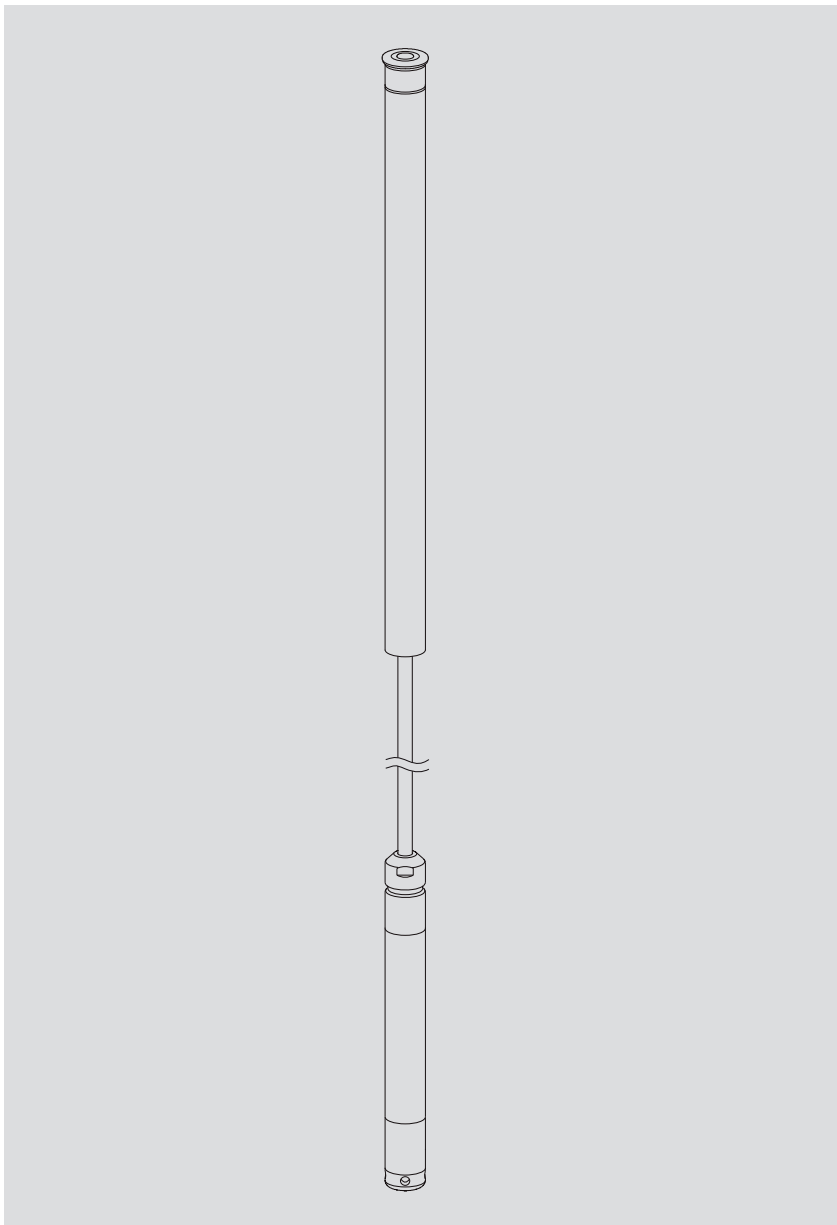


Operating instructions
Groundwater Datalogger
OTT Orpheus Mini



English

These operating instructions (version "06-0311") cover the OTT Orpheus Mini software versions

- ▶ OTT Orpheus Mini firmware: from **V 1.41.0**
- ▶ OTT Orpheus Mini operating program: from **V 1.52.0**

The OTT Orpheus Mini firmware version can be found in the "Advanced operation" mode, "OTT Orpheus Mini" window of the operating program. The version of the operating program can be found via the "Info" function in the "Help" menu.

We reserve the right to make technical changes and improvements without notice.

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1 Scope of supply

- ▶ **OTT Orpheus Mini**
 - 1 groundwater datalogger consisting of a communication unit with installed O-ring, pressure probe cable with pressure compensation capillary and Kevlar cores for longitudinal stabilization, 2 desiccant capsules, pressure probe with datalogger
 - 3 x 1.5 V batteries, alkaline (LR6 · AA) or lithium design (FR6 · AA)
 - 1 Brief instructions
 - 1 factory acceptance test certificate (FAT)

2 Order numbers

▶ OTT Orpheus Mini	Groundwater datalogger Required ordering information - Measuring range: 0 ... 4 m; 0 ... 10 m; 0 ... 20 m; 0 ... 40 m; 0 ... 100 m - System length: 1,5 ... 200 m ($\pm 1\%$ ± 5 cm) - Battery type: alkaline, lithium - Temperature sensor: calibrated/uncalibrated	55.440.002.3.2
▶ Accessories	Installation kit consisting of: Adapter ring 1", adapter plates 2", 4", 6", suspension bracket	55.440.025.9.2
	Adapter plates 3" and 5"	55.440.444.4.1
	Suspension brackets for top caps starting at 2" without recess and for universal installation	55.440.450.4.1
	Cable suspension unit for OTT Orpheus Mini system lengths of > 100 m	on request
	CD-ROM "OTT Orpheus Mini Software" OTT Orpheus Mini operating program for PC and OTT Orpheus Mini operating instructions in PDF format	56.552.000.9.7
	Top cap with integrated fastening hook	
	- for 2" observation wells	24.220.052.9.5
	- for 4" observation wells	24.220.054.9.5
	- for 6" observation wells	24.220.057.9.5
	Intelligent top cap OTT ITC for GSM remote data transfer	55.530.0XX.3.2
	5-sided key for locking OTT top caps	20.250.095.4.1
	Optical OTT Duolink reading head	55.520.017.4.2
	Optical reading head OTT IrDA link USB	55.520.026.9.2
	OTT Orpheus Mini operating instructions	55.440.002.B.D
▶ Replacement parts/ Consumable materials	Alkaline battery LR6 · AA; 3 x required	96.800.004.9.5
	Lithium battery FR6 · AA; 3 x required	97.800.008.9.5
	Desiccant capsules 2x in aluminum bags	97.100.280.9.5

3 Basic safety information



- ▶ Read these operating instructions through before using the OTT Orpheus Mini for the first time! Make yourself completely familiar with the installation and operation of the OTT Orpheus Mini and its accessories! Retain these operating instructions for later reference.
- ▶ The OTT Orpheus Mini is used to measure groundwater levels and the water temperature of the groundwater. Only use the OTT Orpheus Mini as described in these operating instructions!
For further information, → see Chapter 4, "Introduction".
- ▶ Note all the information on safety and warnings given within the individual work steps. All safety information and warnings in these operating instructions are marked with the adjacent warning signals:
 - **Black warning triangle** → warning of possible damage to device, reduced functionality and particularly noteworthy points.
 - **Black warning triangle with yellow background** → there is a health hazard! Detailed information on the hazard with information on how to prevent the hazard and possible consequences of non-observance.
- ▶ Ensure the electrical, mechanical, and climatic specifications listed in the technical data are adhered to.
For further information → see Chapter 21, "Technical data".
- ▶ Handle the pressure probe cable carefully: Do not kink the cable or pull it across sharp edges!
- ▶ Do not make any changes to or retrofit the OTT Orpheus Mini! If changes or retrofits are made, all guarantee claims are voided.
- ▶ Have a faulty OTT Orpheus Mini inspected and repaired by our repair center. On no account carry out repairs yourself!
For further information → see Chapter 19, "Repair".
- ▶ Dispose of the OTT Orpheus Mini properly after taking out of service. On no account put the OTT Orpheus Mini into the normal household waste.
For further information → see Chapter 20, "Notes about the disposal of old units".

4 Introduction

The OTT Orpheus Mini groundwater datalogger provides precise measurement and recording of groundwater levels and temperatures.

The pressure probe equipped with a relative pressure measuring cell uses the hydrostatic pressure of the water column to determine the water level. A pressure compensation capillary in the pressure probe cable gives the measuring cell the current ambient air pressure as a reference. Erroneous measurement results due to atmospheric air pressure fluctuations are thus eliminated.

The OTT Orpheus Mini is available with five measuring ranges:

- ▶ 0 ... 4 m water column (0 ... 0.4 bar)
- ▶ 0 ... 10 m water column (0 ... 1 bar)
- ▶ 0 ... 20 m water column (0 ... 2 bar)
- ▶ 0 ... 40 m water column (0 ... 4 bar)
- ▶ 0 ... 100 m water column (0 ... 10 bar)

With the help of a reference value that is input during startup, the OTT Orpheus Mini's standard setting provides measurement results in the form of depth values. Alternatively, levels or pressure values are possible. The measurement intervals (sample intervals) can be preselected as necessary.

The operating parameters are adjusted with the "OTT Orpheus Mini operating program" PC software. This software allows the system to be conveniently and flexibly tailored to a wide range of measurement requirements of a station. The software can be set to provide a basic or an advanced operator interface. The basic operator interface allows all settings to be adjusted within a single program window. In the advanced operator interface, the sample interval can be controlled through limit events, for example. The software also supports the execution of pump tests.

The stored measured values are made available through an infrared interface (IrDA) for wireless readout by a PC with OTT Orpheus Mini operating program or OTT Hydras 3 or by a PDA with OTT Hydras 3 Pocket.

Together with an OTT ITC intelligent top cap (accessory), remote data transfer and remote parameter input is possible via the GSM mobile telephone network (GSM = global system for mobile communications). The remote data transfer can be optionally carried out by SMS text messages or using the packet oriented mobile radio transmission service GPRS (general packet radio service).

The OTT Orpheus Mini is installed simply by hanging it in observation wells of 1" in diameter and above. Various adapters/suspension brackets are available as accessories for this purpose. Three 1.5 V lithium batteries (type AA) provide an operating life of over five years (sample interval: 1 hour; system length: 50 m). Alternatively, alkaline batteries with a limited working life can be used.

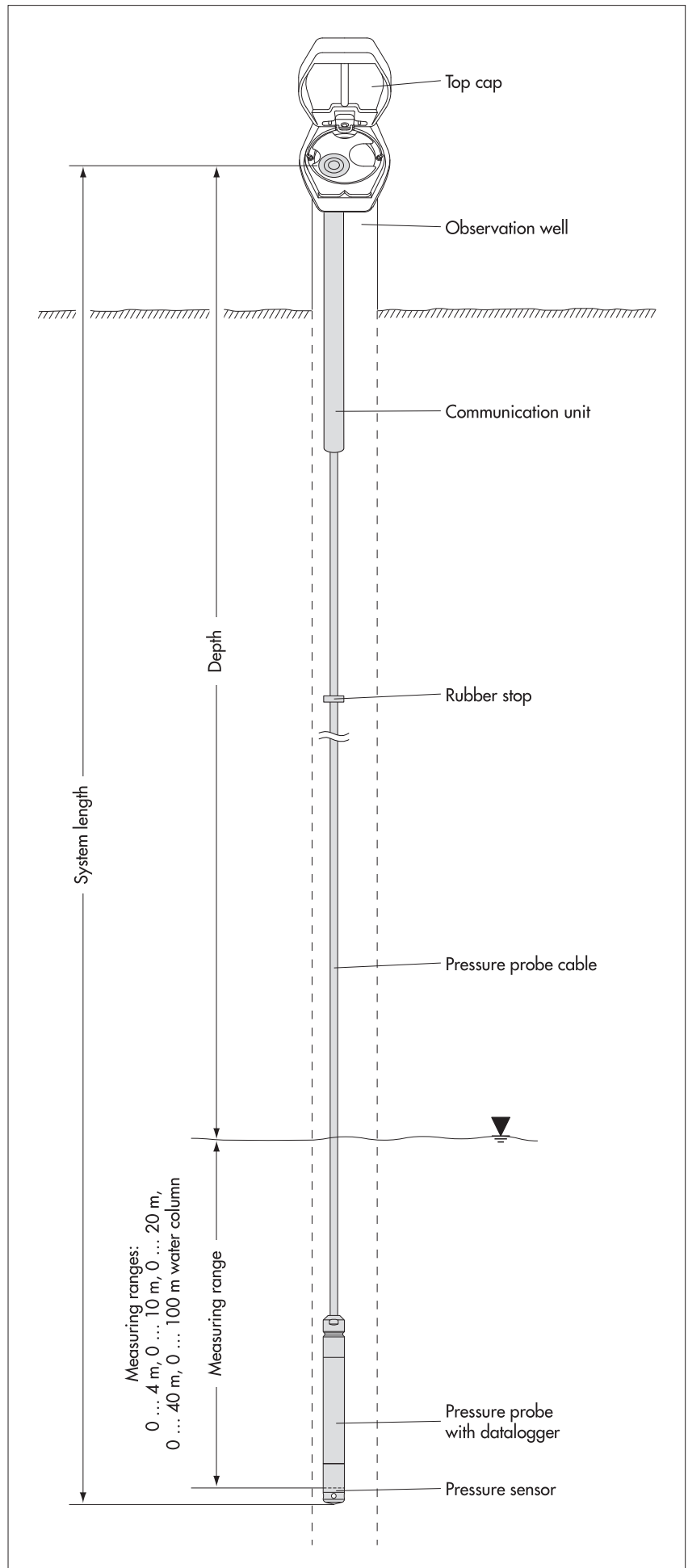
The communication unit of the OTT Orpheus Mini can withstand temporary flooding (for details, see Chapter 21, "Technical data").

