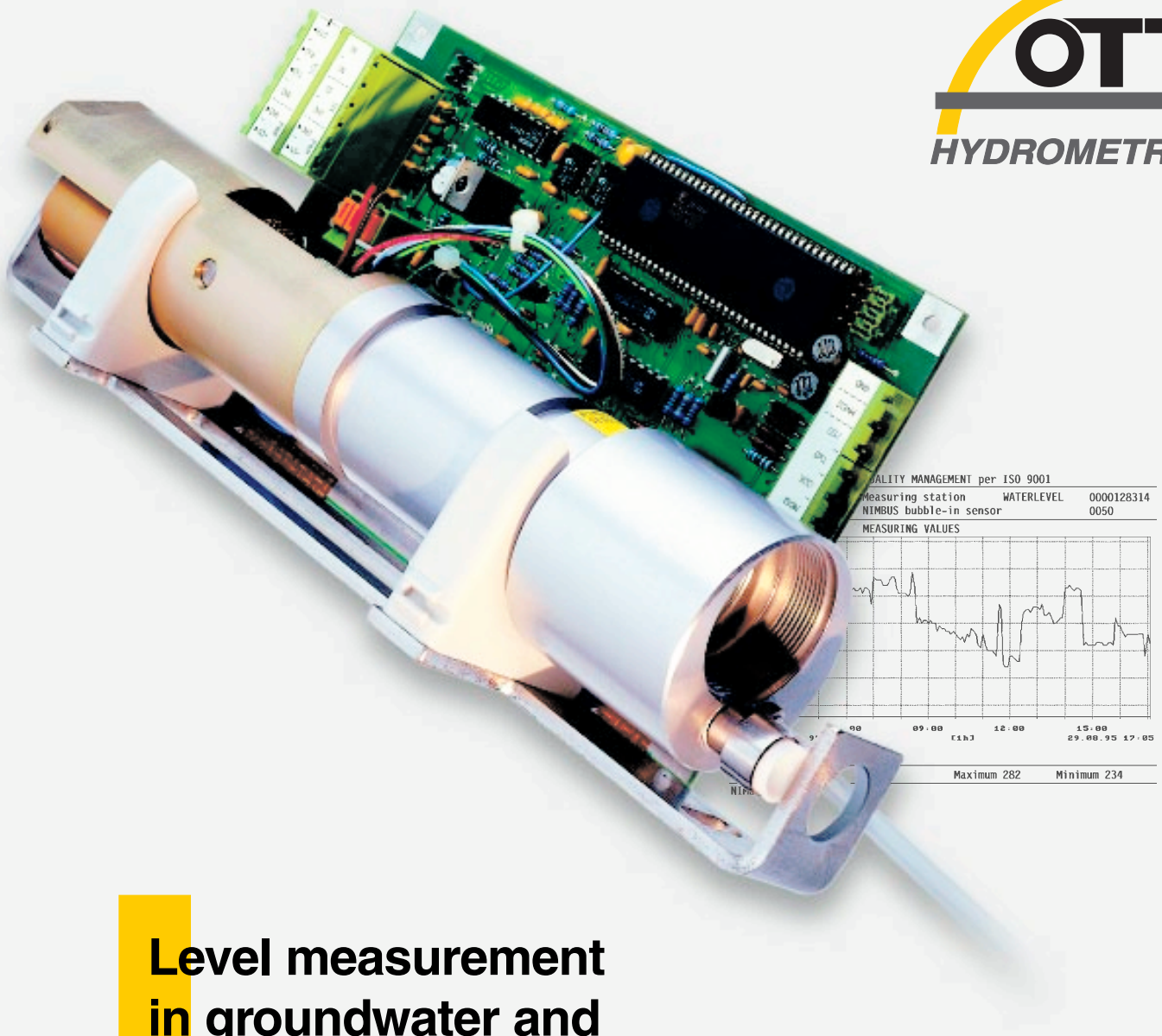
OTT HYDROMETRIE



Level measurement in groundwater and surfacewaters using the bubble-in principle

NIMBUS

- Intelligent sensor card with integrated compact compressor and data memory
  - no external supply of compressed air necessary
- Easy and individual installation
  - Measuring tube can be customized by the user in the field
- Cost reduction since only minor constructional measures are necessary
- RS 232 interface / SDI 12 interface for the connection to external devices e.g. data loggers or data transmission systems from OTT or other manufacturers
- Indirect measuring-principle (bubble-in principle)
  - long-term stability, even in salt water or contaminated water

NIMBUS

The compact intelligent level sensor, using the bubble-in principle, for continuous level measurement both in groundwater and in surfacewaters.

