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product : Dipper-PT/PTEC
revision : 1.2
author : PE, Sp, AC
last change: 03.12.2013

Datalogger Dipper-PT/PTEC

Water level, Temperature, Electric Conductivity

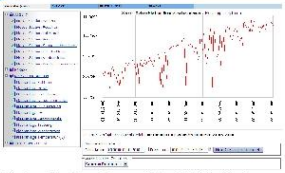
User Manual

- Groundwater observation wells, geohydraulic (aquifer) tests, water drainage control at construction sites and surface water
- Robust housing made of anti-corrosive steel
- High data security due to flash-memory
- Watch-Dog-Function for high operation security
- Maintenance-free: Battery life-time >10 years, exchangeable battery
- Suitable for 1" casing and above
- optional connection to Bluetooth

Groundwater Monitoring site
Data readout via HDA

Observation of Wells

Data Retrieval via
SEBA-HDA



Data Evaluation with SEBA-Software

We are certified
ISO 9001:2008
Certificate No. 01150509
Quality is our standard

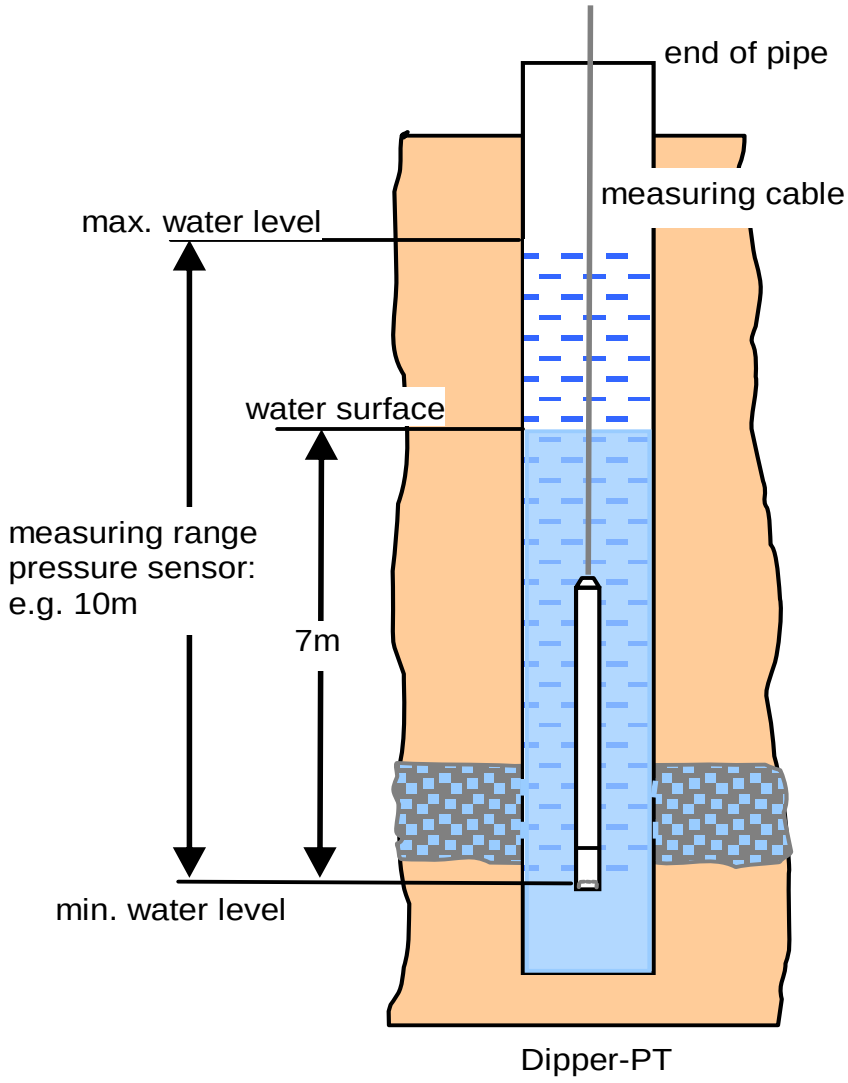
Content:

1. Proper usage

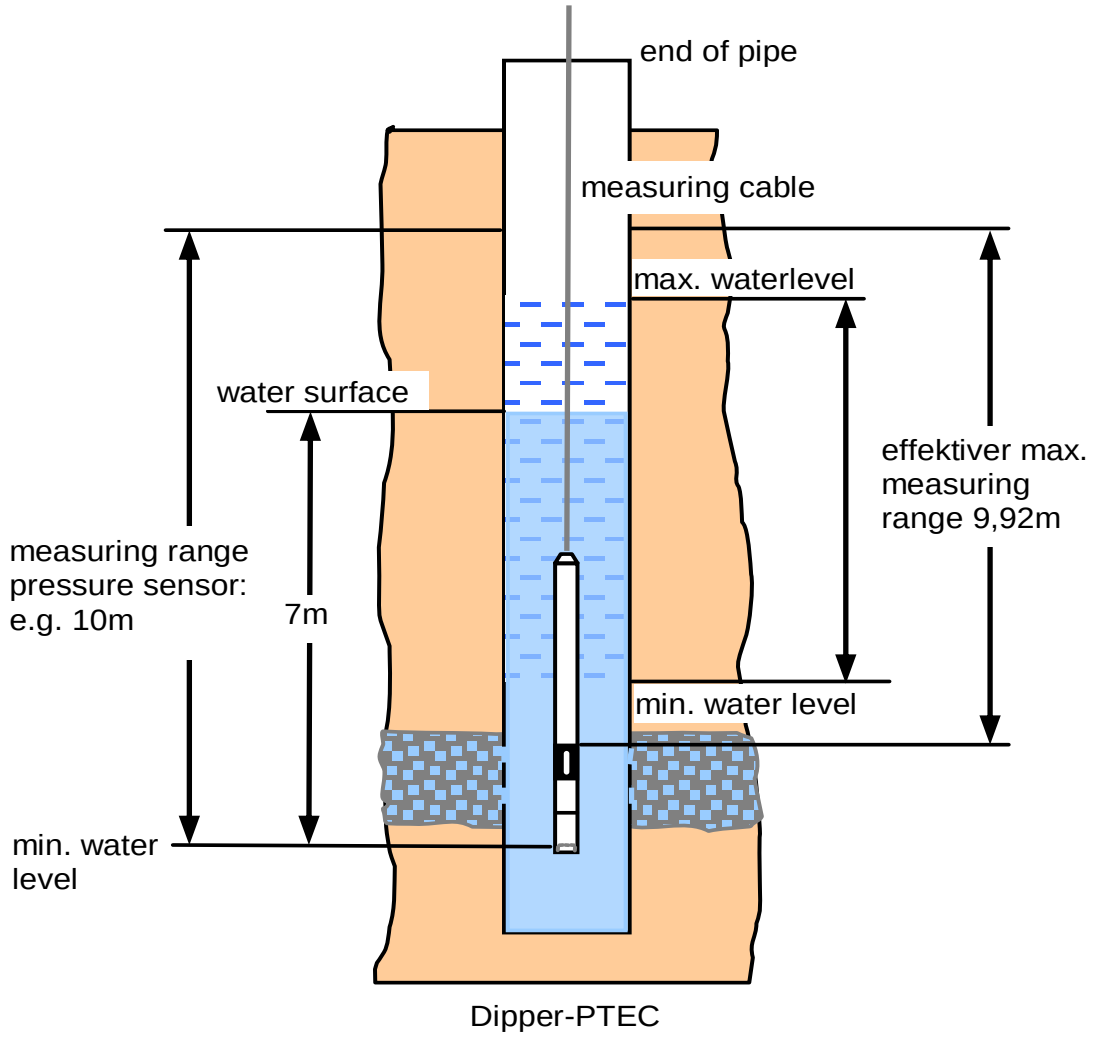
The SEBA Data Logger Type **Dipper-PT/PTEC** is used for digital data logging and data recording of water levels, water temperature and conductivity.
This data logger can be used in both, groundwater and sufacewater.
Additionally the parameters salinity, density and TDS can be calculated and stored.

The proben, depending on the type is made of corrosion-resistant stainless steel 1.4404 (575 MDS) or made of highly corrosion-resistant stainless steel 1.4539 (MDS 577, resistant to salty water). The 1.4404 stainless steel is not suitable for permanent use in brackish water, sea water and other highly saline waters.

Example of use: Ground Water

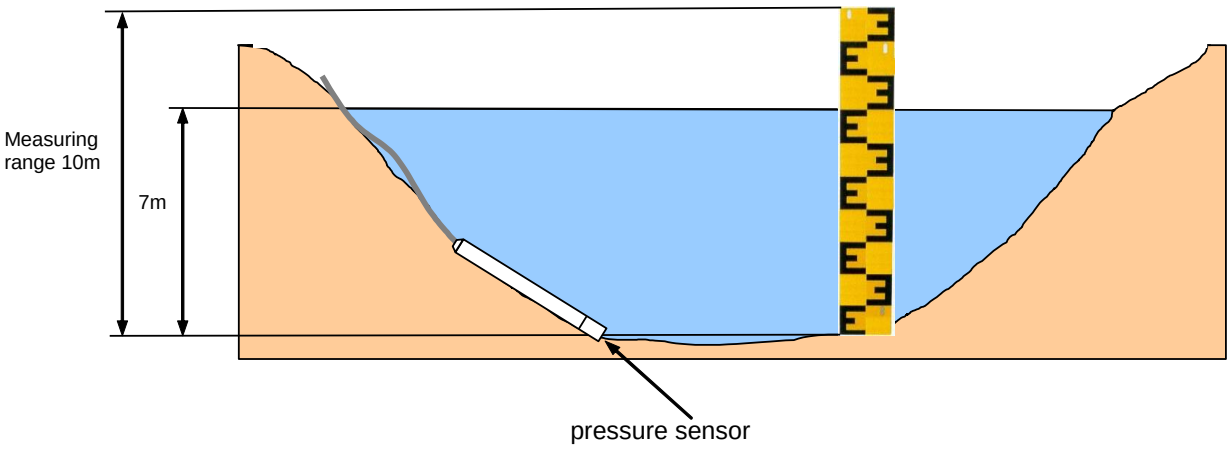


Example of use: Ground Water



Example of use: surface water

Pressure sensor measuring range e.g.
0..10m display: 7m



It must be noted that the pressure sensor always measures the water column above the probe. When the distance between the water level and upper bearing pipe edge is to be measured (mounting-height measurement) or the water level is above sea level, the parameter set of the data logger has to be configured accordingly (see manual of Software SEBAConfig).

2. Product description

There are various types of dippers:

1. **Dipper-PT** (water level and temperature measuring)
2. **Dipper-PTEC** (water level , temperature- and conductivity measuring)

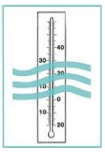
Dipper-PT has an internal battery-operated power supply.
During measurement operation the **Dipper-PTEC** usually receives its power supply from connected devices (SlimCom, SlimLogCom, Unilog) or from the external Alkali-Mangan battery pack in standalone operation.

The **Dipper-PT/PTEC** has a **RS485 interface** for configuring and calibrating the probe, retrieving measurement values and reading data storage. All these functions can be executed with the software package **SEBAConfig.** The probes can also be connected with the interface to remote data transfer systems if these also have an appropriate RS485 interface.

In combination with a remote data transfer system (e.g. **SlimCom**), data and configurations can be transferred in various ways:

- GSM- or GPRS data retrieval (requires DEMASole and a retrieval modem)
- GSM- or GPRS configuration (requires SEBAConfig and a retrieval modem)
- SMS data push (requires DEMASole and a retrieval modem)
- FTP data push (requires an FTP server)

In addition, alarm SMS can be configured to send alarms to up to eight recipients when a certain parameter is exceeded, such as insufficient battery charge levels.



Temperature measurement:
The temperature measurement is conducted with an exact NTC30. The sensor is linearized with an individual voltage calibration via a polynom. The sensor is mounted inside the probe, right behind the pressure membrane at the stainless steel body, which is highly thermo-conductive.

Pressure measurement:
The robust ceramics pressure measurement cell makes it possible to measure the water level above the probe (hydrostatic pressure). The combination of the referential pressure sensor and the special measurement cable with integrated air balance conduit exclude distortions due to air pressure fluctuations.

Conductivity measurement:
The amplifier circuit works with a 4-electrode-measuring cell (2 current- and 2 voltage-electrodes). The conductance of the measured liquid will be determined by a current and voltage measurement. For determination of the conductivity of natural waters the temperature coefficient is programmed, according to European standard (European Standard EN 27888:1994). The compensation can also be switched off or replaced by a correction-factor, defined by the user. The compensation to the physical condition of conductivity works in line with the indicated accuracy and covers a temperature range of 0°C to 50°C. The reference-temperature used by the compensation to physical condition and user-defined is set to 25°C by default. However, it can be modified by the user.

Salinity:
The value of salinity is derivated from the conductivity-measurement. The conversion is based on the temperature compensated acc. to seawater-nLF and the IOT1971 (International Geographic Tables, and Kopenhagen standard sea-water). This parameter is only available in combination with the conductivity-measurement.

TDS:
The TDS measurement (total dissolved solids) is derivated from the conductivity measurement. With a free selectable calibration factor the dissolved portion of solids, contributing to the conductivity, will be calculated in ppm resp. mg/l. The determination of TDS via conductivity is a high-speed process and an approach to the standardized procedures for determination of exhaust steam sediments resp. dry filtrate sediments (DIN 38409). This parameter is only available together with the conductivity measurement.

Water density:
Water density is calculated according to Fotonoff and Millard from the parameters salinity and temperature (only for **Dipper-PTEC**)

3. Safety- and Danger Instructions

When re-filling the drying cartridge, pay attention to the safety data sheet 93/112/EWG according to EU-regulations. The product “KC-Trockenperlen Orange” allows a safe control of the drying procedure. It is especially environmentally friendly as it is free of heavy metal.
In general, please take all necessary precautions when handling chemicals and remember to wear appropriate clothing.
By handling products, which are supplied by electrical voltage, the valid VDE-instructions, especially VDE 0100, VDE 0550/0551, VDE 0700, VDE 0711 and VDE 0860 have to be observed.

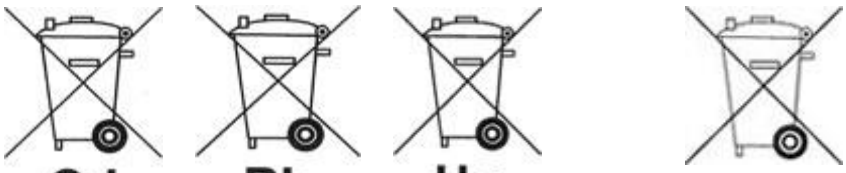
Before opening an instrument, pull off the mains plug and make sure, that the instrument is without power supply. Parts, construction groups or instruments must only be set into operation, in case they are built into a housing and protected against touching. During installation they have to be without power. It’s only allowed to use tools at the instruments, parts or construction groups, in case it is secured, that the instruments are dropped out and the electric loads which are stored in the construction groups inside the instrument, are unloaded.
Conducting cables or conductors, which are connected to the instrument, part or construction group, have to be checked continuously to isolation faults or sites of fractures. By verification of a fault in the supply cable, the instrument has to be switched-off immediately, till the defect cable has been exchanged.
By using construction elements or groups, please make sure, that the features for electrical sizes are observed, according to the respective description.
In case it is not possible to clarify clearly for a non-commercial end-user, which electrical variables are valid for a part or a construction group, how to effect an external circuit, or which external parts or additional instrument can be connected and which connection values these external components should have, please contact always an expert for respective information.
Before setting into operation, generally check if the instrument or construction group is suitable for the field of application. In case of doubts, unconditionally contact specialists, experts or the manufacturer of the used construction group!
Please be informed, that operation and connection faults are beyond our sphere of influence. So, understandably, we cannot take over liability for resulting damages.

<u>Never</u> connect the instrument directly to power supply (110V or 230V) !