Fig. 1: Setup of a groundwater measurement station with the OTT Orpheus Mini.

The OTT Orpheus Mini essentially consists of three components: communication unit, pressure probe cable and pressure probe with datalogger.

OTT Orpheus Mini system length = length of communication unit + cable length + length of pressure probe with datalogger. (The system length is required when ordering an OTT Orpheus Mini. When setting the OTT Orpheus Mini operating parameters the system length is not required.)

(The rubber stop attached to the pressure probe cable prevents the pipe casing from falling when the communication unit is open. Do not move the rubber stop!)



5 Installing, checking and replacing batteries

Please note



- ▶ Only use the battery types specified (no rechargeable types).
- ▶ Always use brand new batteries. Do not mix used and new batteries.
- ▶ Do not mix batteries from different manufacturers.
- ▶ Do not mix lithium and alkaline batteries.
- ▶ Properly dispose of dead batteries. Do not put in household waste.

Suitable battery types

3 x 1.5 V AA cells (LR6/FR6),
alkaline or lithium design (LiFeS; Energizer L91)

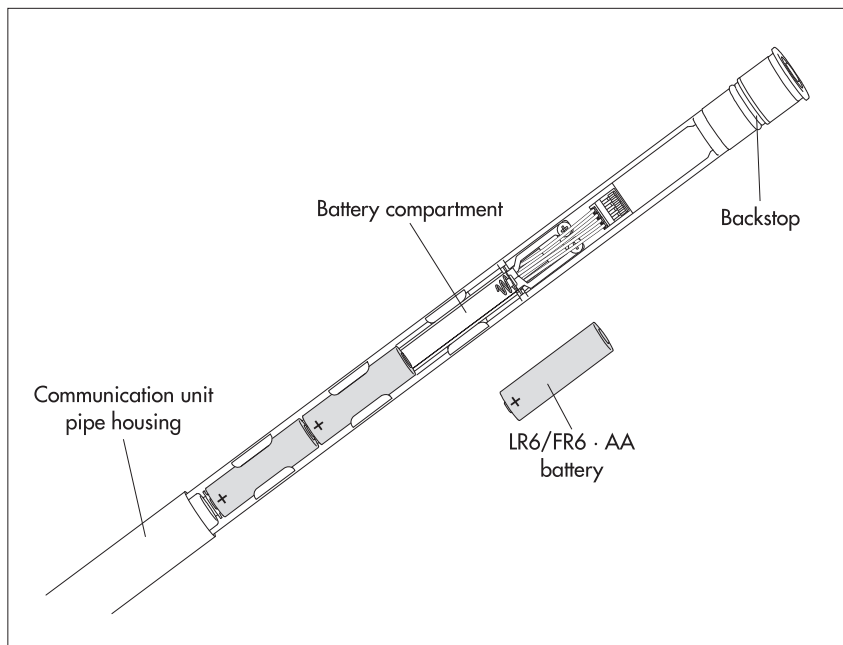
Insert the batteries as follows

- Slide the pipe casing of the communication unit approximately 30 cm in the direction of the pressure probe cable.
- Insert 3 batteries (LR6/FR6 · AA) in the battery compartment as shown in Figure 2. Ensure that the polarity is correct!
- Slide the pipe casing of the communication unit back on until it stops.

Notes

- ▶ The OTT Orpheus Mini begins measurements within a few seconds of the batteries being inserted (there is no on/off switch).
- ▶ If the OTT Orpheus Mini is to be taken out of service → remove the batteries. This will prevent the batteries from draining prematurely and will stop any recording of unusable measurements.
- ▶ When bringing back into operation it takes – dependent on how much data is stored – up to 7 minutes before the OTT Orpheus Mini begins measurements again.

Fig. 2: Installing batteries.



Battery lifetime

With a sample interval of 1 hour and 50 m system length (without OTT ITC)

- ▶ Lithium batteries: at least 5 years
- ▶ Alkaline batteries: at least 1.5 years (high quality battery types)

Note

- ▶ At 0 °C, alkaline batteries drop to approximately 50 % of their original 20 °C capacity and at -10 °C they drop to approximately 35 % due to their design. If temperatures drop below 0 °C at the measurement station, it is recommended that lithium batteries be used.

Check the battery voltage as follows

- Set up the PC/OTT Orpheus Mini communication link (see Chapter 7.2).
- Select the "OTT Orpheus Mini" menu, "View Instantaneous values" function ¹⁾ → the OTT Orpheus Mini starts an instantaneous value measurement → the "Observer" window indicates the current battery voltage and the energy consumed from the batteries so far in Ah.
- If the battery voltage is ≤ 3.5 to 3.6 volts → replace the batteries.
- Click on the "Exit" button.
- Close the operating program.

¹⁾ If set appropriately (Menu "File", function "Options"), the operating program starts at the same time the "Observer" window is opened.

Replace dead batteries as follows

- Open the top cap/observation well cover.
- Pull the communication unit approximately 80 cm out of the observation well and hold (a second person would be useful).
- Slide the pipe casing of the communication unit approximately 30 cm in the direction of the pressure probe cable. (The rubber stop located on the pressure probe cable (see Fig. 1) prevents the pipe casing from falling. Do not move the rubber stop!)
- Remove dead batteries.
- Insert 3 new batteries (LR6/FR6 · AA) into the battery compartment as shown in Figure 2 within 10 minutes. Ensure that the polarity is correct!
- Slide the pipe casing of the communication unit back on until it stops.
- Slowly and carefully replace the communication unit in the observation well.
- Close the top cap/observation well cover.

Notes

- ▶ The OTT Orpheus Mini stores the measured values in a non-volatile memory. There is no loss of data when changing batteries. This also applies to storage without batteries over a long timespan.
- ▶ If it takes longer than approx. 10 minutes to replace dead batteries, the time (and possibly the date) will have to be re-entered (see Chapter 13, "Date and time settings"). Furthermore, it takes – dependent on how much data is stored – up to 7 minutes until the OTT Orpheus Mini begins measurement again.
- ▶ When replacing the batteries, we recommend changing the desiccant capsules at the same time (see Chapter 16.2, "Replacing the desiccant capsules").

6 Installing the OTT Orpheus Mini

System length up to 100 meters

The installation of the OTT Orpheus Mini is carried out by suspending it in the observation well. The necessary accessories and type of installation varies depending on the diameter of the observation well and the design of the top cap:

- ▶ 1" observation wells see 6.1
- ▶ 2", 4", or 6" observation wells,
OTT top caps **with** recess for adapter plate see 6.2
- ▶ Observation wells beginning at 2" in diameter,
Top caps **without** recess for adapter plate see 6.3
- ▶ Special case: observation wells beginning at 2" in
diameter without top cap, see 6.4

System length over 100 meter

For installation of an OTT Orpheus Mini with a system length of more than 100 meters, there is a special cable suspension unit available (see accessories). This suspension unit is described separately.

Fig. 3: Installation accessories – Part 1.

- 1 = hole for OTT Orpheus Mini
- 2 = hole for contact gauge
- 3 = recess for screws on the top cap

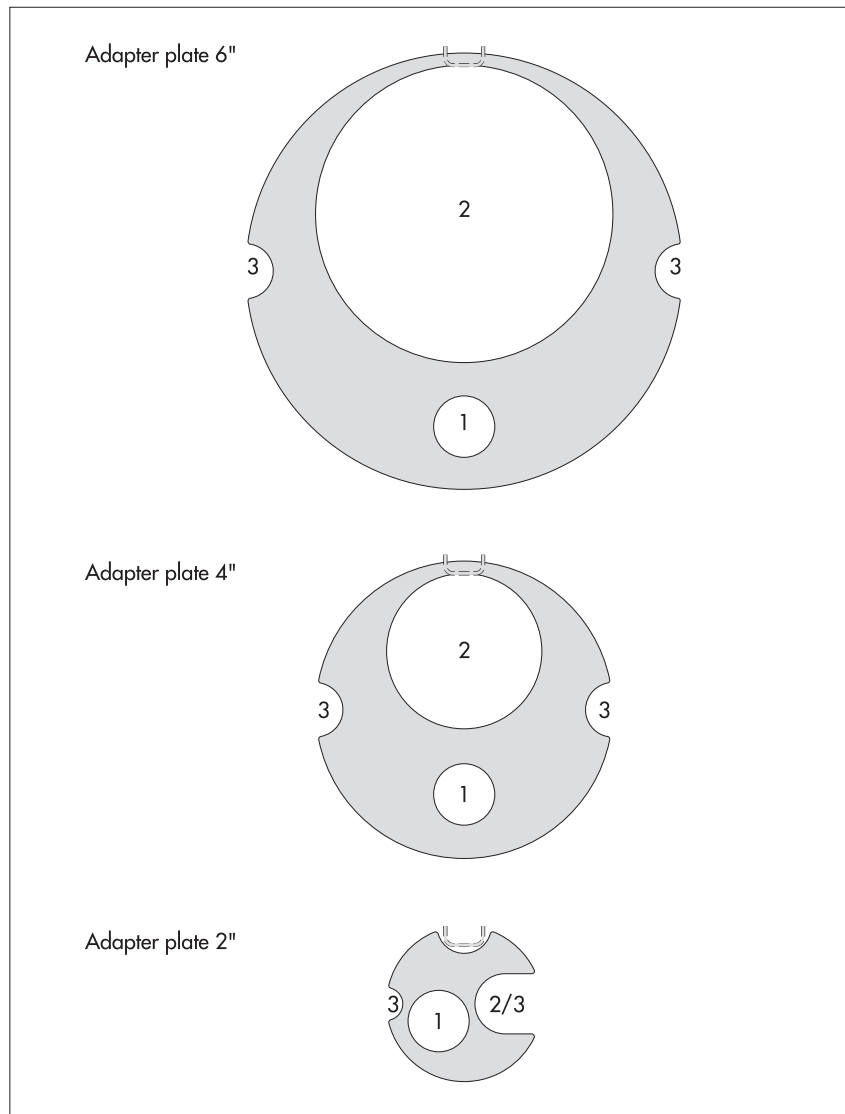


Fig. 4: Installation accessories – Part 2.

