

VERSION 1.19

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## MANUAL FOR SW APPLICATION GEARBOX MOBILE FILTRATION

### DESCRIPTION OF SW AND ITS AIM

The application serves for managing and data collection from mobile filtration devices made by the company EROBOT. In the version 1.19 exists only for devices (mobiles, tablets) with OS Android from the version 4.4 (Kitkat) above.

## ABBREVIATIONS

GMF – Gearbox Mobile Filtration Application

BT – Bluetooth, ver. 3 a 4

WIFI – Wifi radio communication in the norm 802.11b/g/n

FD – Filtration device

LAN – Local Area Network

DHCP – Dynamic allocation of IP address

MAC – Hardware web address, it has every LAN, WIFI a Bluetooth device

## INSTALLATION

The application is installed via a service Google Play. In the browser will be entered GearboxMobileFiltration. The service will find a given application and then it is possible to install that.

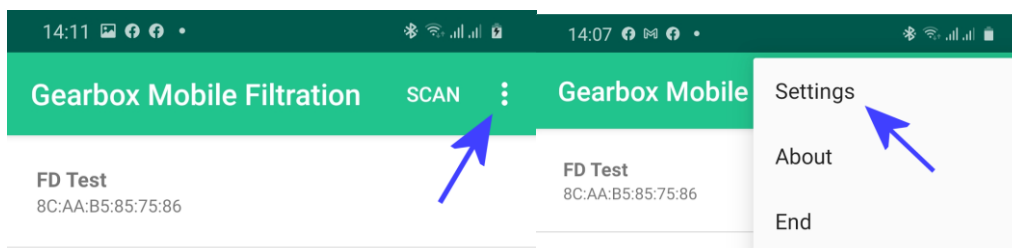
The icon of application

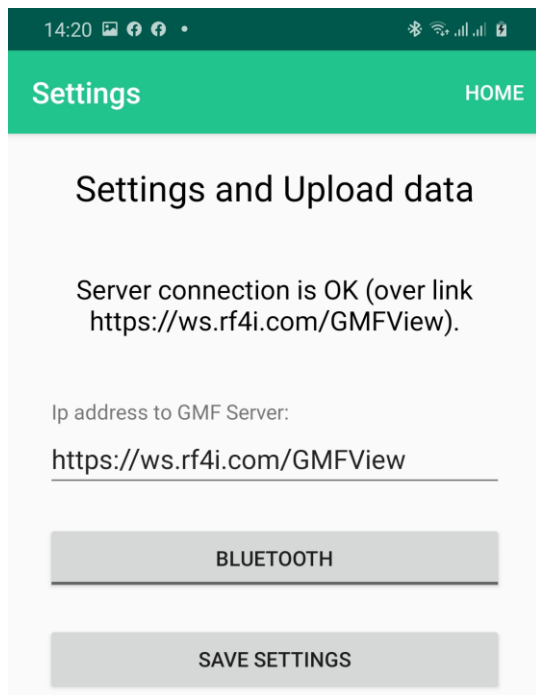


After the installation and running the application there is required a confirmation with some laws to BT, localization services and so on. These are inevitable that a mobile could know to scan visible filtration devices in its range. The application does not require any access to personal information of a user and it also does not collect them during its running.

## INTRODUCTORY START AND CHOICE OF COMMUNICATION – GENERAL SETTING

The application can work in two communication modes- BT and WIFI. The change of a communication mode is done in Settings.





In Settings you have an option to choose a communication mode. By clicking on the **BLUETOOTH** button it will be switched on **WIFI** and vice versa. Subsequently, you save your option by clicking the button **SAVE SETTINGS**. There are other setting options below. All are saved by following clicking on **SAVE SETTINGS**.

In this printscreen, there is also a check box „**Ip address to GMF Server**“. This is used if you want to send data from filtration to the web server for the following analysis and more comfortable visualisation. In case you choose as a communication mode **WIFI** then the setting of a server is important for a basic running the application. In this situation the application does not communicate directly with FD but via a control server.

The text „Server connection is OK ....“ means that the application tested a given address in a check box „**Ip address to GMF Server**“ and communication is possible. When the application would not connect with a server, there will be the unavailability report.

**BT communication** is determined for a direct control of a one FD. BT technology is the type Point-to-Point. It means that only two devices can be connected at the same time. In this case, one mobile/tablet with a running application GMF and one FD.

