

CTD-Diver

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Q1: How should I install my CTD-Diver?

Answer:

Most CTD-Divers are installed in a monitoring well below the water surface. The depth at which you suspend the CTD-Diver depends on the measurement range of the instrument. Prior to installation, determine the lowest possible water level measured from the top of the monitoring well casing (or another reference point). If you now hang the CTD-Diver below this depth, you are sure that the Diver will always measure the water level. The Diver can be installed using a Diver Data Cable (DDC) or suspended on a stretch-free steel cable using the suspension eye. Attach the cable using two cable clips to the cap of the monitoring well casing and the suspension eye of the Diver.

Q2: How do I connect a CTD-Diver to my computer?

Answer:

How you connect a CTD-Diver to your computer depends on the manner in which the CTD-Diver is installed in the monitoring well:

- A CTD-Diver that is suspended on a steel cable in the monitoring well must first be taken out of the monitoring well before the CTD-Diver data can be read out using a Pocket Diver PC or your computer via a USB Reading Unit.

1. Connect the USB reading unit to your computer or Pocket-Diver PC via the USB port..
2. Unscrew the suspension eye of the CTD-Diver.
3. Place the CTD-Diver upside down in the USB Reading Unit.

- A CTD-Diver that is suspended from a Diver Data Cable (DDC) can be left in the monitoring well. You can read out the Diver data using a Pocket PC or directly into your computer using a DDC interface cable:

1. Connect the DDC interface cable to your computer.
 2. Unscrew the protective cap from the end of the Diver Data Cable.
 3. Connect the connector of the interface cable to the end of the Diver Data Cable.
 4. Read out the Diver measurement data into your computer or Pocket-Diver PC.
 5. Replace the protective cap on the Diver Data Cable.
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Q3: What is a Pocket PC and what is Pocket-Diver?

Answer:

A Pocket PC, also called a PDA or Handheld PC, is a hand-held computer that can be used to download the data from Divers in the field. Pocket-Diver is the software package that is supplied for a Handheld PC. The Pocket-Diver program can be installed on the Pocket PC using the program ActiveSync, which is supplied as standard with the Pocket PC. During installation you can decide whether to install a simple version Pocket-Diver Reader (only suitable for reading out Divers) or a comprehensive version Pocket-Diver Manager.

Before you can start using Pocket-Diver you need a Pocket-PC (PDA), a PC running on Microsoft Windows with Microsoft ActiveSync 3.6 or later installed. A USB Host or RS232 CF Card from RATOC Systems Inc. must be installed on your Pocket-PC.

Pocket-Diver was tested on the following Pocket-PCs:

- Dell X50 416MHz 64MB Ram/64MB Rom Windows Mobile 2003 2nd edition
- HP iPAQ 2110 312MHz 64MB Ram/64MB Rom Windows Mobile 2003 2nd edition
- Dell X51 520MHz 64MB Ram/128MB Rom Windows Mobile 5
- HP iPAQ 2490 520MHz 64MB Ram/128MB Rom Windows Mobile 5

with a USB and RS232 reading unit (and both CF cards).

Q4: Can I only use the CTD-Divers at sea level?

Answer:

No, you can use the CTD- Divers at any altitude, from 300 m below sea level to 3,000 m above sea level. You can use the Logger Data Manager or Pocket-Diver software to program in advance the height at which you plan to use the CTD-Diver.

Q5: Do you always need a Baro-Diver and a CTD-Diver for one monitoring well measurement?

Answer:

No, but you must plan for at least one Baro-Diver per network to monitor the barometric pressure. For instance, in a network of 20 monitoring wells, you should install 20 Divers and one Baro-Diver. For larger networks we recommend that an additional Baro-Diver should be installed as a reserve.

Q6: Within which radius of the CTD-Divers do I need to install a Baro-Diver to obtain correct air pressure compensation?**Answer:**

Within a 15-km radius of the CTD-Divers (dependent on the site conditions).

Q7: How can you convert the results of the Baro-Diver measurements from cm water column (cm H₂O) to atmospheric pressure (mbar)?**Answer:**

Dependent on the software version of Logger Data Manager that you use:

LDM 4 - Suppose that the Diver measures 70.74 cm H₂O. To convert this measured value in cm water column into atmospheric pressure, you multiply the sum of the measured value plus 950 cm H₂O by 0.980665. In this example: $(70.74 + 950) \times 0.980665 = 1001$ mbar.

LDM 5/Pocket-Diver 2.0 - Suppose that the Diver measures 1020.74 cm H₂O. To convert this measured value in cm water column into atmospheric pressure, you multiply the measured value by 0.980665. In this example: $1020.74 \times 0.980665 = 1001$ mbar.

Q8: How long does the battery of a CTD_Diver last?**Answer:**

The battery life depends on the measurement frequency, read-out and programming cycles. The following applies for the battery of the CTD-Diver:

- 2,000,000 measurements;
 - 500 read-out cycles;
 - 500 programming cycles.
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Q9: Can the CTD-Divers be used in seawater?**Answer:**

Yes, the CTD-Diver housing is made of the ceramic material zirconia. The pressure

transducer is also made of ceramic material and the end-cap is reinforced plastic. Since these materials do not corrode, the new CTD-Diver can be used in seawater.

Q10: How can I clean my CTD-Diver if it is very contaminated?

Answer:

If your Diver is very contaminated you can clean it using a very dilute acetic or phosphoric acid solution. Place the CTD-Diver in the solution for some time. After cleaning, rinse the Diver well using clean water, in particular the flow openings. If necessary, use a soft cloth to remove deposits. Never use hard brushes, abrasives or sharp objects to clean your CTD-Diver.

Q11: Does the CTD-Diver require calibration?

Answer:

The CTD-Divers are calibrated before they are delivered for temperature, pressure and conductivity. A manufacturer's calibration certificate can be supplied on delivery.

- The temperature and pressure sensors do not need to be calibrated after being calibrated in the factory.
 - You can calibrate the conductivity sensor yourself using Logger Data Manager or Pocket-Diver.
 - It is advisable to put the CTD-Diver in clean water for 24 hours to stabilize the ceramic conductivity cell when the unit has been stored for quite some time.
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Q12: When must the CTD-Diver be calibrated?

Answer:

We recommend that the CTD-Diver should not be calibrated when it is new and used for the first time. Moreover, we recommend that the CTD-Diver be calibrated at the start of a new measurement session. If you also calibrate the CTD-Diver after the measurement session, you will gain more insight into any changes during the session.

Q13: How do I calibrate my CTD-Diver?

Answer:

It is very easy to calibrate a CTD-Diver using the Logger Data Manager or Pocket-Diver; the calibration wizard automatically executes the calibration. You only have to ensure that you place the CTD-Diver in a calibration fluid with a standard conductivity.

For an optimum result, you must ensure that the temperature of the calibration fluid and the CTD-Diver is the same. During the calibration procedure the temperature is

measured. If this is not within certain limits the software will cancel the calibration procedure.

The CTD-Diver can be calibrated at four points. To ensure that the Diver is within specification across the entire measurement range, it must be calibrated at the following points 1.413; 5.00; 12.88 and 80.00 mS/cm. If you choose to calibrate at two points, the conductivity measurements between these two points will be within specification. Outside of these ranges the measurements can be out of spec. You can find further details in the Logger Data Manager/ Pocket-Diver software manual.

Q14: When should you use a CTD-Diver?

Answer:

The CTD-Diver measures the level, the temperature and the electrical conductivity of the ground water. This allows the CTD-Diver to be used in situations where, for instance, the groundwater is becoming increasingly or decreasingly contaminated or salinated.