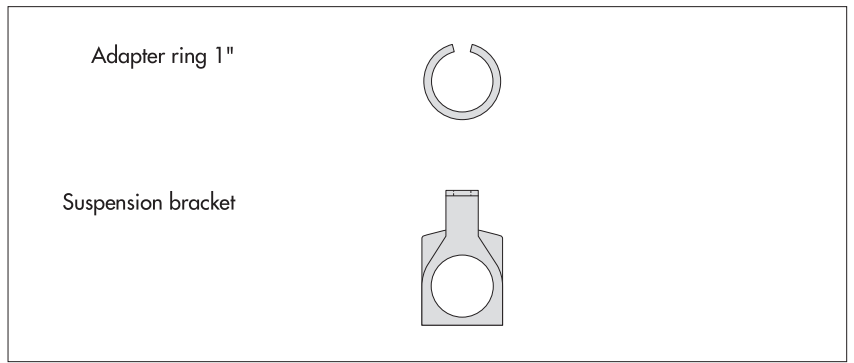
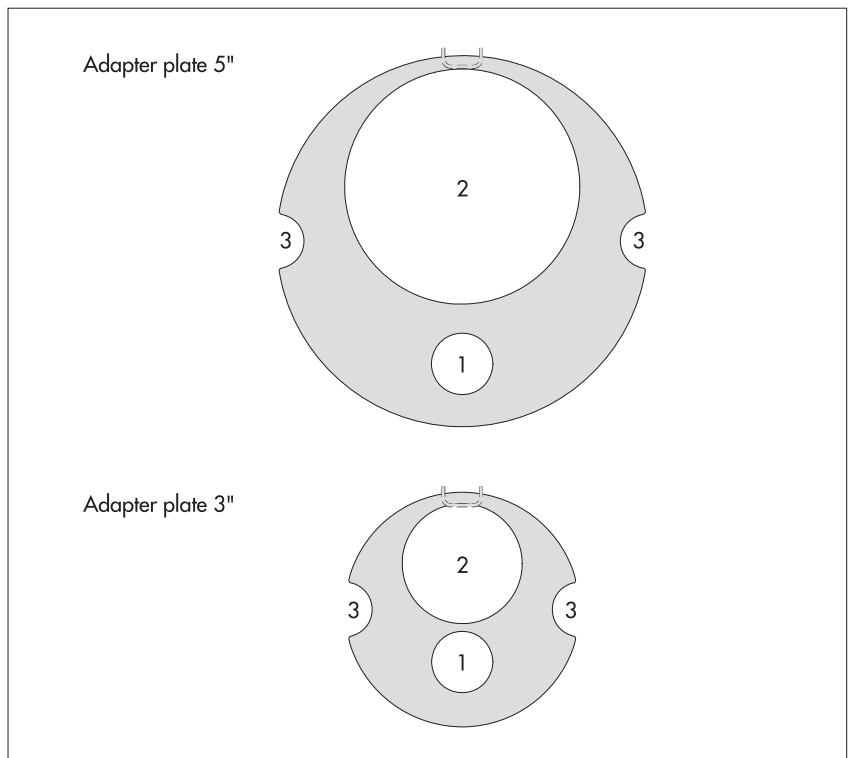


Fig. 5: Accessory adapter plates 3" and 5".

- 1 = hole for OTT Orpheus Mini
- 2 = hole for contact gauge
- 3 = Recess for screws on the top cap



6.1 Installing in 1" observation wells

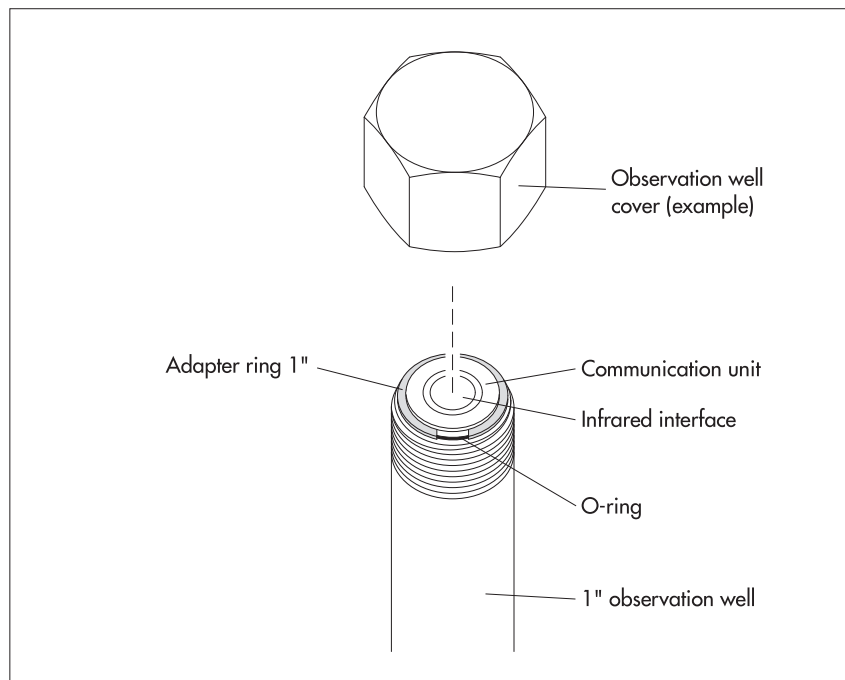
► Required accessories: Adapter ring for 1" observation wells.

Install the OTT Orpheus Mini as follows

- Preliminary work: If not already done, install batteries (see Chapter 5).
- Open the observation well cover.
- Determine the current depth with a contact gauge and make a note of it.
- Slide O-ring from the communication unit onto the pressure probe cable.
- Place adapter ring over the pressure probe cable and slide it until it comes to rest against the communication unit.
- Slide O-ring back onto the communication unit.
- Feed the pressure probe into the observation well.
- **Slowly** and **carefully** lower the pressure probe with the pressure probe cable!
- Feed the communication unit into the observation well until the O-ring sits on the observation well (see Figure 6).
- Set operating parameters (see Chapter 7).
- Close the observation well cover carefully. **Caution:** Do not damage the infrared interface (maintain correct spacing)!



Fig. 6: Installing the OTT Orpheus Mini in 1" observation well.



6.2 Installing in 2", 3", 4", 5" or 6" observation wells, top cap with adapter plate recess

- ▶ Required accessories: OTT top cap with appropriate sized recess and the matching adapter plate.

Install the OTT Orpheus Mini as follows

- Preliminary work: If not already done, install batteries (see Chapter 5).
- Open the top cap cover.
- Insert correctly sized adapter plate into top cap.
- Pass pressure probe through the hole in the adapter plate.
- **Slowly** and **carefully** lower the pressure probe into the observation well with the pressure probe cable (see Fig. 7).
- Pass the communication unit through the hole in the adapter plate until the O-ring sits on the adapter plate (see Fig. 7).
- Determine the current depth with a contact gauge and make a note of it.
- Set operating parameters (see Chapter 7).
- Close the top cap.



Fig. 7: Installing the OTT Orpheus Mini in 2", 3", 4", 5" or 6" observation wells.

Example: 2" observation well

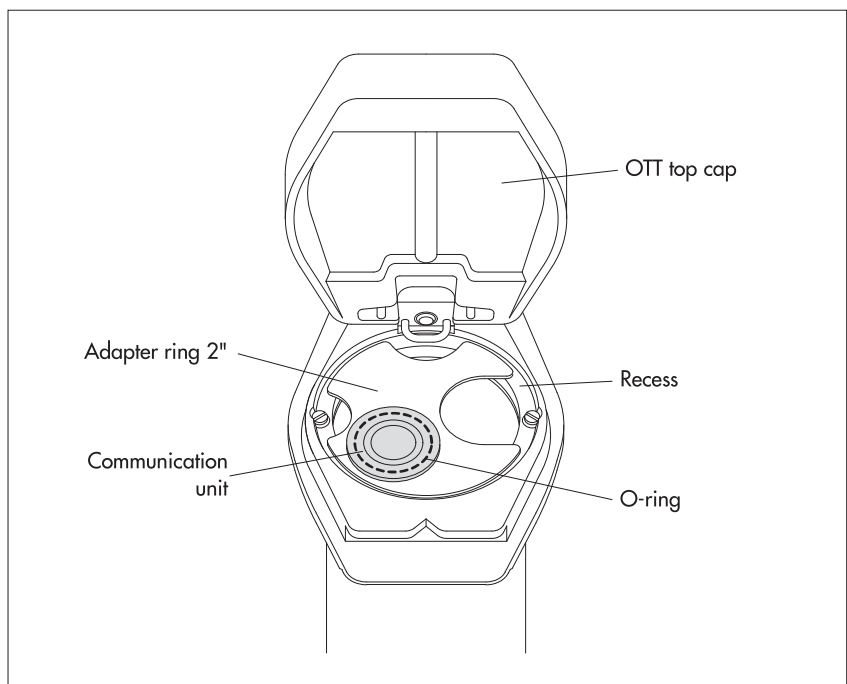
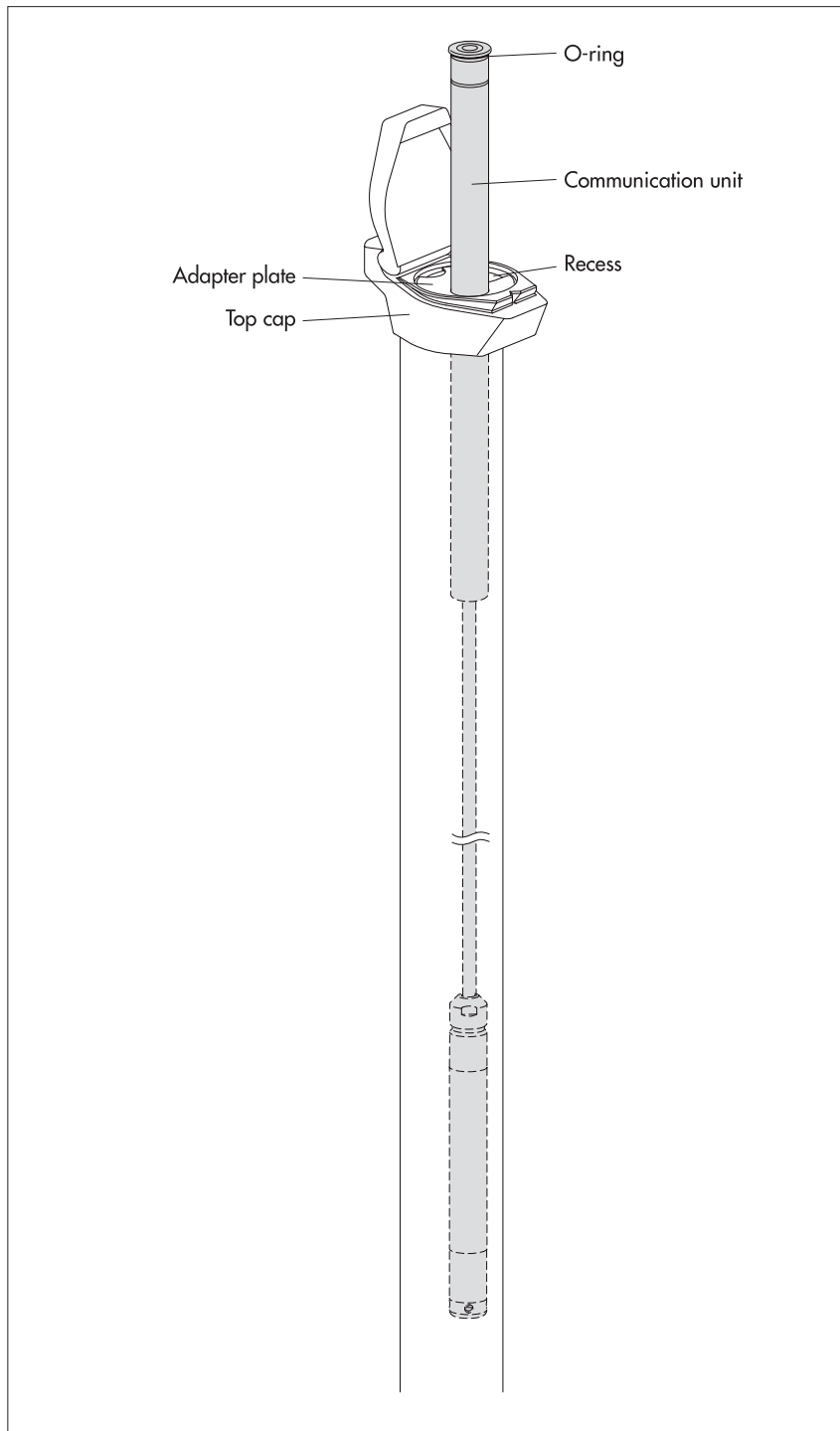


Fig. 8: Installing the OTT Orpheus Mini.



6.3 Installing in observation wells beginning at 2" in diameter, top cap without adapter plate recess

- ▶ Required accessories: Top cap with attachment screw for the upper part of the top cap. Suspension bracket.

Install the OTT Orpheus Mini as follows

- Preliminary work: If not already done, install batteries (see Chapter 5).
- Open the top cap cover.
- Remove the upper part of the top cap (see Fig. 9).
- Place the suspension bracket on the screw (see Fig. 9).
- Reattach the upper part of the top cap (see Fig. 9).
- Pass the pressure probe through the holes in the suspension bracket.
- **Slowly** and **carefully** lower the pressure probe into the observation well with the pressure probe cable.
- Pass the communication unit through the holes in the suspension bracket until the O-ring sits on the suspension bracket (see Fig. 10).
- Determine the current depth with a contact gauge and make a note of it.
- Set operating parameters (see Chapter 7).
- Close the top cap.



