

GETTING STARTED GUIDE Diver-HUB





Contact details:

Van Essen Instruments B.V. Delftechpark 20 2628 XH Delft, Netherlands Tel: +31 (0)15 275 5000

Van Essen Instruments - Canada 219 Labrador Drive, Suite 201 Waterloo, ON, Canada N2K 4M8 Tel: +1 226-791-6499

Van Essen Instruments - USA 4561 Greer Circle, Suite 100 Tucker, GA, United States 30083 Tel: +1 520-203-3445 (US West) Tel: +1 678-983-2818 (US East)

Internet: <u>www.vanessen.com</u> Support: <u>diver@vanessen.com</u>

Copyright © 2022 by Van Essen Instruments B.V. All rights reserved. This document contains proprietary information which is protected by copyright. No part of this document may be photocopied, reproduced, or translated to another language without the prior written consent of Van Essen Instruments B.V.

Van Essen Instruments B.V. makes no warranty of any kind with regard to this material, including, but not limited to, its fitness for a particular application. Van Essen Instruments B.V. will not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this material. In no event shall Van Essen Instruments B.V. be liable for any claim for direct, incidental, or consequential damages arising out of, or in connection with, the sale, manufacture, delivery, or use of any product. Van Essen Instruments and the Van Essen Instruments logo, Diver are trademarks or registered trademarks Van Essen Instruments B.V.





Contents

1	Intro	duction1
2	Setup	an Account2
	2.1	Request Access
	2.2	First Login
	2.2.1	Company Information3
	2.2.2	User Management
	2.2.3	Widget Management
3	Setur	a Project4
	3.1	Project Definition
	3.2	Create a Project
	3.3	Import Project Data5
	3.3.1	Sequence of Data Import6
	3.3.2	Import Images7
4	Diver	Data Collection
	4.1	Manual Data Upload
	4.2	Remote Monitoring
	4.2.1	Operating Principle9
	4.2.2	Diver-Link Configuration9
	4.2.3	Diver Configuration10
	4.2.4	Hardware Deployment11





1 Introduction

Diver-HUB is an easy-to-use, cloud-based web portal delivering centralized and secure access to groundwater monitoring data from anywhere in the world. Diver-HUB allows you to manage groundwater monitoring data in real-time on your desktop, smart phone or tablet. Diver-HUB analyzes Diver data logger time-series, and creates interactive maps and graphs based on your monitoring data, effectively keeping track of all hardware deployed in the field and supporting the overall management of your monitoring network.

This getting started guide outlines how to setup Diver-HUB, create and setup a project and start data collection. Diver-HUB supports two data collection methods: manual and remote monitoring.

The first step is to request an account. At first login, after the account is confirmed, a wizard starts to confirm or set the Diver-HUB configuration. Once completed, a project must be created before data collection can start. Setting up a project is done by importing a set of CSV files with data about the various locations, such as name, address and coordinates. Also, specific well information is needed, so that the system can automatically calculate water levels from the collected Diver data.

After defining the project, already available Diver data can be uploaded using Diver-Office to Diver-HUB or Diver data that is manually collected can be uploaded in the future. In case of a remote monitoring project some additional steps must be done. First, the Diver-Links must be configured using Diver-HUB. Next, the Diver-HUB project data must be imported in Diver-Office before programming the Divers using Diver-Office and/or Diver-Field. Finally, the Divers are connected to the Diver-Links and deployed in the field.





2 Setup an Account

2.1 Request Access

The first step in the process is to request access to Diver-HUB. Go to the Diver-HUB registration page <u>https://www.diver-hub.com/Admin/RegisterCompany</u> and fill out the form and click the Save button.

ص Diver-HUB							
Register Company H	ere you can send a request to cr	eate an account for your co	ompany				
Licence type	Free		Ŧ				
Company	Demo Company						
Address	2083 Dogwood Road						
Zip code	AZ 85040	City	Phoenix				
Country	United States	Telephone					
Order number							
Local admin acco	unt						
First name	Harry						
Last name	Davis						
Email address	Email address						
Cancel			Save				

Please contact us if you require a license type other than Free.

After an account has been created, you will receive an email with a link to the login page and a temporary password.

2.2 First Login

After the first successful login you will be asked to enter a new password.

