

## User's Manual



# Diver-Pocket Reader Diver-Pocket Manager



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# Preface

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## Obtaining Technical Support

To help us handle your technical support questions as quickly as possible, please have the following information ready before you call, or include it in a detailed technical support e-mail.

You may send us your questions via e-mail, fax, or call one of our technical support specialists. Please allow up to two business days for a response.

### Hardware

- A complete description of the problem; when does the problem occur; what are the environmental conditions; etc.
- Product name and type
- Product serial number
- If it concerns a Diver: provide a DAT-file (and/or MON-file) if applicable

### Software

- A complete description of the problem including a summary of key strokes and program event (or a screen capture showing the error message, where applicable)
- Product name and version number
- PocketPC make and model number
- Operating system and version number
- Software installation directory
- Directory location for your current project files

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# 1 Introduction

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## 1.1 General

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Diver-Pocket is a software package that can be used on a PocketPC for programming Divers, reading stored measurements and exporting data. When used with a PocketPC, Diver-Pocket allows you to conveniently read and manage data in the field before exporting the data for further processing by other programs such as Diver-Office. In combination with one or more Divers, Diver-Pocket constitutes a complete and flexible measurement system.

## 1.2 Diver-Pocket Reader and Manager

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Diver-Pocket is available in two variants, namely;

- **Diver-Pocket Reader:** This variant only allows you to read data; Divers cannot be stopped, calibrated or programmed.
- **Diver-Pocket Manager:** In addition to being able to read data, this variant also includes the Diver programming facility which allows you to calibrate CTD-Divers, start and stop Divers, define pumping test, etc.

**Note:** This manual can be used for both the Diver-Pocket Reader and Diver-Pocket Manager. Please note that some features and functionality described in this manual are **ONLY** available in the Manager variant, *i.e.*, programming Divers, calibrating divers, stopping Divers etc.

Either the Reader or the Manager version can be installed on a Pocket-PC. There are two installation packages:

- DiverPocket\_Reader.exe
- DiverPocket\_Manager.exe

A detailed description of the installation can be found in

## 1.3 List of Supported Devices

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### Reading Units

Diver-Office supports the following Reading Units:

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<b>Reading Unit RS232</b>	AS 315
<b>Reading Unit USB</b>	AS 324
<b>Diver USB Reading Unit</b>	AS 330

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### Divers

Diver-Office supports the following Diver groundwater dataloggers:

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<b>Cera-Diver</b>	DI701 DI702 DI705 DI710
<b>Mini-Diver</b>	DI501 DI502 DI505 DI510
<b>Micro-Diver</b>	DI601 DI602 DI605 DI610
<b>(M)TD-Diver</b>	DI240 DI241 DI242 DI243 DI245
<b>Baro-Diver</b>	DI250 (TD-Style) DI500 (Mini-Style)
<b>CTD-Diver (ceramic)</b>	DI261 DI263 DI265
<b>CTD-Diver (stainless steel)</b>	DI218 DI219 DI221 DI222 DI223 DI224 DI227 DI225 DI226
<b>TD-Diver</b>	DI214 DI215 DI217 DI220
<b>D-Diver</b>	DI212 DI213

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### Interface Cables

Diver-Office supports the following Diver interface cables:

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<b>Direct Read Interface Cable</b>	AS 325
<b>PC Interface Boostercable</b>	AS 326
<b>DRC USB Interface Cable</b>	AS 327
<b>Direct Read Interface (short)</b>	AS 328
<b>FT-US232B EVALCABLE</b>	HAD 211

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## Wireless Devices

Diver-Pocket supports the following wireless devices:

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<b>Diver-DXD CF Card</b>	AS333
<b>Diver-DXT</b>	AS4001 AS4002.5 AS4005 AS4010 AS4020 AS4040 AS4080 AS4160 AS4320

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## 1.4 Software and Hardware Requirements

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Diver-Pocket requires the following hardware and software requirements:

### PC Hardware Requirements:

- Microsoft Windows 2000, XP or Vista
- Microsoft ActiveSync 3.6 or later must be installed (comes with PocketPC)

### PocketPC (PDA) Requirements:

- Windows Mobile 2003, Windows Mobile Version 5.0 and Windows Mobile Version 6.0.
- XScale or StrongArm Processor
- Pocket-PC is compatible with USB Host CF Card or RS232 CF Card
- 64 MB of RAM or more

### Wireless Requirements:

- Diver-DXD wireless data transceiver dongle
- Diver-DXT data transceiver

Please refer to your owner's manual to ensure that these requirements are satisfied.

CF card:

- <http://www.ratocsystems.com/english/products/subpages/cfu1u.html>
- <http://www.ratocsystems.com/english/products/CFU2U.html>

Diver-Pocket has been tested on the following Pocket-PCs:

- Archer Field-PC (Jupiter Systems) 590MHz Windows Mobile 5 with a USB and RS232 reading unit (and both CF cards).

## 2 Installing Diver-Pocket

---

### 2.1 Installation of Diver-Pocket with USB/RS232 Reading Unit

---

As outlined in the hardware requirements, Diver-Pocket requires a USB Host CF card or a RS232 CF card in order to read data from the Diver. This card must be properly installed according to the manufacturer's instructions. The driver for the USB Host/RS232 CF card is delivered with the hardware, but is not included in the Diver-Pocket installation. The latest version of the USB Host/RS232 CF driver can be downloaded from the manufacturer's site: <http://www.ratocsystems.com/>

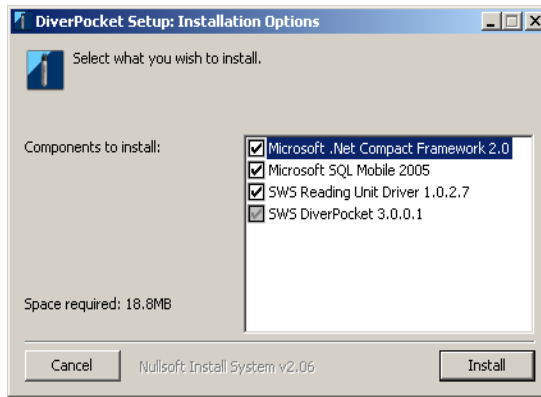
To install Diver-Pocket on your Pocket-PC, follow the steps below:

1. Before you start the installation of Diver-Pocket, make sure that the driver for the USB Host card is installed on your Pocket-PC.

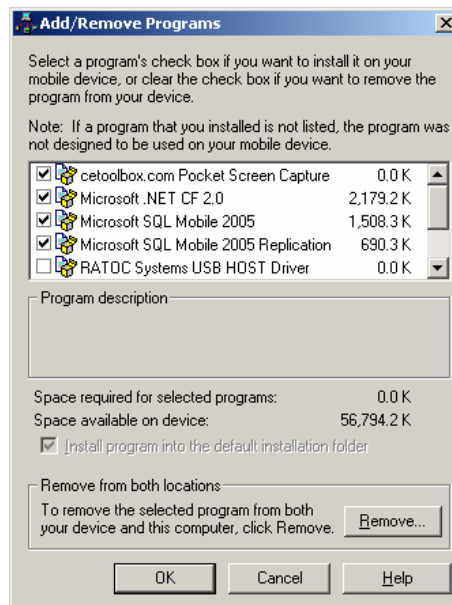
For additional guidance with this step, please visit our online installation guide at the following address:

[http://www.swstechnology.com/equipment\\_product.php?tab=3&ID=5](http://www.swstechnology.com/equipment_product.php?tab=3&ID=5)

2. Make sure that the USB Host card is **not** plugged into your Pocket-PC. Please remove the card if it is plugged into your Pocket-PC.
3. Place your Pocket-PC into the cradle and verify that the cradle is connected to your desktop PC.
4. Insert the Diver-Pocket CD into your CD-ROM Drive. The SWS installation CD Navigator should automatically launch. If the CD Navigator does not launch automatically, open Windows Explorer, navigate the CD-ROM to the Diver-Pocket folder, and double click on either **DiverPocket\_Manager.exe** or **DiverPocket\_Reader.exe**.
5. To begin installing your software, click on either the **Install Manager** button or the **Install Reader** button.
6. Accept the default settings and select the following:
  - Microsoft .Net Compact Framework 2.0
  - Microsoft SQL Mobile 2005
  - SWS Reading Unit Driver
  - SWS Diver-Pocket.
7. Click **Install** to start the installation.