Fig. 9: Installing the suspension bracket in observation wells beginning at 2" diameter with a top cap without a recess.
Example: 4" observation well

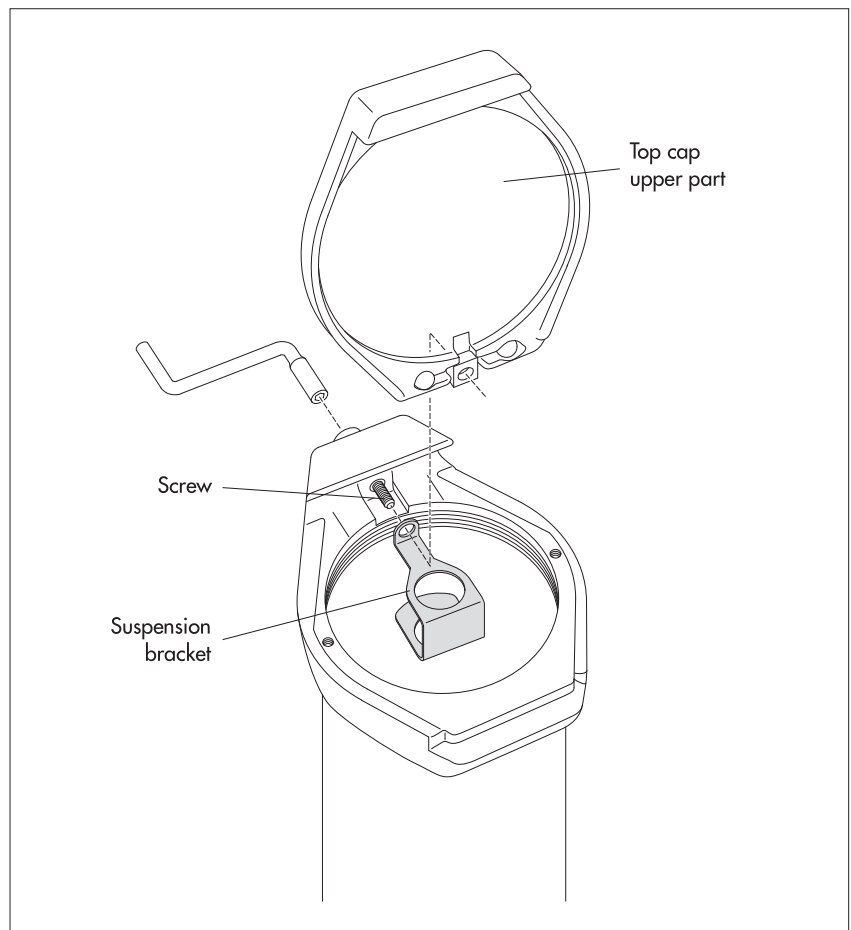
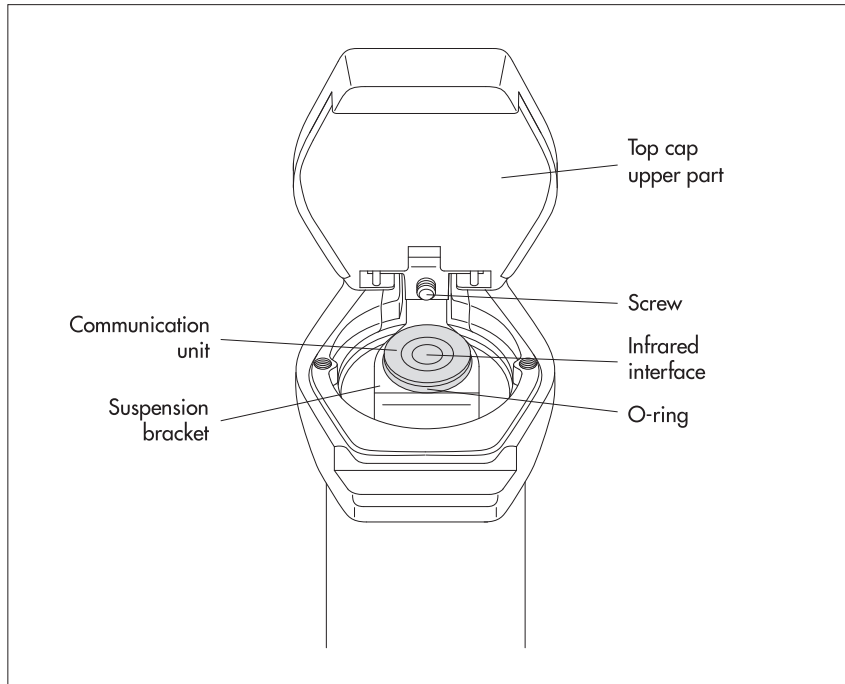


Fig. 10: Installing the OTT Orpheus Mini in observation wells beginning at 2" diameter with a top cap without a recess.

Example: 2" observation well



Caution: For top caps with installed suspension brackets, **never** completely remove the screw in the top cap! Otherwise, the suspension bracket and the OTT Orpheus Mini will fall into the observation well!

6.4 Installing in observation wells beginning at 2" diameter without a top cap

For this installation case, an individual solution to fasten the OTT Orpheus Mini must be found depending on the measurement station. Example: fix a suspension bracket with an M6 Allen bolt/nut laterally at the upper end of the observation well.

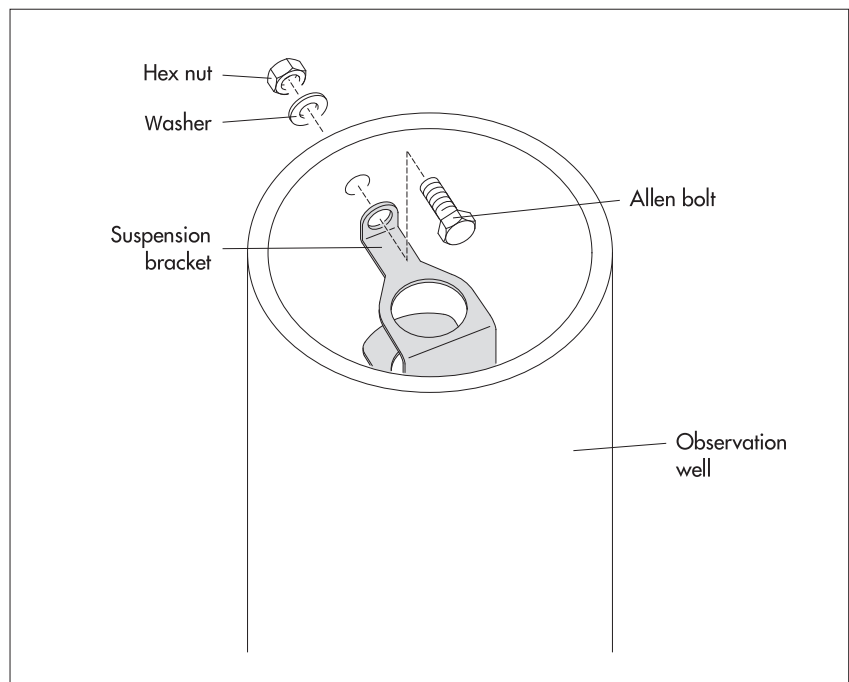
- Required accessories: suspension bracket, for example: M6 Allen bolt, washer and M6 hex nut (all in stainless steel).

Install the OTT Orpheus Mini as follows (example)

- Preliminary work: If not already done, install batteries (see Chapter 5).
- Make a hole (Ø 6.5 mm) laterally at the upper end of the observation well.
- Attach the suspension bracket to the observation well with an M6 Allen bolt, washer and M6 hex nut (see Fig. 11).
- Pass the pressure probe through the holes in the suspension bracket.
- **Slowly** and **carefully** lower the pressure probe into the observation well with the pressure probe cable.
- Pass the communication unit through the holes in the suspension bracket until the O-ring sits on the suspension bracket (see Fig. 10).
- Determine the current depth with a contact gauge and make a note of it.
- Set operating parameters (see Chapter 7).



Fig. 11: Example installation of an OTT Orpheus Mini in an observation well beginning at 2" diameter.
Proceed similarly for other local conditions!



7 Adjusting the OTT Orpheus Mini operating parameters

To adjust the OTT Orpheus Mini operating parameters, you will need the "OTT Orpheus Mini operating program" (WBSPL0.exe) PC software. This software is contained on the "OTT Orpheus Mini software" CD-ROM (accessory).

Hardware and software requirements: see CD insert.

7.1 Installing the OTT Orpheus Mini operating program

Install the OTT Orpheus Mini operating program as follows

- Insert the OTT Orpheus Mini software CD-ROM into the drive of the PC.
- Start the "setup.exe" file in the "\Software\English" ¹⁾ directory (e.g. double click on the file symbol) → the Setup Assistant opens and guides you through the installation.
- Follow the installation instructions on the screen.

¹⁾ Alternatively: "\Deutsch" or "\Français" or "\Español"

7.2 Setting up the PC/OTT Orpheus Mini communication link

In the following chapters, establishing a communication connection between the OTT Orpheus Mini and a PC is a pre-requisite for the subsequent steps. The following description illustrates the various methods of setting up this communication link.

The communication between the OTT Orpheus Mini and a PC is established wirelessly using invisible infrared light (IrDA interface).

Required accessories:

- ▶ OTT Duolink reading head ¹⁾ or
- ▶ OTT IrDA-Link USB reading head

¹⁾ with PCB version "b": see label on the connection line

Note

- ▶ Together with a modem and the OTT ITC intelligent top cap, it is possible to establish a remote communication connection. See online help for the OTT Orpheus Mini operating program.

How to establish a communication link

- Start the OTT Orpheus Mini operating program.
- Change the language for the OTT Orpheus Mini operating program as required: press function key "F3" (multiple times) until the required language appears.
- In the start window, press the "Setup device" button → the operating program displays the "Basic operation" window. No operating parameters for the OTT Orpheus Mini are visible yet.

– Setting up a communication link with the OTT Duolink reading head:

- Connect the OTT Duolink reading head to a serial PC port (COM1, etc.).
- Direct the OTT DuoLink reading head at the OTT Orpheus Mini infrared interface (see Fig. 12).
- In the OTT Orpheus Mini operating program, select the communication path "IrDA – OTT DuoLink" and the serial port used (COM1, ...).

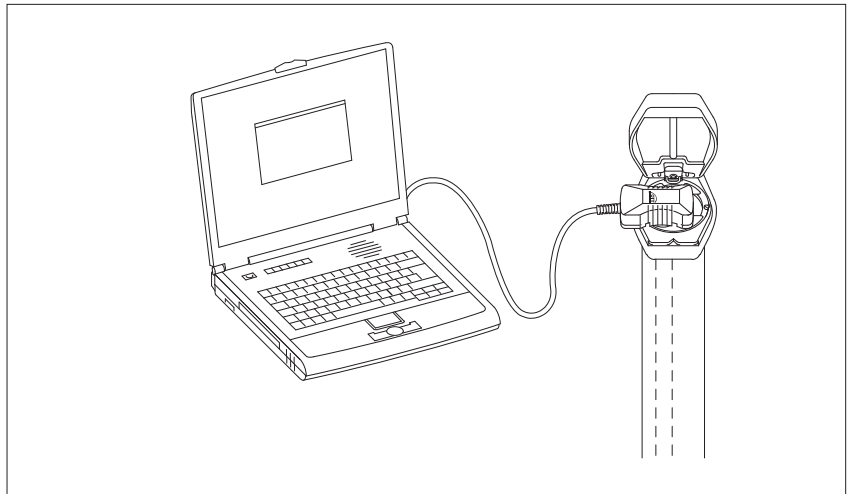
- Setting up a communication link with the OTT IrDA-Link USB reading head:
 - Connect the OTT IrDA-Link USB reading head to a USB port on the PC. (USB interface drivers must be installed – see separate installation instructions.)
 - Place the OTT IrDA-Link USB reading head on the OTT Orpheus Mini infrared interface (see Fig. 12).
 - Select the communication path "IrDA – OTT IrDA-Link" in the OTT Orpheus Mini operating program.

