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**GROUNDWATER & LEVEL MEASUREMENT**  
WATER MANAGER SOLUTION

**STS**  
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# WATER MANAGER SOLUTION

The STS Water Manager is used for high-precision and safety relevant water level measurements. It is used in terrain with a wide variety of conditions and is particularly convincing due to its accuracy, robustness and reliability.

Whether groundwater or level measurement, whether with additional temperature, conductivity or pH moni-

toring, the WMS is used and appreciated by customers from a wide variety of industries thanks to its convenient and simple handling. Due to its modular design, the WMS offers the highest possible flexibility. Even at a later stage, the logger can be extended by various measuring parameters.

## Use of the collected data

- Long-term, balanced management of surface and underground waters as energy and drinking water resources
- Protection of ground- and surface waters, in the sense of balanced management but also as a habitat for flora and fauna
- Providing basic data for processing of natural hazard and water engineering projects
- Planning and dimensioning of infrastructure projects that affect groundwater or surface waters
- Regulatory compliance

## Set up

The WMS consists of three elements:

- High-precision pressure and temperature sensor
- Data logger
- Communication modem for GPRS or UMTS and radio interface



## Features & Benefits

- Long service life optimized hardware
- 100% data security via M2M protocol resp. bidirectional communication
- User-friendly operation thanks to intuitive web interface and status overview
- Worldwide 24/7 data access via web browser
- Flexible alert management with freely selectable limit values
- Interfaces to the most common data processing programs
- Up to 25 000 transmissions per battery possible
- Wireless parameterization
- In case of power interruption, communication via local radio 433 MHz
- Expandable by various parameters, such as e.g. conductivity, oxygen, etc.
- Low IT costs due to inexpensive license and software packages
- Decentralized operation without additional router
- Easy installation and start-up

## Your automated water monitoring system

The groundwater data logger WMS (Water Manager Solutions) is a complete system for measuring, storing and remote transmission of water level, water temperature or other parameters such as pH, oxygen etc. All components such as the level probe, the data logger and the communication unit fit into a 2" level tube and are therefore ideally protected.

### Secure data transmission

The data is transmitted securely via the internet (M2M protocol) to a server, where it can be retrieved by customers worldwide in real time. As standard, a M2M protocol is used, which communicates bidirectionally. This means that data is exchanged simultaneously in both directions between server and logger. If the network breaks down during transmission, both the server side and the logger side notice the miscommunication, mark the missing data packets accordingly and transmit them subsequently. This ensures that no data is lost.

### World wide data access

After successful data transfer, the raw data is stored on the server and prepared for the customer using the existing software. Various measurement and transmission intervals as well as alert settings can be conveniently adjusted from the work place which reduces on-site presence and saves costs.

### Smart monitoring system

In addition to the already mentioned measured values, the device logs the internal housing humidity and temperature, the battery condition, the last transmission and the signal strength. These values are displayed online in the overview monitor by intuitive traffic light colours, so that targeted maintenance of the devices can be carried out.

On-site communication is convenient thanks to a local radio interface. The loggers can be operated, parameterised or read out from a distance of up to 30 metres without physical contact. The 433MHz frequency is used for this purpose.

### Minimum maintenance costs

Thanks to an ultra low power solution no external power supply is necessary. The device is powered by two lithium batteries which can be easily exchanged on site. Using the latest technology we achieve a battery life time of up to 10 years.

The new WMS (Water Manager Solution) not only ensures precise groundwater data, but also creates significant savings in continuous installations with its integrated data transmission. In addition, the device is characterized by a convincing price-performance ratio and thus lives up to its name as an economically well thought-out system.

## Specifications at a glance

- Pressure ranges available from 0 ... 5 to 0 ... 250 mH<sub>2</sub>O (25 bar)
- Absolute or relative design
- Accuracy  $\leq \pm 0.10\%$  FS ( $\leq \pm 0.05\%$  FS on request)
- Temperature measuring range - 5 to 80 °C
- Local radio interface 433 MHz
- Data transmission via GPRS or UMTS
- Material submersible level transmitter: stainless steel, titanium
- Material logger: plastic, stainless steel
- Memory capacity: up to 250 000 measured values
- Measuring intervals from 2 s to 12 h freely selectable
- Housekeeping data: Temperature, humidity and battery status



## SET UP & FUNCTIONS

### Wireless data transmission

The WMS can be parameterized and read out from a distance of up to 30 m via a 433MHz local radio interface.

### Quadband modem

The modern, integrated quad band modem allows worldwide Internet access with all common prepaid or contract SIM cards.

### User-friendly design

The electronics remain protected from humidity, even when replacing the battery in the field, because the battery compartment is hermetically separated from the electronic.