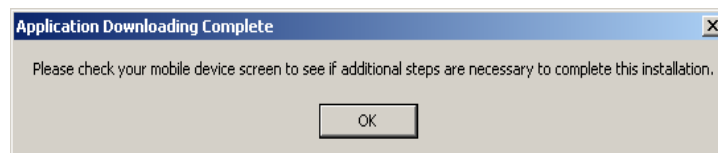
ActiveSync might display a dialog box with a list of programs that will be installed on your Pocket-PC. Programs that will be installed are marked with a grey checkbox.



**This screen does not always appear.**

**Note:** On some Pocket-PCs you may be prompted to specify where to install the software: on the device or on removable storage. Please ensure that the “**Device**” option is always selected. Diver-Pocket will not work properly if it is installed on removable storage.

The Diver-Pocket installation will copy the required files to your Pocket-PC. Once the installation is complete, you will be prompted to verify whether additional steps are necessary (as show below).



If you are running Windows Mobile 2003 Second Edition, you might find the following message on the screen of your Pocket-PC:

*The program you have installed may not display properly because it was designed for a previous version of Windows Mobile.*

This message may be ignored. Tap **OK** to continue. .

8. A message will appear on your desktop PC confirming that the program has been successfully installed.
9. Insert the USB Host/RS232 CF card to your Pocket-PC and connect the reading unit to the USB Host/RS232 CF card.
10. Proceed to *Getting Started with Diver-Pocket* on page 12.

## 2.2 Upgrade Diver-Pocket to 2009.1

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If you already have a previous version of Diver-Pocket (Pocket-Diver 3.0/2.0/2.1.0.0/2.1.1.0/2.1.2.0) installed and you want to upgrade to 4.0.0.x during the installation, uncheck Microsoft .Net Compact Framework 2.0 and Microsoft SQL Mobile 2005 options to speed up the installation. If you are upgrading from Pocket-Diver 2.x, after installing Diver-Pocket 4.0.0.x, Pocket-Diver 2.x may still exist on the PocketPC. You can safely remove the previous version through the **Remove Programs** dialog in Windows Settings.

## 2.3 Quick Installation Guide

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- Remove the USB Host/RS232 CF card from the Pocket-PC.
- Install USB Host/RS232 CF card driver (latest drivers can be found on <http://www.ratocsystems.com/>).
- Run **DiverPocket\_Reader.exe** or **DiverPocket\_Manager.exe**.
- Plug in the USB Host/RS232 CF card.
- Connect the reading unit.



## 3 Getting Started with Diver-Pocket

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This chapter will guide you through the basic steps to setup a project, acquire data from Divers and display data on your screen. The following chapters contain more details on specific topics and include *Managing Projects*, and *Managing Diver Data*.

### 3.1 Launching Diver-Pocket

---

After a successful installation, Diver-Pocket can be launched by tapping the **Windows logo** in the upper-left corner of the Pocket-PC screen.

From the pop-up menu, tap **Programs**. Finally, tap the **Diver-Pocket** icon.

### 3.2 Diver-Pocket Tabs

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There are three different screens (tabs) in Diver-Pocket: Project, Diver and Data.

- The main tabs will have an “**Ok**” button located in the top-right corner. This button will *close* the application.
- All sub-tabs will have an “**OK**” button located at the top-right corner. This button will *Close* the sub-tab, but not the application.
- If information needs to be saved, a “**Save**” button will be displayed. .

## 3.3 Creating a Project

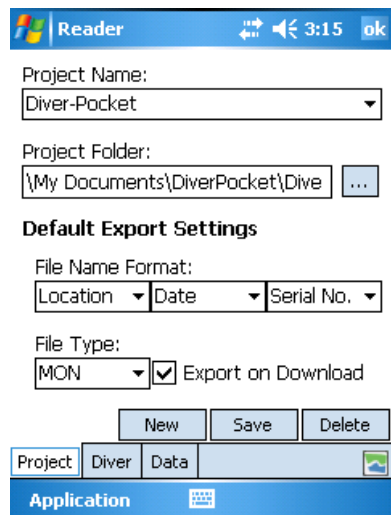


When starting Diver-Pocket for the first time, a message will inform you that the current database is empty and a new project needs to be created. Tap **OK** to proceed.

Enter a **Project Name** and tap the **OK** button

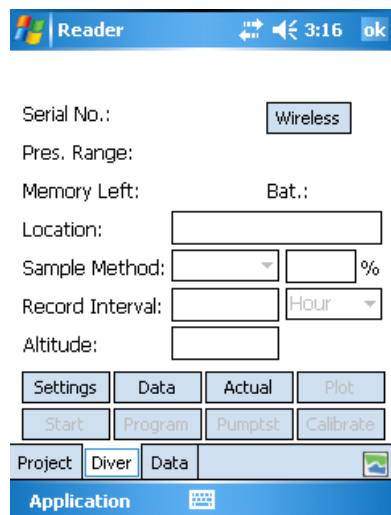
Confirm the default project settings by tapping the **Save** button.

## 3.4 Reading Diver Data



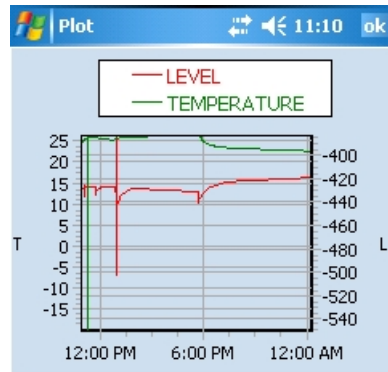
Tap the **Diver** tab at the bottom of the screen. A screen containing empty fields will be displayed (as shown to the left).

Make sure a Diver is placed in the USB Reading Unit and that the USB Reading Unit or DDC interface cable is connected to your Pocket-PC.



Tap the **Data** button to download the settings and data from the Diver. A progress bar indicates the status of the download process. The fields (e.g. Location, Sample Method, Sample Rate) should now contain the Diver information.

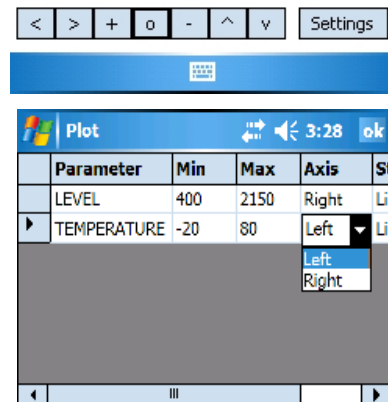
## 3.5 Plotting Data



Tap the **Plot** button to view the downloaded data as a time series plot.

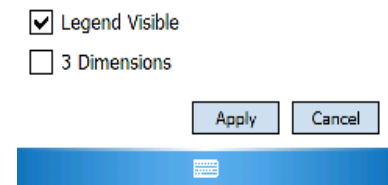
Within the plot screen, you can navigate the time-series graph by using the zoom and pan tools.

Tap the **Settings** button to display information about the plotted parameters or to change the display settings.



If your Diver measures two parameters, assign the second parameter to the right axis. By doing so, the two parameters, each having a different range, will be shown on a different axis leading to a better resolution of both curves.