Notes

- ▶ The integrated infrared interface of a PC (standard for many notebooks) can only be used with the Windows 95 and Windows NT operating systems!
- ▶ The OTT Orpheus Mini infrared interface has a radiation angle of approx. $\pm 15^\circ$.
- ▶ **Caution:** OTT Orpheus Mini connected to OTT ITC: Establishing a communication connection can take up to a minute! (This is always the case if the OTT Orpheus Mini attempts to communicate with the OTT ITC (e.g. SMS message) and the OTT ITC is open at the time.)



Fig. 12: Establishing a communication link PC/OTT Orpheus Mini.



7.3 Adjusting the OTT Orpheus Mini operating parameters

How to set the OTT Orpheus Mini operating parameters

- Click the "Connect" button (alternatively: menu "OTT Orpheus Mini", function "Connect") → the operating program reads the current operating parameters of the OTT Orpheus Mini.
- Adjusting operating parameters (see pages 21/22).
- If necessary: "Set up cyclical data transfer using SMS messages in combination with the intelligent top cap OTT ITC" or "Set up cyclical data transfer using GPRS in combination with the intelligent top cap OTT ITC" (see page 20).



- Set date/time: adjust the proposed PC date/time or individually set date/time using "Set date/time" (see also Chapter 13).

Caution: The operating program automatically corrects any summer time PC adjustments.

- Click the "Connect" button → "Warning: Reset the OTT Orpheus Mini and delete data memory additionally?" Confirm with "Yes" (recommended for initial installation and reinstallations).

Caution: All measured values collected until now will be permanently lost!

- Check the level of the measured value set (pressure sensor). See Chapter 8.
- Remove the OTT DuoLink.
- Close the top cap/observation well cover.



If required: Set up cyclical data transfer with SMS text message in combination with an OTT ITC intelligent top cap ¹⁾

- Activate check box "Modem/ITC connected".
- Activate check box "SMS data transmission active".
- If necessary: Activate the "Authorize Roaming" check box and/or "Store GSM signal strength".
- Click on the "Settings ITC" button → the operating program starts an Assistant for setting all the necessary operating parameters.
- Enter the receiver phone no. for the data SMS. (phone number of a large account or for a PC with GSM modem.)
- Click on the "Next" button.
- If necessary: enter SIM PIN (4-digit) of the SIM card.
- Click on the "Next" button.
- Set or enter the SMS-C phone no. of the network operator. (Phone number of the SMS service center. The SMS-C phone number is normally already saved on the SIM card → in this case, set to "SIM card".)
- Click on the "Next" button.
- Select the mode of SMS transmission.
- Click on the "Next" button.
- Set the interval for transmission of the storage values.
- Click on the "Next" button.
- Set the offset time for the transmission interval.
- Click on the "Exit" button.
- Check the settings afterwards and correct as necessary.
- Click on the "OK" button.

If required: Set up cyclical data transfer using GPRS in combination with an OTT ITC intelligent top cap ¹⁾

- Activate check box "Modem/ITC connected".
- Activate check box "GPRS data transmission active".
- If necessary: Activate the "Authorize Roaming" check box and/or "Store GSM signal strength".
- Click on the "Settings ITC" button → the operating program opens a window with several tabs for setting all the necessary operating parameters.
- Make the required settings in the "General", "Operator", "FTP" and "Time sync." tabs. **Caution:** The SIM PIN for the SIM card used should be deactivated! Otherwise enter the SIM PIN for advanced operation in the "Modem/ITC" tab.
- Click on the "OK" button.

¹⁾ For further information, refer to the online help

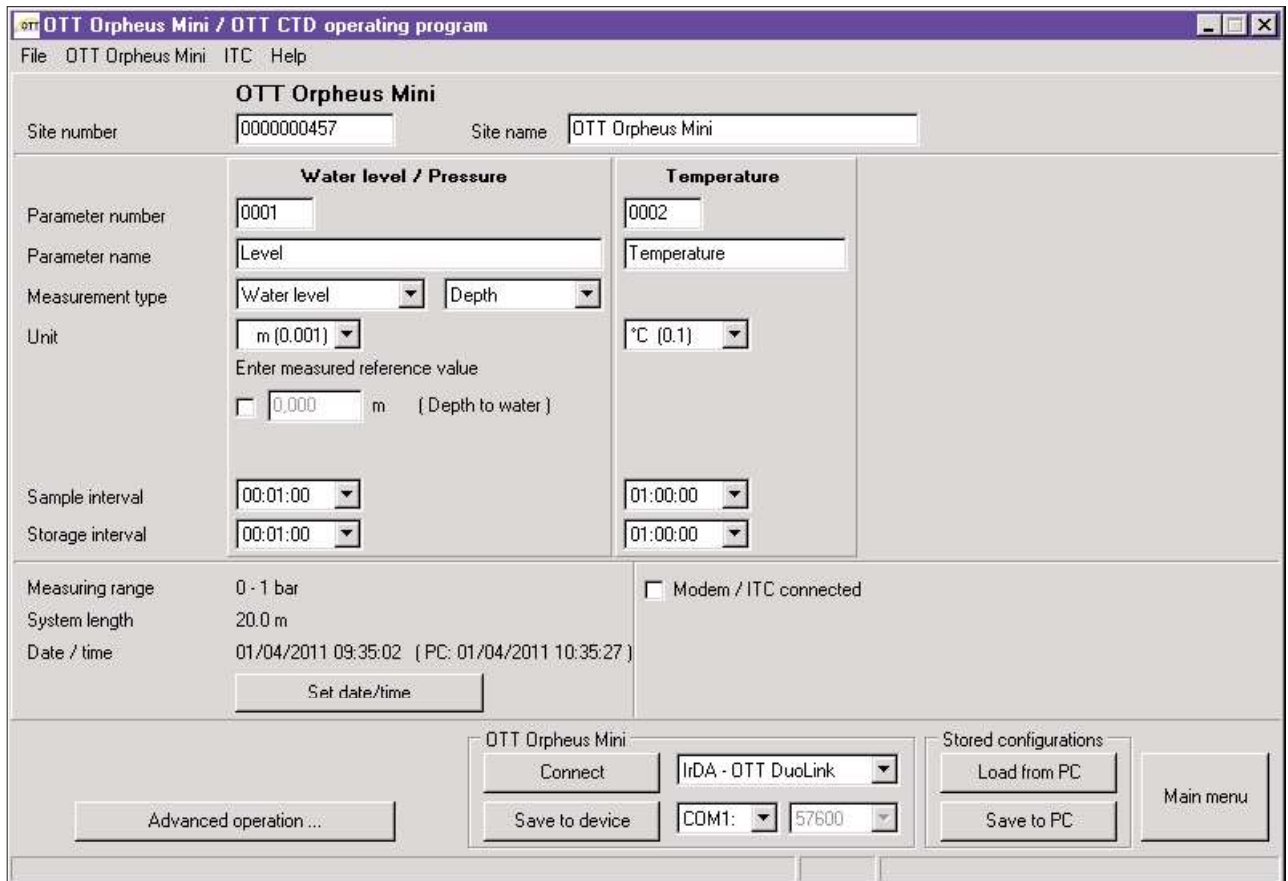


Fig. 13: Setting the OTT Orpheus Mini operating parameters with the OTT Orpheus Mini operating program. The "Advanced operation ..." button is only visible if the "Advanced operation ..." check box is activated in the "Options" window.

OTT Orpheus Mini

- ▶ Site number station number, 10 characters (alphanumeric)
- ▶ Site name station name, max. 40 characters (alphanumeric)

Water level/pressure · temperature

- ▶ Parameter number sensor number, 4 characters (alphanumeric)
- ▶ Parameter name sensor name, max. 40 characters (alphanumeric)
- ▶ Measurement type Water level: depth or level · pressure
- ▶ Unit + – Pressure sensor: m, cm, feet, inch · bar, psi
- Temperature: °C · °F
- Decimal places fixed specification, depending on the units
- m: 3 or 2; cm: 1 or 0; feet: 2 or 1, inch: 1 or 0
- bar: 4 or 3, psi: 3 or 2
- °C: 2 or 1, °F: 2 or 1
- ▶ Enter measured reference value For "Water level · Depth" measurement type: Enter contact gauge value
- Enter measured reference value For "Water level · Level" measurement type: Enter staff gauge value (establish reference to level zero)
- Enter measured reference value For "Pressure" measurement type: Enter reference pressure
- ▶ Sample interval 1 s ... 24 h: time delay at which the OTT Orpheus Mini records measured values and stores them (store only if sample interval = mean interval). The sample interval setting is at a fixed time raster (e.g. sample interval of 10 minutes, time raster ..., 00:10, 00:20, 00:30,
- ▶ Storage interval 1 s ... 24 h: time period for which the OTT Orpheus Mini calculates an arithmetic mean from the sample interval values and stores it. The storage interval must be equal to or larger than the sample interval. The sample interval must divide exactly into the storage interval (e.g. sample interval: 10 minutes; storage interval: 1 hour → the OTT Orpheus Mini stores an arithmetic mean from 6 sample interval values each hour).

Other displays in the "Basic operation" window

- ▶ Measuring range Measuring range of the pressure probe. See Fig. 1
- ▶ System length Cable length including communication unit / pressure probe (see Fig. 1)
- ▶ Date/time Internal date/time of the OTT Orpheus Mini

Detailed information on the "Advanced operation" function can be found in the online help.

Factory settings

OTT Orpheus Mini

- ▶ Site number Serial number of the OTT Orpheus Mini
 - ▶ Site name Orpheus Mini 1
- | | Water level/Pressure | Temperature |
|--|-----------------------------|--------------------|
|--|-----------------------------|--------------------|

In addition, the OTT Orpheus Mini records the supply voltage at a sample and storage interval of 1 hour (see online help).

7.4 Saving/loading the OTT Orpheus Mini configuration

The functions "Load from PC" and "Save to PC" are provided to archive the OTT Orpheus Mini configuration on a PC. For example, you can provide multiple OTT Orpheus Minis with the same configuration.

To store a configuration, proceed as follows

- Select the "Save to PC" function in the "File" menu (or use the button) → the operating program stores the configuration under the name and number of the OTT Orpheus Mini. When changes are made to a configuration that has already been saved, confirm with "Yes" in the window "Warning. This configuration name already exists! Replace?" (otherwise, store the configuration under another measurement station number).

To load a configuration, proceed as follows

- Select the "Load from PC" function in the "File" menu (or use the button).
- For an already opened configuration, confirm "Ignore changes?" message with "Yes" (if necessary, save configuration previously).
- In the "Stored OTT Orpheus Mini configurations" window, select the configuration by double-clicking it → the operating program loads the configuration.

7.5 Importing/exporting the OTT Orpheus Mini configuration

To transfer an Orpheus Mini configuration via diskette or e-mail, for example, the functions Import/Export are available. Likewise, a configuration can be sent via Export as an XML file to the OTT Hydras 3 user software. In the process, the OTT Hydras 3 user software applies all of the measurement station/sensor configurations to an OTT Hydras 3 operating range.

Available export/import formats

- ▶ Export ("BIN" file)
- ▶ Export to a text file
- ▶ Export for the OTT Hydras 3 user software
- ▶ Import ("BIN" file)

The operating program stores all the necessary data of a configuration depending on the export type in its own "*.BIN", "*.TXT" or "*.XML" file.

To export a configuration (*.BIN" file)

This export type is required to transfer an OTT Orpheus Mini configuration as a "*.BIN" file. The configuration can be read back into the OTT Orpheus Mini operating program via the "Import configuration" function.

- Select the "Configuration Export" function in the "File" menu.
- In the "OTT Orpheus Mini – export configuration" window, edit the file name if necessary, select the memory location and click on "Store" → the operating program stores the configuration in a "*.BIN" file.

Note

- ▶ The file name of the "*.BIN" file is arbitrary. The operating program suggests a combination of station number and station name.

To export a configuration (text file)

This export type is required to transfer an OTT Orpheus Mini configuration for documentation purposes as a "*.TXT" file. This "*.TXT" file can be opened with any text editor or text processing program.

- Select the "Export Textfile" function in the "File" menu.
- In the "OTT Orpheus Mini – Configuration" window, edit the file name if necessary, select the memory location and click on "Store" → the operating program stores the configuration in a "*.TXT" file.

Note

- ▶ The file name of the "*.TXT" file is arbitrary. The operating program suggests a combination of station number and station name.

