



Failure to follow these instructions
will void the warranty.

LORENTZ

PS DataModule and PumpScanner App for Android™

OPERATING MANUAL AND USER GUIDE

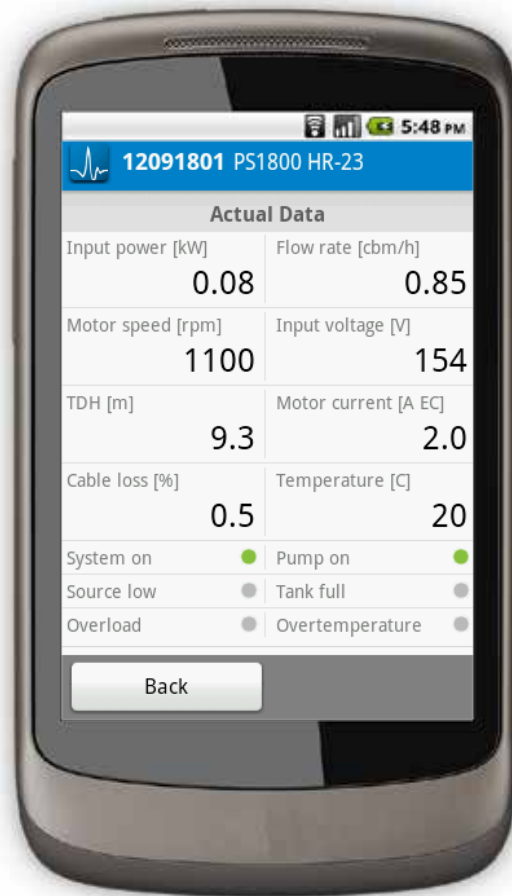
PumpScanner



1 INTRODUCTION

The LORENTZ PS DataModule is an integral data logger and remote control device for the whole PS range of helical, centrifugal and surface pumps. The PS DataModule and PumpScanner for Android™ App open new opportunities in drinking water supply for people and livestock, irrigation and swimming pool applications. The PS DataModule collects performance data from the pump system and stores it for periodic collection. The PS DataModule uses Bluetooth™ to communicate with the LORENTZ PumpScanner Android™ App allowing secure data collection without physical connections.

The PS DataModule opens up new opportunities to improve customer service and for new commercial models.



Pictures may differ from actual product

1.1 Features

- Low cost add on module
- Manage multiple pumps
- Provides data real-time and stores
 - voltages
 - currents
 - input and output power
 - calculated flow rates
 - operating time
 - heads
 - pump speed
 - cable losses
 - temperature, and more
- Bluetooth™ connectivity for secure contactless data transfer
- Stores up to 10 years of data (at 10 minute frequency)
- Real time and stored data
- Two-way communication to program pump speeds and operating times
- Connections for additional external sensors
- LORENTZ PumpScanner for Android™ App for viewing performance data
- PumpScanner is available in Customer / Partner and Standard / Technical versions

1.2 Customer service improvement

- Quickly identify any pump performance issues
- Reduce fault finding time and cost
- Improve technician image – very professional tools available on low cost Android™ smart phones
- Provide clear pump and water source performance information for customers
- Identify any pro-active service work that needs to be carried out ahead of potential failures

1.3 New commercial opportunities

- Pay on use – accurate flow and time measurements allow for pay per volume of water or pay per hour of use charging models to be developed.
- Shared pump ownership – monitoring allows for pump shared ownership and rental models.
- Pro-active maintenance service – demonstrate to a customer why the pump should be cleaned/serviced

2 PRE-REQUISITES AND PLANNING

To setup the features and functions of the PumpScanner App and PS DataModule functionality you will need the following:

- A PS Controller with a PS DataModule installed
- A registration of the pump system components on Sites in the LORENTZ partnerNET
- An Android smartphone or tablet with running Android™ 2.2 (Froyo) or above with Bluetooth™
- A LORENTZ partnerNET account to access your PumpScanner license ID
- An internet connection to download PumpScanner software and to update your PumpScanner license list

Before going to the work site to configure the PS DataModule it is recommended to set up a Site on partnerNET, access your PumpScanner license ID, download PumpScanner and update the license list in PumpScanner settings to reduce the need for using mobile data. The PS DataModule cannot be accessed without setting up a Site on partnerNET and updating the license list within PumpScanner.

3 PUMPSCANNER SETUP AND CONFIGURATION

3.1 Smartphone requirements

To run the PumpScanner App use an ANDROID™ Smartphone with operating software version not less than 2.2.

You can check your actual Version by going to

Settings > **About phone**
> **Software information**
> **Android™ version**

The version number is shown below.