Note on the Implementation of EC Directive accord. to “Battery-Law”

In connection with sales of batteries and accumulators we, as a retailer are committed to giving the following notice according to the “battery-law”:

The end-user is bound by law to return used batteries and accumulators.
The batteries and accumulators can be given back at municipal collection points or in stores or to the dealers.
Thereby the end of the usual life-time has to be reached; otherwise there is a risk of a short circuit, which has to be prevented.
The scope of returnable batteries / accumulators is limited to those batteries / accumulators which we, as the dealer, currently carry or previously carried in our product line. Moreover the returnable number of batteries and accumulators is limited to the typical end-user quantity, no commercial quantities.
Contaminant-laden batteries and accumulators are marked with a crossed waste container and a chemical symbol (Cd = Cadmium, Hg = quicksilver or Pb = Lead) which help to classify the harmful heavy metal.



Cd (cadmium) **Pb** (lead) **Hg** (mercury) Low-polluting batteries and accumulators only show a crossed waste container.

4. Setup and installation of Dipper-PT

4.1 Preparation for Use

Before the **Dipper-PT** is adapted to the specific demands of the measuring task, please ask yourself the following questions:

a) What is the max. anticipated water level (min. tap A min)?
b) What is the min. anticipated water level (max. tap A max)?

The Dipper should at least be placed **10cm** below the lowest anticipated water level.

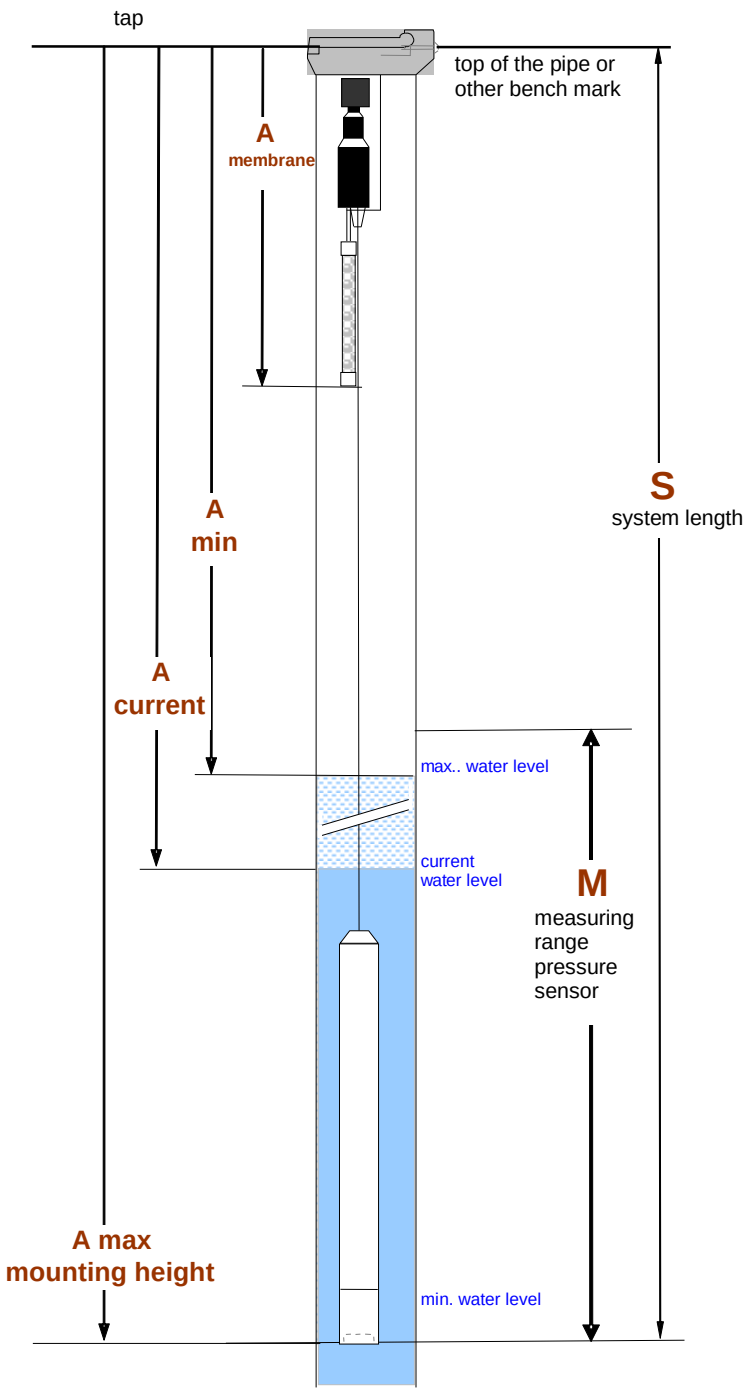
4.2 Determination of mounting height

The distance from the upper edge of the well-cap to the deep-water level is the **maximum mounting height** A max (hanging depth).

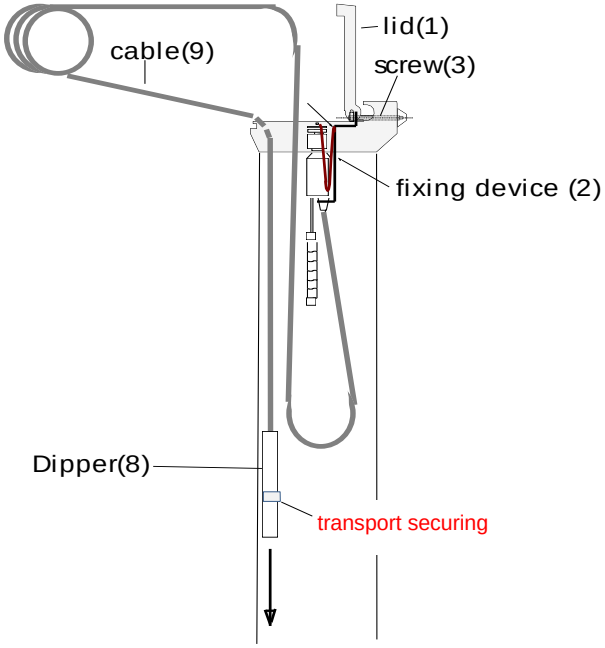
The system length S in this example and often in practice as well is equal to the hanging depth.
If the position of the hanging point of the **Dipper-PT** does not match the reference point, the system length must be changed according to the difference.

The mounting height A must be greater than the mounting height A membrane (absolute ca. 50 cm). If the water level rises above the membrane of the balance pressure tube, the rise in water pressure is no longer registered. **Attention!** Water can also enter the membrane and damage the **Dipper-PT**.

In order to record water level changes without gaps the difference between the mounting height A hanging depth and minimal mounting height A must be less or equal to the measurement range of the pressure sensor. In case of water levels exceeding the measuremnet range of the pressure sensor, a constant water level is indicated.



4.3 Installation of Dipper-PT

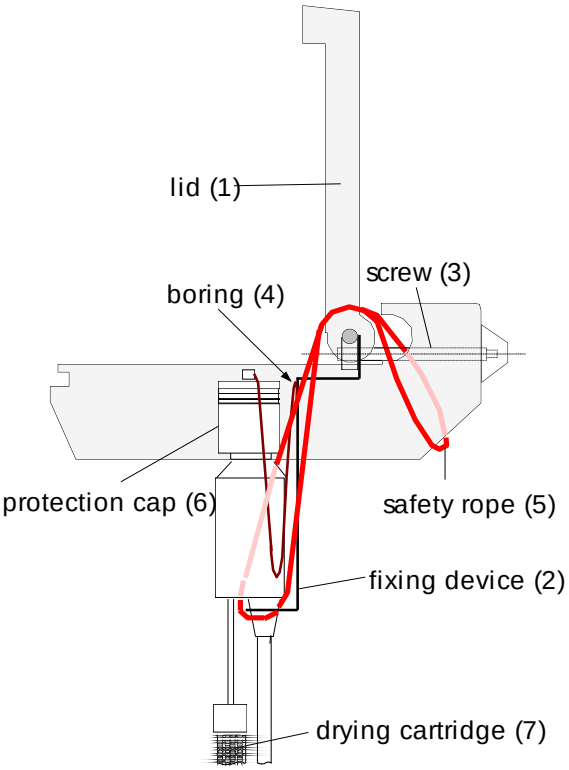


Approach for observation tubes ≥ 4“

- Remove the lid (1) of the top piece of the observation tube.
- Put the fixing device (2) on the screw of the lid (3).
- Put back the lid (1) and turn the screw (3) until the lid is fixed but still open!
- Check whether the fixing device is tightly fixed.
- Put the protection cap on the plug.
- remove the transport securing from Dipper-PTEC
- Slowly lower the **Dipper-PT** into the observation tube.

Approach for observation tubes 1½ “, 2“, 3“

- Remove the lid (1) of the top piece of the observation tube.
- Remove the transport securing from Dipper-PTEC
- Slowly lower the **Dipper-PT** into the observation tube and fixit tightly.
- Put the safety rope (5) around the top piece
- Put the fixing device (2) on the screw of the lid (3).
- Put back the lid (1) and turn the screw (3) until the lid is fixed but still open!
- Check whether the fixing device is tightly fixed.
- Pull back the slotted safety rope (5) over the lid and put back the protection cap onto the plug.



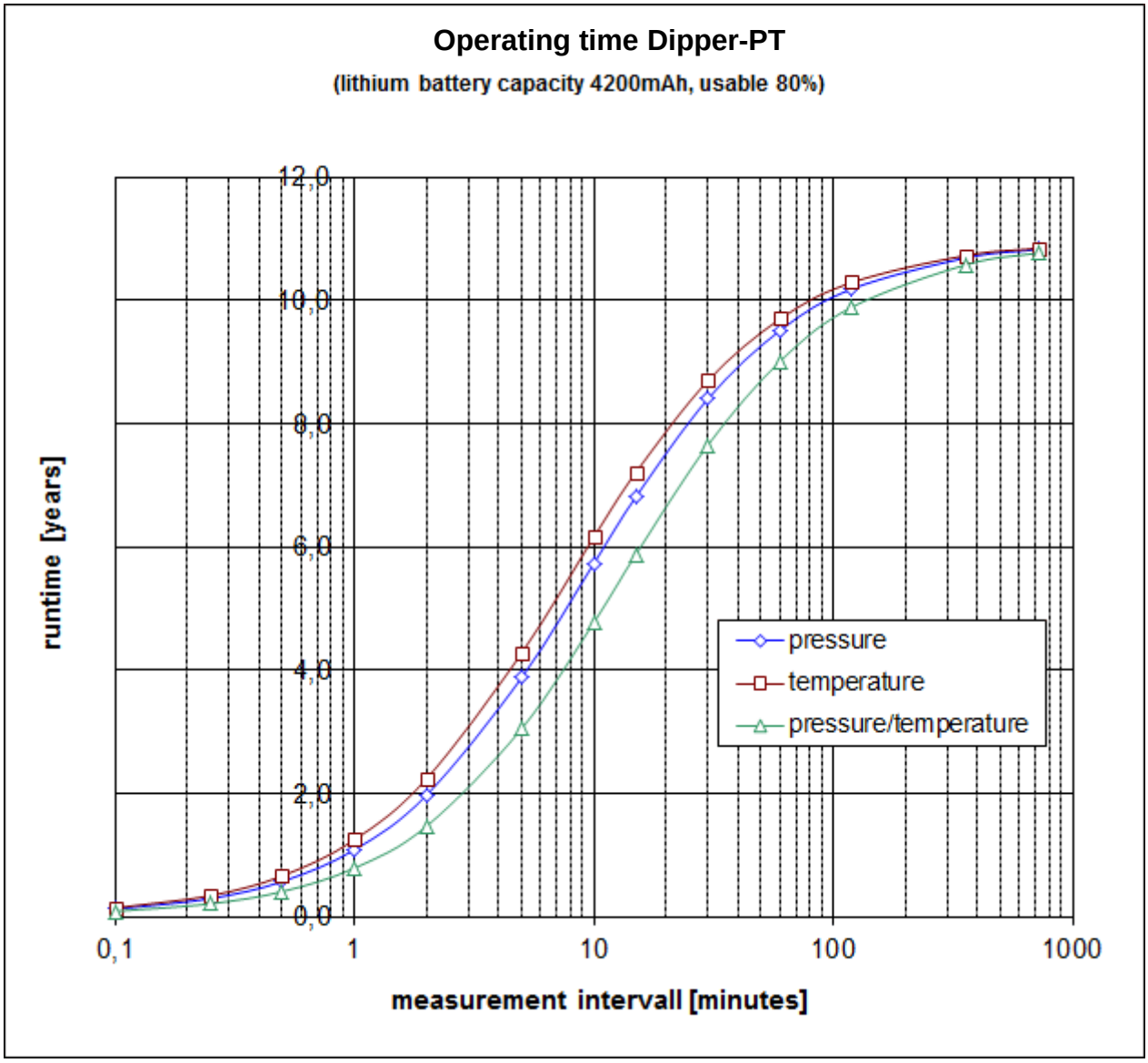
When lowering the Dipper-PT with loose fixing device and by taking off the lid from the top piece with inserted Dipper-PT, the Dipper has to be secured. Thread in the attached safety rope (5) through the boring (4) at the fixing device and tie a loop into it.
By screwing off of the top piece and in case of loose fixing device turn the loop around the top piece and hence prevent the **Dipper-PT** from falling.
Check the safety rope (5) after each insertion and exchange it if it is damaged.

After adjusting resp. data download of Dipper, disconnect the interface cable and put the safety cap back onto the plug. Make sure that no moisture reaches the plug. Afterwards, close the **top piece.**

For any following openings, do not open the top piece completely, as this might result in loosening the fixing device of your Dipper and you are in danger of dropping the Dipper into the observation tube.

4.4 Maximum recording time

The power supply of the **Dipper-PT** is provided by two internal AA-lithium batteries 3.6V, Type SL-760, 2100mAh. The operating time depends strongly on the data acquisition rate and registered numbers of data channels (see diagram).



The voltage can be monitored with the internal lithium-battery channel (usually channel 31). It is recommended to change the battery at about **3.3V** in order to ensure secure data recordings. If the charge drops to 3.2V, the measurement is stopped automatically.

The voltage supplied via the RS485 is shown on channel 32. When e.g. a converter is connected, the voltage that supplies the **Dipper-PT** is displayed. If e.g. the Dipper is connected to a SlimCom, the voltage of the SlimCom is shown on this channel.

Recommendation:
If batteries are running low, an exchange before the start of winter season is recommended.

5. Setup and installation of Dipper-PTEC

5.1 Connecting the Battery Compartment

The following pictures describe how to attach the **Dipper-PTEC** to the battery compartment (or SlimCom).

Screw the **Dipper-PTEC** connector onto the ***battery compartment*** or the ***SlimCom*** housing.

Then hang the metal bracket first on the underside of the **Dipper-PTEC** plug and attach to the housing with the nut.

Close off the open end of the metal bracket with cable ties as shown.

5.2 Preparing for Use

Before the **Dipper-PTEC** can be adapted to the data collection requirements, please ask yourself the following questions:

a) How high of a maximum water level is expected?

b) What variations in the measurement range can be expected?

c) At which depth should the conductivity and temperature measurements be taken?

For representative pressure, temperature, and conductivity measurements, the **Dipper-PTEC** should be positioned at least 17cm below the lowest water level expected.

If measurement range is unknown, select a sufficient measuring range for the pressure sensor. Large variations in the conductivity values will be measured by adaptive measuring ranges (up to 4).