It can be used wherever sophisticated technology is required to obtain economical, fast and reliable measuring results.

The individual adaption of the NIMBUS to the individual measuring location is done on-site.

The ease of operation and the unbeatable cost-effective ratio alows the user to install the system in a large range of applications, such as:

- **in tidal areas,**
- **in groundwater,**
- **at elongated, flat slopes (wide foreland),**
- **on barrage walls, bridges, gates of dams as well as sluices, etc.,**
- **on rocky foundations,**
- **if there is danger of icing of silting-up of the float well,**
- **for short-term measurements,**
- **in dry areas (storage basins, wadis, etc.).**

NIMBUS

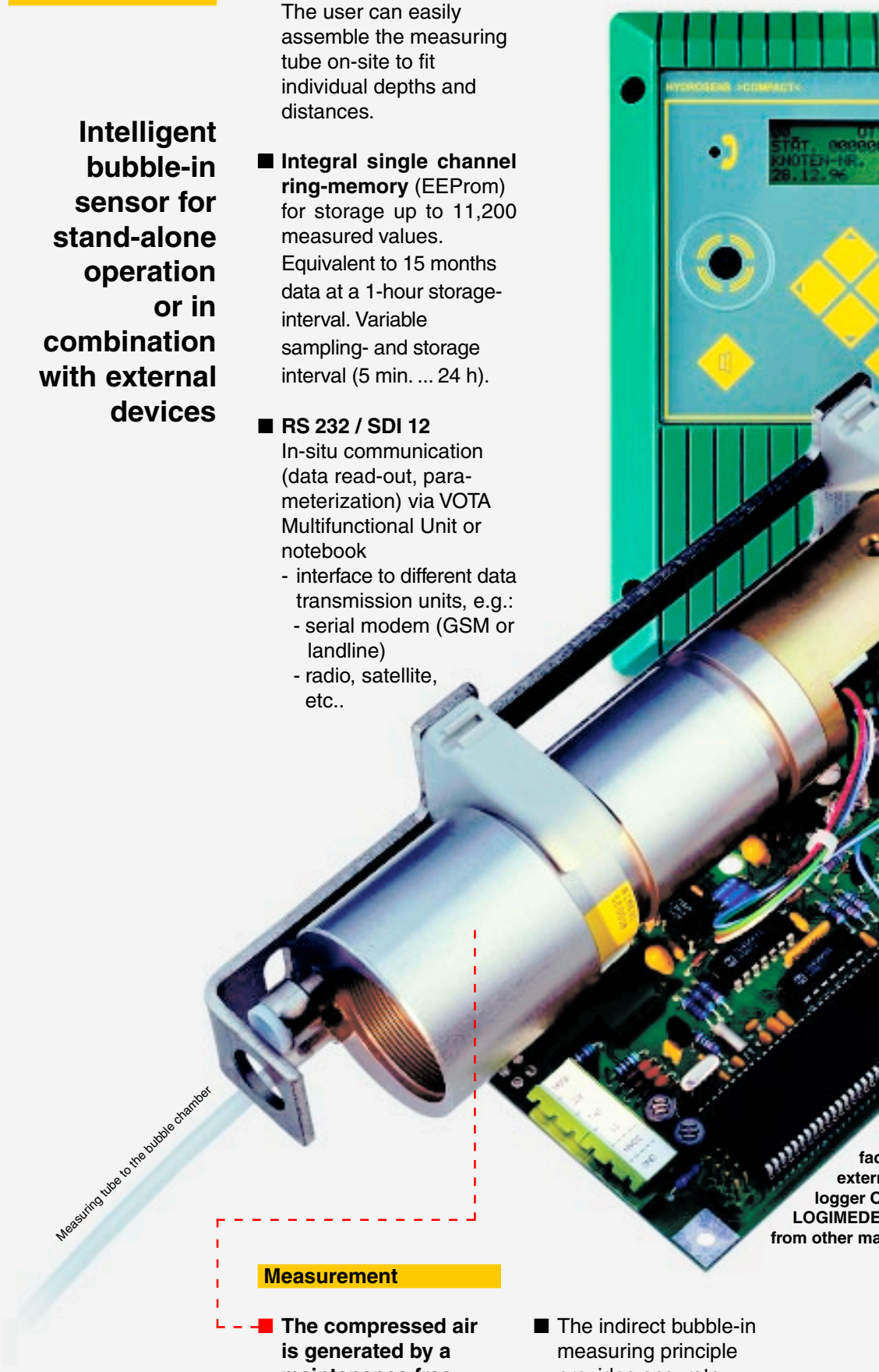
Intelligent bubble-in sensor for stand-alone operation or in combination with external devices

