The Data Logger by STS: Monitoring Water Parameters (Level, Temperature, Conductivity) in Ground and Surface Water

The professional measurement of pressure requires accurate data every time – there is no margin for error. STS has taken on this challenge since 1987 and has been optimizing this measurement on a regular basis ever since. Today, we represent reliability and precision to meet the most exacting of standards.

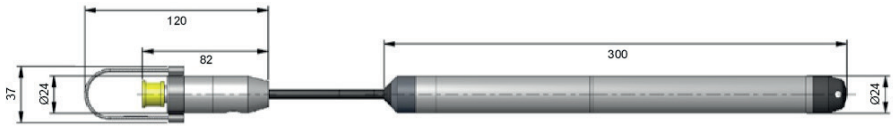
As a manufacturer, STS sells products based on a modular design. This approach enables solutions that are customized to the clients' needs, which in turn can be adapted to individual challenges. In doing so, we always put the highest emphasis on delivering the best quality product, combined with user-friendly customer service. Our Data Logger DL.OCS is of course no exception to this.

Level, temperature and conductivity are key parameters in water management. The continuous monitoring of these parameters is often required over an extended period of time. In order to work efficiently, a reliable and accurate measuring technology that can be operated with very little effort is required. The Data Logger DL.OCS combines a highly precise piezo-resistive sensor with a robust, mostly maintenance-free design as well as an easy-to-use, Windows-based software interface.

Benefit from the following features with the Data Logger DL.OCS by STS:

- Highest quality: You continuously receive exact data with the same sensor for many years.
- Little effort: The Data Logger mostly works maintenance-free.
- Easy handling: The software is very user-friendly.
- Short delivery times.

The Data Logger DL.OCS: One Device for Many Applications



Does the ground water level remain the same during tunnel constructions or does it drop? How is the level affected during the wet season? How significant is salt water intrusion in coastal areas? How constant is the temperature in thermal springs? These questions require precise answers. Precision is the specialty of the Data Logger DL.OCS.

Ground water, surface water, well or construction monitoring: the Data Logger DL.OCS reliably monitors water level, temperature and conductivity (optional) at individual intervals. The 16 MB flash data storage can save up to 1.5 million data points for each parameter. Four different measurement series can be conducted simultaneously. Benefiting from a total of 16 measurement series: daytime-specific analyses, seasonal specific analyses and project-specific analyses (e.g. aquifer test) becomes possible.

The most important facts about the DL.OCS at a glance:

- Level measuring range: 0...250 mH2O
- Total error: ≤ ± 0.05 % FS (-5...50 °C / 23...122°F)
- Temperature measuring range: -5...80 °C / 23...176°F
- Conductivity measuring range: 0...200 mS/cm
- Interface: USB
- Material: stainless steel, titanium
- Measuring interval: 1s...24h
- 1.5 mil. measured data per channel
- Battery operation
- Multi parameter probe: pressure, temperature, conductivity
- Installable within 2" and 4" monitoring wells

Dependable Results, Long Lifespan

Thanks to its rugged design, the Data Logger easily withstands harsh conditions. Measurements can be conducted at temperatures from -5 to 80°C / 23...176°F. Moreover, the energy usage is very low with only 6µA. The automatic depassivation feature assures an optimized battery life of up to ten years. The piezo-resistive pressure sensor is very robust and excels with a measuring accuracy of +/- 0.03% FS of the measuring range. The pressure measuring ranges are not pre-defined and can be set individually.

Pressure measuring range (mH2O)

	2...5	> 5...20	> 20...250
Overpressure	≥ 3 bar / ≥ 44 psi	≥ 3 x FS (≥ 3 bar / ≥ 44 psi)	≥ 3 x FS
Burst pressure, (1)	> 200 bar / > 2900 psi	> 200 bar / > 2900 psi	> 200 bar / > 2900 psi
Accuracy, (± % FS)	≤ 0.15	≤ 0.05	≤ 0.03
Total Error, (2), (3), (± % FS)			
-5 ... 50°C/23...122°F (typ./max.)	≤ ± 0.20 / 0.40 ≤ ± 1.0 / 2.0 cm H20	≤ ± 0.10 / 0.20 ≤ ± 0.5 / 1.0 cm H20	≤ ± 0.05 / 0.10
-5 ... 80°C/23...176°F (typ./max.)	≤ ± 0.50 / 1.00 ≤ ± 2.0 / 4.0 cm H20	≤ ± 0.10 / 0.20 ≤ ± 1.0 / 2.0 cm H20	≤ ± 0.10 / 0.20
Long term stability, (4)	< 0.5 % FS / < 4 mbar / < 0.06 psi	< 0.2 % FS / < 4 mbar / < 0.06 psi	< 0.1 % FS / < 0.2 % FS