5.3 Calculating Hanging Depth Dipper-PTEC

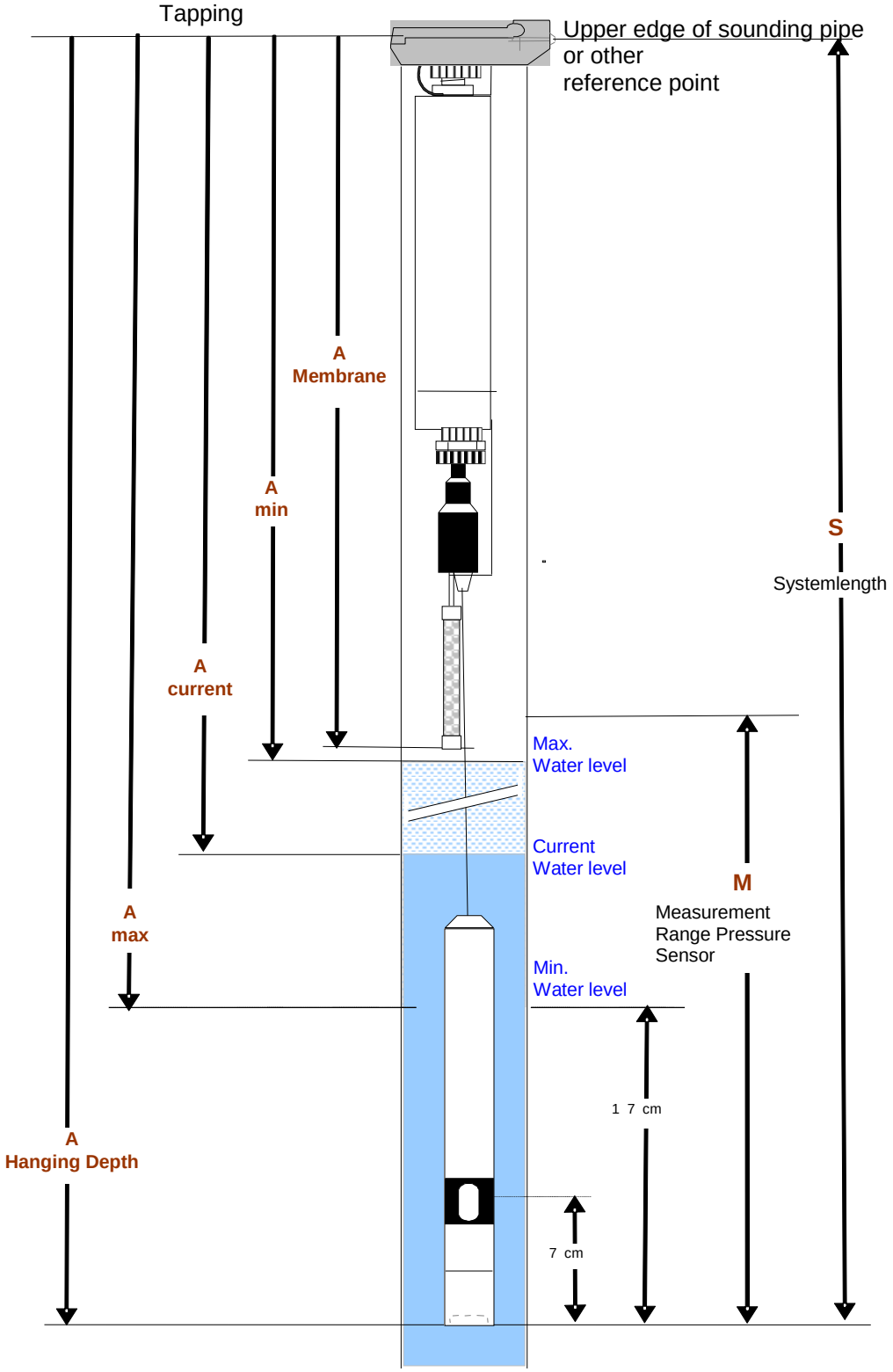
The distance from the upper edge of the well cap to the lowest water level equals the maximum tapping A_{max} (Fig.).

The **minimum hanging depth** A equals the maximum tapping A_{max} plus 17cm.

System Length S often equals the hanging depth in practice and in the example here. If the position of the hanging point of the **Dipper-PTEC** does correspond to the reference point, then the system length must be corrected to make up the difference.

Tapping A_{min} must be larger than Tapping A Membrane (absolute ca. 80 cm). If the water level exceeds the membrane of the pressure balance pipe, the increase in water pressure will no longer be recorded.

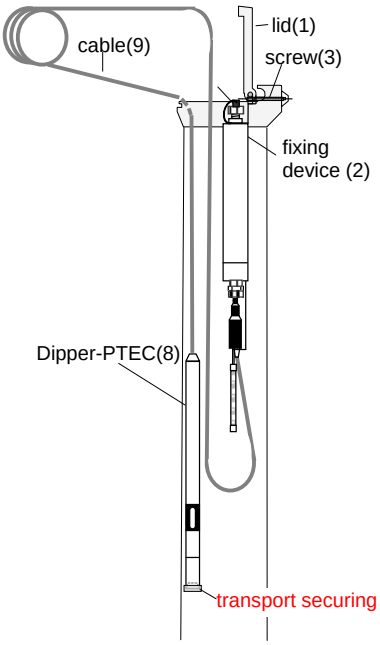
Warning! Water can then penetrate over the membrane and damage the **Dipper-PTEC**.



To record level changes continuously, the difference from tapping A hanging depth and the minimum tapping A_{min} must be smaller than the measurement range of the pressure sensor. In case of water levels exceeding the measuremnet range of the pressure sensor, a constant water level is indicated.

5.4 Installation of Dipper-PTEC

For any following openings, do <u>not</u> open the top piece completely, as this might result in loosening the fixing device of your Dipper and you are in danger of dropping the Dipper into the observation tube.

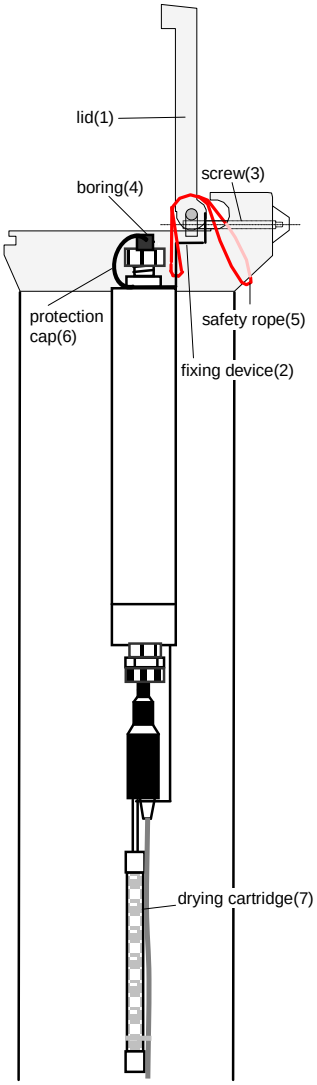


a) Approach for observation tubes ≥ 4“

- Remove the lid (1) of the top piece of the observation tube.
- Put the fixing device (2) on the screw of the lid (3).
- Put back the lid (1) and turn the screw (3) until the lid is fixed but still open!
- Check whether the fixing device is tightly fixed.
- Put the protection cap on the plug.
- remove the transport securing from Dipper-PTEC
- Slowly lower the Dipper-PTEC into the observation tube.

b) Approach for observation tubes 1½“, 2“ und 3“

- Remove the lid (1) of the top piece of the observation tube.
- remove the transport securing from Dipper-PTEC
- Slowly lower the Dipper into the observation tube and fix it tightly.
- Put the safety rope (5) around the top piece
- Put the fixing device (2) on the screw of the lid (3).
- Put back the lid (1) and turn the screw (3) until the lid is fixed but still open!
- Check whether the fixing device is tightly fixed.
- Pull back the slotted safety rope (5) over the lid and put back the protection cap onto the plug.



By lowering of the Dipper-PTEC with loose fixing device and by taking off of the lid of the top piece with inserted Dipper-TEC, the Dipper has to be secured. Thread in the attached safety rope (5) through the boring (4) at the fixing device and tie a loop into it.

By screwing off of the top piece and in case of loose fixing device turn the loop around the top piece and hence prevent the **Dipper-TEC** from falling. Check the safety rope (5) after each insertion and exchange it if it is damaged.

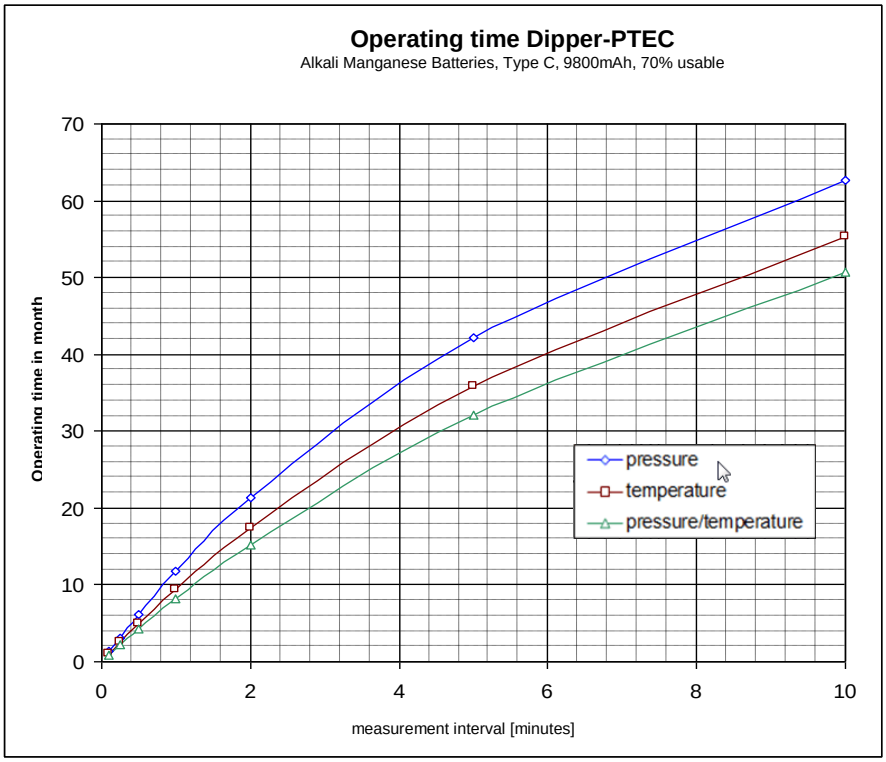
After adjusting resp. data download of the Dipper, disconnect the interface cable and put the safety cap back onto the plug. Make sure that <u>no moisture reaches the plug</u>. Afterwards, close the top piece.

5.5 Maximum Recording Time

The operating time depends strongly on the data acquisition rate and registered numbers of data channels (see diagram).

If the **Dipper-PTEC** is operated with the standard battery compartment, following recording durations are to be expected (see Table):

Measurement Frequency (mins)	Max. Recording Time [months]		
	p	T/EC	T/EC/p
1440	121	120	120
720	120	119	119
360	118	118	117
120	113	110	109
60	105	101	99
30	93	87	83
15	75	68	63
10	63	55	51
5	42	36	32
2	21	17	15
1	12	9,4	8,1
0,5	6,1	4,9	4,2
0,25	3,2	2,5	2,1
0,1	1,3	1,0	0,9
0,083	1,1	0,8	0,7



On the power supply voltage channel, usually channel 32, the voltage coming from the battery compartment is displayed or receives power from another device such as the SlimCom directly connected to the **Dipper-PTEC**. To ensure data collection, it is recommended to change out the batteries when they drop to between **4.3V and 4.6V**. If the charge drops below **4,0V**, measurement is automatically stopped.

For example, a connected converter will display the voltage being supplied to the **Dipper-P/PTEC**. If the Dipper is connected to a SlimCom, its voltage will be displayed on this channel.

<u>Recommendation:</u>
If batteries are running low, an exchange before the start of winter season is recommended.
We recommend also changing the batteries after no more than a year to prevent damage caused by potentially leaking batteries.

6. Operation with SEBAConfig

6.1 Configure communication to the SEBAConfig

The software **SEBAConfig** functions as a platform for activation, maintenance and retrieval of measurement data from data collectors and digital sensors. These activities can be executed with a user-friendly surface.

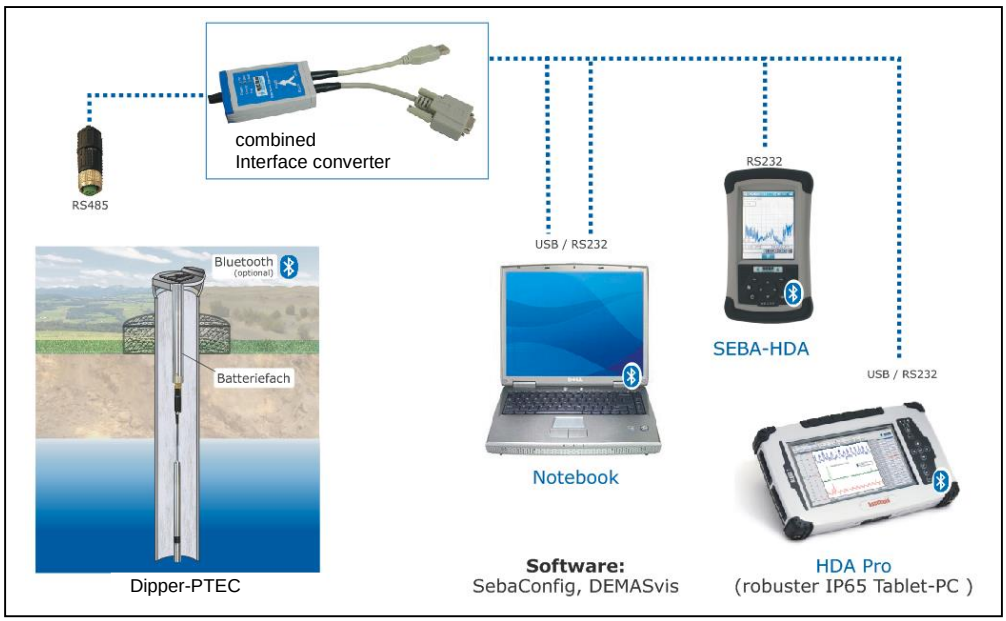
Connection to the **Dipper-PT/PTEC** with SEBAConfig for

- Setting the time and date
- Setting the channel commands
- Setting the measurement cycle
- Measurement customization
- Calibration of measurement parameters
- Display of data that was just measured
- Reading of recorded measurement data
- Start and stop of measurement data recording

When using a modem:
- Setup SMS alarming
- Modem-timer settings
- Setting the push-transfer

When operating the **Dipper-PT/PTEC** with a remote data transmission device, e.g. SlimCom, the modem configuration of the device has to be separately executed with the program **SEBA ModemConfig** for the following settings:

- Setup communication mode
- Setup provider data
- Setup GPRS retrieval
- Setup target of data push
- Setup alarm recipient and –template

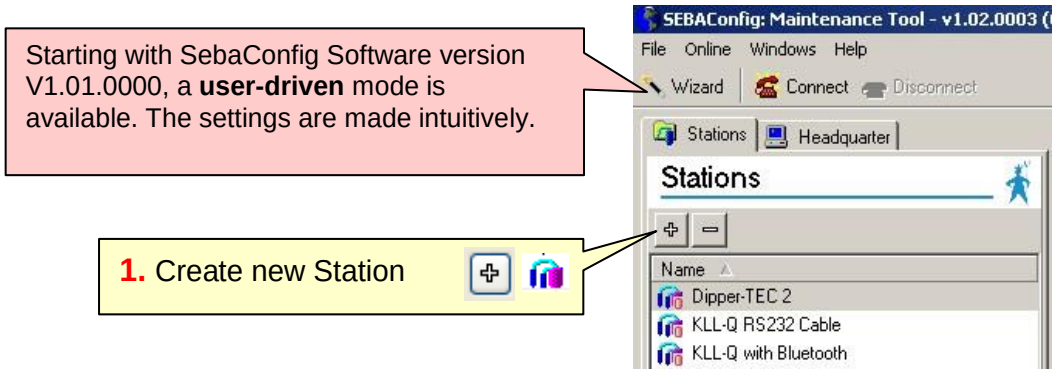


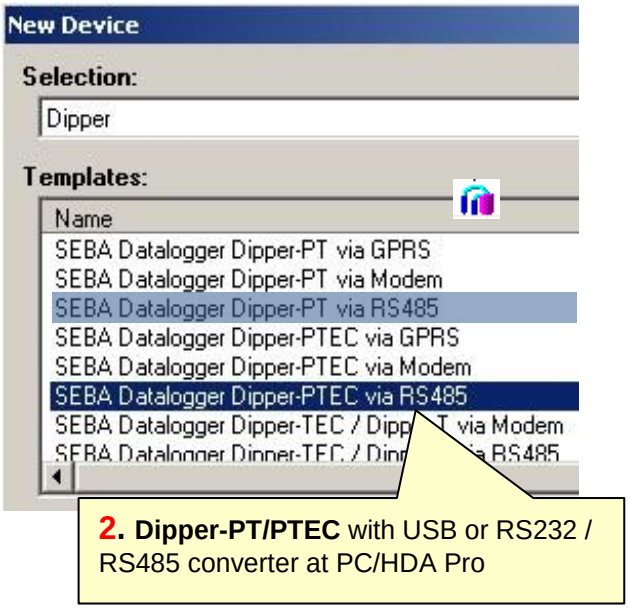
6.2 Connecting to the Dipper-PT/PTEC with SEBAConfig (classic view)

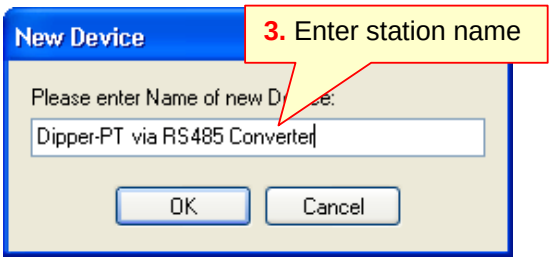
Plug the interface converter into the RS485 of the **Dipper-PT/PTEC** and connect it with the serial interface RS232 or with the USB interface of the computer.
Please always use the latest version of “SEBAConfig”
Caution: In former versions of SEBAConfig(older than version 1.00.1200), Dipper-PT/PTEC are not implemented.