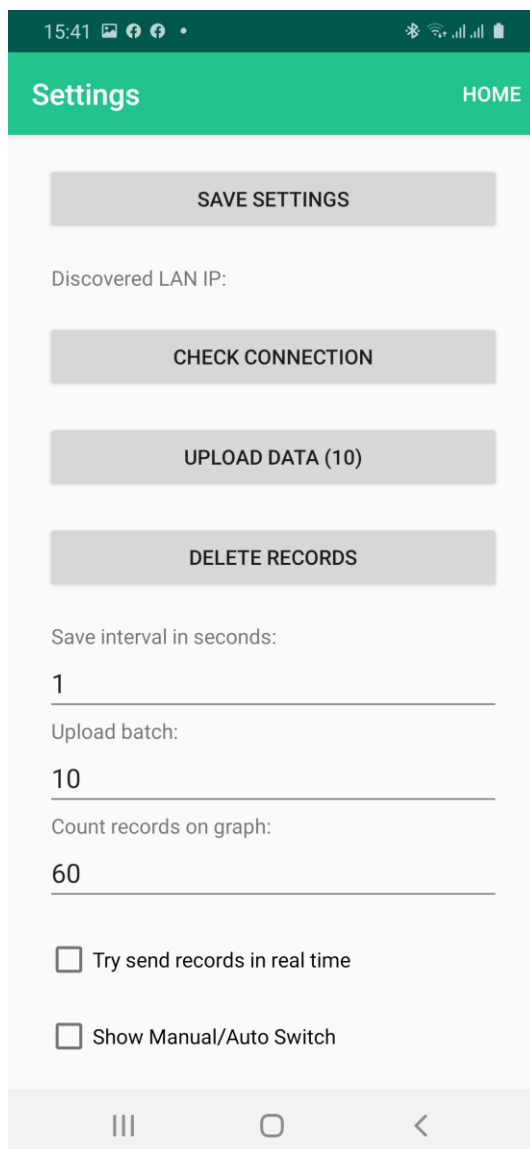
**Note:**

When you choose BT communication mode, it is valid for the communication with FD. So, filtration data are saved to a mobile device. If a given device is connected to for example your company's WIFI network or it has available internet through GSM, it can indirectly send data to GMF server on an entered address.

**WIFI communication** is determined for a work with several FDs at the same time. Scenario of a such communication is depicted below. So, you have more FDs which you put on various robots, in the range of these FDs is situated communication GMF server. FDs send own data to a server through WIFI and also, they get orders. You manage the whole system through GMF application on a mobile or tablet.



### Other settings



In Settings, except for the change of communication mode between **BLUETOOTH** and **WIFI**, you also have other options.

„**Discovered LAN IP**“, it is only informative box. If you would conduct GMF server and it connects to your company's network through LAN connection, then the system writes out IP address which a server got allocated through DHCP.

**CHECK CONNECTION** is a button for a repeated testing the connection with GMF server.

**UPLOAD DATA** is a button for sending collected data from filtration to GMF server. In a bracket you see the number of records that are saved on a mobile phone/tablet and which will be sent. After sending, data will be erased in order not to take the place.

**DELETE RECORDS**, If you do not want to send data and you do not want to have them on a mobile phone/tablet too, you can simply erase them.

„**Save interval in seconds**“ , when a filtration is running, data are gained from a filtration device every second. It is useless to have registered every second of the filtration for a further analysis, the creation of a graph and filtration protocols. This is the reason why there is an option to set how often gained data will be saved. If you enter e.g., an interval 2, data from FD will come every second but to the local database and subsequently for sending to a server will be saved only every second record. It is a saving the local data disposal site and subsequently saving during transfer to a server.

„**Upload batch**“, when data are sent to a server, it is almost hundreds and thousands of records. If it was a continuous transfer, the risk of a mistake would be created during a transfer. In order to raising security of a transfer, the system divides records into small blocks. In this case, after 10 records. Maximal possibility is 99.

„**Count records on graph**“ , in a real time, a graph is drawn from saved data of a filtration. Depicting space of a mobile/tablet is relatively small. Also, the user can have a preference to see e.g., the last minute of a filtration because of a good visibility of values. Eventually, he wants to see the whole process of a filtration e.g., in 30 minutes. Through this setting he can select how many values he wants to see in a graph.