👚 Home > 🎪 Settings > 👗 My Profile > 🛛 Change password >	
Email	
registration and a second second	
Temporary password	
••••••	
New password	
Confirm password	
Cancel	Save





2.2.1 Company Information

Next, you will be asked to verify your company information. Click Next when the information is correct.

2.2.2 User Management

In the User Management section, you can add new users. If you are the only user click Next.

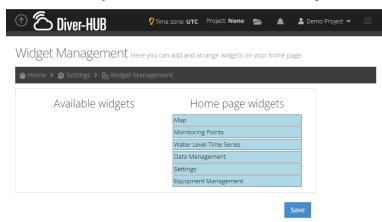
🔿 🖒 Div	ver-HUB	? Time zone: UTC	Project: None	-	•	💄 Demo Project 🗸			
User Management Here you can add, edit or delete users and local administrators									
會 Home ゝ 🎄 S	合 Home > ☆ Settings > ♦ User Management								
Name 🖨	Email 🖨	Lo	ocal admin 🖨						
Add new +									

2.2.3 Widget Management

In the Widget Management section, you can determine which widget will be shown on your homepage and in which order. Drag-and-drop the widgets from the Available column (left) to the Home page column (right).

🔊 🖒 Diver-HUB	🖓 Time zone: UTC	Project: None	e a	💄 Demo Project 🗸	
Widget Management Her	e you can add and a	rrange widgets c	on your home p	oage	
合 Home 🕨 🌣 Settings ゝ 🗞 Widget Ma	inagement				
Available widgets	Но	ome page	widgets		
Map					
Monitoring Points					
Water Level Time Series					
Equipment Management					
Settings					
Data Management					
				Save	

In this example all available widgets will be shown on the homepage in the order as shown below. Click Done when you are satisfied with the selected widget and their order.



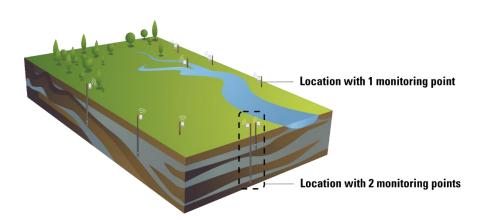




3 Setup a Project

3.1 Project Definition

A project in Diver-HUB is defined as a set of locations as depicted in the figure below. A location has a unique name and X, Y coordinates. At each location there are one or more monitoring points (Divers). Each monitoring point must have a unique name.

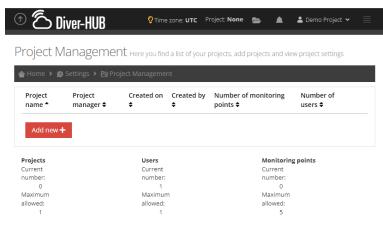


3.2 Create a Project

After completing the setup of Diver-HUB or after logging in to Diver-HUB the homepage will be shown.



Click the Settings button and then the Project Management button. The following view will appear. Click the Add new + button. Only users with administrator rights can create a new project.







The following view will appear. Type a Project name, assign a Project manager, select the users for the Project team and click Save. The settings for the Public Web Portal are for display only. Please contact Van Essen Instruments if you want to make your groundwater data publicly available on www.diver-hub.com/public/tucson.

🕆 🖒 Diver-HUB 🔹 🕈	Time zone: UTC Project: None 🖕 🛕 🛔 Demo Project 👻 🗮
New Project Here you can create a ne	ew project
合 Home ゝ 淼 Settings ゝ 🖻 Project Manag	ement > Create New Project
Project name	DemoVEI
Project manager	Demo Project 🗸
Vertical reference datum \heartsuit	Mean Sea Level 🗸
Project logo	Please select a .jpg file for the project logc Browse
Public Web Porta	l
Show data in public web po rtal	Not Set 🗸
Data available via API	Not Set 🗸
URL slug	
Show also provisional wate r level data	
Project team	
Demo Project	Default 🗸
Cancel	Save

3.3 Import Project Data

In this step locations and monitoring points will be setup. The data can be imported using the Data Management widget. In the Home screen click the Data Management tile and the view as shown below will appear. Then click the desired Templates tile and download the Excel file for each import.