### Protection class IP68

The battery compartment and the electronics are sufficiently sealed so that short time flooding (24 h at max. 1 meter water column) does not impair the functionality of the logger.

### Operating temperature - 40°C ... 85°C

The logger was successfully tested at -40°C in the Siberian winter. The data recording as well as the transmission worked perfectly.





**Internal memory (backup)**

The internal data logger is capable of recording up to 250 000 measured values. Irrespective of whether these have already been transmitted or not.

**Remote configuration**

The settings can be changed at any time via the GPRS or UMTS network.

**Battery change**

Thanks to the sophisticated design, the two lithium batteries can be easily replaced by the customer on site.

**Battery life time**

10 year lifetime with hourly measurement and daily transmission of all standard parameters.

**Standard SDI-12 interface**

All sensor types with SDI-12 interface can be connected to the logger and configured via the software.



## SENSOR SYSTEMS



Measuring range: 0 ... 5 to maximum 0 ... 250 mH<sub>2</sub>O

Measuring level accuracy:  $\leq \pm 0.10\%$  FS  
( $\leq \pm 0.05\%$  FS on request)

Compensated temperature range:  $-5 \dots 80^\circ\text{C}$

Temperature accuracy: typical  $< \pm 0.3^\circ\text{C}$

Temperature measuring range:  $-25 \dots 85^\circ\text{C}$

## LEVEL & TEMPERATURE

As a long-standing partner with hydrologists, STS has developed and proven itself as a specialist for monitoring river, lake and groundwater levels. In the field of water supply, STS primarily manufactures products for level and pressure regulation. These are used, among other things, for reservoir management and monitoring fresh water distribution.

## PH & REDOX

By integrating this probe you get two measured variables in one unit. By measuring the pH value you can check and optimise the quality of your drinking water treatment. This way you can be sure that legal requirements are met and the infrastructure is protected from harmful influences. The measurement of the redox value (also known as ORP oxidation-reduction potential) is used in drinking water treatment for control of the treatment processes such as ozonation, elimination of iron, manganese and nitrate or disinfection. A high redox potential is always given in an oxygen-rich environment. A low redox potential, on the other hand, indicates a lack of oxygen and an increase in organic substances.



Measuring range: 0–14 pH

Measuring accuracy: 0.01 pH

Measuring range:  $-1000 \dots +1000 \text{ mV}$

Measuring accuracy:  $< \pm 2 \text{ mV}$

Temperature range: 0 ... 60 °C



## TURBIDITY SENSOR

Turbidity is the term for an optical phenomenon caused by the scattering of light by suspended (undissolved) particles present in a liquid. If a light beam hits a particle, part of the light is reflected, part is absorbed.

Depending on the particle shape and surface condition, the light is scattered with varying intensity in all directions.

Measuring range: 0 ... 4000 NTU

Measuring accuracy: < 5% of measured value

Temperature range: 0 ... 50 °C

## CONDUCTIVITY / SALINITY

The measurement of conductivity is used in drinking water treatment to check the quality of raw water or to check treated water. A strongly increased conductivity value can indicate a contamination of the water, if this is not geologically caused. The use of a conductivity sensor serves to monitor water quality and to comply with legal requirements.



Measuring range: 0 ... 200 mS / cm

Measuring accuracy: < 1% FS

Temperature range: 0 ... 50 °C



## OXYGEN

A measurement of the oxygen concentration in drinking water treatment is used for monitoring the condition of drinking water. A high dissolved oxygen content indicates that the water treatment system is functioning perfectly. If the oxygen content is too low, the water can be enriched with atmospheric oxygen by natural processes such as aeration. The use of an oxygen probe serves to monitor water quality and to comply with legal requirements.

Measuring range: 0.0 ... 20.0 mg / L / ppm / ppm

Measurement accuracy: < 0.1 mg / L / ppm

Temperature range: - 10 ..... 60 °C

## DL.WMS.MINI

The product portfolio for the water level and groundwater industry has been expanded with the DL.WMS.mini which is another highly efficient and reliable short-range radio data logger. It measures both the pressure and the temperature

in the medium with an accuracy of 0.2% FS. The system consists of a data logger and a pressure sensor mounted on the cable end. The DL.WMS.mini can be used in river, lakes, canals or ground water.



### Function

The hydrostatic pressure of the water column is measured via an absolute pressure sensor and transmitted to the logger. The logger contains a high-precision barometric pressure transducer which continuously measures the current ambient pressure. The logger calculates the reference value of the current ambient pressure with the measured value of the sensor.

This design eliminates the need for a pressure compensation capillary in the cable. Thanks to its intelligent quies-

cent mode and low-power hardware, the system is highly energy-saving and efficient.