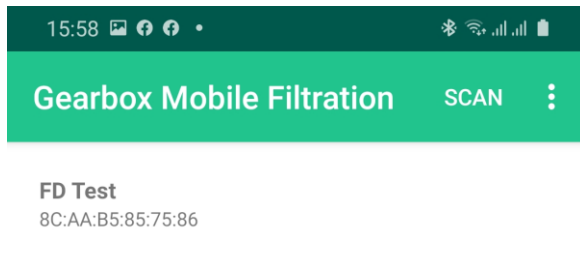
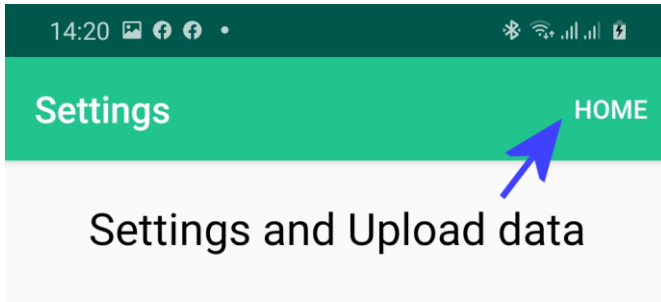
During the combination „Save interval in seconds = 1“and „Cound records on graph = 300“ you would see in a graph the last 5 minutes of a filtration with consistency 1 second.

A check box „**Try send records in real time**“ serves for sending data in a real time. When a check box is marked, the system does not send data to GMF server but it locally saves them. On a button „**UPLOAD DATA (10)**“ you see in a bracket that 10 records are locally saved. In a practice it is much more. When a mobile/tablet has a connection to a company’s WIFI or available internet through GSM, beside this marked check box, it tries to send data when they will be opened, so directly during a filtration. In a such case, data will not be locally saved but they directly shift to a server. It is interesting in a scenario when you run a filtration. You let a mobile/or tablet with an application beside FD in order to collect data but it simultaneously sends data to a server. You come into the office, sit down at the PC and through a web of GMF server you can watch the process of a filtration.

A check box „**Show Manual/Auto Switch** “serves for a depiction of a switcher in a dashboard of filtration. It is not needed in common production conditions to switch FD from **Auto** regime to **MANUAL**. It is done only in specific tests when operation needs manually change the output of a FD. This is the reason why this switcher is standardly hidden.

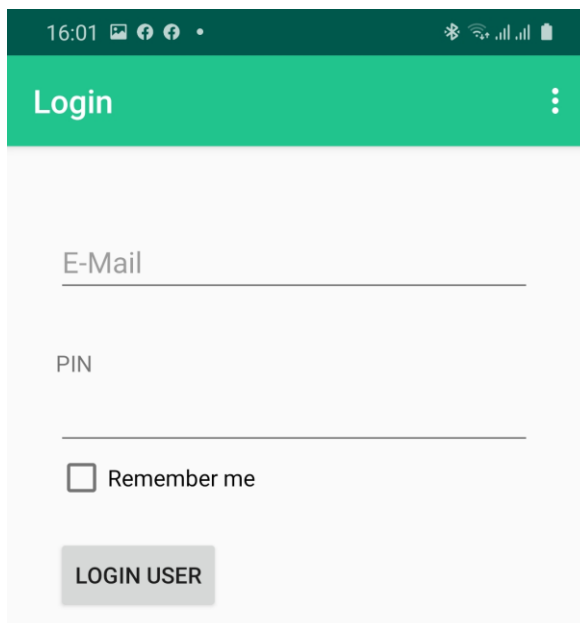
## SEARCHING FD AND RUNNING A FILTRATION

When you have set a communication mode and other related settings, it is possible to approach to a single work with FD. Click for return from menu Settings on upper menu HOME.



If you chose a communication mode BT you will go back to HOME where you see the list of found FD.

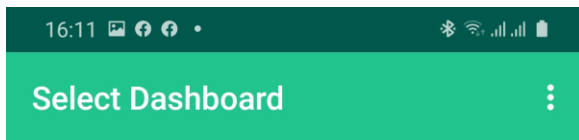
You will see their name and MAC address. Then click on a chosen FD.