🔿 🖒 Diver-l	HUB [©] Tirr	ne zone: UTC Project: D	emoVEI 📂 🌲	💄 Demo Project 👻	≡				
Templates Here you can download template files for each import									
摿 Home 🕨 🔁 Data M	· 合 Home → ြb Data Management → [b] Templates								
1. Location Metadata	2. Monitoring Point Metadata	3. Link Monitoring Point and Name Programmed in Diver datalogger	4. Barometric Source for Barometric Compensation	5. Cable Information for Barometric Compensation					
6. Monitoring Point Top of Casing Elevation	7. Ground Surface Elevation	Location Images	Manual Groundwater Measurement Data	User Defined Notifications related to Time- Series Data					
Provisional Water Levels	Monitoring Point Water Density								





The Excel template file contains information about the required data format of each column. The columns in green in the Excel template file are mandatory fields, the yellow columns are optional.

The value for the *client_name* must be equal to the Company in Settings > My Profile. The value for *project_name* must be selected from one of the project listed under Settings > Project Management.

After filling out the Excel template file, save the file as a CSV file. Next, navigate to Data Management > Import and click the Import+ button. The following view will appear, in which you select if you want Diver-HUB to add new objects (locations & monitoring points) and/or update existing objects. Select the time zone corresponding to the time stamps of the imported data.

🕆 🖒 Diver-HUB	🖓 Time zone: UTC Project: DemoVEI 👝 🛕 💄	, Demo Project 🖌 📃
Import Here you can import your d	ata using CSV and ZIP file(s)	
🖀 Home ゝ 🔁 Data Management ゝ	🖰 Import Management 🔸 Import	
Choose CSV or ZIP file to import	Please select a *.csv or *.zip to import	Browse
Import new data objects	Allow	~
Update existing data objects	Allow	~
Time zone (for date time values)	(UTC) Coordinated Universal Time	~
Back		Import

3.3.1 Sequence of Data Import

Diver-HUB automatically calculates water levels for each monitoring point. This requires the following minimum dataset. The data must be imported in the following sequence:

- 1. Location Metadata. Each location must be added as a row in the template file.
- 2. *Monitoring Point Metadata*. A location can contain one or more monitoring points. Each monitoring point must be added as a row in the template file.
- 3. *Link Monitoring Point and Name Programmed in Diver datalogger*. The link between the monitoring point in Diver-HUB and the name programmed in the Diver datalogger is time dependent. Multiple Divers with different names that were used in the same monitoring point can be listed in this template file. Add a row for each name including a timestamp.
- 4. *Barometric Source for Barometric Compensation*. Each monitoring point requires a link to a barometer (barometric source) that is used for the barometric compensation including a timestamp that indicates the start of the link to that specific barometer. When another/new barometric source is used for compensation, add a new row to the template file including a timestamp (*date_from*) from when the new barometric source must be used.
- 5. *Cable information for Barometric Compensation.* Each monitoring point must have at least one value for the cable length including a timestamp. In case cable length changes over time, new values including a timestamp may be added as a new row to the template file.
- 6. *Monitoring Point Top of Casing Elevation*. Each monitoring point must have at least one value for the top of casing elevation including a timestamp. In case the top of casing changes over time, new values including a timestamp may be added as a new row to the template file.
- Ground Surface Elevation. Each monitoring point must have at least one value for the ground surface elevation including a timestamp so that the water level below ground surface can be calculated. In case the ground surface elevation changes over time, new values including a timestamp may be added as a new row to the template file.





3.3.2 Import Images

Images, e.g. location photo and borehole log plot (bhlp), can be imported for each location by downloading the *Location Images* template. In the columns *photo1*, *photo2* and *bhlp_image* type the exact name of each file including its extension, e.g. *jpg*, *png* and save the *Location Images* template as a CSV file. Subsequently, create a ZIP file and add the *Location Images* CSV file and image files to it. Do not use sub-folders. The ZIP file can be imported in the same way as other data; navigate to Data Management > Import.