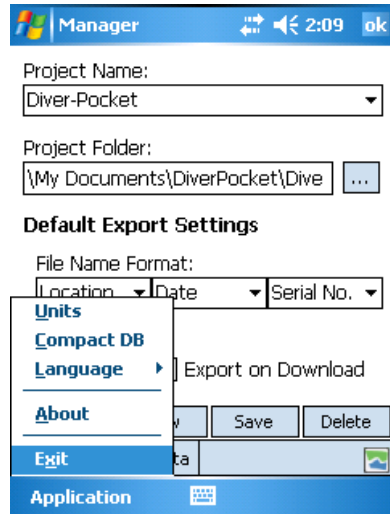
Tap **Apply** to close the plot screen.



You have now successfully downloaded data from a Diver and visualized the data in a time-series plot.

## 3.6 Hiding & Exiting Diver-Pocket

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You can hide (minimize) Diver-Pocket by tapping the **X** in the upper-right corner. The program is not stopped and is still running in the background.

To completely close Diver-Pocket, tap **Application** and then **Exit**.

## 4 The Basics

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There are three different screens or tabs in Diver-Pocket (as shown below).

- The main tabs will have an “**Ok**” button located in the top-right corner. If selected, this button close the application.
- All sub-tabs will have an “**OK**” button located at the top-right corner. If selected, this button will *close the sub-tab*, but not the application, without saving.
- If information needs to be saved, a “**Save**” button will be displayed.

The first tab is the **Project** tab. At this screen you can define the project name, the project folder and the export settings. For more details on this topic, refer to *Managing Projects (page 12)*.

The middle tab is the **Diver** tab. This screen is used for reading and programming Divers. For more details refer to *(page 15)*.

The third tab is the **Data** tab. Here you can plot and export data. For more details, refer to *Managing Diver Data (page 25)*.

Manager 2:11 ok

Project Name:  
Diver-Pocket

Project Folder:  
\\My Documents\\DiverPocket\\Dive

Default Export Settings

File Name Format:  
Location Date Serial No.

File Type:  
MON Export on Download

New Save Delete

Project Diver Data

Application

*Project Tab*

Manager 2:12 ok

Serial No.: Wireless

Pres. Range:

Memory Left: Bat.:

Location:

Sample Method: %

Record Interval: Hour

Altitude:

Settings Data Actual Plot

Start Program Pumpst Calibrate

Project Diver Data

Application

*Diver Tab*

Manager 2:12 ok

Location	Date & Time
sws06	05/05/09 14:00:34

Select All

Delete Export Plot

Project Diver Data

Application

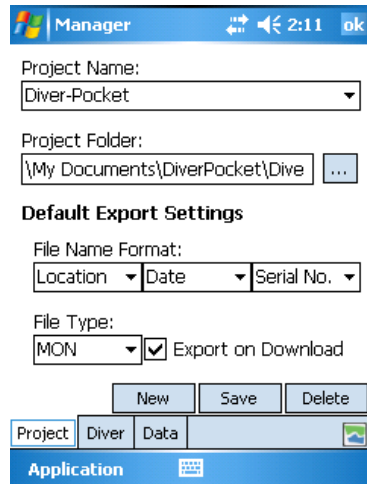
*Data Tab*

### 4.1 Managing Projects

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In Diver-Pocket, a project combines data from multiple Divers, belonging to the same monitoring project. Each project can have its own default settings as defined by the user. As shown in the image below, each project requires a default project folder, an associated file name format and a file type for exporting data. When starting Diver-Pocket for the first time, you will be prompted to create a new project before proceeding.

## 4.1.1 Editing and Opening an Existing Project



The screenshot shows the 'Manager' dialog box with the following fields and controls:

- Project Name:** A dropdown menu currently showing 'Diver-Pocket'.
- Project Folder:** A text field showing '\My Documents\DiverPocket\Dive' with a browse button (...).
- Default Export Settings:**
  - File Name Format:** Three dropdown menus showing 'Location', 'Date', and 'Serial No.'.
  - File Type:** A dropdown menu showing 'MON' and a checked checkbox for 'Export on Download'.
- Buttons:** 'New', 'Save', and 'Delete' at the top right.
- Tabbed Interface:** A row of tabs labeled 'Project', 'Diver', and 'Data'. The 'Project' tab is selected.
- Footer:** A blue bar with the word 'Application' and a small icon.

Tap the **Project** tab to display the project settings. The project settings include the following fields:

The **Project Name** cannot be changed once the project has been created. Select an existing project from the **Project Name** drop-down box. If the current project has not been saved, you will be prompted to confirm the changes.

**Project Folder:** This is the location where the exported (.dat, .mon and .csv) data files will be stored. With every Diver download, a binary .dat file will be created by default. The .mon or .csv files can be created automatically by setting the default export flag (see below) or manually from the **Data** tab.

All created .dat, .mon and .csv files use the **File Name Format** settings. This allows you to associate a filename with three strings (serial number of Diver, location of Diver and timestamp of download). If the timestamp is not included as part of the filename (e.g. only serial number plus location name are included in name format), then a **\_1**, **\_2** etc. extension will be added to each file in order to make the filename unique. **NOTE:** It is good practice to include the timestamp in the filename.

**File Type:** This defines the type of files that are created when data is exported either manually or automatically.

If the **Export on Download** checkbox is checked, a file is exported automatically with every Diver download. If the Pocket-PC's memory is limited or if the additional export is too time consuming, you may export the same files manually from the database at a later point in time.

### Project Time Settings:

For long term monitoring projects, the time of all the measurements must be aligned to a standard time to ensure that the sampling frequency is consistent when the time changes due to day light savings time. Specifying the project time in Diver-Office ensures that your Diver is synchronized with the original Diver time and that no gaps or overlap occur in your data. You can choose from the following options:

---

<b>Computer Time</b>	If you choose this option, the project time will always be the same as your computer time. This is how project time worked in previous versions of Diver-Office
<b>Winter Time</b> ( <i>Standard Time</i> )	If you choose this option, the project time will always be synchronized with standard time, e.g., UTC + x, where x depends on the time zones in your region; <b>day</b> light savings will be ignored.
<b>Summer Time</b> ( <i>Daylight Savings Time</i> )	If you choose this option, the project time will always be synchronized with summer time, e.g., UTC + x - 1, where x depends on the time zone of your region; winter time will be ignored.

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Most monitoring projects use standard time, completely ignoring day light savings time. In some rare cases, long-term monitoring is done using day-light savings time (winter time is ignored). Either time is acceptable, as long as it is maintained throughout the full duration of the monitoring project.

For short term projects or pumping tests, you will most likely use the computer time, as shifts in time due to day light savings are usually irrelevant.

Please note that in order for this feature to work, you must have the appropriate time zone selected in your PDA's **Date and Time Settings**.

Tap the **Save** button to save the settings of the current project.

## 4.1.2 Creating a New Project

Tap the **Project** tab.

Tap the **New** button. The screen shown on the left will appear.

Enter a project name. **NOTE:** Do not use special characters (e.g. \ / : \* ? " < > |) as the project name is the default name for the project folder.

Tap the **OK** button.

If necessary, modify the settings on the project screen as described in *Editing and Opening an Existing Project* (page 12).

## 4.1.3 Deleting an Existing Project

Tap the **Project** tab.

Tap the **Delete** button to delete the current project and all related records in the database. The project folder will not be deleted automatically. Please use the **Windows Mobile** file explorer to delete the project folder from your Pocket-PC.

## 4.2 Connecting to Diver-NETZ

Diver-Pocket (v.3.0 and 4.0) allows you to read and program Divers from a remote location in the field, using a wireless connection. To use this feature, a **Diver-DXD dongle** must be connected to your Pocket-PC and a **Diver-DXT cable** must be attached to each Diver.