To export a configuration (OTT Hydras 3)

This export type is required to transfer an OTT Orpheus Mini configuration to the OTT Hydras 3 application software. This "*.XML" file is read in via the Hydras 3 function "File", "Import Station Configuration (XML)".

- Select the "Export Hydras 3 (XML)" function in the "File" menu.
- In the "OTT Orpheus Mini – XML configuration" window, check the file name, select the memory location and click on "Store" → the operating program stores the configuration in a "*.XML" file.

Note

- ▶ The file name of the "*.XML" file is arbitrary. To avoid affecting later data transfer, it should not be changed. The operating program proposes a combination of measurement station number and measurement station name along with the ending "*.STATION.XML".

To import a configuration

- Select the "Import Configuration" function in the "File" menu.
- For an already opened configuration, confirm "Ignore changes?" message with "Yes" (if necessary, save configuration previously).
- In the "OTT Orpheus Mini – Configuration Import" window, select the appropriate "*.BIN" file and click on "Open" → the operating program reads in the configuration from the *.BIN" file. (Prior to this, save any configuration that is already open).

Note

- ▶ The standard factory configuration is located on the "OTT Orpheus Mini Software" CD-ROM.

8 Determining and displaying instantaneous values (Observer function)

The operating program has a so-called "Observer" to enable the determination and display of instantaneous values. The Observer also makes it possible to enter a manually determined measurement, e.g. contact gauge value, into the data-logger (Observer registration).

Various options can be set concerning the observer:

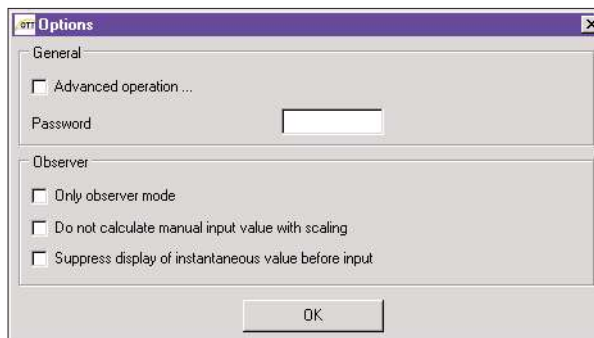
- ▶ Selection possibility in the start window of the OTT Orpheus Mini operating program:
 - Direct and exclusive calling of the Observer or
 - Opening of a window to set the operating parameters
- ▶ Effect of an optionally entered Observer registration (pressure sensor):
 - The Observer registration is only used as a check value or
 - the Observer registration leads to a value change (set offset)
- ▶ Suppress the display of the instantaneous value (pressure sensor) prior to the input of an observer registration

Set the Observer options as follows

- Start the OTT Orpheus Mini operating program.
- Select the "Options" function in the "File" menu. (If the option dialog cannot be called, a password must first be entered. See Chapter 12)
- Activate checkbox(es) of the required Observer option(s):
 - Only observer mode
 - Do not calculate manual input value with scaling (only check value/no value change)
 - Suppress display of instantaneous value before input
- Click on the "OK" button.

Fig. 14: Input window to establish options for the observer.

For further information on protecting the OTT Orpheus Mini operating program with a password, see Chapter 12.



The combination of "Only observer mode" with a password protects the operating program against unauthorized input of operating parameters.

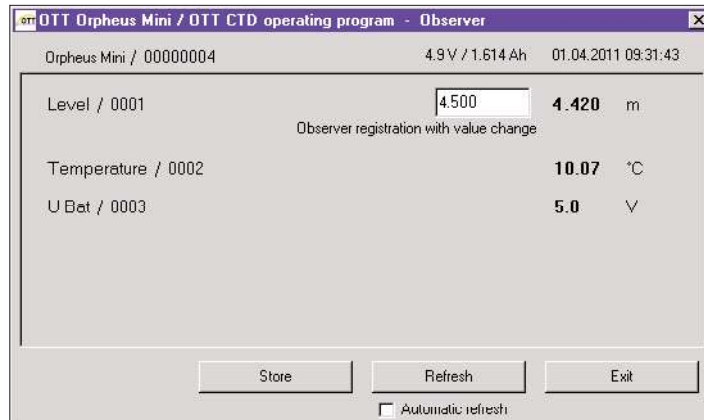
The "Advanced operation ..." option displays an additional button in the window for setting the operating parameters.

Call the Observer function as follows

- Start the OTT Orpheus Mini operating program.
- Set up the PC/OTT Orpheus Mini communication link (see Chapter 7.2).
- Depending on the option set: In the start window of the OTT Orpheus Mini operating program, either select "View Instantaneous values" or "Setup Device" and in the subsequent window select the "View Instantaneous values" function in the "OTT Orpheus Mini" menu → the OTT Orpheus Mini starts an instantaneous value measurement and the "Observer" window opens:

Fig. 15: Display/input window "OTT Orpheus Mini operating program – Observer".

The window displays the current instantaneous value for all measurements. Furthermore, the window displays the sensor number/name, the current battery voltage, the amount of power used from the batteries up to now, and the date and time.



- If necessary: Input Observer registration into the entry field of the pressure sensor and click on the "Store" button.
- If necessary: Start new instantaneous value measurement: click on the "Refresh" button (" Automatic refresh" starts an instantaneous value measurement every 5 seconds).
- End the Observer: click on the "Exit" button and close the OTT Orpheus Mini operating program.

Notes

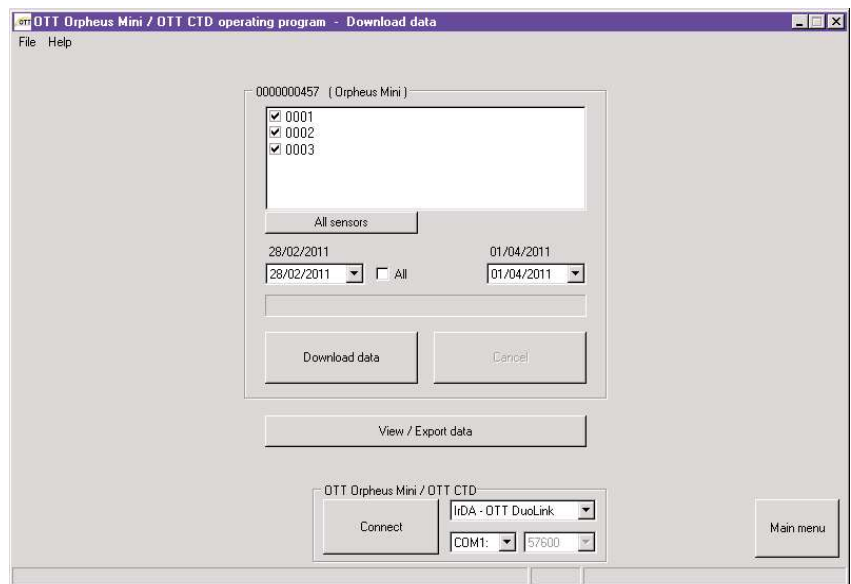
- ▶ The OTT Orpheus Mini stores each call of the Observer function in an info channel with the date and time of day. After reading in and accepting into the OTT Hydras 3 user software, this information can be displayed in the evaluation window of a sensor using the "Info Data" > "Station" > "Show" function ("Observer registration general"). They are likewise visible via the "View/Export data" > "Table" function of the OTT Orpheus Mini operating program.
- ▶ If the " Do not calculate manual input value with scaling" check box in the "Options" window is activated, the OTT Orpheus Mini also stores the input check value, as well as the current instantaneous value. After reading in and accepting into the OTT Hydras 3 user software, this information can be displayed in the evaluation window of a sensor using the "Info Data" > "Sensor" > "Show" function ("Observer registration with check value). They are likewise visible via the "View/Export data" > "Table" function of the OTT Orpheus Mini operating program.

9 Downloading data

Read out data as follows (on location)

- Start the OTT Orpheus Mini operating program.
- Set up the PC/OTT Orpheus Mini communication link (see Chapter 7.2).
- Press the "Download Data" button in the start window → the operating program displays the available sensors and the possible period for downloading in the "Download data" window. If these values are not visible: Press the "Connect" button.
- Select the required sensors or "All sensors".
- Select the required read period or "All". (The row above the entry field shows the complete time period for which there are data.)
- Click the "Download data" button → the operating program copies the measured values from the OTT Orpheus Mini to the PC. The data are then available in the program directory of the operating program.
- If necessary: Display measurements via the "View/Export data" function and/or export to a software application.
- Click on the "Main menu" button.

Fig. 16: Downloading data.



Alternative possibilities for downloads:

- ▶ **With the OTT Orpheus Mini operating program and an OTT ITC**
In conjunction with a modem and the OTT ITC intelligent top cap, it is also possible to establish a remote communication link with a modem. See the online help.
- ▶ **Using the "OTT Hydras 3 (Basic)" PC application software**
Select the required station in the tree view with a double click. Make the appropriate settings in the subsequent window and click on the "Start" button. For further information, see the online help for the OTT Hydras 3 (Basic).
- ▶ **With a Pocket PC and the "OTT Hydras 3 Pocket" software.**
For further information, see the OTT Hydras 3 Pocket brief instructions.

10 Exporting data

After reading out into the OTT Orpheus Mini operating program, the measurement and information data can be found in the "RAWDATA" sub-directory of the program directory (standard setting: "C:\Program files\OTT\OrpheusMini_CTD\RAWDATA"). To transfer to an external application, you can export the data in various formats:

- ▶ CSV – structured text file in CSV format (Comma-Separated Values)
- ▶ Excel – Microsoft Excel spreadsheet program
- ▶ OTT Hydras 3 – raw data format for the OTT Hydras 3 user software
- ▶ OTT MIS – OTT-specific file format for automatically importing into the measurement database of the OTT Hydras 3 user software

Using the "Export Options" dialog window, you can set the location for saving and, with CSV format, various export parameters also. The data remain in the sub-directory after export. If required, you can specifically delete them.

Info data can only be exported to the OTT Hydras 3 user software.

How to export the data

Step 1 – make export settings:

- Click on the "View/Export data" button in the start window.
- In the "View/Export data" window, click on the "Export Options" button (see Figure 17).
- Set the path to the location of the required export format (standard setting: "C:\Program files\OTT\OrpheusMini_CTD\Export"). No path can be set for the "Excel" format: the operating program automatically opens Microsoft Excel during the export and displays the data in a new worksheet. In format "Hydras 3" the "?" button can be used to automatically find the installation directory of OTT Hydras 3.
- In format "CSV": set the "Field separator", "Dec. separator", "Date format" and "Time format". For the date and time formats, the typical Windows placeholders can be used.

Step 2 – Exporting data:

- Select the required station/sensor in the list (multiple selection possible).
- Click on the "Export ..." button.
- Confirm message about successful export with "OK".
- If required, delete the exported data: click on the "Delete" button. (Station/sensor must still be selected.)
- Confirm the message with "Yes".

11 Displaying data

After downloading to the OTT Orpheus Mini operating program, the measurement and information data can be found in the the "RAWDATA" sub-directory of the program directory (standard setting: "C:\Program files\OTT\OrpheusMini_CTD\RAWDATA"). For an initial check, you can display the data graphically and numerically and print them out if required.