4 Diver Data Collection

4.1 Manual Data Upload

Diver-Office can be used to upload Diver data to Diver-HUB. In Diver-Office click on the Data button in the toolbar the following window will appear:

-	ata		•	
	ppensate Export	Delete Diver-HUB	(?) Help	
— Filter				
2	Regular Monitoring Points	Barometric Monitoring Po	sints 🔽 Suitable for i	upload to Diver-HUB
	logdidi Monitoning Folinto			
2	Uncompensated			
5	Partly Compensated			
	Compensated			
ilter	time series starting from:			Apply
1990	0-01-01 🔲 🔻 12:00:00 AM 🗏	to 2018-03-13	12:18:02 PM 😫	Reset
				<u>-1</u> 0001
	Monitoring Point	Start Date & Time	End Date & Time	Download Date & Time
/	Img baro 1	2007-10-23 9:00:00 AM	2008-03-17 12:00:00 PM	2018-03-12 12:17:49 PM
2	Img baro2	2007-10-23 9:00:00 AM	2008-03-18 9:00:00 AM	2018-03-12 12:17:49 PM
/	lmg bw1a	2007-10-23 9:00:00 AM	2008-03-03 2:00:00 PM	2018-03-12 12:17:49 PM
/	lmg bw1b	2007-10-23 9:00:00 AM	2008-03-03 2:00:00 PM	2018-03-12 12:17:49 PM
/	lmg bw3a	2007-10-23 9:00:00 AM	2008-03-03 3:00:00 PM	2018-03-12 12:17:49 PM
/	lmg bw3b	2007-10-23 9:00:00 AM	2008-03-03 3:00:00 PM	2018-03-12 12:17:50 PM
/	lmg bw8a	2007-10-23 9:00:00 AM	2008-03-03 3:00:00 PM	2018-03-12 12:17:50 PM
/	lmg bw8b	2007-10-23 9:00:00 AM	2008-03-03 3:00:00 PM	2018-03-12 12:17:50 PM
	lmg bw9a	2007-10-23 9:00:00 AM	2008-03-03 4:00:00 PM	2018-03-12 12:17:50 PM
~	lmg bw9b	2007-10-23 9:00:00 AM	2008-03-03 4:00:00 PM	2018-03-12 12:17:50 PM
		2007-10-23 9:00:00 AM	2008-03-03 10:00:00 AM	2018-03-12 12:17:50 PM
	lmg ja3a	2007-10-23 3.00.00 /10		
~	lmg ja3a Img ja3b	2007-10-23 9:00:00 AM	2008-03-03 10:00:00 AM	2018-03-12 12:17:50 PM
	••		2008-03-03 10:00:00 AM 2008-03-17 3:00:00 PM	2018-03-12 12:17:50 PM 2018-03-12 12:17:51 PM
	lmg ja3b	2007-10-23 9:00:00 AM		

You can upload specific time series data to Diver-HUB from the Data dialog. Enable the Suitable for upload to Diver-HUB checkbox to filter the time series that can uploaded. Suitable time series are those that were downloaded directly from the Diver or from imported DAT files. Enable the checkbox(es) for the desired time series data and click the Diver-HUB button from the toolbar. The following dialog will display:

Upload Data to Diver-HUB - Step 1 of 2			×
Please enter usemame and password for your Diver-HUB account.			
Usemame:			
Password:			
Remember username and password			
			_
Cancel < Back Ne	xt >	Uplo	ad

Fill out the Username and Password fields and click the Next > button to select the project upload the data. In the next step, select the project to upload the data to. Click Upload to send the data to Diver-HUB.





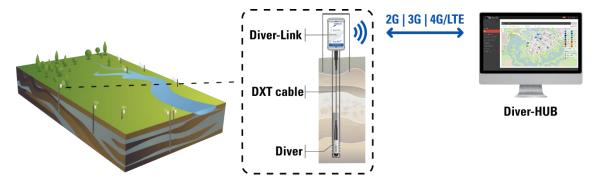
Upload Data to Diver-	HUB - Step 2 of 2		_		×
Please select a Diver-H	UB project.				
Diver-HUB Projects:					
DemoVEI			\sim		
	Cancel	< Back	Next >	Upl	oad

If the Diver-HUB project is properly set up, then Diver-HUB will automatically compensate the Diver data into water levels. The uploaded data and the resulting water level data will be shown in the Water Level Time-Series widget.

4.2 Remote Monitoring

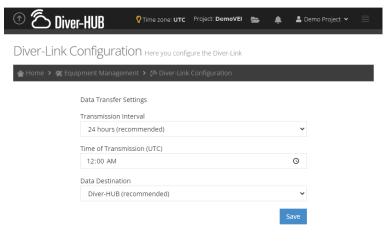
4.2.1 Operating Principle

A Diver groundwater datalogger is suspended on a DXT Cable which is connected to a Diver-Link at the top of the well. The Diver-Link connects to a 2G, 3G or 4G/LTE cellular network and transmits the Diver data and the data from its internal barometric datalogger to the Diver-HUB server.