**Note:** Currently, Diver-NETZ only supports one wireless connection within the effective range of the Diver-DXT (~ 150 metres). Multiple connections to Diver-NETZ can potentially disrupt communication, *e.g.*, reading and downloading Dive data, with connected Diver-DXTs.

## 4.2.1 Setting up a Wireless Connection

The screenshot shows the 'Manager' screen of the Diver application. At the top, there's a status bar with a signal icon, a battery icon, and the time '2:12'. Below this, there are several input fields: 'Serial No.', 'Pres. Range', 'Memory Left', 'Bat.', 'Location', 'Sample Method', 'Record Interval', and 'Altitude'. A 'Wireless' button is circled in red. Below the input fields are several buttons: 'Settings', 'Data', 'Actual', 'Plot', 'Start', 'Program', 'Pumptst', and 'Calibrate'. At the bottom, there's a 'Project' section with 'Diver' and 'Data' tabs, and an 'Application' bar at the very bottom.

From the **Logger** tab, tap the **Wireless** button to setup a wireless Diver connection.

**Note:** Diver-Pocket will become unstable if you unplug the Diver-DXD while operating in wireless mode. Please be sure to exit Diver-Pocket before you remove the Diver-DXD.

The screenshot shows the 'Wireless' screen of the Diver application. At the top, there's a status bar with a signal icon, a battery icon, and the time '3:41'. Below this, there's a table with two columns: 'Location' and 'Signal'. Below the table is a 'Password' field with the text '0123456789ABCDEF'. There's a checkbox labeled 'Use Backup Password' which is unchecked. Below that, there's a radio button labeled 'Scanning...' which is selected. At the bottom, there are four buttons: 'Scan', 'Chg Pwd', 'Connect', and 'Close'.

In order to ensure that your Diver data remains secure and private, each Diver is assigned a password so that only you can retrieve its data.

By default, each Diver is registered with the following password until you choose to change it:

**0123456789ABCDEF**

In the event that a Diver password is lost, you can select the **Use Backup Password** checkbox and retrieve the Diver using its built-in serial number (located on the Diver).

Specify the Diver(s) password and tap **Search** to scan for available Divers.

Wireless 3:51 ok

Location	Signal
BACK UP BARO	1
SWS	47
SWS670	43

Password:

☐ Use Backup Password

☒ Scanning...

Diver-Pocket will search for active Divers within a range of 150 meters.


**Note:** The range will change depending on the environment in which the data collection is performed (e.g. environments with more topographical obstructions will decrease the potential range). The location of the Diver-DXT will also affect the range.

It may take up to 30 seconds to locate a Diver. When a Diver is found, it is listed in the table under **Location**. The corresponding value listed in the **Signal** column represents the strength of the signal (0–100).

To connect to a Diver, select the checkbox beside the desired Diver from the table, and tap **Connect**.

Manager 2:20 ok

Micro-Diver **STOPPED**

Serial No.: \$0081 **DXD Off** 


Pres. Range: 1000.000 cmH<sub>2</sub>O

Memory Left: 0 Bat.: 85%

Location:


Sample Method: Fixed

Record Interval: 10 Second

Project Diver Data 

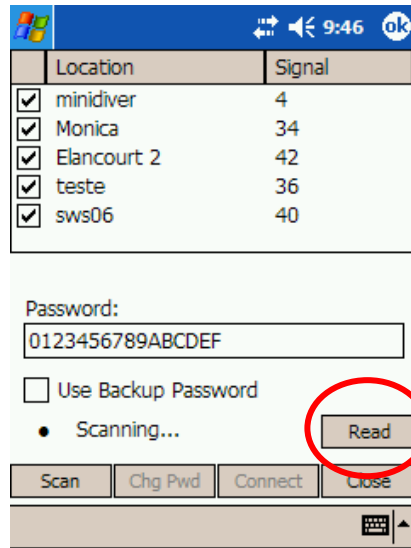
Application

Now that you have connected to a Diver, you can proceed to read and program Diver settings, and download Diver data.

The green status bars  in the top-right corner allows you to monitor the strength of your wireless connection while you work with wireless Divers. The number of green bars increases as the signal strength increases, and vice versa.

To disable a connection, tap the **DXD Off** button.

## 4.2.2 Downloading Data from Multiple Divers

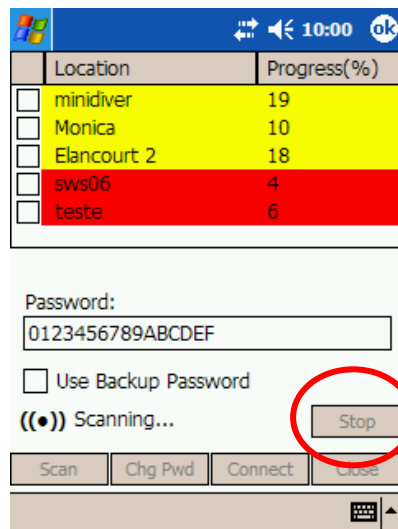


Diver-Pocket allows you to download data from multiple Divers simultaneously. To do so, first initiate wireless mode, as described in the previous section.

Once the wireless Divers have been detected, select the checkboxes beside the desired Divers, and then tap the **Read** button.

It is recommended that you use this feature only with connections that have a signal strength of at least **40-50**. Connections below this threshold may freeze during the download process. The likelihood of this behavior is greater when the number of connected Divers increases.

**Note:** Diver-Pocket can download data from up to 6 Divers simultaneously..

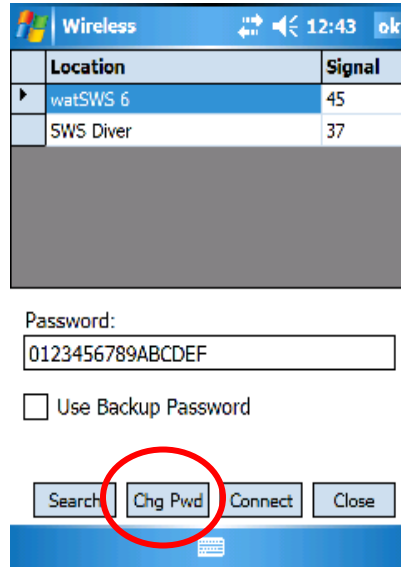


During the data download process, Diver-Pocket displays the progress for each Diver under the **Progress(%)** column.

Each Diver is also colored depending on the status of the Diver. **Yellow** indicates that the data download is in progress. **Green** indicates that the Diver download has completed successfully. **Red** indicates that the download has been manually stopped.

To manually stop downloading data from a diver, select the checkbox beside the desired Diver, and then tap the **Stop** button.

## 4.2.3 Changing Wireless Diver Password



Wireless 12:43 ok

Location	Signal
watSWS 6	45
SWS Diver	37

Password:  
0123456789ABCDEF

☐ Use Backup Password

Search Chg Pwd Connect Close

To change a Diver password, select a Diver from the location table and tap the **Chg Pwd** button.



Change Radio Pass 4:24 ok

SWS 7

Please type in a new password:  
[Text Field]

Re-enter Password:  
[Text Field]

This window allows you to change the Radio password for the selected diver. After the password has been changed, the Diver will be disconnected from the network, and you must reconnect using the new password.

Change Cancel

At the **Change Radio Password** screen, enter a new password for the wireless Diver. You must confirm the new password by entering it again.

Finally, tap the **Change** button to save the new password. If successful, a message will display confirming that the password has been changed. The Diver will then disconnect from the current network, and you will need to reconnect using the new password.

Please refer to the **Diver-DXT installation manual** for more information on how to change the password.