■ **Easy, cost-effective installation**
The user can easily assemble the measuring tube on-site to fit individual depths and distances.

■ **Integral single channel ring-memory** (EEProm) for storage up to 11,200 measured values. Equivalent to 15 months data at a 1-hour storage-interval. Variable sampling- and storage interval (5 min. ... 24 h).

■ **RS 232 / SDI 12**
In-situ communication (data read-out, para-meterization) via VOTA Multifunctional Unit or notebook
- interface to different data transmission units, e.g.:
  - serial modem (GSM or landline)
  - radio, satellite, etc..

Possible com



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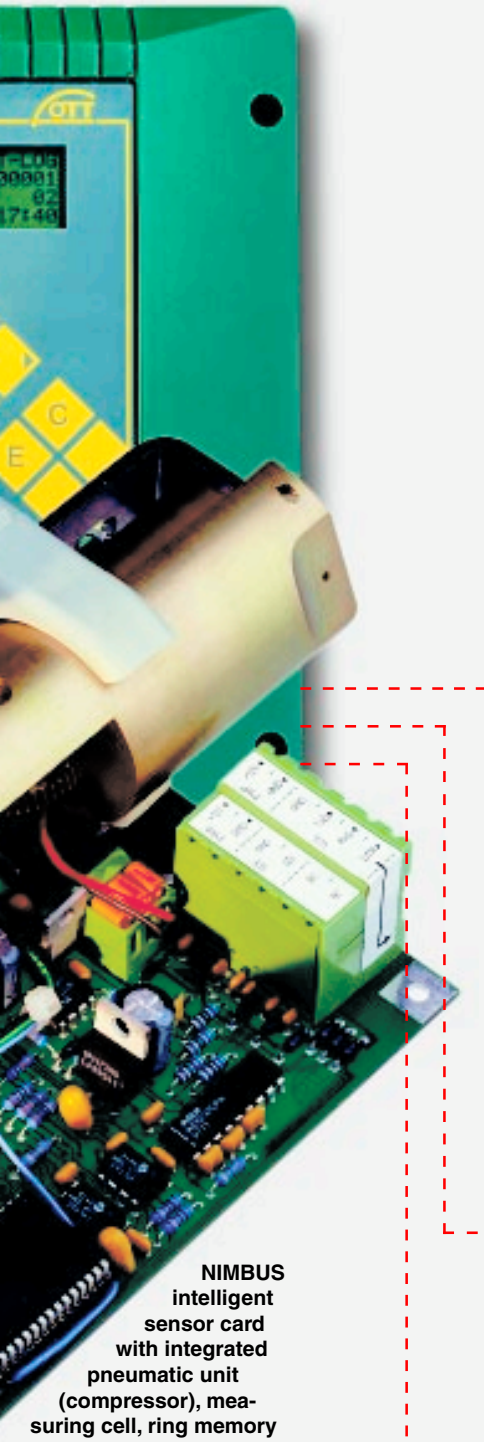
Measurement