The Smartphone has to be Bluetooth®-compliant. (Most Android™-Smartphones are Bluetooth-compliant.)

Recommended phone hardware:

- The minimum screen resolution is: 320x480 pixels
- RAM > 384MB
- CPU > 800MHz

3.2 Download and install of the PumpScanner App

Our Apps and the updates are not available through Google Play (Android Marketplace). You will find the latest version of PumpScanner on partnerNET under the Support section.

Since the PumpScanner App cannot be downloaded from Google Play you must allow the installation of Apps from unknown sources. To do this


- Enter the main menu, where all other Applications are located, then go to

Settings > **Applications**

- Make sure that the item “**Unknown Sources**” is checked (fig. 1).



Note: After the installation of the PumpScanner App you can disable the installation of Apps from unknown sources again.

When you have downloaded the PumpScanner App, start the installation of the file. Look for the file in the taskbar or the download folder  on your mobile phone.

Click on the file and start the installation (fig. 2).

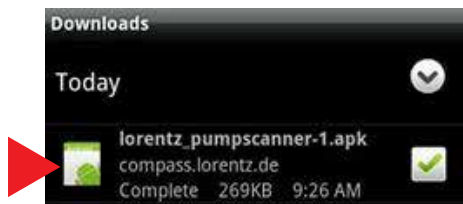


Fig. 2: Start installation

3.3 Install with QR code

Another way to download the PumpScanner App is by using a QR code scanner. Search in the Android™ Market-place for such an application (for example Google goggles), if you do not already have such a scanner.

After scanning the code, follow the link and the download will start immediately. Install the application as mentioned before.

Follow the instructions given by the software. It needs a few seconds to install the application. When it finished you can open PumpScanner (fig. 3).



Fig. 3a: Scan the QR code



Fig. 3b: Receive the link

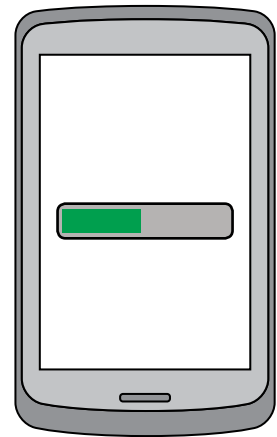


Fig. 3c: Download file

3.4 Synchronize the clock on first start



It is important that the time and date on your Android device is correct. You will be given the option to synchronize this time with the PS DataModule. If you do not have correct and synchronized times then data may not be correctly downloaded.

3.5 Updating the PumpScanner App

When an internet connection is available PumpScanner will check for new versions and prompt you to install the latest. If you want to update to a new version of the PumpScanner App manually you can start with section 4. You do not need to uninstall the application. The installation of the new software version will replace the old one. The previous user data will be saved.

4 USING PUMPSCANNER

4.1 Starting the application

The PumpScanner App is launched from the all apps launcher simply by clicking on the LORENTZ PumpScanner icon:



You may have to look for it by scrolling through the main menu; this depends on the smartphone you use and the number of installed applications.



Make sure that the PS Controller is turned on. It is not necessary for the pump to be running but power must be available to the PS Controller.



Do not forget to synchronize your PumpScanner date and time, cf. chapter 3.4

4.2 Setting PumpScanner up

To use PumpScanner you must enter the license ID. From the PumpScanner start page select settings, you can now enter the License ID. Your license ID can be found on LORENTZ partnerNET in the Support section under PumpScanner. Note this is a unique license key for you, do not share it.

Some features of PumpScanner are role based, some features require licensing of the DataModule.



Fig. 4a:

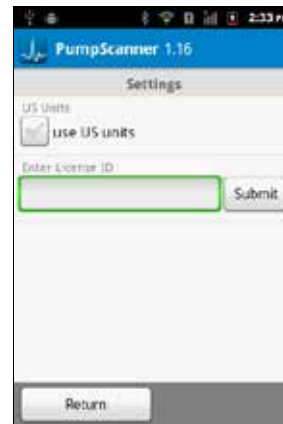


Fig. 4b:

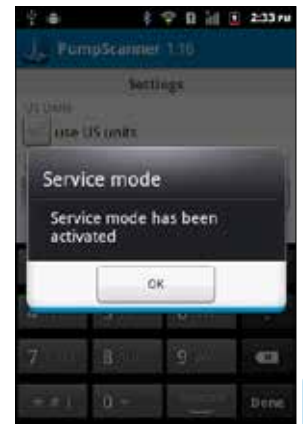


Fig. 4c:

4.3 Pump list

When the PumpScanner App starts, it will search for pumps immediately. This will take a few seconds (fig. 5a). When the application finds a pump it will be shown on the list. Choose the pump you want to use (fig. 5b).