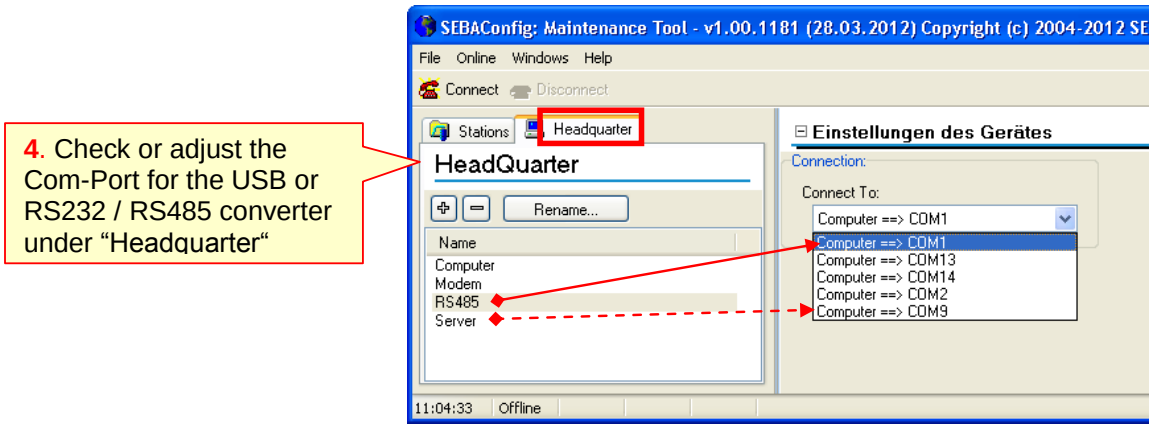
Start program „SEBAConfig“ 

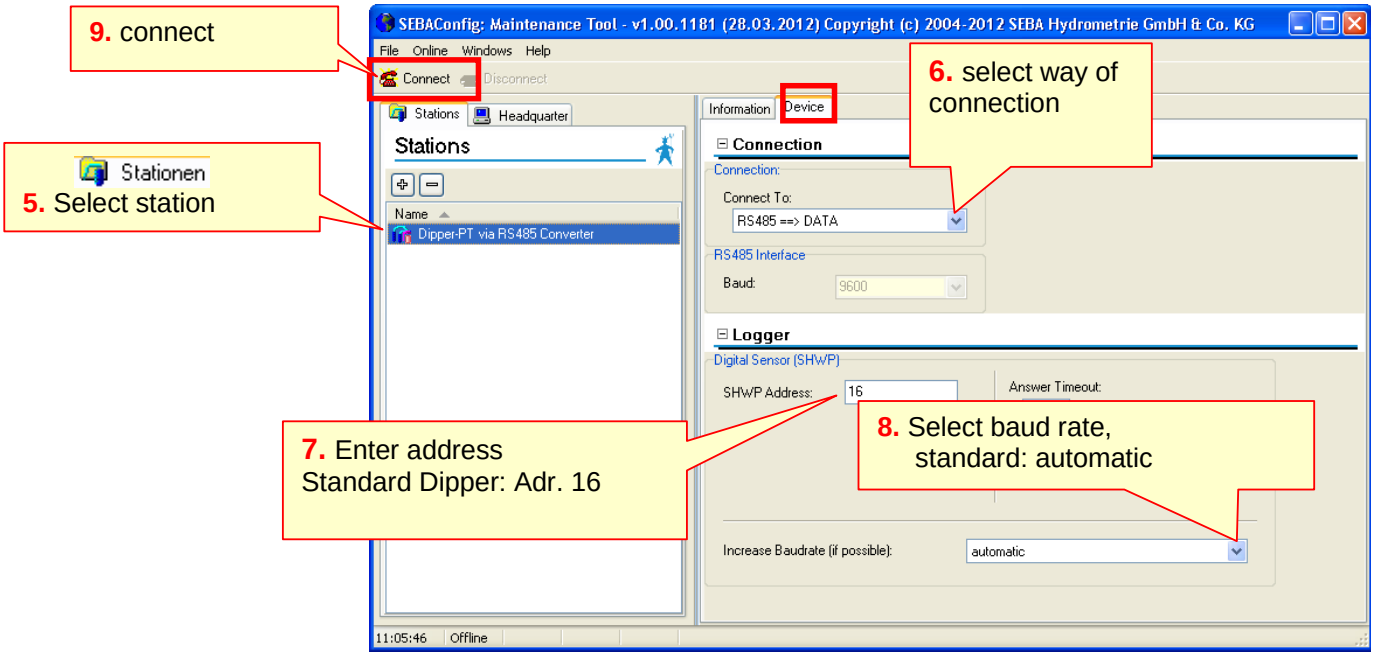
→ and follow the provided steps.





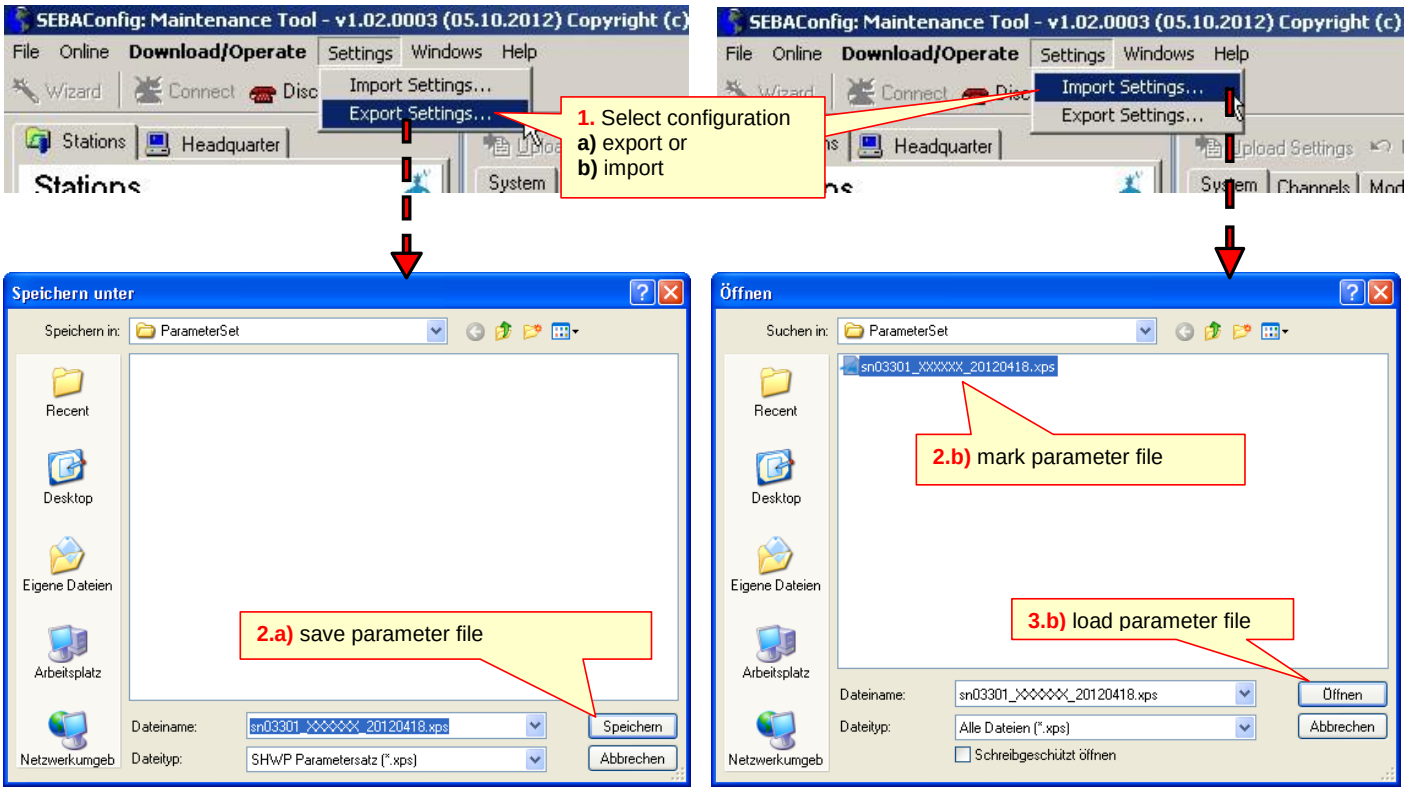

New Device
3. Enter station name
Please enter Name of new Device:
Dipper-PT via RS485 Converter
OK
Cancel


4. Check or adjust the Com-Port for the USB or RS232 / RS485 converter under "Headquarter"
SEBAConfig: Maintenance Tool - v1.00.1181 (28.03.2012) Copyright (c) 2004-2012 SE
File Online Windows Help
Connect Disconnect
Stations
Headquarter
HeadQuarter
Rename...
Name
Computer
Modem
RS485
Server
Einstellungen des Gerätes
Connection:
Connect To:
Computer ==> COM1
Computer ==> COM1
Computer ==> COM13
Computer ==> COM14
Computer ==> COM2
Computer ==> COM9
11:04:33 Offline


9. connect
Stationen
5. Select station
SEBAConfig: Maintenance Tool - v1.00.1181 (28.03.2012) Copyright (c) 2004-2012 SEBA Hydrometrie GmbH & Co. KG
File Online Windows Help
Connect Disconnect
Stations
Headquarter
Stations
Name
Dipper-PT via RS485 Converter
Information
Device
6. select way of connection
Connection
Connection:
Connect To:
RS485 ==> DATA
RS485 Interface
Baud:
9600
Logger
Digital Sensor (SHWP)
SHWP Address:
16
Answer Timeout:
7. Enter address
Standard Dipper: Adr. 16
8. Select baud rate,
standard: automatic
Increase Baudrate (if possible):
automatic
11:05:46 Offline

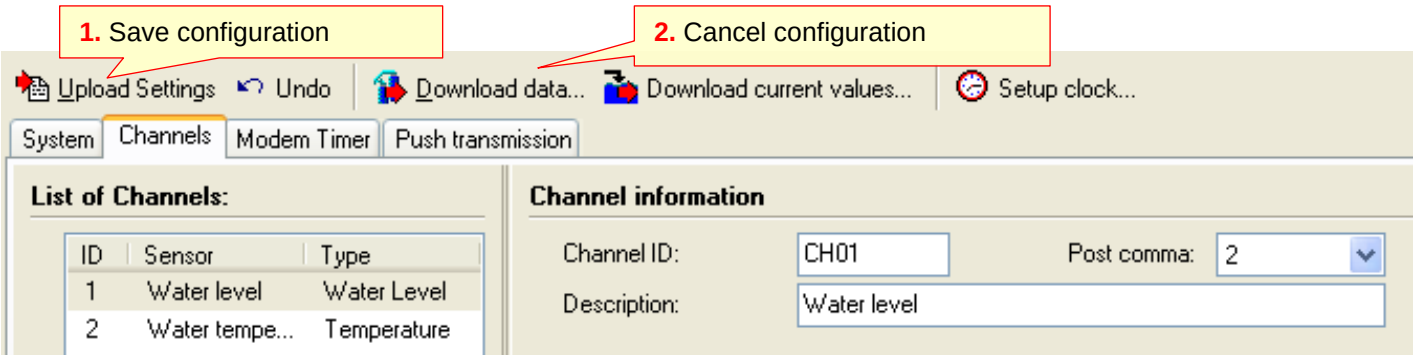
6.3 Operation with the software SEBAConfig

6.3.1 Load and save device configuration



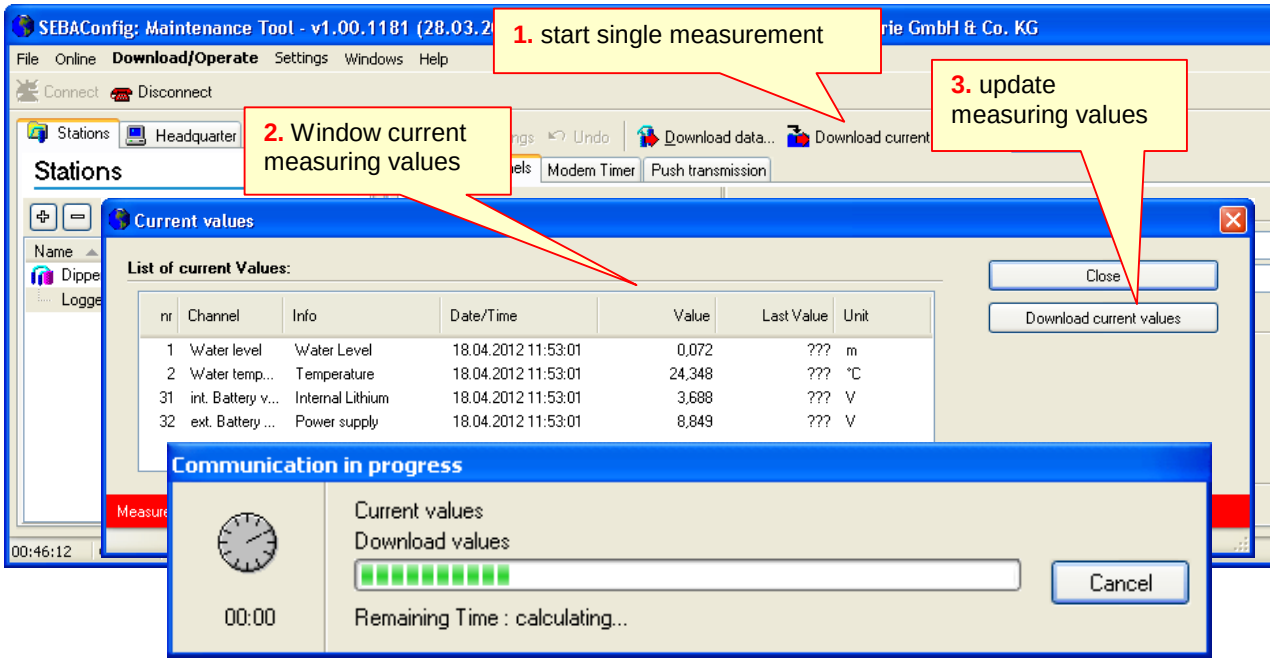
Tip: We recommend saving the configuration before making a change.