1. Transducer
2. Total error including accurancy, hysteresis, repeatability and temperature influences
3. The error values are valid within the corresponding temperature range
4. 1 year (typ./max.)

Temperature measuring range, (1) (°C/°F)

	-5...50 / 23...122	-5...80 / 23...176
Accuracy (2)	≤ ± 0.5 °C / 32.9°F	≤ ± 1.5 °C / 34.7°F
Response time, (3), (4)		
T 0.50	9 s	9 s
T 0.63	15 s	15 s
T 0.90	27 s	27 s

1. Temperature measurement included
2. Accuracy of the equipment ± 2°C/35.6°F
3. Time in seconds that the sensor needs to carry out, e.g. 63% of a temperature change
4. Time of measurement for liquid medium

Every measured value has a time stamp (incl. date) and can be transmitted to Windows-based computers using the accompanying software. You benefit from simple and dependable data transmission and storage. The device features a battery charge level display that takes into account the ambient temperature and battery characteristics. The Data Logger can optionally be connected to an external energy supply (e.g. solar) as well. These characteristics make the Data Logger maintenance-free for the most part. Your advantage: You get an all-round carefree package. The Data Logger conducts measurements over a long period of time without human intervention.

High Precision, Easy Handling

Windows-based software enables the data transmission. The software is installed within two minutes on the computer. Entering individual measuring settings can be completed in only a few clicks.

Other than the option for individual settings, the DL.OCS soft-ware also contains various helpful features for the analysis and visualization of the collected data.

In order to enable the greatest possible flexibility, there are various options for the readout of the collected data. Data can be read for a specific time period, from or until a specific point in time. Furthermore, users can set an alarm that is activated when individually defined limits are exceeded. The Data Logger can also be configured to automatically commence recording when an alarm point is triggered.

The Data Logger DL.OCS by STS is the technological basis for precise and dependable data in pressure measuring.

Electrical specifications

Power Supply (1)	Lithium Battery SAFT LS 14500, 3.6V AA 2250 mAh
Max. cable length	300m

1. External power supply (9...30 VDC) on request

System Requirements

PC / Notebook	Min. 1.6 GHz Dual Core x86: Min. 10 GB, RAM: Min. 2 GB
Tablet PC	Get in touch with STS
Operating System, (1)	Windows XP SP3, 7, 8, 8.1, 8 Pro (32-/ 64-Bit)

1. Not compatible with Windows 8 RT

The standart Data Logger can be enhanced with these optional features:

- For applications in very demanding liquids (such as thermal water monitoring or corrosive applications), we offer the sensor in a titanium casing with an especially long lifespan.
- An external energy supply (such as solar energy) is optional.
- If required, the DL.OCS can be equipped with an additional conductivity measurement feature (0...200 mS/cm).

The Data Logger DL.OCS - The Solution for Exact Tide Monitoring

Predicting tides is important for people for various reasons. Commercial and recreational fishermen require insights to increase their catch, ships need knowledge on the speed and direction of tides to navigate shallow waterways.

Despite increasingly larger ships and an increase in traffic, the dimensions of canals often remain unchanged. This is why it is important to know exactly how deep they are. There is no margin for error.