To delete a pump from the list, long-click on the pump name.

The software can only pair with pumps which were registered on your Sites page within partnerNET and after updating the license list in PumpScanner. The PS DataModule can be licensed online for additional functionality. Please see the PS DataModule Licenses module on LORENTZ partnerNET which can be found on the support tab.

If you have any problems with the connection please see the trouble shooting section of this manual.



Fig. 5a: Scanning for pumps in the area



Fig. 5b: Pump list

4.4 PumpScanner Dashboard

After the pairing process is complete the dashboard is displayed. The "Pump profile" and the "Stored data" will synchronize automatically. Stored data can take some minutes to synchronize depending on how many records there are.

On the dashboard (fig. 6) you will see:

- **Actual data:** your DataModule sends out
- **Pump profile** of your pump system
- **Stored data** of your pump system
- **Firmware update:** will update the firmware on the PS DataModule if it is required to do so
- **Pump list** button will bring you back to the pump list
- **Connect** or **Disconnect** start and stop the connection to your phone



Fig. 6: PumpScanner dashboard

4.5 Pump profile

4.5.1 Pump system profile

Once you are connected via the Bluetooth to a PS DataModule you should first make sure that your Pump profile is correct and saved (fig. 7).

- **Controller:** Choose your PS Controller
- **Pump unit:** Choose your pump unit
- **Cable length:** Cable length to your pump
- **Cable size:** Cable size of the cable to your pump


 **Note: You will not be able to save settings unless you have a connection via Bluetooth to the PS DataModule.**



Fig. 7: Pump profile

4.5.2 Pump system settings

The following settings can be made to the PS DataModule. Some options require the installation of additional equipment such as a flow meter or pressure sensor.

- **Flow meter:** Set the flow in liters per impulse
- **Pressure sensor:** Set the pressure measuring range
- **Speed limitation:** Set the maximum motor speed limitation in revolutions per minute, this overrides the internal speed control potentiometer in the PS Controller
- **Timer:** Running time and pause time limitation, this is useful where a well has a low yield
- **PS DataModule sample rate:** Setting of the PS DataModule sample rate



Fig. 8a: Pump system settings 1



Fig. 8b: Pump system settings 2

For standard solar pump applications we recommend not to set the sample rate at less than 1 minute. Setting a higher sample rate will considerably increase the time to download stored data. With a 10sec sample rate it will take 20 min to download 2 months of records.

In the last row the current firmware version of the PS DataModule is displayed.



You can only change the settings when you are connected with the pump.

4.6 Actual data

The "Actual data" shows the key running data of the pump system that is current connected. Displayed are the input power, flow rate, motor speed, input voltage, total dynamic head, motor current, cable loss and controller temperature. The controller LED status indicators are also replicated on the display (fig. 9).



◀ Actual data

◀ Status indicators

Fig. 9: Actual data

4.7 Stored data

"Stored Data" allows you to view data that has been recorded in the PS DataModule. You can choose between 4 modes:

- (1) Year
- (2) Month
- (3) Day
- (4) Hour

You can switch between these modes by clicking on the buttons. In the first three modes you can read out the running time (in [h]) and the pumps output (in [m³]) per year, month or day. In Mode four you have buttons to switch between flow rate, motor speed, voltage and the current.

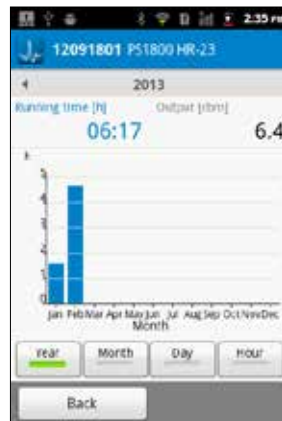


Fig. 10a: Stored data: by year



Fig. 10b: Stored data: by month



Fig. 10c: Stored data: by day



Fig. 10d: Stored data: by hour

You can navigate in the mode windows by sliding the date / time left or right



Fig. 11a: Navigating in data 1



Fig. 11b: Navigating in data 2



Fig. 11c: Navigating in data 3



Fig. 11d: Navigating in data 4

When you rotate your smartphone into landscape – auto-rotate screen should be activated – you can zoom in and out on the graph view. Use finger spread and pinch to zoom and navigate with finger swipe.