# 5 Reading and Programming the Diver

## 5.1 Reading Data and Settings from the Diver

The screenshot shows the 'Manager' application interface. At the top, there's a status bar with a Windows logo, the text 'Manager', and icons for connectivity, volume, and time (2:28). Below this, the 'Micro-Diver' status is shown as 'STOPPED' in red. The interface lists several parameters: 'Serial No.: \$0090' with a 'Wireless' button; 'Pres. Range: 1000.000 cmH2O'; 'Memory Left: 47801' and 'Bat.: 83%'; 'Location: SWS' in a text field; 'Sample Method: Fixed' in a dropdown menu; and 'Record Interval: 15' in a text field with a 'Minute' dropdown. Below these are two rows of buttons: 'Settings', 'Data', 'Actual', 'Plot' in the first row, and 'Start', 'Program', 'Pumptst', 'Calibrate' in the second row. At the bottom, there's a 'Project' tab with sub-tabs 'Diver' and 'Data', and an 'Application' bar with a keyboard icon.

Tap the **Logger** tab to:

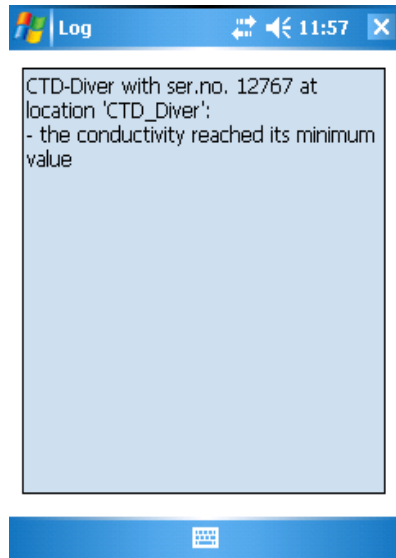
- read Diver data,
- program the Diver,
- start and stop the Diver.

Tap the **Settings** button to download the settings from the connected Diver.

Tap the **Data** button to retrieve the data from the connected Diver. The download process includes:

- Downloading the data to a binary .dat file. This is an image of the Diver memory and is stored in a sub folder (DAT) of the project folder. The download time is approximately five minutes for the entire Diver memory (48,000 readings).
- Saving the data from the .DAT file to the database. This step takes less than ten seconds to complete.
- If specified in the project settings, the data may be automatically exported to a \*.MON or \*.CSV text file. For a full Diver memory, this step takes approximately one to two minutes to complete.

## 5.2 Viewing QA/QC Log

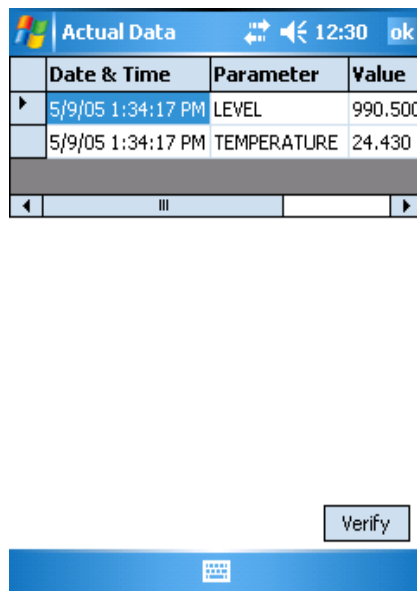


When data is downloaded from a Diver, Diver-Pocket performs a basic check for data that may be erroneous or corrupted. If erroneous data is detected, Diver-Pocket will list the time-series information and reason in the QA/QC log (shown to the side).

Some reasons for corrupted Diver data may include:

- The data includes **maximum** or **minimum** values, *e.g.*, for a CTD-Diver, if conductivity values are equal to the minimum values of zero this may suggest that the Diver wasn't properly submersed in water. If data is equal to the maximum this may suggest that the conductivity range is not suitable.
- The data is corrupted due to a low battery in the Diver.

## 5.3 Reading Actual Data from the Diver



Tap the **Actual** button to display a real time measurement for each parameter of the connected Diver.

**NOTE:** These values are only displayed and not saved to the database. Also, real time measurements are only shown for the following Divers: Micro-Diver, CTD-Diver, Mini-Diver, CTD-Diver, and Cera Diver. Older Divers, such as the CTD stainless steel Diver, will only display the most recent stored measurements on all channels.

Tap **Verify** to enter a measurement manually and compare it to a measurement taken with the Diver (shown below).

Manual Measurement 15:54 ok

Cable Length: 5 Meter

Barometer: 980 Millibar

Manual Measurement: 5 Meter

Actual Value: 1000.900 CM H2O

Difference: 1.578 CM H2O

Calculate

## 5.4 Programming the Diver

Manager 2:28 ok

Micro-Diver STOPPED

Serial No.: \$0090 Wireless

Pres. Range: 1000.000 cmH2O

Memory Left: 47801 Bat.: 83%

Location: SWS

Sample Method: Fixed

Record Interval: 15 Minute

Settings Data Actual Plot

Start Program Pumpst Calibrate

Project Diver Data

Application

Diver-Pocket allows the programming of the following settings: **Location**, **Sample Method**, **Sample Rate**, and **Altitude**.

To change any of these settings, manually enter the desired values. Once the new values have been entered, tap **Program**.

To confirm that the new settings have been programmed, tap **Settings**. The fields should appear blank for a moment before displaying the newly defined settings.

### 5.4.1 Location

The Diver location is an identifier that may be specified by the user on the Logger tab. This is usually required if a Diver is assigned to a new location. **NOTE:** It is highly recommended that you assign a unique name to each Diver location. Also, since the Location name will be used as part of the filename for exporting data, the Location name does not accept special characters that would lead to an invalid filename (e.g. \ / : \* ? \* < > | )

### 5.4.2 Sample Method and Sample Rate

The **Sample Method** may be one of the following:

- **Fixed**
- **Event-based**

- One of the predefined pumping test settings (**Setup A, B, or C**),
- **Averaging** (Micro-Diver & Cer-Diver only)
- or **User Defined**.

## Fixed

A fixed sample method will acquire and store data at regular time intervals. Select a unit from the **Record Rate** drop-down box (e.g. Hour, Minute, Second, 0.5 Second) and enter an associated time value in the adjacent box.

### Example

With a 10-second record rate, the CTD-Diver takes a measurement every 10 seconds on all channels settings and stores this value in its internal memory. The maximum number of measurements is 16,000. In this case, the internal memory will be full after 1 day, 20 hours, 26 minutes and 30 seconds. The Diver stops taking measurements when the memory is full.

**NOTE:** A CTD-measurement will be stored as a record with the data: **date + time + level + temperature + conductivity**. All measurements are imported together as one series in Diver-Pocket.

## Event Based

When you select this method, the Diver compares each sample to the last stored sample and calculates a difference. A new sample is only stored when the difference exceeds a specified percentage from the last stored sample on the leading parameter. Generally, the leading parameter is pressure. For the *CTD-Diver* the leading parameters is conductivity.

If you select this method, the **Variation** field will be displayed. In the field **Variation**, specify the appropriate difference threshold. Enter this difference as a percentage of the total range of the Diver. The percentage must lie between 0.1% and 25%. Also, you must specify a **Sample Rate**

### Example

Suppose you entered a variation of 2.5 % for a CTD-Diver with an 80 mS/cm measuring range and a sample rate of 30 minutes. The CTD-Diver will then take a measurement every thirty minutes and compare it with the last stored conductivity value. It will only store a new measurement:

- if the conductivity differs by 2 mS/cm (i.e. 2.5 % of 80 mS/cm) or more from the last stored conductivity value, or
- if the conductivity did not differ by at least 2 mS/cm in the last 250 measurements.

Conductivity is the leading parameter for the CTD-Diver. Therefore, changes in water depth will not affect the storage of measurements.