■ **The compressed air is generated by a maintenance free piston-pump with integral valve-function.**
Unlike with conven-tional bubble gauges, no external compressor or nitrogen bottle is required.

■ The indirect bubble-in measuring principle provides accurate measurements with long-term stability, in salt water or contaminated water. Automatic zero-point correction before each measurement.

bination e.g. NIMBUS and "MIDI" Housing



NIMBUS intelligent sensor card with integrated pneumatic unit (compressor), measuring cell, ring memory and RS 232 / SDI 12-interface for combination with nal devices such as the data TT-LOG (HYDROSENS), the S (coming soon) or devices nufacturers.

Open modular system-architecture - flexible and easy-to-use

HYDROSENS «MIDI»

Protective housing (wall mounting type) for the accomodation of NIMBUS System and OTT-LOG data logger etc., including:

- **Optical interface** [1] **(infrared technology)**
  - data read-out and parameterization in the field via
    - VOTA Multi-functional Unit (leaflet number 55.520.000.P.E.)
    - notebook
    - palmtop
  - insensitive to humidity and dirt
  - easy handling.
- **LC-display** [1] for clear and easy-to-read indication of system- and sensor-parameters (level-monitoring function).
- **Touch-key path** [1] The well-arranged user matrix enables fast configuration of the data logger and the respective sensors via integral touch-key path.

OTT-LOG

Multi-channel data logger to extend the NIMBUS sensor card in compound with the «MIDI» protection housing.

- **buffered circular memory** for up to 400,000 measuring values (1 MB storage capacity).
- **pre-setting of**
  - sample- and storage intervals
  - limiting values for alarm-management
  - reference points
  - event-controlled recording, i. e. storage only takes place if there are actual changes in the measuring values.
- **real-time clock**
- **RS 232 interface** for the direct connection of the NIMBUS-HYDROSENS to various data-communication systems.
- **Additional slots (3)** for input cards. Easy connection of additional sensors (e. g. for conductivity, temperature, rainfall, etc.).
- **CAN-BUS**

HYDROSENS / VOTA Communication via optical reading head (Duo-Link)

1) in combination with OTT-LOG data logger

Principle

A piston pump inside the instrument enclosure generates compressed air, which flows through a dedicated line into the bubble chamber at programmable intervals, where it bubbles out uniformly into the groundwater.

Depending on the groundwater level (h) above the bubble chamber orifice, an air pressure equal to the hydrostatic pressure (g) is established inside the measuring tube.

$$g = \rho \cdot g \cdot h$$

ρ = specific gravity of water
g = gravitational acceleration m / sec ^{2}

Assuming a constant liquid density, there is a linear relationship between the water level to be measured and the air pressure inside the measuring tube.

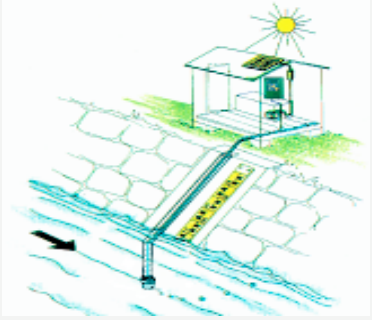
The measuring tube pressure and the barometric pressure are measured concurrently by an absolute pressure measuring cell on the sensor card.The water level is calculated as the difference between the two signals.