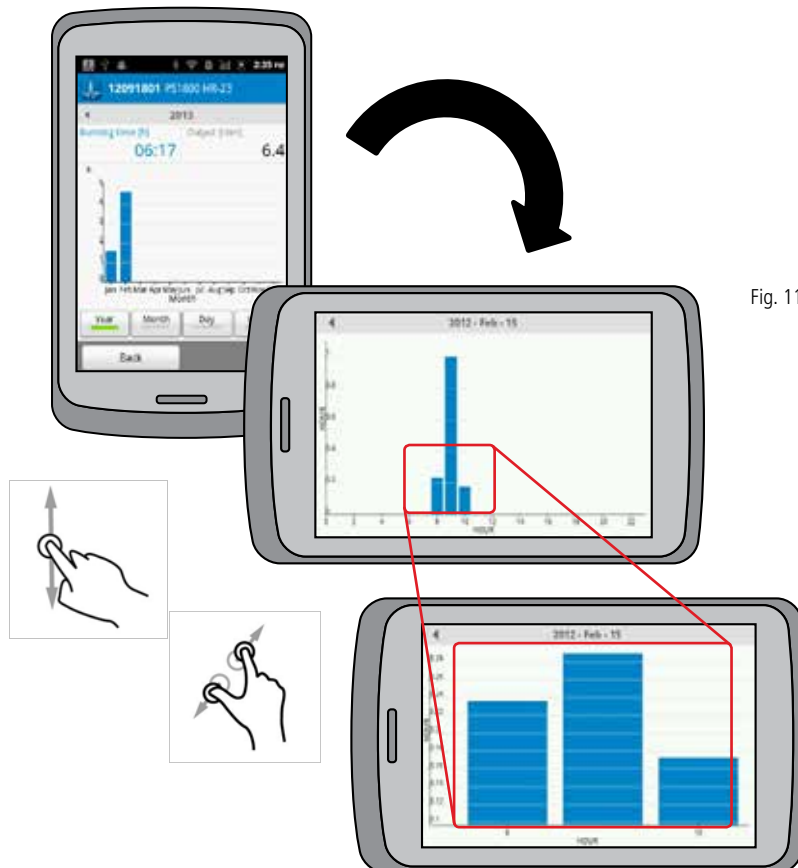


Fig. 11e: Navigating in data 5

4.8 Firmware upgrades

The Firmware update option will check the version of the chose PS DataModule against the latest available.



You can only update firmware when you have a connection by Bluetooth(TM) to the PS DataModule.

To upgrade the PS DataModule follow the steps below:



Fig. 12a: Firmware update 1:

Press the Program button



Fig. 12b: Firmware update 2:

Accept the confirmation message by pressing **update**



Fig. 12c: Firmware update 3:

The firmware will now be updated via Bluetooth. **Do not switch off the controller or Android device** during this process, ensure you stay close to the pump controller



Fig. 12d: Firmware update 4:

When the update has been completed you will see a confirmation message.

4.9 PumpScanner license ID

PumpScanner license IDs are specific to individual LORENTZ partnerNET users. License IDs are available to LORENTZ approved partners. Your license ID will be available



It is important that you open the PumpScanner application from time to time when your Android device is connected to the internet (WiFi or mobile data). PumpScanner may lock itself if you do not connect to the internet every 90 days. This feature has been added to ensure software versions are kept up to date.

4.10 Default mode

The default mode of PumpScanner has very limited functionality as long as no license ID is entered. By entering the code

999999999

you can reset your PumpScanner to default mode. To gain access to additional functionality, enter the PumpScanner license ID available to you in partnerNET.