**NOTE:** Energy is expended when a sample is acquired, even when the sample is not stored in memory. Therefore, this method may deplete battery resources before the Diver memory can be completely filled. .

You can minimize this problem by specifying a modest sample rate.

## Averaging Sampling Method

When programmed with the Averaging Sample method, the Diver samples data at a specified “fast” rate (**Sample Interval**) and then stores an average of these values at the specified averaging rate (**Record Interval**).

For example:

**Record Interval:** 1 hour

**Sample Interval:** 1 Minute

When programmed and started with these settings, the Diver will *read* a sample every minute, and *record* an average of the samples every 1 hour.

## Predefined Pumping Tests

Diver-Pocket includes three convenient predefined pumping tests available from the **Sample Method** drop-down box. This method is only available for Divers that support this feature.

The specifications of these predefined sample methods are as follows:

### Pumping Test Setup A

Base Sample Rate: 0.5 seconds

Step	Number of samples	#Intervals
1	1200	1
2	5400	2
3	41400	10

### Pumping Test Setup B

Base Sample Rate: 1 second

Step	Number of samples	#Intervals
1	600	1
2	1080	5
3	5400	10
4	40920	30

### Pumping Test Setup C

Base Sample Rate: 5 seconds

<b>Step</b>	<b>Number of samples</b>	<b>#Intervals</b>
1	120	1
2	270	4
3	900	12
4	1800	60
5	44910	240

## User Defined Pumping Test (Cera-Diver and Micro-Diver only)

You may also define your own pumping test sample method by tapping the **Pumptst** button and specifying the necessary details:

The screenshot shows the 'Pump Test' screen. At the top is a blue header bar with a Windows logo, the text 'Pump Test', and icons for back, forward, and a clock showing 10:59. Below the header is a table with two columns: 'Name' and 'Description'. The table body is currently empty. At the bottom of the screen are three buttons: 'Add', 'Edit', and 'Delete'.

Tap the **Pumptst** button to display the **User Defined Sample Method** screen.

The screenshot shows the 'Pump Test' screen with input fields. The header bar is the same as the previous screenshot, but the clock now shows 11:06. Below the header are three input fields: 'Name:', 'Description:', and 'Base Sample Rate:'. The 'Base Sample Rate' field has a dropdown menu currently set to 'Second'. At the bottom right is a 'Next' button.

Tap the **Add** button and a new dialog box will appear. Specify a name, description (optional), and a base sample rate. Once these fields are completed, tap the **Next** button to continue.

The screenshot shows the 'Please Define Step' dialog box. The header bar has the text 'Please Define Step' and the clock shows 11:08. Below the header is a 'Save' button. Below the button is a table with four columns: 'Step', '#Samples', '#Intervals', and 'Sample Rate'. The table has 10 rows, numbered 1 to 10. The first row has values 12000, 2, and 12 Minutes. The second row has 14000, 4, and 24 Minutes. The third row has 10000, 2, and 12 Minutes. The fourth row has 12000, 1, and 6 Minutes. The remaining six rows (5-10) have 0, 0, and 0 Minutes. At the bottom of the screen is a blue bar with a small icon.

Step	#Samples	#Intervals	Sample Rate
1	12000	2	12 Minutes
2	14000	4	24 Minutes
3	10000	2	12 Minutes
4	12000	1	6 Minutes
5	0	0	0 Minutes
6	0	0	0 Minutes
7	0	0	0 Minutes
8	0	0	0 Minutes
9	0	0	0 Minutes
10	0	0	0 Minutes

In the **Define Step** dialog , you must enter the number of samples and the number of intervals for your sample method (as shown to the left).

Tap the **Save** button to save the method. A pop up message will appear confirming the method has been saved.

Tap **Ok** to return to the previous dialog and then **Ok** again to return to the main **Pump Test** dialog.

**NOTE:** In order to save the sample method, the total number of samples must equal the total memory of the connected Diver.

### 5.4.3 Altitude

The screenshot shows the 'Manager' application window. At the top, it says 'CTD Diver STOPPED'. Below this, several fields are displayed: 'Serial No.: 12767' with a 'Wireless' button; 'Pres. Range: 10000.000 cmH2O'; 'Memory Left: 15975' and 'Bat.: 97%'; 'Location: CTD-Diver'; 'Sample Method: Fixed' with a dropdown arrow; 'Record Interval: 60' with a 'Minute' dropdown; and 'Altitude: 3000' with a 'meter' unit. At the bottom, there are two rows of buttons: 'Settings', 'Data', 'Actual', 'Plot' in the first row, and 'Start', 'Program', 'Pumptst', 'Calibrate' in the second row. Below these is a 'Project Diver Data' section with a small icon.

Specify the altitude above sea level for the location of the Diver. The value entered will be in the units that are programmed in the Diver. (i.e. meters or feet). The ranges are:

- -300 m to 3,000 m
- -1,000 ft to 10,000 ft

**Note:** Altitude is only available for CTD-Divers including DI240-DI245, DI209-DI220.

## 5.5 Stopping a Diver

In order to stop a Diver, the settings must have been read and the status must be “started”.

Tap the **Stop** button. A confirmation screen will be displayed to prevent accidental stopping of the Diver. Tap **Yes** to stop the Diver or tap **No** to prevent the Diver from being stopped.

## 5.6 Starting a Diver

Before you start a Diver, make sure that you have programmed the Diver using the **Program** button. After tapping **Program**, the fields will momentarily appear blank before displaying the settings. Verify that the settings are correct.

The screenshot shows the 'Start Logger' dialog box. It has a title bar with 'Start Logger' and a clock showing '3:54'. There are three radio button options: 'Immediate Start' (selected), 'Future Start', and 'Smart Future Start'. Below 'Future Start' is a date field showing 'Friday, September 21, 2007' and a time field showing '15:54:13'. Below 'Smart Future Start' is a timestamp '2007-09-21 14:55:09' and a checked checkbox for 'Sync Clock'. A red warning message states: 'This action will erase all data on the logger.' At the bottom are 'Start' and 'Cancel' buttons.

To start a Diver, tap the **Start** button to display the **Start Logger** dialog box.

Select **Immediate Start** to start the Diver immediately, or select **Future Start** to specify a future start-time.

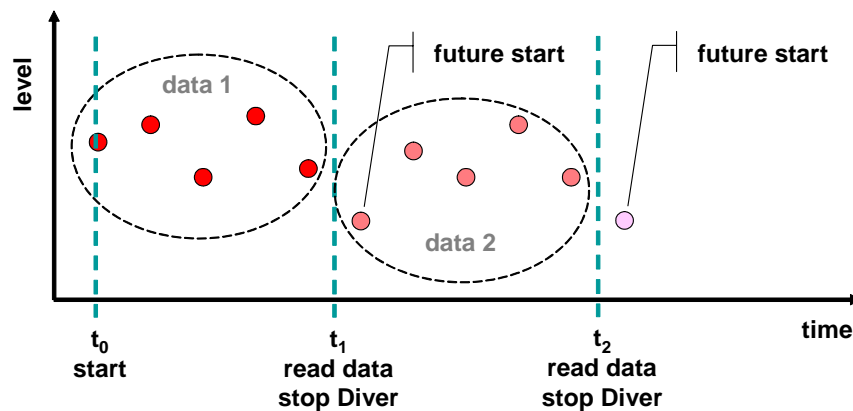
**Smart Future Start** automatically restarts the Diver at the next required sample time based on the original start-time and the sample interval. You may also choose to synchronize the Diver's internal clock with the project time by checking the **Sync Clock with Project Time** checkbox.