4.2.2 Diver-Link Configuration

First select the project for which you want to configure the Diver-Links. Then, in the Home screen click the Equipment Management tile. Next, click the Diver-Link Configuration tile and the view as shown below will appear.







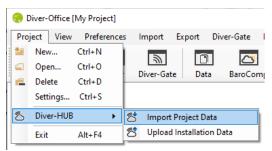
Set the desired data transmission interval, the time of the day that the transmission must occur and the data destination. Click Save to store the settings and on the next connection of the Diver-Link to the server, these settings will be applied.

Setting the Data Destination to External FTP Settings requires you to setup your own FTP server and enter the login credentials for it here. Choosing this option will not show any Diver data in Diver-HUB.

4.2.3 Diver Configuration

For the system to link the Diver-Link and Diver to the appropriate Diver-HUB project the following procedure for programming the Divers must be followed.

Open Diver-Office and open any project. Go to Project > Diver-HUB > Import Project Data.



A dialog wizard appears. In the first step enter your username and password for your Diver-HUB account. In the second step, a list of available Diver-HUB projects is shown. Select the Diver-HUB project from which you want to import the data and click Next. In the third step a list of all the monitoring points in the selected project is shown. Deselect the monitoring point that you do not want to import. By default, all monitoring points are selected. Click Import to import the selected monitoring points.

If the project name that is being imported does not yet exist in Diver-Office, then a new project will be created. Otherwise, the monitoring point information in the existing project will be updated. At the bottom of Project Settings details frame, the Diver-HUB project is now shown.

Project Settings	
Tucson	
Project Folder:	
C:\Users\ \AppData\Roaming\DiverOffice\Tucson	<u></u>
Default Export Settings	
File Type:	
DAT MON CSV NITG	
XLSX	
Filename Format:	
Monitoring Point \checkmark Date and Time \checkmark Serial Number	\sim
Export on Download	
	Edit
Project Time Settings	
O Computer Time (Winter Time)	
O Coordinated Universal Time (UTC) O Daylight Saving Time (Summer Ti	me)
Vertical Reference Datum:	
Mean Sea Level	~
Diver-HUB Project:	
Tucson	





Now the Divers can be programmed. Connect the to the computer through a USB Reading Unit (part no AS330) or the Smart Interface Cable (part no. AS346) and click the Diver button to open the Diver window. See the image below for an example where the following parameters are used:

- Select the Monitoring Point name from the dropdown list: "MW17-ob"
- sample method: "Fixed Fixed-length memory"
- record interval: 1 hour.

After entering the settings, the Diver must be programmed by clicking the Program button.

Diver				_	
Settings Data	Real-Time Start Progra				
Diver Properties TD-Diver (D1805)	STOPPED		Configure Diver Monitoring Point:		
Serial Number:	\$A061		MW17-ob		`
Firmware Version:	V1.17		Sample Method:		
Pressure Range:	50 mH2O	1	Linear - Fixed-length memory	\sim	
Started at:	8/19/2016 2:00:00 PM		Record Interval:		
Stops at:	9/22/2016 9:45:00 AM		1 Hour	~	
Samples Taken:	0 / 72000				
Battery Left:	100%				
Actual Data					
Date & Time	Parameter Value	Unit			
9/23/2016 3:18 PM	Pressure 1050.000	cmH2O			
9/23/2016 3:18 PM	Temperature 24.620	Celsius			
3/23/2010 3.101 M					

Once the settings are successfully programmed into the Diver the Start button will be enabled. Clicking the Start button opens the Start Diver dialog as shown below. Here you can select from the three start methods. It is recommended to select the Future Start option to start the Diver at a specified time in the future. Please refer to the Diver product manual for more details on programming Divers.

4.2.4 Hardware Deployment

Now that the Divers are programmed, they can be connected to the Diver-Link through a DXT Cable. Please refer to the Diver-Link Product Manual on how to setup and deploy the Diver-Link. Once the Diver is connected to the Diver-Link, its data will appear in the selected Diver-HUB project.