If you chose a communication mode WIFI the entry dialogue will be depicted.

Here you do not communicate directly with FD but with GMF server and it communicates with FD.

The authorization is needed here, except for security in a such central management of several FDs at once there are also processional reasons. The system is set in order to enable several technicians work with several FDs at the same time with a central server. That is why they need to be authorized and see only own FD.



Global dashboard



Device detail

After a user verification in case of WIFI mode, you will see this screen. Furthermore, WIFI mode has the advantage in a global dashboard in comparison with BT.

It is because during the communication FD through server all information about all available FDs are collected at once. And so, it is possible to have a central dashboard which informs you in a simpler way.

If all FDs work normally, the semaphore is green and its color covers all situation in a production. If a color will change you get information which FD “has a problem” and you can solve it. This system is designed for service technicians who set several FDs in a production at the same time and who do not have time and place to click between single FD and to find out their working state.

If you want to see a detail of a concrete FD then click on the icon “Device detail”. You will see the list of FD similar to BT regime and choose a concrete FD.

### CAUTION

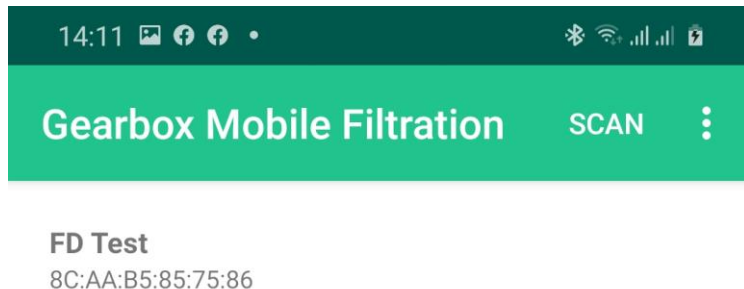
WIFI mode functions only with a GMF server. It means that if you want to use these functionalities you have to buy HW and SW GMF Server and it locates to the operation in radio range working FD.

If in Settings in a check box is “Ip address to GMF Server” set the address <https://ws.rf4i.com/GMFView> so the application can send data gained from FD through BT but they are available only for watching through web and they do not enable direct operating FD.

In a conclusion, if you want to use WIFI communication mode you have to have set a local GMF server.

## WORK WITH FD

During common work activity of FD you can find out from menu HOME, if the application is already running in BT mode or WIFI, you see the list of available FDs.



You simply click on a chosen FD. If the list is empty or not actual, so you switched some FDs and you do not see it in the list, you can click “SCAN”. The system makes repeated searching of available FD.

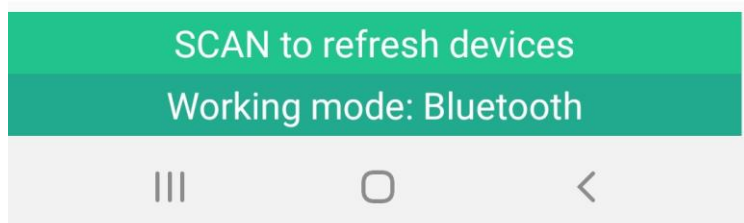
In the lower part, you see the status line “SCAN to refresh devices”. Below this one, there is the line with indication in which communication regime of the application works.

By clicking on three vertical dots in the right upper corner, you open menu with offers “**Settings, About, End**”.