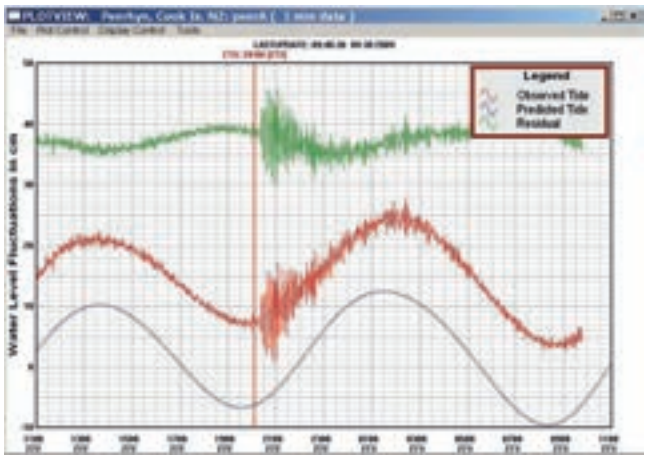
The construction of bridges and port facilities also requires knowledge of tides in order to determine the height of objects and to assess the force these objects need to be able to withstand.

Professional Data Storage

In order to rule out a falsification of the data on depth, it is common to ignore the highest and lowest values caused by waves during the tide. To counter the influence of waves, the so-called linear average is applied in most cases. To do so, a user usually records the measured values over a previously defined time period and calculates the average.

Beforehand, the measuring intervals are defined, followed by an interval in which no values are recorded. This process repeats itself continuously.

The U.S. Naval Oceanographic Office for example advises to record data over 6 minutes in a 1 second interval and to subsequently save the mean value. The process has to be repeated after 15 minutes.



Source: NOAA National Oceanic and Atmospheric Administration

The Data Logger DL.OCS

Our experience and our know-how are the basis for a technology that enables very exact measurements. The DL.OCS is a case in point. The Data Logger allows you to record level changes during tides with uttermost precision. Due to its polynomial compensation measuring cell and the accompanying correction of nonlinear deviations, the level can be determined with an accuracy of 0.5 cm (0.196 inch). Thanks to its storage volume of 1.5 million values per channel, the Data Logger is the perfect solution for long-term measurements.

For demanding applications in salt water, STS also offers a titanium edition of the Data Logger DL.OCS to optimize the lifespan of the device.

In addition to recording water levels, the Data Logger can also monitor the temperature and – optionally – the conductivity of the monitored medium. Various applications, such as the extent to which the use of road salt influences water quality, can be conducted easily.

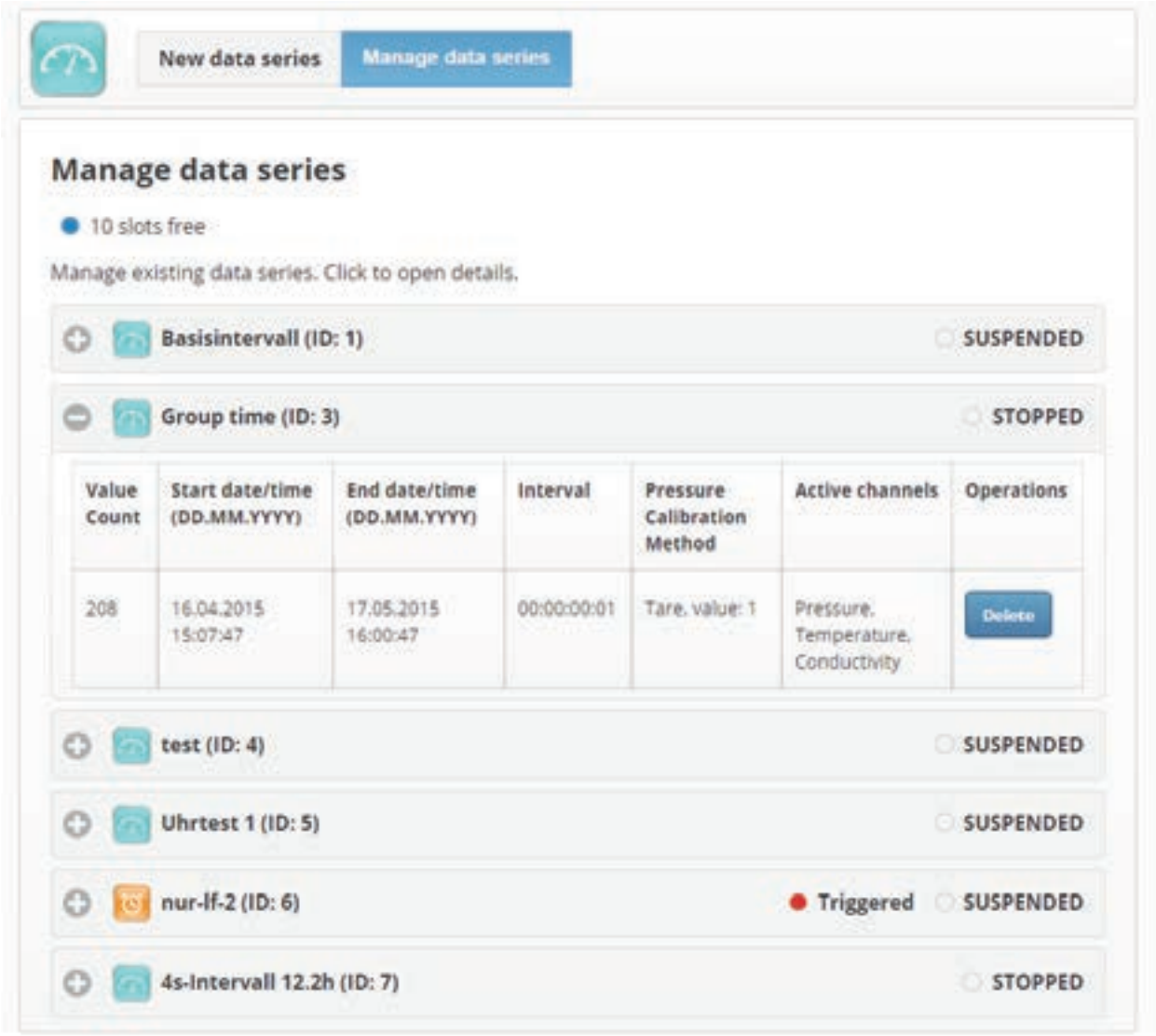
The Data Logger DL.OCS - The Best Partner for Aquifer Tests

