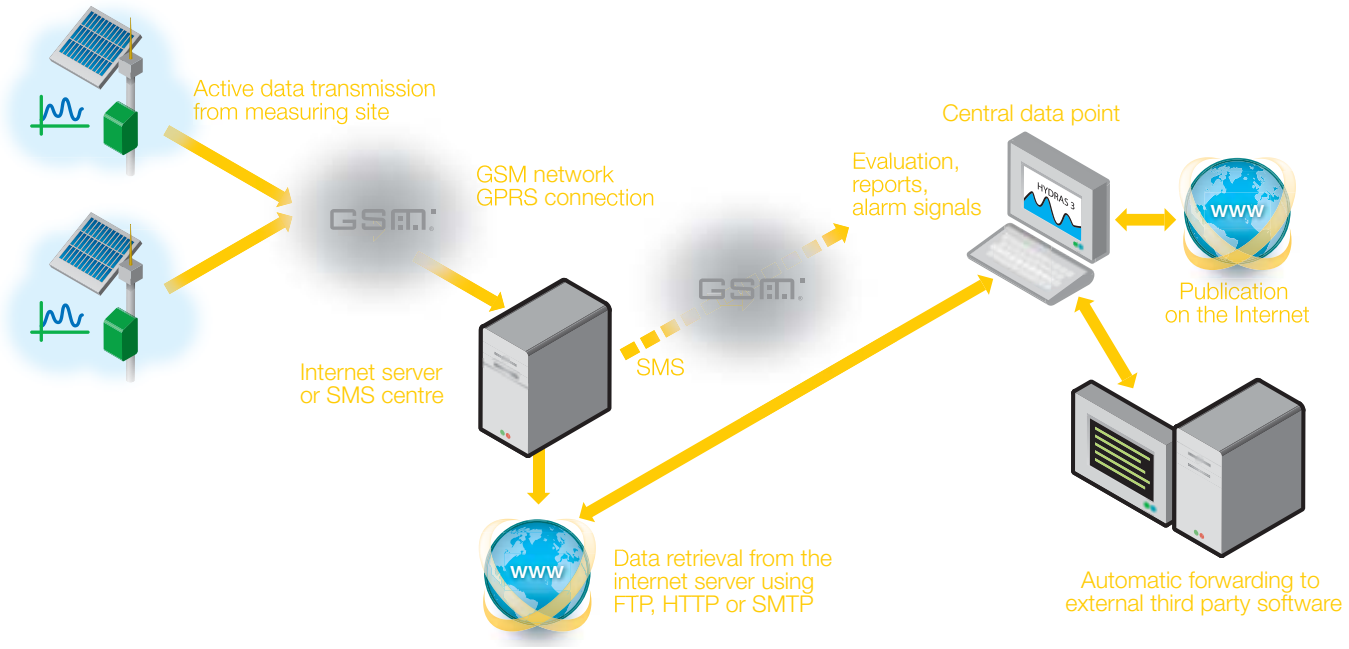
SMS / GPRS Data transmission

Data transmission via SMS

SMS data transmission sends the outgoing data from the measurement site over the SMS service and through to the central data collection point or it can be transmitted to a central SMS-Server. The measurement network software (OTT Hydras 3, Basic & Standard versions, or Hydras 3 Pro) accepts SMS information directly, or retrieves it via the X.25/X.31 telecommunications protocol, or using an FTP internet connection to the SMS-server.

Clear advantages

- SMS data transmission saves energy through activation of the modem only when needed, and significantly extends the battery's service life.
- Communication events in series are time-consuming, and no longer necessary; the parallel reception of multiple data transmissions is handled efficiently by the receiving server.
- The central software and data transmissions operate separately. Numerous methods are possible for accessing the raw data that is retrieved.



GPRS Transmission via FTP, HTTP or SMTP

GPRS stands for "General Packet Radio Service" – this technology enables the transfer of data packets via an internet protocol over a mobile radio network.

The packet-orientated data transmission over GPRS is accounted for by the actual amount of data transferred, as opposed to the GSM method, which is based on the time connected. The method based on the volume of data transferred allows costs to be significantly reduced, while still enabling the central data point to collect "real-time" data (e.g. every minute).

GPRS allows direct data transmission over the internet, which means standard protocols, such as FTP, HTTP or SMTP (email) can be used for data transfer. No proprietary software is therefore needed for receiving data. A suitable server system is all that is required to access the data.

With analogue to SMS or D-channel transmissions, the transfer is initiated from the measurement site. The connection to the remote server is established over the internet, and the data can be downloaded to the central server. The measuring network software (OTT Hydras 3 or Hydras 3 Pro) retrieves the data from the server using an FTP internet connection.

Clear advantages

- Based on volume of data transferred
- Data is transmitted directly to the internet – no proprietary software needed on the receiving side; the data is accessed with a standard server

Data transmission via Meteosat/GOES satellite

The OTT HDR equips measuring sites with DCP transmission capabilities (Data Collecting Platform) via Meteosat and GOES satellites. The automatic synchronisation of frequency and of the internal clock through the GPS signal (Global Positioning System) guarantees very stable transmission frequencies and times.

In the Master-Slave arrangement the OTT HDR acts as the slave-transmitter, executing transmission commands issued by a connected OTT LogoSens or DuoSens data logger.

The data are actively transmitted from the measuring site via satellite to the satellite data exchange. From there, the data are retrieved through an FTP internet connection (e.g. with OTT Hydras 3 or Hydras 3 Pro).