Due to its dimensions, the logger is suitable for installation sites from a diameter of 2" inch. The DL.WMS.mini can even be used in harsh environments and can withstand temporary or permanent flooding without any problems. Thresholds can be freely selected using the event control function and the measuring intervals can be dynamically adjusted if the values fall below or exceed the thresholds.

### Highlights

- Pressure measuring ranges up to 100 mH<sub>2</sub>O available
- Accuracy of 0.2% FS
- Operating temperature – 10 °C to + 80 °C
- Communication via local radio (433 MHz)
- Up to 250 000 measurement data
- Up to 10 years service life with one battery
- Connectable version available

### Advantages

- Long and predictable maintenance intervals (housekeeping data, low power hardware)
- Storage capacity of up to 6 years at hourly intervals
- Can be connected to a WMS for building up a complete measuring network



### Communication

The DL.WMS.mini is operated as a standalone system and can, in combination with the WMS, generate a network of up to 24 loggers. In this system, the WMS acts as a kind of router and transmits the collected measurement data via

GPRS or UMTS to the corresponding server. Without an additional WMS, the DL.WMS.mini is conveniently monitored and operated via local radio interface.

The system can be expanded at any time even after installation.



### Perfect design

- Slim design for wells from 2" diameter
- Easily accessible battery compartment allows battery change without additional tools directly on site
- Logger and sensor made of stainless steel for highest material resistance and product durability

### Straightforward operation

- The measuring points no longer have to be opened at places that are difficult to access.
- Simultaneous data upload or parameterization of several probes possible
- Thanks to the modularity, the same software is used for the DL.WMS.mini and for the WMS (Water Manager Solution)



# WATERMANAGER WEB CLIENT (CLOUD)

## Advantages of the WMS Webserver

- The availability of the WMS Web Client is guaranteed around the clock (24 hours / 365 days)
- The system is password-protected and the data is transmitted in encrypted form
- In addition, a data record can be transmitted by email for each measurement
- Overview of all measuring devices incl. their display of internal housing humidity and temperature, battery status, last transmission and signal strength
- Automatic display of measured values
- Direct access to the individual raw data sets, logger parameter files and logbook which provides valuable information in the event of an alert
- The logger parameters can be programmed directly on the server. Thus the on-site operations are reduced to a minimum



- Advanced user management allows the administration of different user groups and measuring devices («package dependent»)
- The map function gives you an overview of the measurement network
- Responsive Web Client, for access via mobile device



## Your analysis software

- Various automatic interfaces to common hydrological analysis software (e.g. Wiski, HydroPro, Hydras3, HygrisC, TMCSV, CSV) can be offered. Thus you can work in the familiar software environment.
- Individual interfaces can be realized on request.
- Simple export of CSV data
- Automatic data export of the logger data to a predefined FTP server possible.

## Alert Management

- If a threshold value is exceeded or fallen below, the system can send a notification via SMS or email to a defined user group.
- Internal housing humidity and temperature, battery status, transmission and signal strength are also monitored.





# STS – SENSOR TECHNIK SIRNACH

## YOUR PARTNER FOR WATER & ENVIRONMENT

STS Sensors Technik Sirnach has been developing and producing solutions since 1987 for customer specific applications and systems in the field of pressure measurement technology. Because of our close cooperation with customers and suppliers, STS Sensor Technik Sirnach is able to convert customer requirements into high-quality products at short notice.

STS Sensor Technik Sirnach places the highest demand upon the quality, precision, reliability and longevity of its sensors and components parts.

Subsidiaries in Germany, Italy, France, Great Britain and China, as well as our competent sales partners, guarantee the worldwide sales and servicing of the STS product portfolio.

### STS stands out for the following services:

- High quality:** High accuracy (<0.05% FS), temperature compensation, long-term stability and long service life guaranteed by our own measuring cell production.
- Modularity:** More than 30 000 configurations available in 2–3 weeks delivery time, even in small quantities.
- Customer projects:** STS is specialised in niche markets and develops customer-specific solutions.



### GROUND- AND SURFACE WATER

STS is a long-standing partner of hydrologists. Through this cooperation we have established ourselves as specialists in the monitoring of river, lake and groundwater levels.



### WATER TREATMENT

In the field of water treatment and the monitoring of waste water, STS has since the very beginning been supplying sensors to well-known manufacturers of such systems.



### WATER SUPPLY

Where water supply is concerned, STS mainly supplies products for level and pressure regulation. These are used, among other things, in reservoir management and the monitoring of fresh water distribution.



### DESALINATION

STS has many years of experience in the field of desalination plants. STS products are mainly used here for pressure monitoring in pipe systems and for water level measurements in tanks and basins.



### DECONTAMINATION OF POLLUTED SITES

Reliable monitoring of groundwater levels is essential to the remediation of contaminated sites. STS level probes can be easily optimized for contact with aggressive hazardous substances.





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