6.3.2 Change configuration and undo

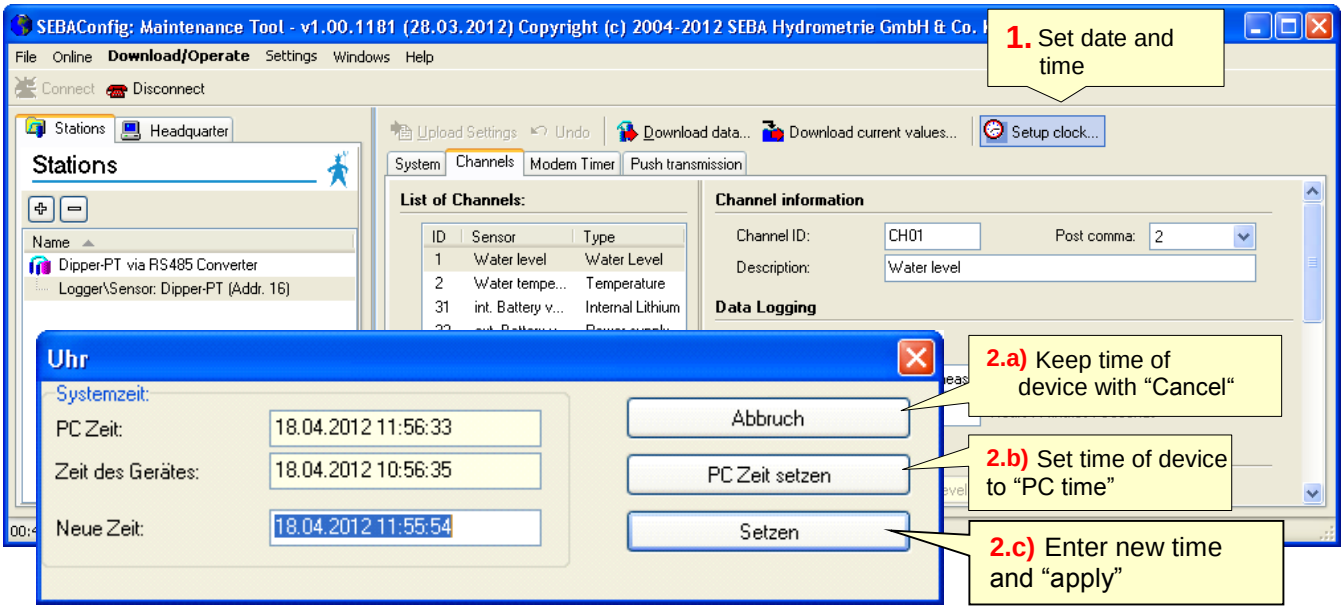


All changes to the SEBAConfig surface must be sent to the device with "upload settings". “Undo” allows to revert all changes that have not been transferred.

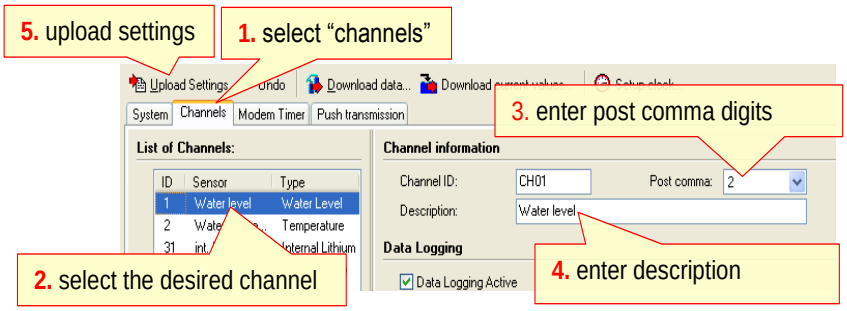
6.3.3 Display measurement values



6.3.4 Date and time



6.3.5 Channel information



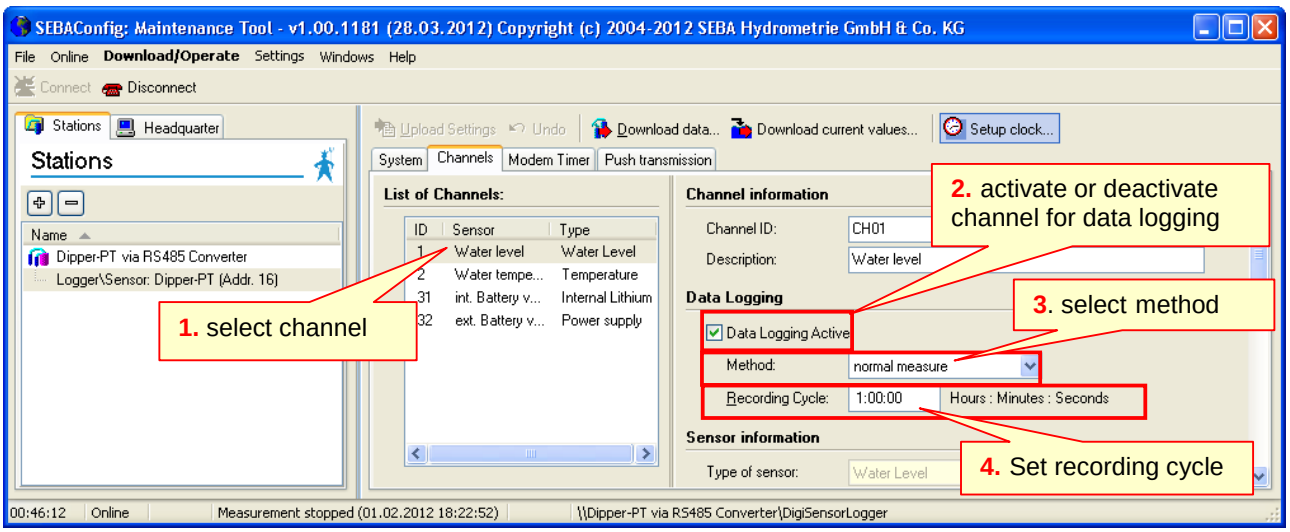
Note:

The channel ID is also transferred during data push and retrieval and assigned to the proper channel. The ID does not have to be changed for a standard data transfer when using SEBA software.

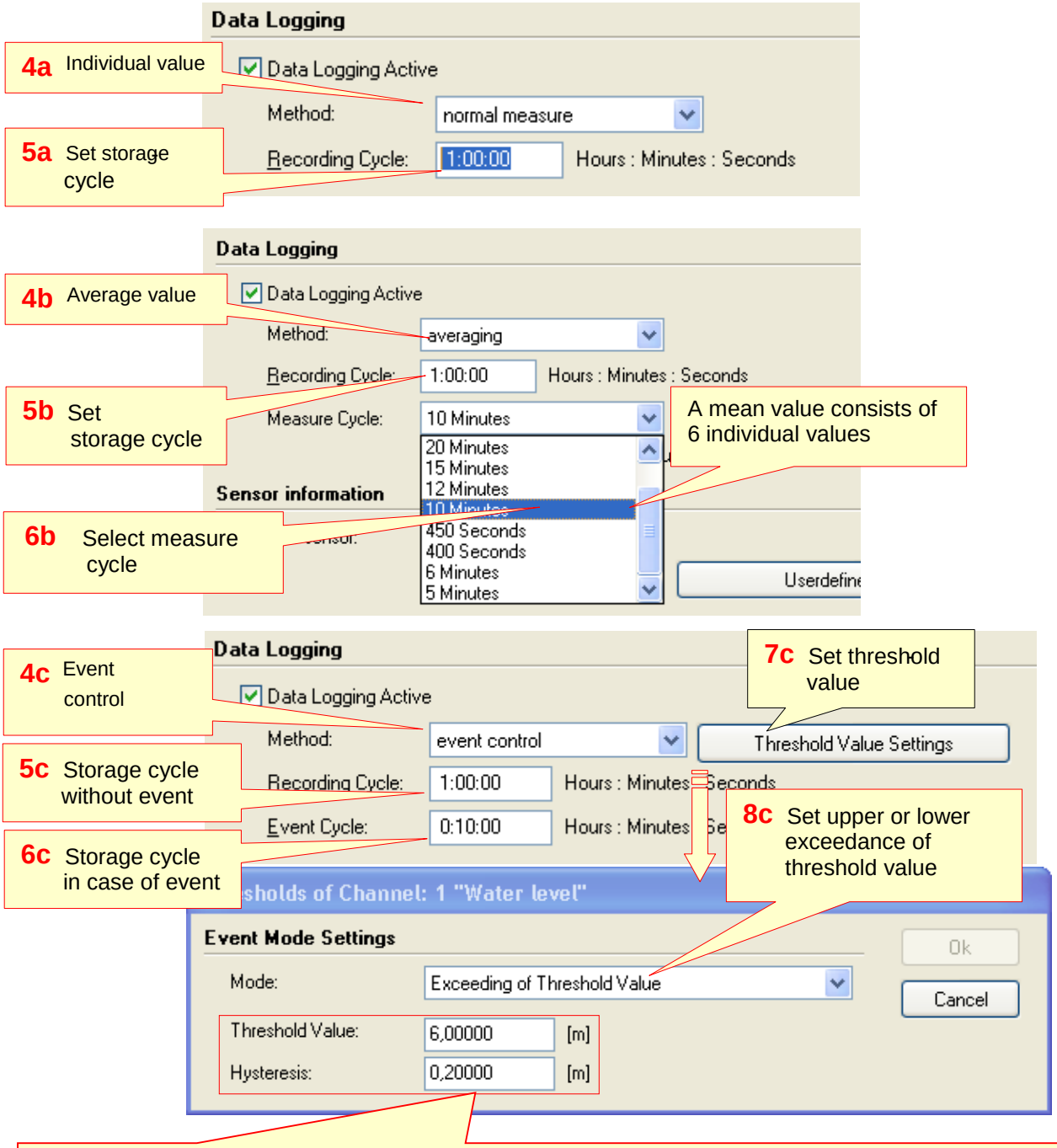
Attention!

Do not change the Channel-ID. This ID is necessary to assign the push-data in the data base. If the ID has not been changed, the identification for the channels 1-32 is CH01-CH32.

6.3.6 Measurement value recording

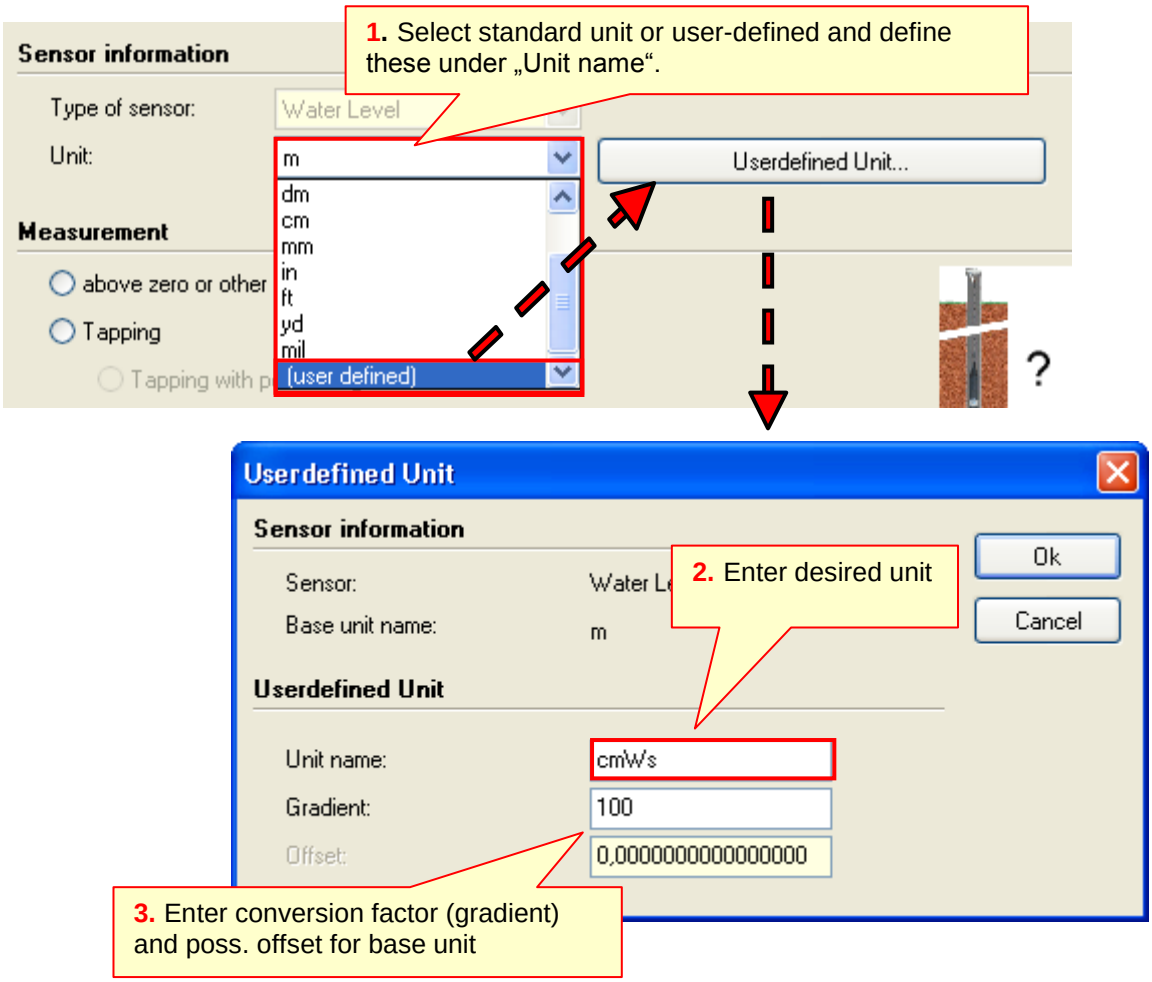


6.3.7 Recording methods



9c Enter threshold value or hysteresis in this example for **setting a lower exceedance;** the event cycle is activated when the value is below 6m (e.g. measurement value 5.9m). The event cycle is deactivated when the value 6.2m (threshold value plus hysteresis) is exceeded, e.g. 6.3m.
If the **setting for upper exceedance has been configured,** the event cycle is activated when the value exceeds 6m (e.g. measurement value 6.1m). The event cycle is deactivated in this case if the value 5.8m results, threshold value minus hysteresis (e.g. measurement value 5.7m).