#### ATTENTION:

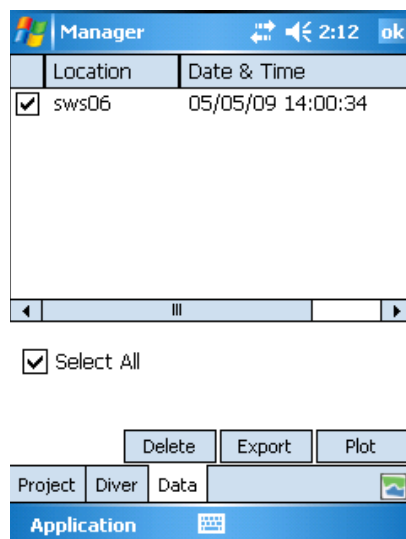
All data in the Diver memory will be erased and irretrievable once the Diver is started. Be sure to download this data before proceeding.

## 5.6.1 Smart Future Start

The **Smart Future Start** option provides optimal use of Diver memory, download speeds and data management. The Smart Future Start option can be explained best by the picture depicted below. Suppose the Diver was started at  $t_0$  and data was collected. At  $t_1$ , the Diver is stopped and *data 1* is read. The Smart Future Start time is given and the Diver proceeds to sample as if it was not stopped. At  $t_2$ , data 2 is collected, the Diver is stopped and the Smart Future Start time is given. *Data 2* can then be linked to *data 1* in the Logger Data Manager. To ensure that timed data is accurate, the Smart Future Start can be synchronized with the Pocket-PC clock by checking the **Sync Clock** box.



## 5.7 Managing Diver Data



Tap the **Data** tab. You will see a list of all downloaded time series of the current project.

Every Diver download is saved to the database as a time series. A time series is defined by the location, a timestamp of the download time, and a unique Diver serial number. You may select one or several time series.

Tap the **Export** button to export all selected time series to text files, e.g., \*.MON, \*.CSV. This will create one file for each selected record in the project folder. Remember, the file format, name, and target path (Project Folder) are defined in the project settings on the **Project** tab.

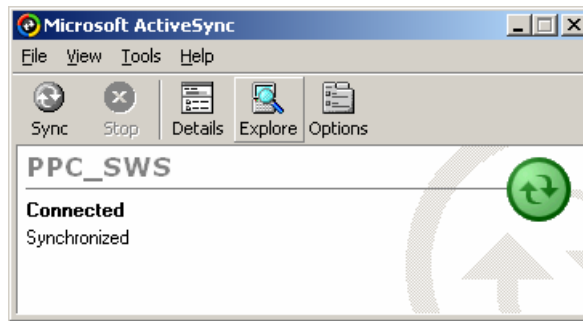
Tap the **Delete** button to delete the selected records from this project.

**NOTE:** After you delete a record, apply the **Compact Database** command from the **Application** menu. This will shrink the database file and save space on the Pocket-PC.

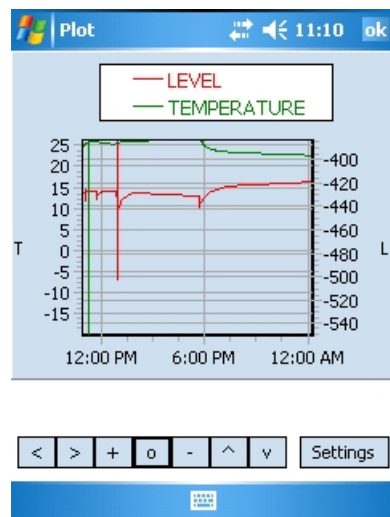
Tap the **Plot** button to display the selected record in a time series. Note that this command is only available when only one record is selected.

## 5.8 Exporting Data to a PC

To transfer data from the Pocket-PC to your Desktop PC, connect the Pocket-PC to the PC and start Microsoft ActiveSync (if not automatically started). Click the **Explore** button to browse the contents of the Pocket-PC (as shown below). You can transfer files to your PC by using **Copy/Paste** or **Drag/Drop**.



## 5.9 Time Series Plots








There are two ways to display downloaded data in a time series plot:

- Tap the **Logger** tab and tap **Data** to download data from the Diver. As the download is finished, the plot button will become active. Tap the **Plot** button. This will display the downloaded data.
- Tap the **Data** tab. Select a record from the stored list. Tap the **Plot** button to display the downloaded data.

To enhance the plotting speed, Diver-Pocket will resample the data whenever a time series plot is made. **NOTE:** Only values that are different by 0.1% will be displayed.

The data for all the available parameters will be displayed. To hide a parameter, tap on its name in the legend. Tap it again to unhide it.

You may use the following navigation buttons to view a selection of the plot in more detail:

- |   |                        |
|---|------------------------|
|  | Move left              |
|  | More right             |
|  | Zoom in                |
|  | Reset default settings |
|  | Zoom out               |



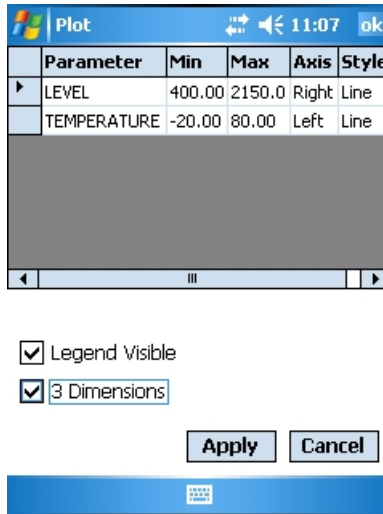
Move up



Move down

## 5.10 Plot Settings

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Tap the **Settings** button to display the parameter settings (as shown to the side).

The grid in the upper part of the screen displays the parameters that are available in the plotted time series. The minimum and maximum values are read from the Diver settings and cannot be changed. However, you may assign parameters to individual axis to improve the vertical resolution of the plotted parameters. The last column of this grid allows you to define how the data is represented on the plot (e.g. lines or bars).

Check the **Legend Visible** box to make the plot legend visible.

The **3 Dimensions** option allows you to give your plot a 3D or 2D appearance.

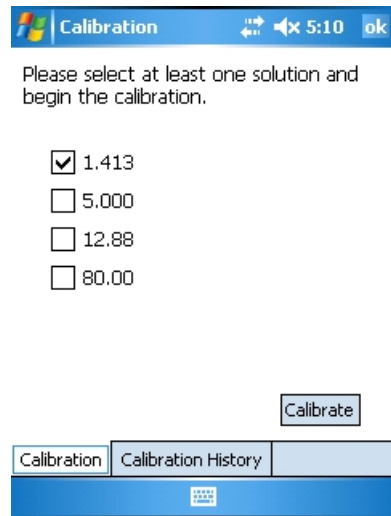
## 6 CTD-Diver Calibration

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Diver-Pocket features the ability to calibrate the ceramic CTD-Divers as well as retrieve the calibration history from the CTD-Diver. It is necessary to regularly calibrate the CTD-Divers to ensure accuracy and reliability.

### 6.1 Calibration

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The ceramic CTD-Diver can be calibrated at a maximum of four points. The solution must have a temperature between 5 °C (41 °F) and 30 °C (86 °F). **NOTE:** It is advisable to place the fluid(s) in the room where the calibration is to take place before the actual calibration starts to allow the fluid temperature to stabilize. Once the fluid temperature has stabilized, you can proceed to calibrate the Diver.

Connect the CTD-Diver to the Pocket-PC and immerse the CTD-Diver in the solution.

Tap the **Logger** tab and then tap the **Settings** button to read the settings from the Diver.

Once the Diver is recognized as a CTD-Diver, the **Calibrate** button will become active.

Next, tap the **Calibrate** button to open the *Calibration* wizard.

Select the check box(es) next to the appropriate solution(s) that will be used to calibrate the Diver.