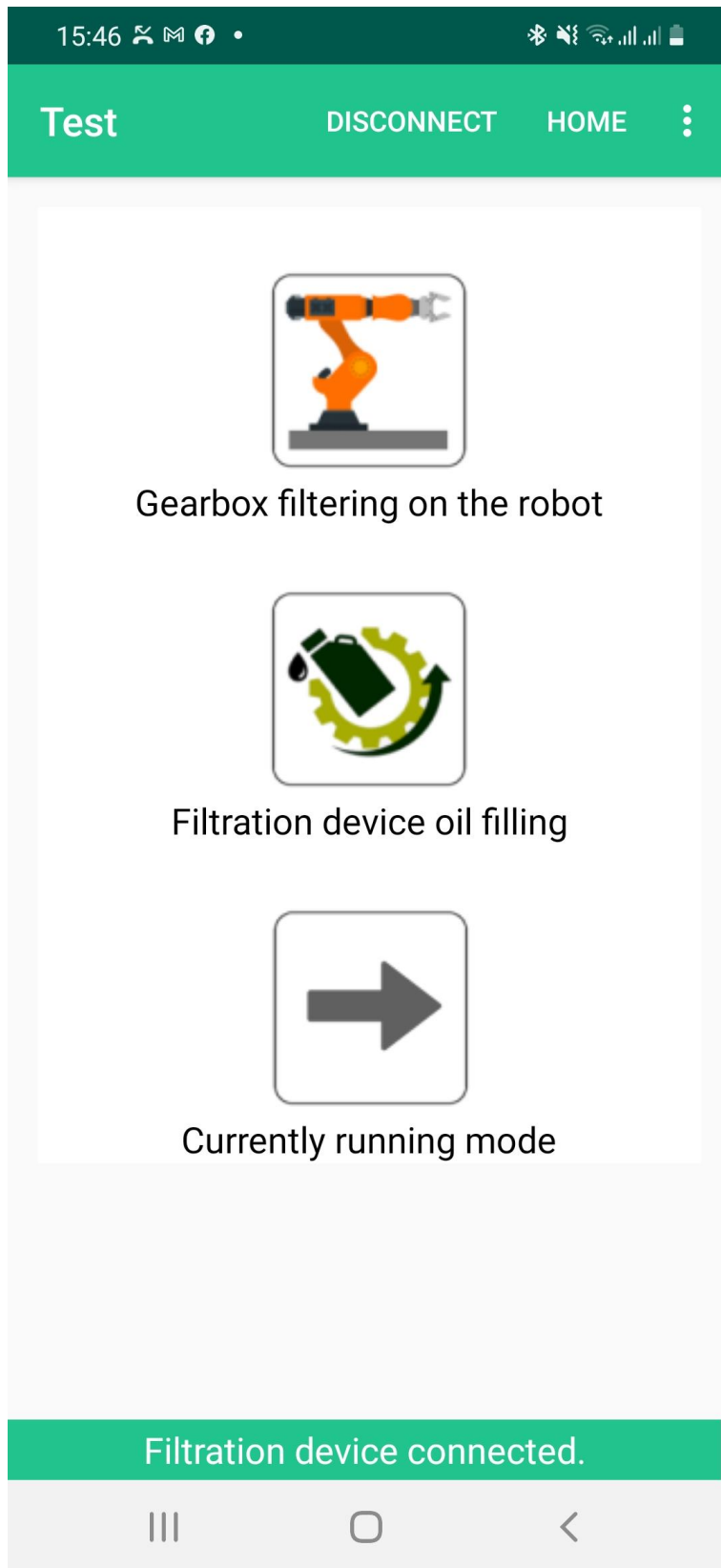
**Settings** was specified upper.

**About** informs you about a version of the application and there is an option of finding new version. If the system finds out that a new version exists, it will offer you to install it. It will open a service Google Play. Then in Google Play you click on uninstall in order to erase actual version from a mobile/tablet and then you let to install a new one.

**End** is finishing the app.







After clicking on a chosen FD, the app will depict an option of the filtration of gearbox on a robot or filling filtration device. The regime of a filtration of gearbox is a basic activity of FD. Filling the filtration device is used in case when you changed a filter in FD and it is needed to pour it by oil. The third option opens actually running mode in a given FD.

FD must be used in the operation and so during filtration of gearboxes with forward oil poured filter. It is needed to realize that if you immediately started to filter a gearbox after the change of oil, so it could create problems with insufficiency of oil in the system. After a filtration, in a gearbox would be insufficiency of oil because of the part would stay in a filter.

If you change a filter and run FD "on table" for the process of pouring by oil, you choose the option "Filtration device oil filling". In this regime FD, it does not control pressures and temperature as it is during normal work regime of filtration gearboxes.

**CAUTION:** In case of the regime BT it is possible that there will not be created a connection with a given FD. It is caused by a single technology.

Bluetooth. The solution is repeated by clicking on "Connect" in upper menu.

11:27 [Icons]

**FD Test** DISCONNECT [Menu]

**Device Name:**  
FD Test

**Gearbox S/N:**  
SN-2021114091856

**Set time:**  
0

**Volume of oil:**  
0

SAVE PARAMETERS

Low working temperature, stop filtration !