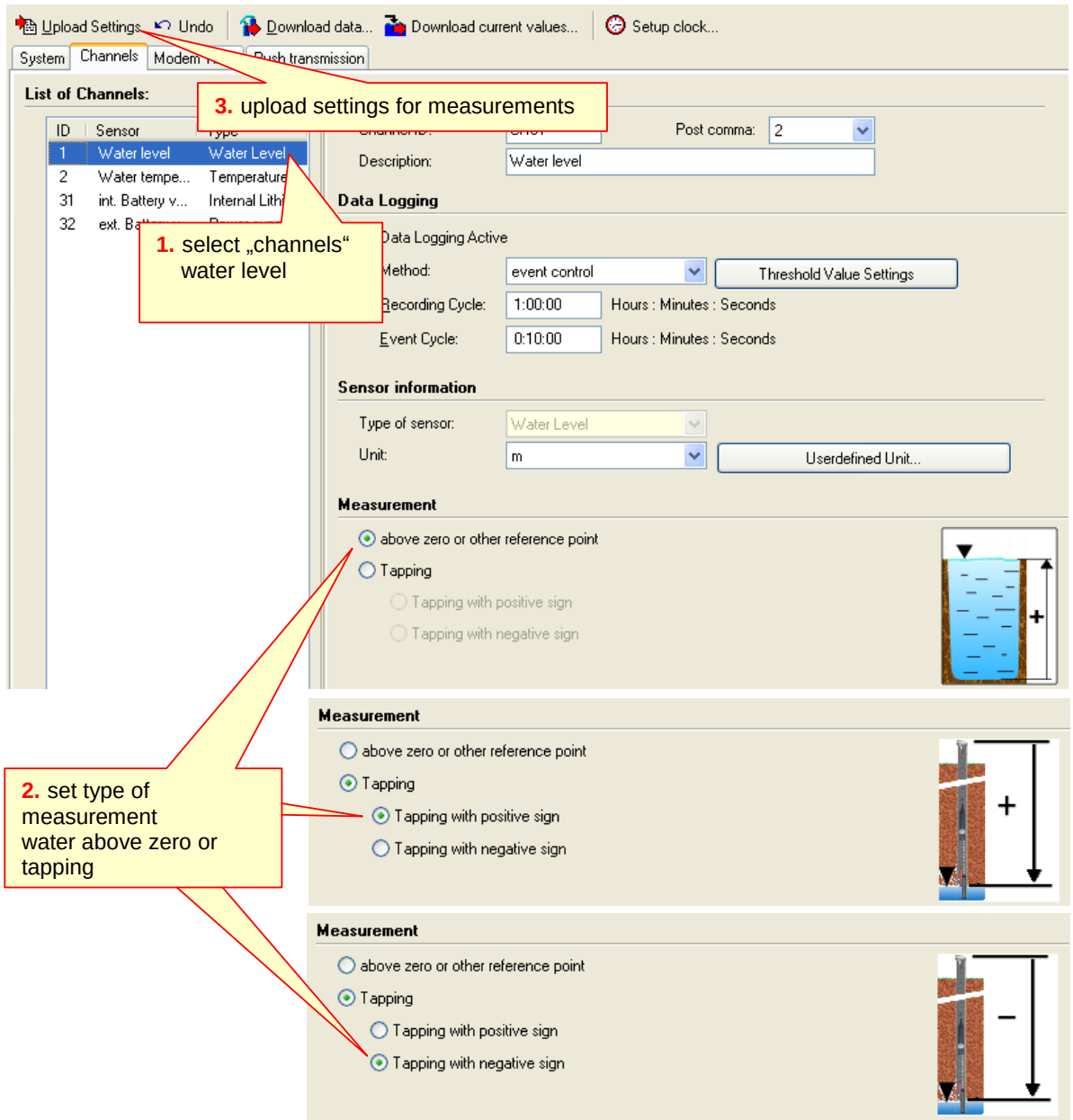
6.3.8 Units



[User-defined unit] = [Base unit] x Gradient + Offset

The unit for the measurement or calibration must be selected on the sheet of the respective sensor. The user can also define units (2). The conversion (3) to the base unit must be entered in each case. The unit must be a maximum of 7 characters including spaces.

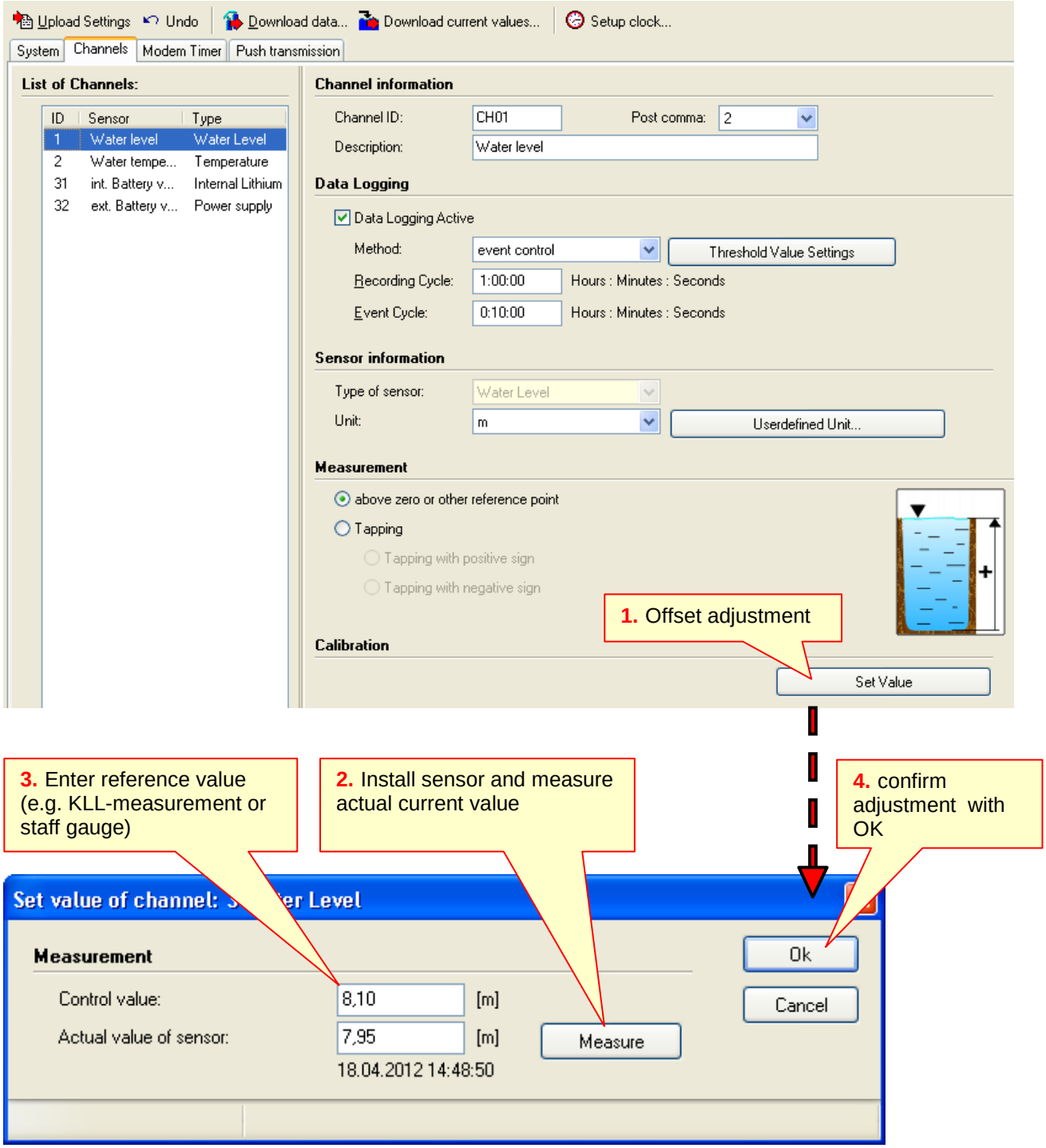
6.3.9 Reference point water level



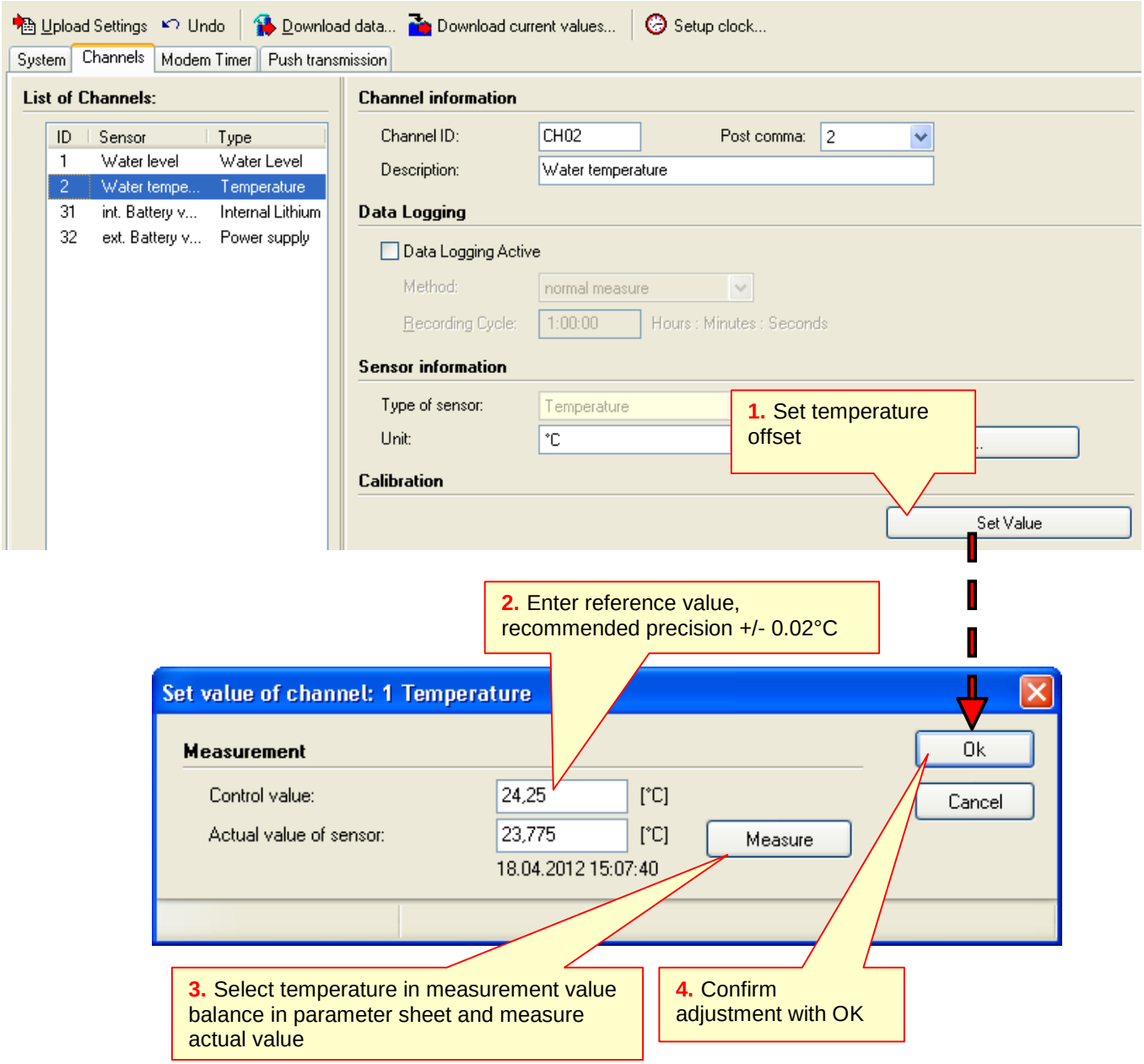
	Reference for measurement value adjustment
Water column above sensor	Calibration in air
Water level above SL or other reference point	Measured reference point (e.g. water-level bar)
Positive mounting height measurement	Reference point (often upper bearing pipe edge), reference measurement with KLL
Negative mounting height measurement	Reference point (often upper bearing pipe edge), reference measurement with KLL

Tip: Confirm the correct settings by pulling up the data logger simulating a water level drop. Comparing water level readings before/after, the reading shows either an increase (reference ‘tapping’) or decrease (reference ‘sea level’) depending on the choice of reference point.

6.3.10 Measurement value adjustment of waterlevel

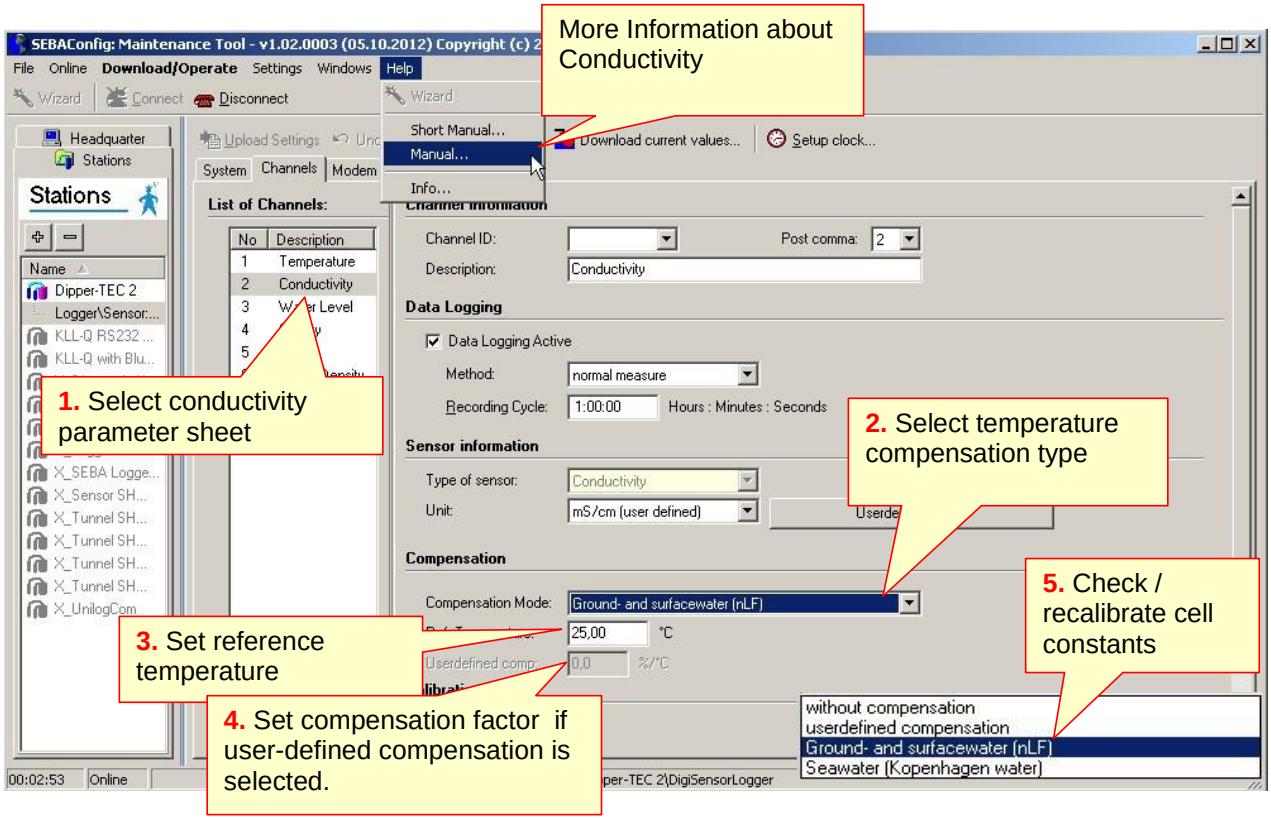


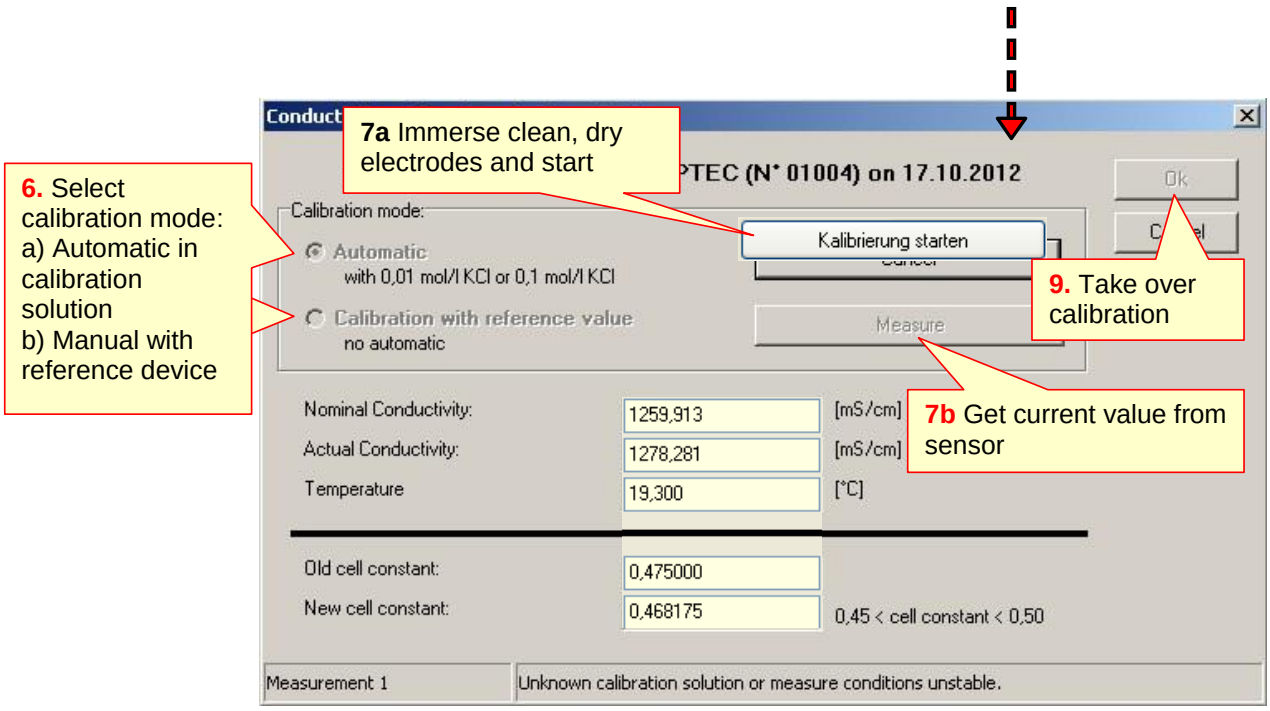
6.3.11 Measurement value adjustment of temperature



6.3.12 Calibration Conductivity

The 4 ranges of the 4-pole conductivity measuring cell are pre-adjusted by the manufacturer with precision resistors. The cell constant of a new sensor amounts to 0,475 1/cm and is also pre-calibrated. The cell can be calibrated by the user either by means of a 0,01 or 0,1 molare KCl or with an exact reference instrument. The cell constant can also be entered directly. Generally, the calibration is long-term stable. Depending on the operation conditions, the electrode should be cleaned, checked and (if necessary) re-calibrated every 6 – 12 months.