Clear advantages

- High-Data-Rate transmitter for 100 and 300 bps
- Simple configuration for connecting OTT LogoSens and DuoSens
- Certified for Meteosat and GOES
- Turn-key solution: the Meteosat data communications package includes the transmitter and software for retrieving data from the EUMETSAT Broadcast System, and transferring it to the measuring network database for evaluation.

Superior protection for extreme environments thanks to the robust sealed housing

The Master-Slave configuration allows effective control of the transmitter, enabling easy integration with the OTT LogoSens or third party data loggers

Independent 16 kB time slot operated data storage unit and 8 kB of random access alarm memory

Status LEDs indicate GPS-signal, transmitter activity, and power supply

Automatic GPS-adjusted time and broadcast frequency

Extremely low power consumption; in sleep mode < 200 µA

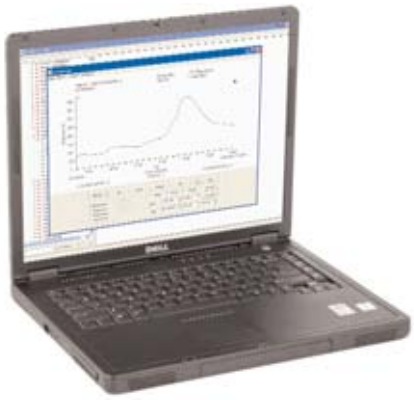
RS 232 interface for data transfer in the Master-Slave configuration with added transmission reliability (CRC-Check)

More flexible connection of Synergetics 18b or Compro 420-70 Cross-Yagi type aerials; integrated aerial orientation prediction

OTT system integration and accessories

Accessory: OTT Vota 2 – the readout and control unit

Accessory: OTT Hydras 3 Basic user software



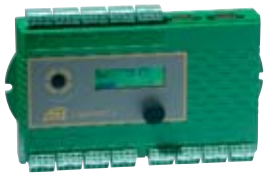
OTT system integration

Modem and adapter
The appropriate modem and adapter will be installed based on the selected data transmission method

Power supply
A solar module with accumulator or mains power supply are available

OTT system integration
For assembly and safe installation of the measuring station a range of suitable housings are available. Whether for an indoor or outdoor site, we can offer the right housing solution to meet your needs

Technical Specifications



	OTT DuoSens	OTT LogoSens
Power supply	6 … 28 VDC	8 … 15 VDC
Power consumption at 12 V		
Active Mode	ca. 15 mA	ca. 60 mA
Idle Mode	50 µA	500 µA
Idle Mode (e.g. COM2 port active, contact closed)	500 µA	5 mA
Clock		
Clock Type	Real-time clock (RTC)	Real-time clock (RTC)
Accuracy	±1 min/Month at ca. 25 °C	±1 min/Month at ca. 25 °C
Runtime after external power supply cut off	10 years	10 years
Communications interface		
RS 232	1x	2x
Infrared (IrDA) beam angle	30°	30°
GPRS	yes	yes
SMS active data transfer	optional	optional
Data storage	4 MB, non-volatile Ring memory (no data loss on power-cut)	4 MB, non-volatile Ring memory (no data loss on power-cut)
Logical channels	30+1 Info-channel	30+1 Info-channel
Polling interval	5 s - 24 h	5 s - 24 h
Storage interval	5 s - 24 h	5 s - 24 h
Display	optional, graphical dot-matrix 122 x 32 pixels	standard, graphical dot-matrix 122 x 32 pixels
Inputs		
Number of physical inputs	2 x pulse/status inputs 1 x SDI-12 1 x RS 485	8 configurable inputs (except 2 x pulse inputs)
Additional inputs	analogue expansion board with 2 inputs (voltage, current PT 100) / serial expansion board RS 232 with 2 inputs	1 expansion board with 8 configurable inputs (except 1 pulse input)
RS 485 input (Legacy protocol)	Kalesto, Parsivel	Kalesto, Parsivel, Sonicflow
Voltage input	50 mV/5 V/10 V (with exp. board)	5 V/10 V
Current input	0 … 20 mA/4 … 20 mA (with exp. board)	0 … 20 mA/4 … 20 mA
PT 100	Yes (exp. board)	Yes
Pulse input	Yes	Yes
Conductivity	No	Yes
NTC input	No	Yes

Technical Specifications

	OTT DuoSens	OTT LogoSens
Frequency input	No	Yes
Potentiometer	Yes (0P69, 3-way)	No
Outputs		
Relay output (galvanically isolated)	1x	2x
Max. voltage	28 VDC	28 VDC
Leakage current	< 5 µA/28 VDC	< 5 µA/28 VDC
Current load	max. 10 mA U_{CE} < 0,5 VDC	max. 1.6 A electronic short-circuit recognition safety system
Voltage output	switchable power source $U_{bat.}$ max. 10A	– + 5.5 VDC max. 1A – looped voltage supply – -12VDC max. 100mA
4-20 mA output (galvanically isolated)	not available	1x
SDI-12 output	–	1x
Dimensions (L x W x H)	140 x 100 x 68 mm	216 x 142 x 48.5 mm
Weight	ca. 240 g (Basic)	ca. 440 g
Protection rating	IP 30	IP 30
Housing material	ABS	ABS
Temperature range	–40 °C … 70 °C	–35 °C … 70 °C
Humidity	10 … 90 %, Non-condensing	10 … 90 %, Non-condensing

OTT – Your partner for:

- Water level measurement in ground and surface water
- Discharge and flow measurement
- Precipitation measurement
- Water quality measurement
- Data management and communications
- HydroService: consulting, training, installation and maintenance

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