How to display data graphically

- Click on the "View/Export data" button in the start window.
- Select the required station/sensor in the list (multiple selection possible – info data can only be displayed numerically).
- Click on the "Graph" button → the operating program displays the window with the graphical view of the selected data;
 - Show ruler: function key "F12". Move ruler: arrow keys ← →.
 - Zoom in: draw the required area by dragging with the mouse.
 - Zoom out: function key "F12".
- Print graph: Select the "Print" function in the "File" menu.
- Close graph: Select the "Exit" function in the "File" menu (or)

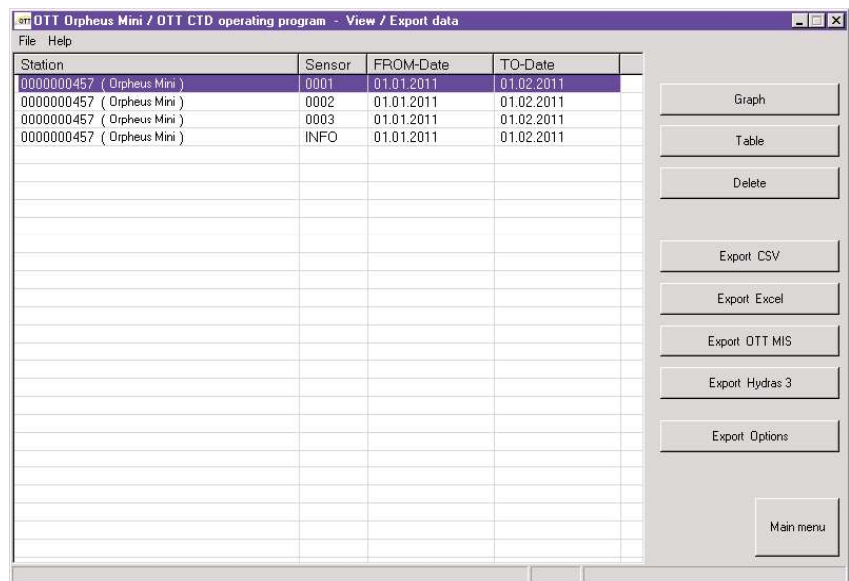
How to display data numerically

- Click on the "View/Export data" button in the start window.
- Select the required station/sensor in the list (multiple selection possible).
- Click on the "Table" button → the operating program displays the window with the numerical view of the data in the OTT data protocol;
 - Only display measured values: select "Values".
 - Highlight special areas (only with information data): Select "Observer & Operation", "Alarm & Limit", "Communication & Error", "Error & Service log".
- Printing the numerical display: Select the "Print" function in the "File" menu.
- Closing the numerical display: Select the "Exit" button (or)

How to delete the data

- Select the required station/sensor in the list (multiple selection possible).
- Click on the "Delete" button.
- Confirm the message with "Yes".

Fig. 17: Viewing/exporting data.



12 Protecting the OTT Orpheus Mini and OTT Orpheus Mini operating program with a password

To prevent any unauthorized input of operating parameters, you can

- ▶ protect the OTT Orpheus Mini and
- ▶ OTT Orpheus Mini operating program

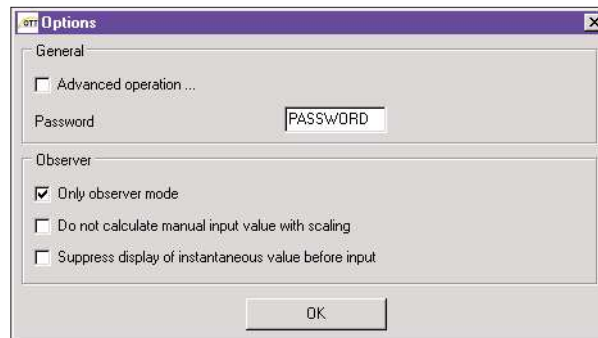
with a password for each.

How to protect the OTT Orpheus Mini operating program with a password

- Start the OTT Orpheus Mini operating program.
- Select the "Options" function in the "File" menu.
- Enter a maximum eight-digit password in the "Password" input field. Permitted characters 0 ... 9, A ... Z. (This password is independent of the OTT Orpheus Mini password.)
- Activate "Only observer mode" check box.
- Click on the "OK" button.
- Close the operating program → the operating program is now protected: the "Setup device" button in the start window is no longer visible.

Fig. 18: Protecting the OTT Orpheus Mini operating program with a password – input window to provide a password.

A password-protected operating program only makes sense if the operating program starts in Observer mode (activate "Only observer mode" check box)!



Caution:

- ▶ If the password is lost, you can no longer configure or parameterize the OTT Orpheus Mini on this PC. If this occurs, contact the OTT HydroService.
- ▶ The password assigned here only relates to the OTT Orpheus Mini operating program installed on this PC. The OTT Orpheus Mini itself is not protected by this!

How to release a password-protected OTT Orpheus Mini operating program

- Start the OTT Orpheus Mini operating program.
- Select the "Options" function in the "File" menu.
- Enter the password in the "OTT Orpheus Mini" window.

Fig. 19: Releasing OTT Orpheus Mini operating program – password input window.

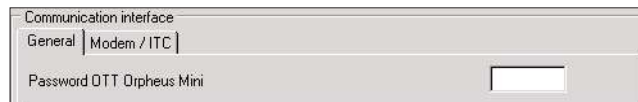


- Click on the "OK" button.
- Deactivate the "Only observer mode" check box.
- Remove the entry in the "Password" field.
- Click on the "OK" button → the operating program is released.

How to protect the OTT Orpheus Mini with a password:

- Start the OTT Orpheus Mini operating program.
- Set up the PC/OTT Orpheus Mini communication link (see Chapter 7.2).
- Click on the "Setup Device" button in the start window.
- Click on the "Advanced operation ..." button.
(Button not visible? → activate the "Advanced operation ..." check box in the "Options" function in the "File" menu.)
- Click on the "Connect" button.
- In the tree view, select "Communication interface".
- Enter a maximum eight-character password in the "Password OTT Orpheus Mini" input field. Permitted characters 0 ... 9, A ... Z. (This password is independent of the OTT Orpheus Mini operating program password.)
- Click on the "Connect" button.
- Warning: "Reset OTT Orpheus Mini and delete data memory additionally?" Confirm with "No" → the OTT Orpheus Mini is now protected against unauthorized operation.

Fig. 20: Protecting the OTT Orpheus Mini operating program with a password – input window to provide a password.



Caution: If the password is lost, you can no longer configure or parameterize the OTT Orpheus Mini. If this occurs, contact the OTT HydroService.

How to release a password-protected OTT Orpheus Mini

- Start the OTT Orpheus Mini operating program.
- Set up the PC/OTT Orpheus Mini communication link (see Chapter 7.2).
- Click on the "Setup Device" button in the start window.
- Select the "Enter password" function in the "OTT Orpheus Mini" menu.
- Enter password.
- Click on the "OK" button.
- Confirm message "Password accepted! OTT Orpheus Mini unlocked!" with "OK".
- Click on the "Connect" button → the operating program downloads the current OTT Orpheus Mini operating parameters.

Fig. 21: Releasing the OTT Orpheus Mini – password input window.



13 Date and time settings

The internal clock of the OTT Orpheus Mini is a high-accuracy, real-time clock. It runs as soon as batteries are installed in the OTT Orpheus Mini. After the batteries are removed, the clock will continue to run for approximately 10 more minutes. For longer periods of power interruption, the OTT Orpheus Mini loses the date and time. When batteries are re-installed, the OTT Orpheus Mini assumes the date and time of the last stored measured value, with one minute added to the stored time. The date and time are set using the OTT Orpheus Mini operating program.

Set the date and time as follows

- Start the OTT Orpheus Mini operating program.
- Set up the PC/OTT Orpheus Mini communication link (see Chapter 7.2).
- Click on the "Setup Device" button in the start window.
- Select the "Date/time" function in the "OTT Orpheus Mini" menu (alternatively: button "Set date/time" → the operating program reads the date and time out from the OTT Orpheus Mini and opens the "OTT Orpheus Mini – Date/time" window.

Fig. 22: OTT Orpheus Mini date and time settings.



- If necessary: click on the "Refresh" button → the OTT Orpheus Mini reads out the date and time again.
- If necessary: set the values required in the two input fields.
- Click on the "Set date/time" button → the operating program sets the OTT Orpheus Mini date and time to the PC time/date or the values set.
- Click on the "Exit" button.



Caution: If the PC is on summer time mode (ID: PC (DST)), the operating program automatically uses the standard time without summer correction (winter time). To receive continuous time series, it is a good idea not to use summer time in the OTT Orpheus Mini.

In connection with a GPRS remote data transfer and the "Time synchronization" function, it is necessary to refer the time to UTC/GMT and to set the time zone of the station in the advanced operation, "OTT Orpheus Mini" window (see online help).

14 Deleting data memory



Caution: The stored measured values in the OTT Orpheus Mini are permanently lost when deleting the data memory! If necessary download measured values before deleting!

Delete the data memory as follows

- Start the OTT Orpheus Mini operating program.
- Set up the PC/OTT Orpheus Mini communication link (see Chapter 7.2).
- Click on the "Setup Device" button in the start window.
- Select the "Delete data memory" function in the "OTT Orpheus Mini" menu.
- Acknowledge the warning "Are you sure you want to delete data memory?" with "Yes" → the operating program deletes the complete data memory of the OTT Orpheus Mini (all measurement channels including the info channel). The OTT Orpheus Mini then determines and stores the water level and the water temperature again using the sample interval settings set.

15 Updating OTT Orpheus Mini firmware

If required, you have the possibility to update the OTT Orpheus Mini firmware (operating system). This makes sense if, for example, devices delivered at different times are to receive the same operating system version. Updating is carried out via the OTT Orpheus Mini operating program. According to availability, an updated version of the OTT Orpheus Mini firmware can be found on the internet site "www.ott.com" in the "myOTT" area.

How to update the firmware

- Download the new version of the firmware (File: e.g. "spl01m_V1.40.1.bin") from the internet site.
- Move the file "spl01m_VX.XX.X.bin" to the directory in which the OTT Orpheus Mini operating program is located.
- Set up the PC/OTT Orpheus Mini communication link (see Chapter 7.2).
- Select the "Firmware update" function in the "OTT Orpheus Mini" menu.
- Confirm message with "Yes" → the operating program copies the new firmware to the OTT Orpheus Mini. The OTT Orpheus Mini then determines and stores the water level and the water temperature again using the sample interval settings set.



Caution: During the update, avoid breaking the communication link (e.g. by accidentally removing the OTT DuoLink from the infrared interface of the OTT Orpheus Mini.) If the communication link is broken, the firmware will no longer run! In the same way, no other programs should be started or files opened during the copying process!

Notes

- ▶ If there are multiple ".bin" files in the directory, you will have to manually select the required file.
- ▶ The measurements saved in the OTT Orpheus Mini are not lost after an update.

16 Maintenance work

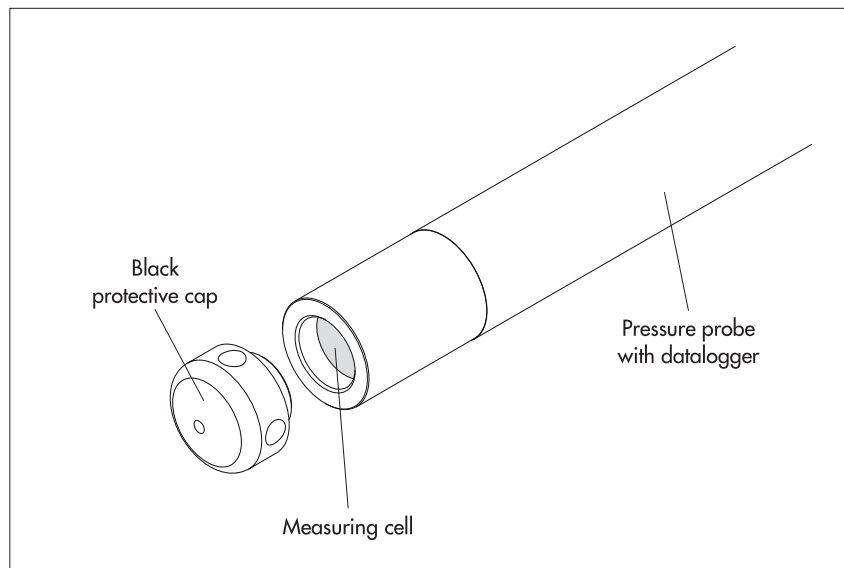
16.1 Cleaning the pressure probe

Recommended interval: every 12 months
With difficult local measuring conditions (heavy deposits): as required every 4 to 6 months.
(Measurements that are inaccurate or not plausible indicate a contaminated pressure sensor.)

How to clean the pressure probe

- Open the top cap/observation well cover.
- Completely remove the OTT Orpheus Mini from the observation well.
- Remove the black protective cap.
- Clean the pressure sensor carefully using a brush and water. Lime scale deposits can be removed using a common household scale remover. Make sure to follow the use and safety instructions of the scale remover!
- Rinse the pressure probe **thoroughly** with clear water!
- Reattach the black protective cap.
- Reinstall OTT Orpheus Mini (see Chapter 6).
- Determine current reference value with a contact gauge and enter it (see Chapter 7.3 or 8).
- Close the top cap/observation well cover.

Fig. 23: Cleaning the pressure probe.