Automatic calibration with a 0,01 or 0,1 molare KCl solution:

For the calibration measurement please dip in the conductivity sensor together with the temperature sensor into the solution. This solution should be fresh and the dipped in parts should be cleaned and flushed before. To ensure the quality of the calibration solution, sensors which are not to be calibrated, should be equipped with their protection caps.
After the measurement has been started, the calibration runs automatically. The uncompensated measuring value of the sensor will be accepted when it is constant. Together with the indicated uncompensated reference value it forms the new cell constant.

Calibrating with a Reference Device:

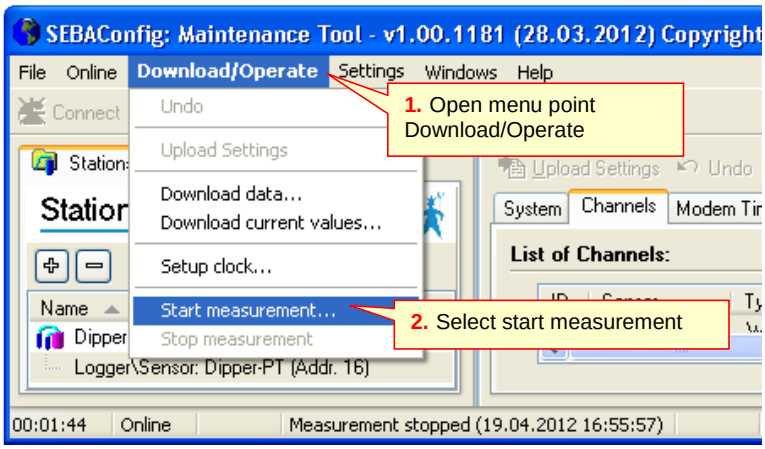
The sensor and the reference device together make a popular form of calilbration. The calculated reference value is set as a target when calibrating the sensor. This and the actual value queried from the sensor manually are used to calculate the new cell constant. Prerequisite fort he calibration is the sensor and reference device being set to the same temperature compensation and the reference value has a precision of +/-0.5 %. Alternatively, any preferred reference solution can be used with a precisely defined conductivity over the concentration of the contents. In this instance, the same instructions as with automatic calibration are followed.

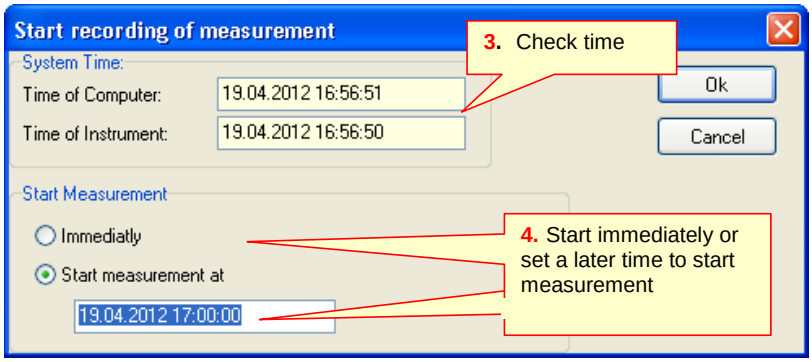
Measurement:

Please dip in the conductivity measuring cell completely into the measuring medium. Observe the response time of the temperature sensor for a correct compensation. In most cases deposits and films can be compensated due to the special 4-electrode arrangement. Aggressive and oily measuring media, as well as strong acids and bases or organic solvents can shorten the life time considerably and result in faulty measuring values. Claims for compensation for so caused defects and mechanical damages can not be accepted .

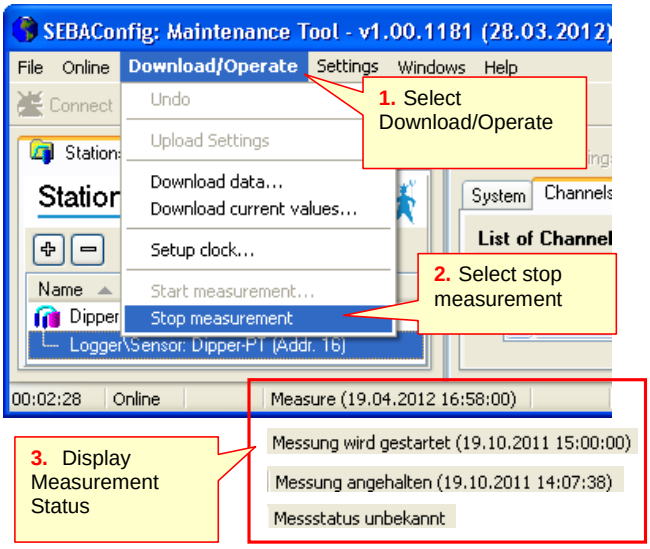
6.3.13 Start measurement

Before starting a measurement, the data-transfer settings must be when using a remote data transfer system (e.g. SlimCom).

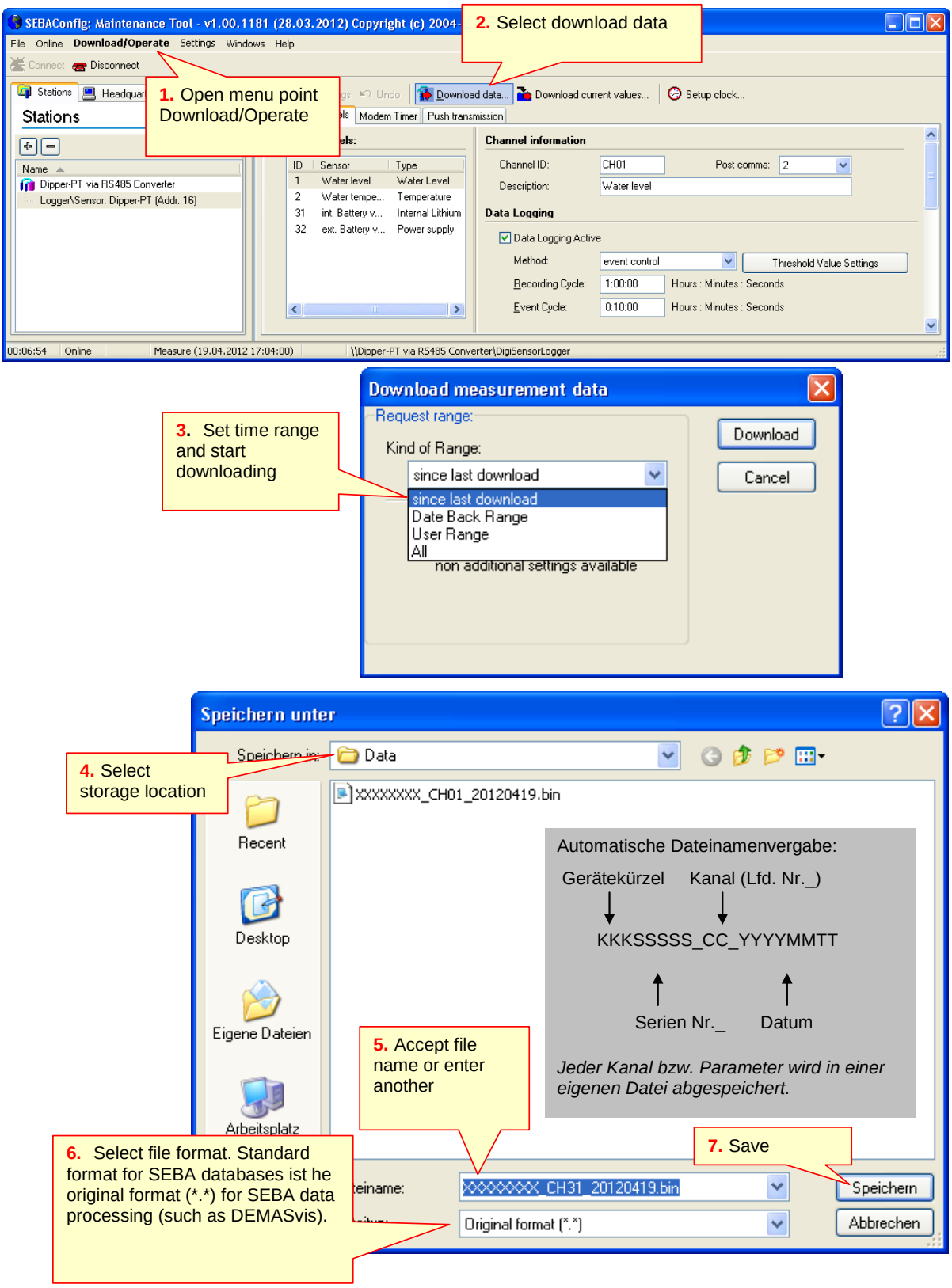




6.3.14 Stop measurement

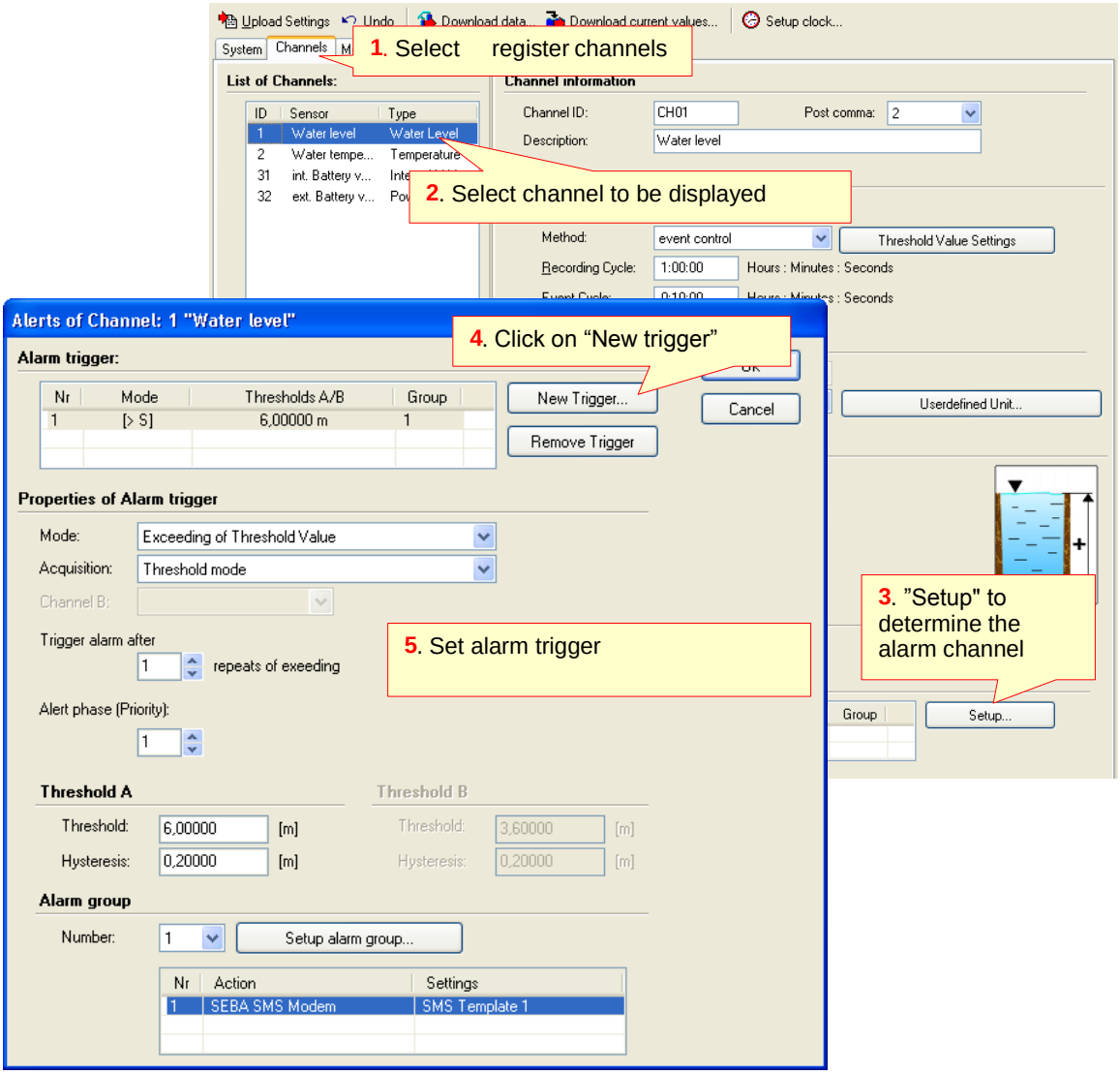


6.3.15 Read measurement



6.3.16 Data transfer - SMS alarm settings

These settings only apply to systems with remote data transfer.



Note 1:
Enter threshold value and hysteresis: In this example the event cycle is activated for **lower exceedance** when the value is below 6m (e.g. measurement value 5.9m). The event cycle is deactivated when the value 6.2m (threshold value plus hysteresis) is exceeded, e.g. 6.3 m.

If the **setting for exceedance** has been configured, the event cycle is activated when the value is higher than 6m (e.g. measurement value 6.1). The event cycle is deactivated in this case when the value 5.8m results, threshold value minus hysteresis (e.g. measurement value 5.7m).

Note 2:
The alarm-SMS have already been predefined for groups 1-4 with templates 1-4.

Template 1 (= Group 1) = German
Template 2 (= Group 2) = English
Template 3 (= Group 3) = English
Template 4 (= Group 4) = English

The setting for the alarm recipient is executed in the modem with the **SEBAModemConfigurator.**

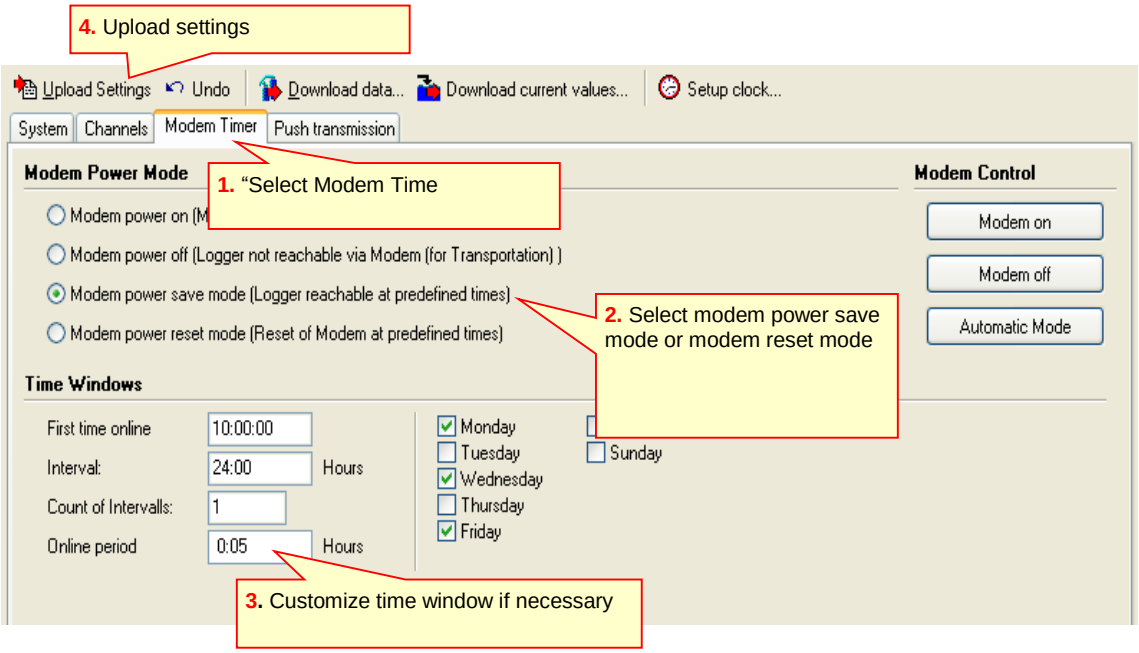
6.3.17 Data transfer - modem control

These settings are only visible when your logger has been configured for a remote data transfer. If you wish to retrofit a remote data transfer and activate the function in the logger, please write to support@seba.de.