Filtration device connected.

After clicking the option "Gearbox filtering on the robot", "Filtration settings" will depict.

They are settings for a given concrete filtration.

#### Device Name

You have the option to change also the name of FD, it is because if you use several FD they are systemically distinguished by MAC address but it is convenient for the user to name them how he needs.

#### Gearbox S/N

A serial number of a gearbox. The system saves records that then can be used for creation of protocols from a filtration. You need to differentiate which gearbox was filtrated. Because of it you have the option to enter a serial number or various identificatory for every gearbox. If you do not enter any serial number, the app will generate one.

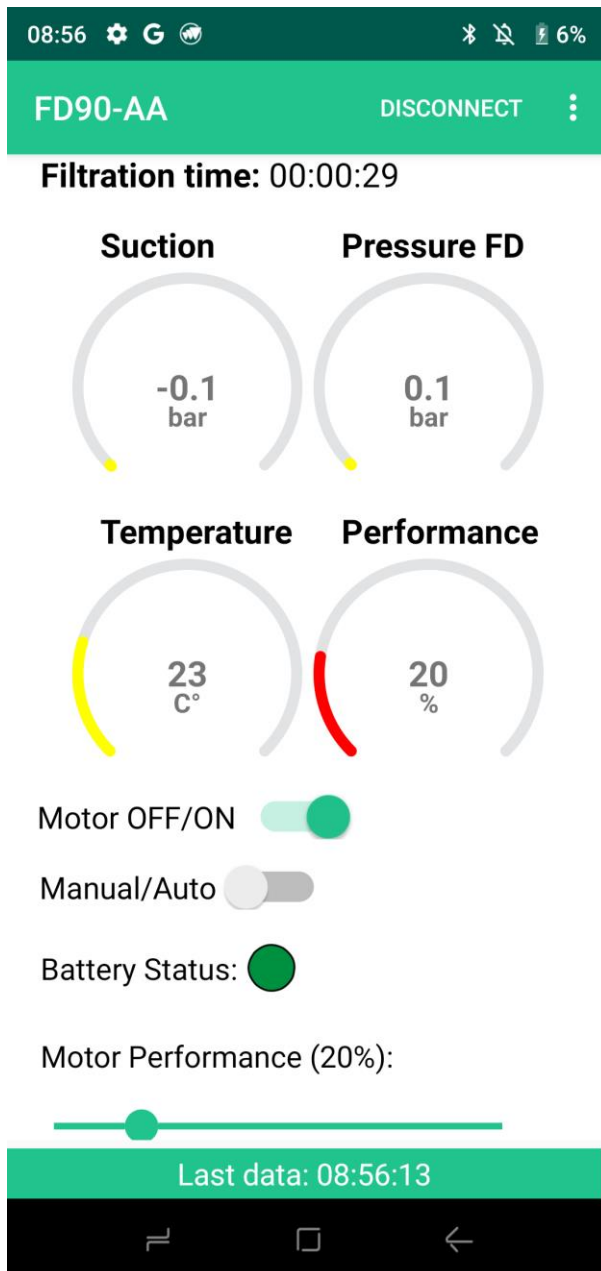
#### Set time

You have the option to set time of a filtration. For example, If you enter 20 the filtration will run 20 minutes and then it will automatically end.

#### Volume of oil

If FD you bought has an implemented sensor of the flow of oil, it is possible to set a filtration also on the basis of capacity.

We continue by clicking the button „SAVE PARAMETERS“.



After saving parameters, main dashboard will depict.

If you set **Set Time** or **Volume of Oil** then this information will appear, too.

Filtration time is information about the length of a filtration. During a filtration there are few seconds long security stoppings of FD because of a test of sucking and pressure. These stoppings filtration happen automatically but Filtration time is continuous and it will determine the whole length of a filtration out of these security stoppings.

Pointers **Suction, Pressure FD, Temperature and Performance**. They are informative pointers with the aim to provide user an overview about physical quantities measured in the process of a filtration.