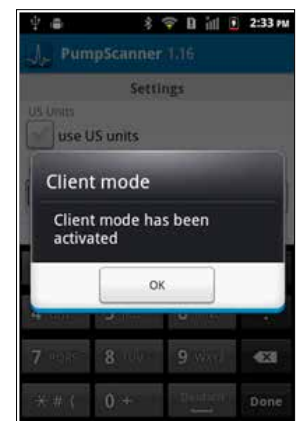
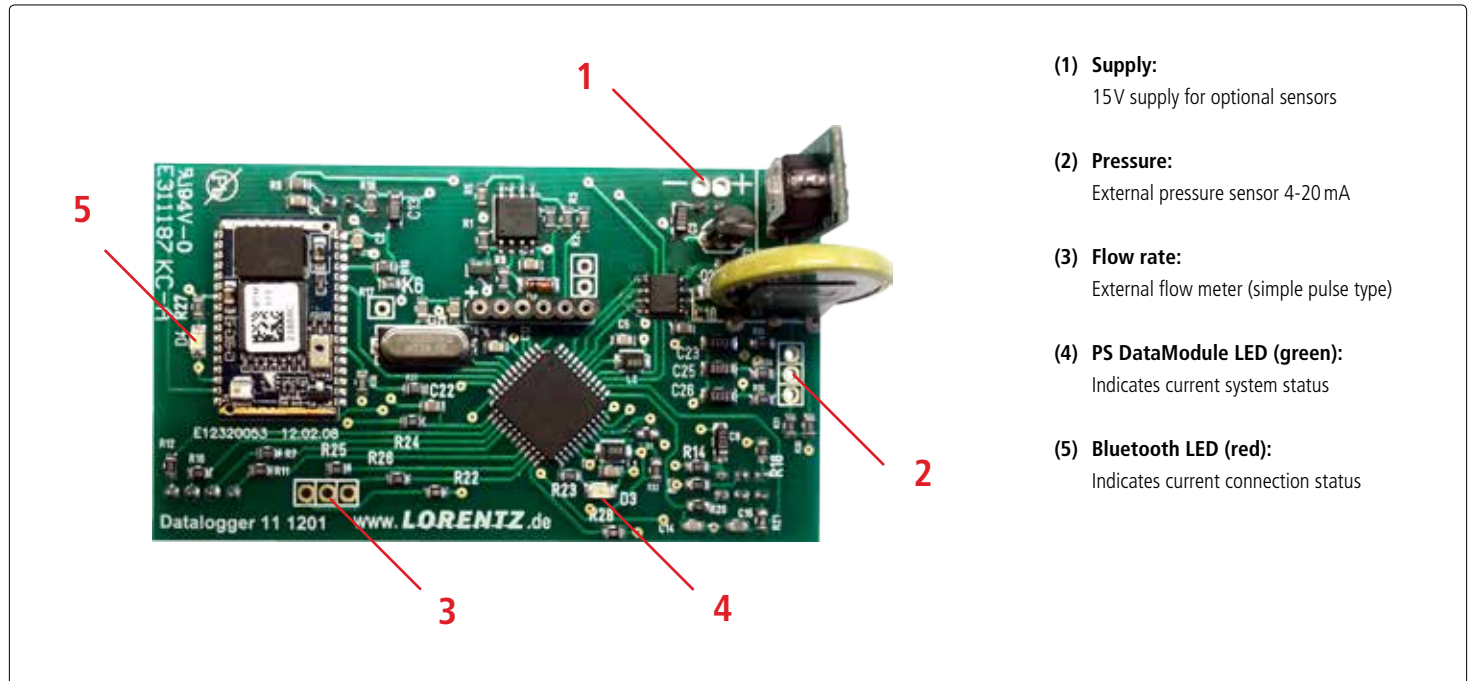


Fig. 13: Client mode

5 TROUBLE SHOOTING

Here is a description of the PS DataModule.



- (1) **Supply:**
15V supply for optional sensors
- (2) **Pressure:**
External pressure sensor 4-20 mA
- (3) **Flow rate:**
External flow meter (simple pulse type)
- (4) **PS DataModule LED (green):**
Indicates current system status
- (5) **Bluetooth LED (red):**
Indicates current connection status

Fig. 14: PS DataModule PCB with cable connections

5.1 PumpScanner

Be sure you have installed the latest version of the PumpScanner App. If you have any problems check the following:

- Is the smartphone compatible (see section 2.1)?
- Did you register the pump system on Sites in partnerNET?
- Did you update the license list in PumpScanner?
- If synchronizing of "Stored data" does not finish then ensure PS DataModule and PumpScanner Versions are both the latest
- If PumpScanner cannot find the pump, deactivate Bluetooth on your mobile phone, wait until the Bluetooth LED on PS DataModule flashes and then return to PumpScanner

5.2 Bluetooth connection

When the LED (figure 14, point 5) of the PS DataModule flashes, you can get a Bluetooth connection. When the LED is permanent on, the Bluetooth connection is set up.

If you are having problems check the following:

- Does the PS DataModule have power? The PS Controller must be on.
- Is the PS DataModule PCB correctly seated in the socket?
- Are PS DataModule and PumpScanner versions up to date, check on partnerNET?
- Is the system registered on Sites and the PumpScanner license list updated?
- Are you within Bluetooth operating range?

5 TECHNICAL DATA

PS DataModule:

- Dimensions 82.5 mm x 47 mm x 20 mm (LxWxH)
- Bluetooth Class 2 communication
- Range: approx. 5-8 m (15 to 25 ft) depending on circumstances.
- 4MB Flash Memory
- Based on 24 h operation per day the storage capacities are as follows:

PS DataModule sample rate / max. Storage capacity:

1 s	72 h
10 s	30 d
1 min	6 months
5 min	2.5 years
10 min	5 years
30 min	15 years
60 min	30 years

Based on a solar day these times will be greatly extended, typically x2+