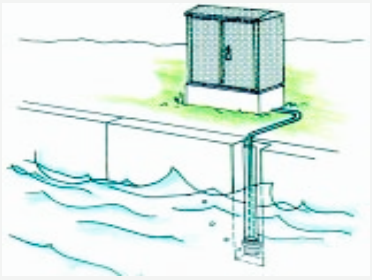
This measuring method prevents a potential zero-point drift of the measuring cell from influencing the accuracy of the instrument.

The usage of an absolute pressure measuring cell makes the instrument completely unaffected by humidity and condensation.

The measured values are stored in the integral single-channel data logger.

Data transmission to external devices and data loggers via RS 232 / SDI 12 interface.





Technical data

NIMBUS Intelligent Level-Sensor

Dimensions: 230 x 100 x 60 mm (L x W X H)
Temperature range: - 10 °C ... + 60 °C

Sensor card
for the installation in a protective housing (HYDROSENS "MIDI" and the like) consisting of
RS 232- / SDI 12 output
- for connection to external devices (e.g. data logger OTT-LOG, Logimedes, etc.)
- data readout.

Ring-memory (EEProm)
for storage up to 11.200 measured values = 15 months data at 1 hr storage interval adjustable sampling- and storage interval (5 min. ... 24 h).

Absolute-pressure measuring cell
Silicon-DMS, piezoresistive
Resolution by displaying in: m = 1 cm
mm = 5 mm
ft. = 0.01 ft
Accuracy: better than 1 cm (0.03 ft)
Measuring range: 13 m (42 ft.) water column
Overload: 20 m (60 ft.) water column

Mini-compressor (Pneumatic unit)
maintenance-free piston pump for compressed air, lifetime lubricated, valve-controlled.

Accessories

12 V / 6.5 Ah power supply:
(accu, solar or mains supply)

Measuring tube
(Special synthetic material):
straight tube, including push-fit connector
(maximum length approx. 150 m)
inside diameter: 2 mm
outside diameter: 4 mm

Bubble chamber (surface waters)
2" dia., special synthetic material,
can be mounted to 2" protecting tubes.

or

Bubble chamber (groundwater)
1" dia., special synthetic material.

Kevlar core (groundwater)
for depth positioning of the bubble chamber in the groundwater.

Options

«MIDI» compact housing for wall mounting in a protective housing (shelter)
Dimensions: 190 x 250 x 140 mm (L x W x H)
(Depending on the individual requirements other housing types can also be used).

- **Optical Interface** [1] (infrared technology)
- **LC-display** [1] 4-lines
- **Touch-key path** [1]
  (6 keys) for easy handling in the field (control, parameterization).

1) in combination with OTT-LOG data logger

OTT-LOG Multichannel Data Logger
circular memory, buffered 128 KB storage capacity for 52,000 measuring values (standard) or 1 MB storage capacity for 400,000 measuring values (optional)
- sample and storage intervals can be pre-set from 1 minute to 24 hours
- limiting values for alarm-management
- reference points
- event-controlled recording (storage delta)
- simple parameterization by clear, well-arranged user matrix.

- **Additional input card slots**
  for easy connection of three additional sensors, e. g. with following output signals: 4 ... 20 mA, 1 ... 5 V, SDI 12, RS 232, mV, PT100, pulse, 0 ... 5 W, -2 ... +2 V, digital parallel, etc.

Real-time clock

RS232 Interface

CAN-BUS
Field bus to link up to 30 HYDROSENS modules via two lines.

EMC
- fulfills EMC Guidelines EU (89/336/EEC)
- CE-approved.

Small design details may be changed without notice

Delivery program, e.g.:

Raingauges
Shaft Encoders
Data Loggers
Remote Data Transmission
Water Level Recorders
Current Meters

Please ask for free information

OTT HYDROMETRIE

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