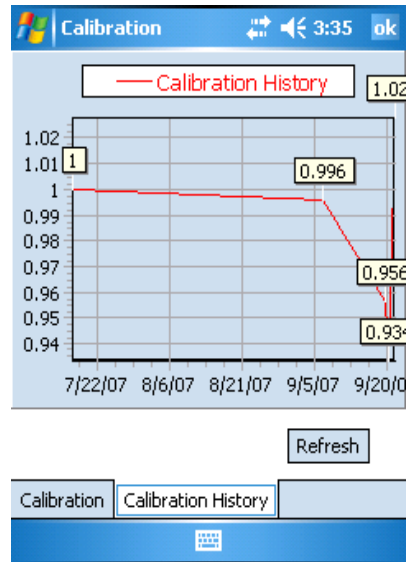
Tap the **Calibrate** button to begin calibrating the CTD-Diver.

A message will appear stating that all data on the CTD-Diver will be erased, tap **Yes** to continue or **No** to cancel.

A message will appear to immerse the CTD-Diver in the selected solution. Tap **Ok** to continue.

Diver-Pocket will then calibrate the CTD-Diver according to the specified solutions. If the calibration was successful, a message will appear. Tap **Ok** to continue.

## 6.2 Calibration History



Diver-Pocket is also capable of reading and displaying the calibration history from CTD-Divers. Each time a CTD-Diver is calibrated, the settings are saved to the CTD-Diver's internal memory. This feature is useful for monitoring changes in calibration over time which may aid in explaining significant variations or anomalies in data.

Ensure the CTD-Diver is connected to Pocket-PC.

Tap the **Logger** tab, and then tap the **Settings** button to read the settings from the Diver.

Once the Diver is recognized as a CTD-Diver, the **Calibrate** button will be made available.

Tap the **Calibrate** button to open the *Calibration* wizard.

Tap the **Calibration History** tab at the bottom of the screen (as shown to the left).

The *Calibration* history will be displayed as a plot. .

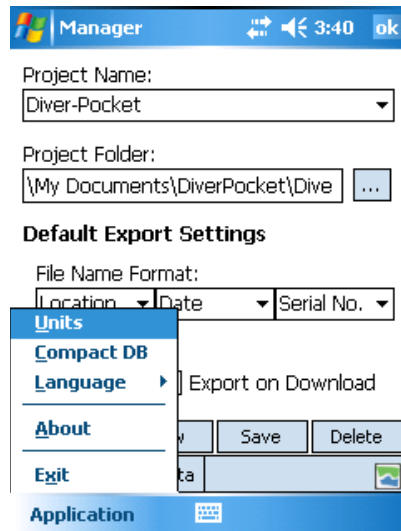
## 7 Application Settings

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You can modify the default application settings in Diver-Pocket by accessing the **Application** button (as shown below).

### 7.1 Changing the Units

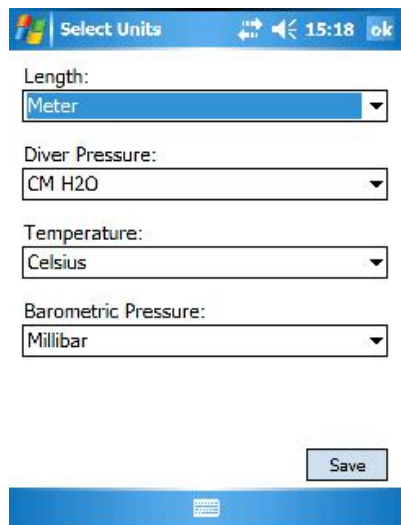
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Tap on **Units** to change the default units.

### 7.2 Changing the Units (Detail)

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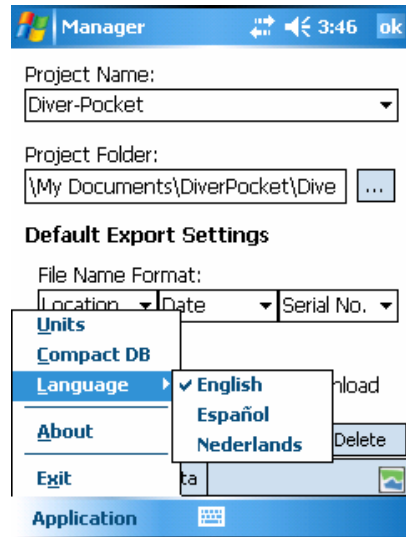
From the drop-down menus, specify a unit for each parameter (Length, Diver Pressure, Temperature, Barometric Pressure).

Tap “Save” to save the changes. The settings will apply to the entire Application and export files.

**NOTE:** The “Barometric Pressure” units are only used in “Actual” form, please refer to the [“Reading Actual Data from the Logger”](#)

## 7.3 Changing the Language

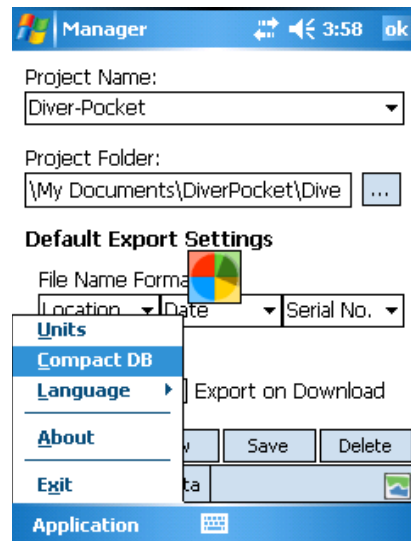
---



This option allows you to change the language of Diver-Pocket. Select from **English**, **Spanish** and **Dutch**.

## 7.4 Compressing the Database

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Please recall that deleting any data in the database does not shrink the size of the database. Tap **Application** in the menu bar and then tap **Compact DB** to compact the database (as shown to the side).

## 8 Troubleshooting

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### 8.1 Interruption in Communication

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Diver-Pocket will inform you with a message if the communication between the computer and the Diver is disturbed, *e.g.*, when there is no Diver connected.

You can confirm the message, take action to solve the problem and then try again. Communication may be disturbed for the following reasons:

- The USB Reading Unit is not properly connected to the Pocket-PC.  
**Action:** Ensure the USB Reading Unit or RS232 Reading Unit is connected to the Pocket-PC.
- Diver-Pocket tried to communicate with the Diver just as it was taking a measurement.  
**Action:** Confirm the message and try again.
- The Diver is not properly connected to the USB Reading Unit or RS232 Reading Unit.  
**Action:** Ensure that the optical connectors on both the Diver and the USB Reading Unit are clean. If not, you can clean them with a soft cloth.
- The Pocket-PC shows a message that an unknown device was found.  
**Action:** see bullet points below.

If the actions outlined above do not resolve the communication problem, proceed as follows:

- Exit the Diver-Pocket program using menu **Application** → **Exit**
  - Unplug the USB Host CF card
  - Disconnect the USB Host CF card from the USB Reading Unit
  - Plug in the USB Host CF card
  - Connect the USB Reading Unit to the Pocket-PC
- Wait 5 seconds
- Start the Diver-Pocket program and tap the **Read** button

If these actions do also not solve the issue, try a **Soft Reset** of the Pocket-PC as described in the product Pocket-PC manual.

### 8.2 Pocket-PC Power Management Issues

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Default settings on most Pocket-PCs automatically shut off if there is no user activity for a set length of time, typically 3 to 5 minutes. This can cause the Pocket-PC to shut off and disrupt the download process. To avoid this problem, the **Power Settings** must be changed on the Pocket-PC. In Windows Mobile, these settings can be accessed in the following manner:

Tap **Start** menu > **Settings** > **System** tab at bottom of **Settings** window > **Power** icon > **Advanced** tab

At this screen, there will be a check box which can turn the power save feature on or off. It is recommended that this feature is disabled when working with large datasets to avoid download disruption.



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