ATTENTION!
When delivered, the system is in the “Modem power off” mode. Thus, no communication or data transfer is initially possible via GSM/GPRS!

The modem-timer control can be used in two ways:

- "**Modem power save mode**": The modem is usually off. It is only activated at defined time windows. The device can only be accessed via GSM or GPRS during these times.
- "**Modem reset mode**": The modem is usually on. It is only deactivated at set times to ensure a periodic connection to the network.



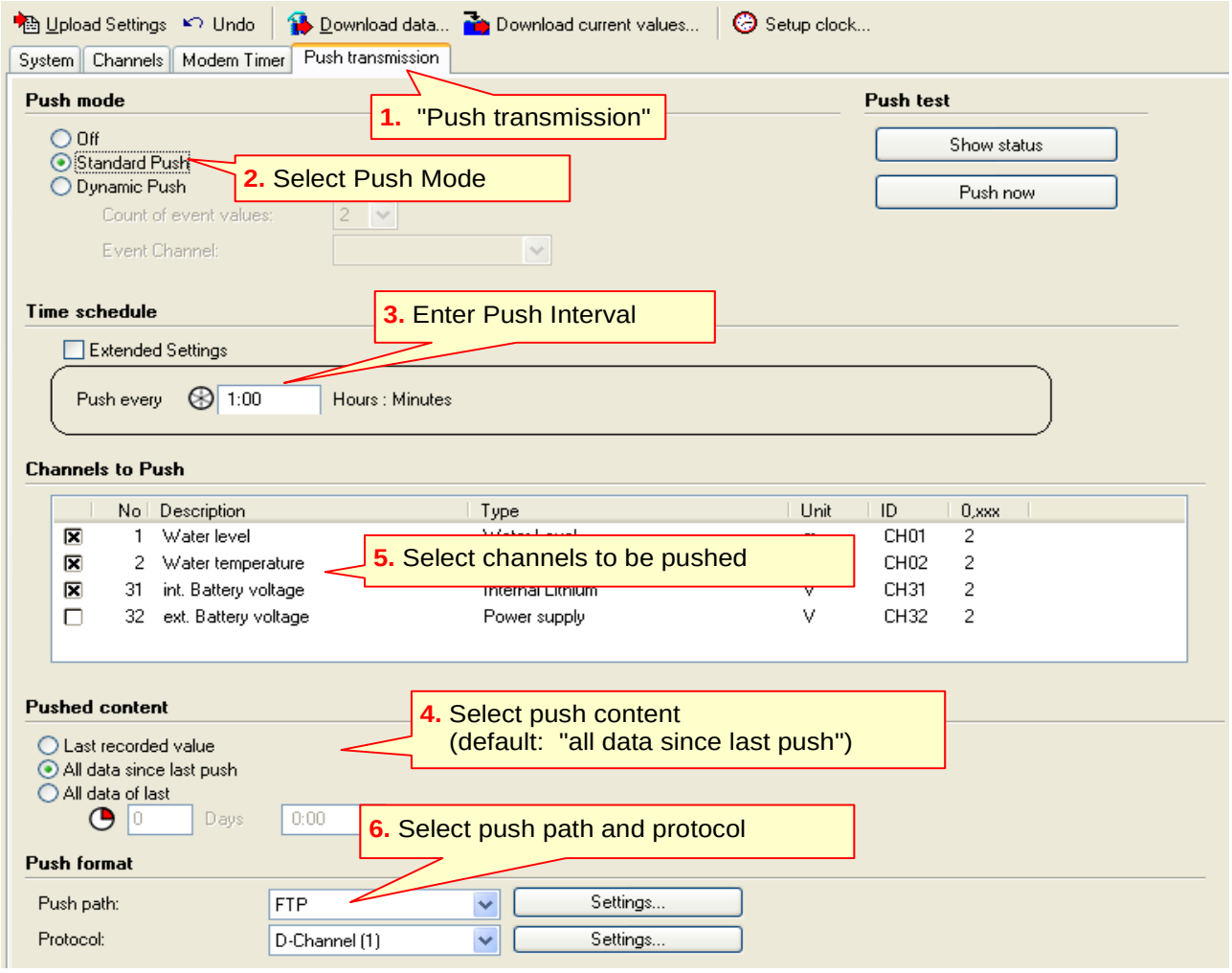
Data push with FTP and the SMS alarm are completely independent from the settings for the modem controls (except for “Modem power off”).

The modem is activated for data push or SMS alarm and, if necessary, it can be deactivated upon completion of the data transfer (if the modem was off before).

Note:
You must set-up a modem-connection in order to execute the configuration according to your local GSM/GPRS provider.

6.3.18 Data transfer PUSH settings (with SEBAModemConfigurator)

These settings are only visible when your logger has been configured for a remote data transfer. If you wish to retrofit a remote data transfer and activate the function in the logger, please contact support@seba.de.



Note:
You have to connect to the modem in order to configure the used FTP server or the SMS-push recipient to whom the data is to be pushed.

SMS data transfer sends compressed data, which cannot be read on a cell phone. You need a reception modem (standard SEBA GSM742 or Fastrack GO) and the software package DEMASole for receiving and converting the data.

7. MAINTENANCE

The **Dipper-PT/TEC** includes multiple sensors, which must be cleaned in regular intervals, depending on pollution level.

7.1 Pressure sensor

The sensor for this parameter requires hardly any maintenance. Dirt residue should be cleaned off. The offset calibration for the display “Water and pressure sensor” can be executed in air with the program SEBAConfig.

7.2 Temperature sensor

The sensor for this parameter requires hardly any maintenance and cannot be accessed by the user. A possibility exists to re-adjust the offset.

7.3 Conductivity

The only required maintenance is the regular cleaning of the electrodes. The following pollutants on the graphite electrodes can be removed with the listed cleaning solution at room temperature.

Pollutant	**Cleaning Solution**
Water-soluble substances	Distilled Water
Fats and oils in large quantities	Warm water and household cleaner Rubbing alcohol (let sit for max. 5 min.)
Lime and hydroxide deposits	Vinegar (acetic acid) (10%)

The conductivity measurement cell is fixed in place and can only be replaced by specialist personal.

7.4 Dry cartridge

When re-filling the drying cartridge, pay attention to the safety data sheet 93/112/EWG according to EU-regulations. The product “KC-Trockenperlen Orange” allows a safe control of the drying procedure. It is especially environmentally friendly as it is free of heavy metal.
Dry cartridges with no color, which are saturated in water, must be changed. The change interval depends on relative humidity and temperature. The granules can be dried in an oven at 130-160 ° C and then re-used or ordered new from SEBA Hydrometrie

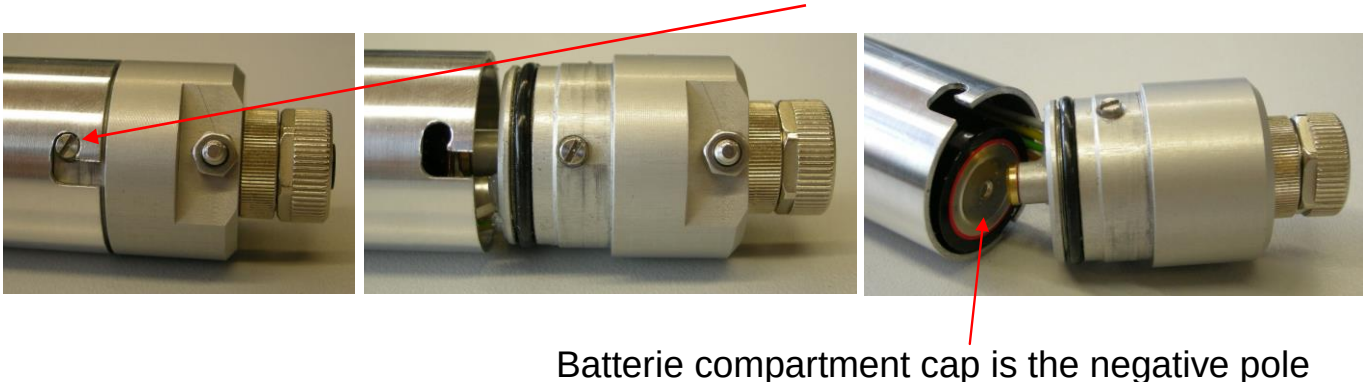
7.5 Change of batteries Dipper-PT

It is recommended to change the battery at about **3.3V**…**3.4V**. At a voltage decrease to **3.2V**, the measurement is automatically stopped. The change can only be effected at SEBA Hydrometrie GmbH & Co. KG, including firmware update and check.

7.6 Change of batteries Dipper-PTEC

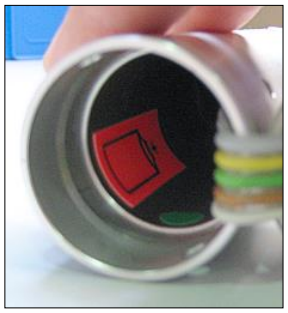
It is recommended to change the batteries when their charge drops to **4.3V…4.6V**. If the battery drops below **4.0V**, measurement automatically stops.

To open the battery compartment, turn the two screws to the right into the device.



Batterie compartment cap is the negative pole

- Pull off the battery compartment lid carefully
- Make sure that the flat band cable is not pulled into the compartment; just fold the compartment cap to the side.
- Remove used batteries.
- Add 4 new batteries to the device.



Battery Direction:
Put battery into compartment with the positive **"+"** pole first. The negative pole **"-"** is below in the battery compartment lid.

Inside the housing is a symbol to help ensure batteries are correctly inserted.

To close, apply light pressure to the battery compartment lid. Turn the two screws to the left and out to fasten the lid.

When changing the batteries, make sure that no moisture or dirt gets into the compartment.

8. Technical data

8.1 Dipper-PT

General:	The probe can be used in existing water-level pipes that are 1" and larger. An inner pipe diameter of 1½" is required for the upper 50 cm for the hanging equipment (for existing bearing pipe seals) and the dry cartridge. Due to its construction, the measurement system cannot be influenced by weather
Storage temperature:	-20…+60°C
Operation temperature:	-5 ... +60°C, not freezing
Storage capacity:	4 Mbyte Flash storage (about 320,000 measurement values)
Microprocessor:	32 bit
Electricity consumption standby:	Max. 30µA
Electricity consumption measurement:	Max. 30mA
Measurement interval:	30 seconds to 99 hours; optional: 1 second
Dimensions of Dipper probe body	Diameter: 22mm Length: 300mm
Weight of probe body:	0.4 kg
Cable length	Up to 1000m
Batteries	Internal AA-lithium battery pack 2x3.6V parallel, Type SL-760, 2100mAh (changeable at SEBA)
Pressure sensor:	Ceramics measurement cell, capacitive measurement principle
Measurement range:	0 - 2/10/20/40/100/200m water column (ρ H2O=1kg/dm³), other measurement ranges upon request
Accuracy:	+/- 0.05% FS
Resolution:	15 bit (ca. 0.36 mm in measurement range 0-10m)
Long-term stability:	+/- 0.1%/annum
Temperature dependency:	+/- 0.01%/K

Temperature sensor:	NTC30
Measurement range:	-5 ... +50°C
Accuracy:	+/- 0.3°C (optional temperature with calibration +/- 0.1°C)
Resolution:	0.00325°C
Material:	Probe body corrosion resistant stainless steel 1.4404 (MDS 575, standard version) or highly corrosion-resistant stainless steel 1.4539(MDS 577, salt water resistant version). Conductivity cell: PVC, Graphite Cable coating: PUR (KTW approved)

8.2 Dipper-PTEC

General	The sensor can be used in current sounding pipes from 1½". The only requirement is that the pipe must be at least 1” in diameter and straight. For current sounding pipe locks, a 2” diameter for the soundingpipe is necessary for the upper 80 cm of the hanging device for dry cartridges and battery compartment. Depending on the design, the measurement system can be completely free from the effects of weather.
Protection class:	IP68 (for the battery compartment as well)
Storage temperature:	-20…+60°C
Operation temperature:	-5 ... +60°C, not freezing
Storage capacity:	4 Mbyte Flash storage (about 320,000 measurement values) Access to any time range in the storage
Measurement interval:	30 seconds to 99 hours; optional: 2 seconds
Microprocessor:	32 Bit
Dimensions of probe body	Diameter 22mm, Length 320mm
Weight of probe body:	0,38 kg
Dimensions of Battery box:	Length: 345mm Diameter: 35mm
Weight of Battery box:	0,33 kg without Batteries
Batteries:	Type 4x1,5V Baby, Alkali-Mangan batteries
Pressure sensor:	Ceramic measuring cell
Measurement range:	0 - 10 m etc. resp. on request
Accuracy:	0,05% FS
Resolution:	16 Bit (about 0.36 mm in measurement range 0-10m)
Long-term stability:	0,1%/Year
Temperature dependency:	0,01%/K
Temperature sensor:	
Measuring range:	-5 ... +50°C
Accuracy:	+/- 0,1°C

Resolution:	0,00325°C

Conductivity sensor:

Measurement principle:	4-polig, with automatic compensation of pollutants
Measuring ranges:	Measurement range totaling 0-200mS/cm, subdivided into 4 ranges with automatic switching 0 - 200 µS/cm; 0,2 - 2 mS / cm; 2 - 20 mS / cm and 20 - 200 mS/cm
Accuracy:	Measuring range 1: 0...200µS +/- 1µS Measuring range 2-4: 0,2...200mS +/- 0,5% of the measurement value
Resolution:	16 Bit (Measuring range 1: 0,03µS/cm; Measuring range 2: 0,3µS/cm; Measuring range 3: 3 µS/cm; Measuring range 4: 30µS/cm)
Material:	Probe body corrosion resistant stainless steel 1.4404 (MDS 575, standard version) or highly corrosion-resistant stainless steel 1.4539 (MDS 577, salt water resistant version). Conductivity cell: PVC, Graphite Cable coating: PUR (KTW approved)

9. Accessory

9.1 for Dipper-PT

Item

- Bearing pipe seal with security seal in sizes 2", 3", 4", 4½, "5" and 6"
- Dry cartridge
- Key with security seal
- SEBA-Dual-Converter RS232/USB-RS485 (PC/Laptop/HDA-Pro)

Software:
- SEBAConfig (control program)
- DEMASvis (graphics- and table program for visualization of measurement data)

9.2 for Dipper-PTEC

Article as in 9.1 plus

Item

For Calibration of the Conductivity Sensor

LF-Set

Consisting of:
- 460 ml LF1.413 mS standard
- calibration beaker Lf with snap-on lid
- cleaning brushes

Support by SEBA Hydrometrie GmbH & Co. KG

As we are interested in a continuous improvement and extension of our products, you are always welcome to send us your questions. Notify us about occurring bugs or send your requests to:

support@seba.de