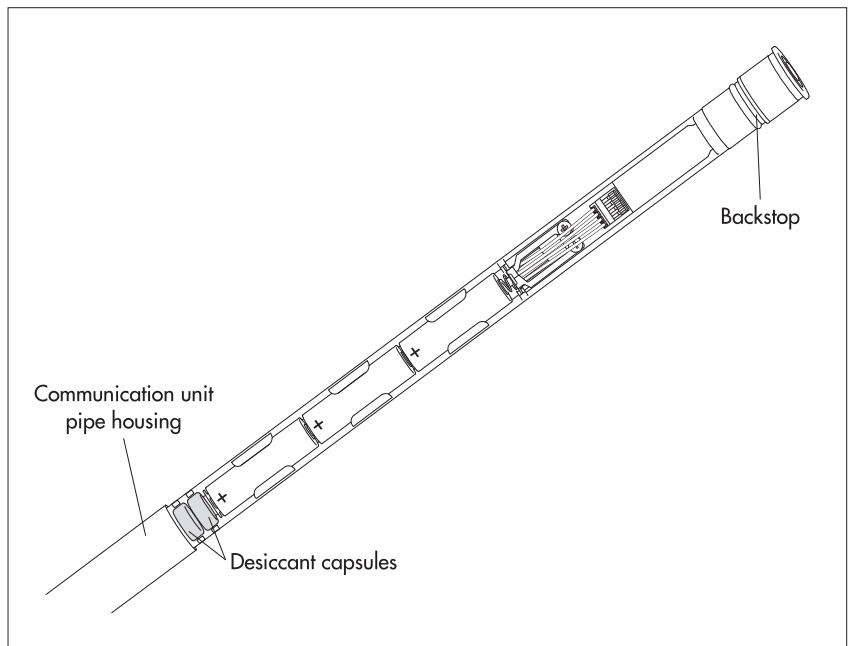
16.2 Replacing the desiccant capsules

Recommended interval: Depending on the level of air humidity at the station, every 12 to 24 months and when replacing the batteries.

How to replace the desiccant capsules

- Open the top cap/observation well cover.
- Pull the communication unit approximately 80 cm out of the observation well and hold (a second person would be useful).
- Slide the pipe casing of the communication unit approximately 30 cm in the direction of the pressure probe cable. (The rubber stop located on the pressure probe cable (see Fig. 1) prevents the pipe casing from falling.)
- Remove used desiccant capsules.
- Install 2 new desiccant capsules.
- Slide the pipe casing of the communication unit back on until it stops.
- Slowly and carefully replace the communication unit in the observation well.
- Close the top cap/observation well cover.

Fig. 24: Replacing the desiccant capsules



16.3 Checking/replacing the batteries

See Chapter 5.

17 Error messages

If erroneous measurements occur, or if an operating fault occurs, the OTT Orpheus Mini stores one of the following error messages in the data memory instead of a measured value.

- ▶ Err 00 internal error (automated measurement)
- ▶ Err 01 internal error (AD conversion error)
- ▶ Err 03 Exceeded measuring range
- ▶ Err 10 Measured value (still) not recorded

Internal errors indicate a device defect if they occur repeatedly.

18 Troubleshooting/fault correction

No communication possible (operating program/OTT Orpheus Mini)

- ▶ Password programmed?
→ input correct password.
- ▶ Batteries installed?
→ install batteries.
- ▶ Battery voltage lower than about 3.6 V?
→ insert new batteries.
- ▶ Battery contacts corroded?
→ carefully clean the battery contacts.
- ▶ Pressure probe cable damaged?
→ send OTT Orpheus Mini to the factory for repair.
- ▶ Infrared interface dirty?
→ clean the infrared interface carefully with a damp, soft cloth.
- ▶ Setting measured value not possible?
→ scaling module missing. Check configuration*
(for advanced operation, see online help).

Communication starts and then breaks off

- ▶ Battery voltage lower than about 3.6 V?
→ insert new batteries.
- ▶ Distance from readout unit/IrDA interface to OTT Orpheus Mini too small/large?
→ maintain correct distance (see Chapter 7.2).

Erroneous measured values

- ▶ Temperature values erroneous
→ check configuration* (for advanced operation, see online help).
- ▶ Pressure sensor values erroneous
→ check configuration* (for advanced operation, see online help).
→ Check the pressure compensation capillary in the communication unit (blocked?). If necessary, clean.
→ Check pressure sensor for contamination. Clean if necessary.

No measured values in database

- ▶ Configuration incorrect?
→ check configuration* (for advanced operation, see online help).
- ▶ Battery voltage lower than about 3.6 V?
→ insert new batteries.

* The standard factory configuration is located on the "OTT Orpheus Mini Software" CD-ROM .

19 Repair

- With a problem with the device, use Chapter 18, Troubleshooting/fault correction to see if you can resolve the problem yourself.
- In the case of device defects, please contact the repair center of OTT:

OTT Hydromet GmbH
Repaircenter
Ludwigstrasse 16
87437 Kempten · Germany
Telephone +49 831 5617-433
Fax +49 831 5617-439
repair@ott.com

Caution: Only have a defective OTT Orpheus Mini checked and repaired by the OTT repair center. Under no circumstances carry out any repairs yourself. Any repairs or attempted repairs carried out by the customer will result in the loss of any guarantee rights.

20 Notes about the disposal of old units



Within the member countries of the European Union

In accordance with the European Union guideline 2002/96/EC, OTT takes back old devices within the member countries of the European Union and disposes of them in an appropriate way. The devices concerned by this are marked with the symbol shown aside.

- For further information on the return procedure, please contact your local sales contact. You will find the addresses of all sales partners in the internet on "www.ott.com". Please take into consideration also the national implementation of the EU guideline 2002/96/EC of your country.

For all other countries

- Dispose of the OTT Orpheus Mini properly after taking out of service.
- Observe the regulations applicable in your country for the disposal of electronic devices.
- Never put the OTT Orpheus Mini into the normal household waste.

Materials used

See Chapter 21, Technical data

21 Technical data

Water level

Measuring range	0 ... 4 m water column (0 ... 0.4 bar) 0 ... 10 m water column (0 ... 1 bar) 0 ... 20 m water column (0 ... 2 bar) 0 ... 40 m water column (0 ... 4 bar) 0 ... 100 m water column (0 ... 10 bar)
Resolution*	0.001 m; 0.1 cm; 0.01 ft; 0.1 inch 0.0001 bar; 0.001 psi
Accuracy (linearity + hysteresis)	± 0.05 % full scale
Long-term stability (linearity + hysteresis)	± 0.1 %/a full scale
0-Point	± 0.1 % full scale
Overload safe without permanent mechanical damage	
0 ... 0.4 bar	4 bar
0 ... 1 bar	10 bar
0 ... 2 bar	15 bar
0 ... 4 bar	25 bar
0 ... 10 bar	40 bar
Units	m, cm, ft, inch, bar, psi
Pressure sensor	ceramic; temperature-compensated
Temperature-compensated operating range	-5 ... +45 °C (ice free)

Temperature

Measuring range	-25 ... +70 °C
Resolution	0.1 °C (calibrated: 0.01 °C)
Accuracy	±0.5 °C (calibrated: ±0.1 °C)
Units	°C · °F
Power supply	3 x 1.5 V batteries (LR6 · AA, FR6 · AA) alkaline or lithium design (LiFeS; Energizer L91)
Current consumption	
active, measurement	30 mA
active, communication	50 mA
passive	30 µA
Service life (1 h sample interval, 50 m system length, without ITC)	
with lithium batteries	at least 5 years
with alkaline batteries	at least 1.5 years (high quality battery types)
Clock	
Design	Real-time clock
Accuracy	±1 minute/month (at +25 °C)
Buffer period for battery replacement	max. 10 minutes
Interface	Infrared (IrDA)
Storage temperature	-40 °C ... +85 °C

Data memory

Measurement memory	4 MB
Number of measurements	approx. 500,000
Number of logical channels	6 + 1 Info channel
Physical channels (input signals)	Water level/pressure Temperature Supply voltage
Sample interval	1 second ... 24 hours
Storage interval (mean interval)	1 second ... 24 hours

* at a value range of ±32.750 m; ±3275.0 cm; ±327.50 ft; ±3275.0 inch; ±3.2750 bar; ±32.750 psi

Individually configurable functions

- simple or advanced operation
- 5 extended sample intervals with start/stop time indication, support of pump tests
- Selection of units
- Pressure/level measurement or depth measurement
- With consideration of the local gravitational acceleration
- Display of instantaneous values with level monitoring function
- Password protection
- Measured value processing: Calculation of mean; delta storage; scaling function; extreme value storage; limit control of the sample interval
- Virtual sensor/virtual terminal
- Together with OTT ITC: alarm management; remote data transfer

Mechanical Data

Can be installed in observation wells

- with adapter ring
- with adapter plates for top caps with recess (OTT, HT)
- with suspension brackets for top caps without recess/universal installation

1"
2", 3", 4", (4,5"), 5", 6"
≥ 2"

Dimensions

Communication unit L x Ø
Pressure probe (L x Ø)
System length (cable length including communication unit/pressure probe)

400 mm x 22 mm
195 mm x 22 mm
1,5 ... 200 m ±1 % ±5 cm

Weight

Communication unit (incl. batteries)
Pressure probe
Pressure probe cable

approx. 0.410 kg
approx. 0.300 kg
approx. 0.082 kg/m

Material

Pressure probe housing
Cable jacket
Communication unit

POM, stainless steel 1.4539 (904 L)
PUR
ABS, PC stainless steel 1.4539 (904 L)/ 1.4462 (UNS S31803)

Protection class

Communication unit
Pressure probe

IP 67 (submersion depth max. 2 m; submersion duration max. 24 h)
IP 68

Performance classification of the sensors in accordance with DIN EN ISO 4373

Measurement reliability

Performance class 1

Temperature range

Temperature class 2

Relative humidity

Class 1

EMC limits

- Resistance to electrostatic discharge (ESD)
- Resistance to electromagnetic fields
- Resistance to transient fields (burst)
- Resistance to surge
- Resistance to HF, asymmetric
- Line-borne and radiated interference

complies with EN 61000-4-2 (4 kV contact discharge)
complies with EN 61000-4-3 (10 V/m)
complies with EN 61000-4-4 (4 kV)
complies with EN 61000-4-5 (4 kV)
complies with EN 61000-4-6 (10 V)
complies with EN 55022 Class B (30 ... 1000 MHz)



**Konformitätserklärung
Declaration of Conformity
Declaration de Conformité**

Wir/ We/ Nous
Anschrift/ Address/ Adresse
OTT Hydromet
Ludwigstraße 16
D-87437 Kempten

erklären, dass das Produkt/ declare that the product/ déclarons que le produit

Bezeichnung/ Name/ Nom
OTT Orpheus Mini

Artikel- Nr./ Article No./ No. d' Article
55.440.002.3.2

mit den Anforderungen der Normen übereinstimmt./ fulfills the requirements of the standard./ satisfait aux exigences des normes.

EG (2004/108/EG):

national:

international:

EN 61326-1:2006
Störaussendung/ emission/ émission
Klasse/ class/ classe

IEC 61326-1

B

B

EN 61000-4-2 (4 kV/8 kV)
EN 61000-4-3 (10 V/m)
EN 61000-4-4 (4 kV)
EN 61000-4-5 (4 kV)
EN 61000-4-6 (10 V)

IEC 61000-4-2 (4 kV/8 kV)
IEC 61000-4-3 (10 V/m)
IEC 61000-4-4 (4 kV)
IEC 61000-4-5 (4 kV)
IEC 61000-4-6 (10 V)

Ort und Datum der Ausstellung/
Place and Date of Issue/
Lieu et date d' établissement

Kempten, den 15.12./2010

Name und Unterschrift des Befugten/
Name and Signature of authorized person/
Nom et signature de la personne autorisée

Dr. Anton Felder
(CEO)

OTT Hydromet GmbH
Postfach 21 40 · 87411 Kempten
Ludwigstraße 16 · 87437 Kempten
Tel.: +49 831 5617-0
Fax: +49 831 56 17-209
info@ott.com
www.ott.com

Geschäftsführer: Dr.-Ing. Anton Felder, Jörg Mayer, Ronald Marcel Peters
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All business transactions shall be subject to our General Terms and Conditions (see "www.ott.com/GTC")

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OTT Hydromet GmbH

Ludwigstrasse 16
87437 Kempten · Germany

Tel. +49 831 5617-0

Fax +49 831 5617-209

info@ott.com · www.ott.com