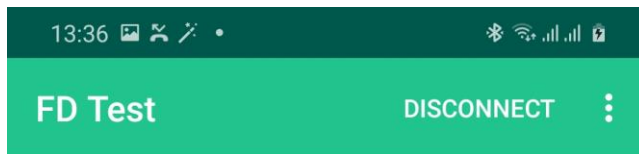
**Suction** – Pressure on input of FD

**Pressure FD** - Pressure in FD between pump and filter

**Temperature** – Oil temperature after input into FD

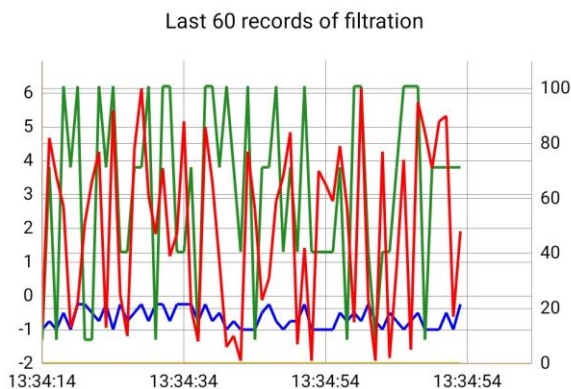
**Performance** – Output of pump in FD

A colour of pointers changes when value is fine or it is not ideal, eventually inconvenient. If it comes to defective values. FD automatically reacts or points you out by faulty reports or bubbles with a faulty text.



Motor OFF/ON

Battery Status: ●

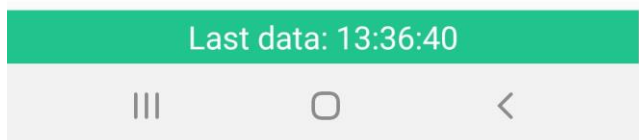


- Suction (left Y axis)
- Pressure FD (left Y axis)
- Temperature (right Y axis)
- Motor Performance (right Y axis)

SHOW CHECK-STOP RECORDS

Send record in real time:  No

Wifi module on the FD



The second part of a dashboard filtration.

**Motor OFF/ON** is turning off or turning on FD.

**Battery Status** indicates the state of battery on FD, green-yellow-red. In case that FD detects the state of battery as red so it does not allow to run a filtration. If a battery comes to a red state during a filtration, FD itself turns off filtration after a while.

“Last 60 records of filtration”, the name of a graph says to you that it depicts last 60 saved reports from a filtration. In “**Settings**” you can change the number of reports in a graph.

“**SHOW CHECK-STOP RECORDS**”, this button shows you values which FD had in time of security Check stoppings. And so, controlled stoppings when FD evaluates if **Suction** a **Pressure FD** is convenient for the running filtration. These data can be useful during analysis of functioning and process of values on FD.

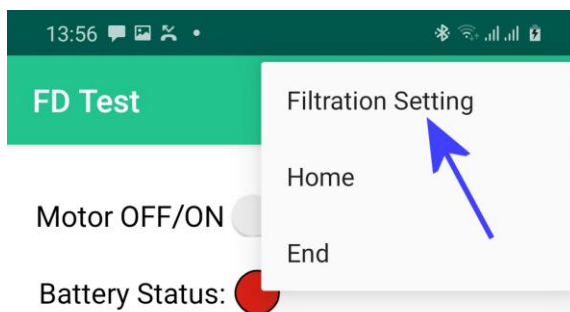
“**Send record in real time: No**”, If you are in “Settings” marked the checkbox „**Try send records in real time**“ then the application will try to send date on at the address entered in a checkbox „**Ip address to GMF Server**“. Mobile/Tablet has to have connection to Internet either through your company’s WIFI or through GSM.

„Wifi module on the FD“ , this computer enables turn off/on WIFI communication on FD. It is really used if you communicate with FD through BT but you bought GMF server and you want FD to communicate through WIFI toward GMF Server.

If you communicate with FD only directly through BT, let this switcher off. If you turn it on, it can cause problems during BT communication. FD will try to search GMF Server in the range and switch a regime on WIFI.

„Last data“ , it is only information when last data came from FD to the application. It is interesting in case of the analysis of communication problems if they would appear.

If you want already in the process of a filtration additionally to edit e.g. „Gearbox S/N“ or set „Set Time“ then click the right, above on three vertical dots.



Through the option “**Filtration Setting**” it continues back to the setting of parameters of a filtration and you can change required values.

„**Home**“, you go back to the list of found FDs. So, if you have in the operation more FDs, you will switch between them.

„**End**“, the end of the whole application.