Professional pumping tests enable a detailed assessment of the output of new wells. As is often the case, only the right technology will lead to dependable results. The Data Logger DL.OCS makes no compromises and delivers accurate data all the time.

The output of a well can be determined exactly with the use of the Data Logger DL.OCS. Thanks to the precise measuring cell, water levels can be measured with high accuracy. The great data storage capacity of the Data Logger DL.OCS, with up to 1.5 million measured values per channel, also enables pumping tests with a very short interval over a long period of time. In practice, this means that the Data Logger can record more than 17 days when using a measuring interval of one second. This enables a very clear picture of the pumping test.

Pluggable Variants

The PUR cable can be attached to the DL.OCS with a pluggable screw connection. In this way, various cable lengths can be attached to the Data Logger when faced with different well depths. This takes very little time and is easily done. Hence the Data Logger can be used for several pumping tests.



The PUR cable can be attached to the DL.OCS with a pluggable screw connection. In this way, various cable lengths can be attached to the Data Logger when faced with different well depths. This only takes very little time and is easily done. Hence the Data Logger can be used for several pumping tests.

Duplication

The pumping test can already be prepared in the office and transferred to the Data Logger in the field thanks to the DL.OCS application computer software. Moreover, a pumping test can be copied to several Data Loggers. All in all, 16 measuring se- ries can be defined according to individual requirements, e.g. measuring interval, start time and end time. Accordingly, the pumping test can be programmed with 16 different sequences. The storage capacity of the device guarantees the safe recording of all data.

If the pumping test is interrupted for whatever reason, the re- cording of measured values can be paused with only a single click. The recording process can be resumed with just as little effort.

It is of course possible to program an activity-controlled measuring series while the Data Logger is already in operation. In this way, it is possible to start another measuring series independent of the on-going pumping test when a previously defined value was exceeded. If required, the new measuring series re- cords the well‘s behavior in the critical area. Once normal operating conditions resume, this alarm measuring series ceases automatically. The alarm measurement remains on stand-by for the remainder of the pumping test and will again become active and start recording once the critical value is exceeded.

The recorded pumping test can be read out as Excel file once it is completed.

Furthermore, the defined pumping test can also be exported and thus several Data Loggers can be programmed in very little time with the same measuring series.

Imprint

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