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WIRELESS TILT ANGLE SENSOR DU-BLE

User Manual



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1. General information

Wireless tilt angle sensor DU-BLE (hereinafter - 'sensor', 'device', 'article', 'angle sensor' or 'DU-BLE'), manufactured by the Escort Monitoring Systems, is designed to measure the angle at which certain parts of machinery and mechanisms tilt and to determine the direction in which such parts rotate (if set to the corresponding mode) relative to the gravity.

The values of measurements are transmitted to a tracker via radio channel at the 2.4 GHz frequency. The sensor 'DU-BLE' can be installed on different agricultural or heavy machinery units with tilting/rotating parts whose activity needs to be monitored.

The 'BLE-BASE' BLE-RS485 adapter is used to connect the wireless sensor with a GPS device via the RS-485 communication interface.

The sensor is designed to be used in different systems of vehicle and machinery monitoring and, as a rule, is installed alongside a GPS/GLONASS tracker.

2. DATASHEET

Table 2.1. Technical specs and characteristics of the wireless tilt angle sensor DU-BLE

Spec	Value
Radio channel frequency	2.4 GHz
Power supply voltage	3 ... 3,7V
Power consumption, not more than	17 mA
Data exchange output	Bluetooth LE (BLE)
Receiver sensitivity / transmitter power	-96 dBm / +4 dBm
Data exchange protocol	Escort BLE
Range (under normal operating conditions in absence of interference and obstacles when working with the base), not less than	10 meters
Margin of error	$\pm 1^\circ$
Operating conditions: - ambient temperature - atmosphere pressure	-45 ... 50 °C 84 ... 106,7 kPa
Ingress protection marking	IP69S
Explosion proof mark	0Ex ia IIB T3X
Dimensions, no more than	100X100x50 mm
Weight, no more than	0.3 kg

Table 2.2. Technical specs and characteristics of the wireless sensor's 'BLE-BASE'

Name	Value / units
Operating mode	digital
Digital outputs: - GPS tracker communication interface - Data exchange protocol - Data exchange baud rate - DU-BLE communication interface - Data exchange protocol	RS485 LLS 19200 bps Bluetooth LE(BLE) Escort BLE
Output data range: - digital data	0 ... 4095 units or 0 ... 1023 units
Connection signal range (under normal operating conditions in absence of interference and obstacles when working with the RS485-BLE adapter)	10 meters
Data transmission interval	10 seconds
Receiver sensitivity / transmitter power	-96 dbm/ 4 dbm
Ingress protection marking in accordance with GOCT (State Standard) 14254	IP67
Electric shock resistance rating in accordance with GOCT (State Standard) 12.2.007.0	Class III
Operating conditions: - ambient temperature - extreme temperatures limits - atmosphere pressure	-40... + 50 °C -60 ... +85 °C 84 ... 106,7 kPa
Dimensions, not more than	56X23x10 mm
Weight, not more than	0,1 kg

3. Product design

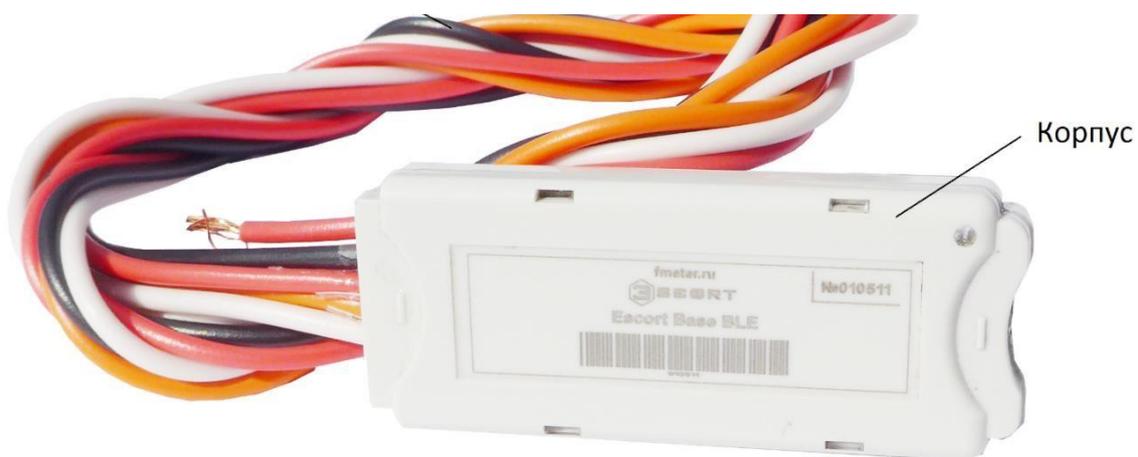


Ушки крепления защитной крышки на пломбу - Fitting orifices of the case for the seal

Голова измерителя с монтажным фланцем - Sensor's head with the mounting flange

Защитная крышка - Protective case

Fig. 3.1. Product design of the wireless tilt angle sensor 'DU-BLE'



Корпус - Body

Fig. 3.2. Product design of the wireless tilt angle sensor's RS485-BLE adapter 'BLE-BASE'

4. Equipment kit

4.1. Wireless tilt angle sensor DU-BLE

Name	Quantity
Wireless angle sensor 'DU- BLE'	1
Self-tapping screw 4.8 x 50 with rubber washer	4
Serialized Φ ACT-330 seal	1
Protective case	1
Datasheet	1
Packaging	1

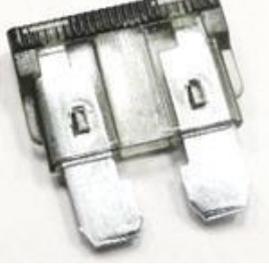
Articles in the kit (the image can slightly differ from the original)

Protective case	Self-tapping screw 4.8 x 50 with rubber
	
Serialized Φ ACT-330 seal	
	

4.2. Equipment kit of the wireless tilt angle DU-BLE sensor's RS485-BLE adapter 'BLE-BASE'

Name	Quantity
Wireless tilt angle DU-BLE sensor's RS485-BLE adapter 'BLE-BASE'	1
Installation kit:	1
1A Fuse	1
Fuse holder	1
Datasheet	1
Packaging	1

Articles in the kit (the image can slightly differ from the original)

1A Fuse	Fuse holder
	

5. Packaging

The wireless tilt angle sensor DU BLE and the wireless tilt angle sensor's RS485-BLE adapter 'BLE BASE', as well as the Datasheet and the installation kit of each article, is packaged in semi-rigid corrugated cardboard package up to 2 articles in one box.

The installation kit is packaged in ZIP-bags.

6. Installation

When selecting the spots to install the sensor and the 'BLE-BASE' adapter (or a GPS tracker), be sure to reduce the amount of any obstacles between the sensor and the BLE-BASE that could prevent the data exchange between them.

The 'BLE-BASE' adapter should be installed in the vehicle's cabin, **as close to the sensor as possible**, or next to the glass window on the back side of the cabin (if there's one) to achieve the best stability of the connection.

The adapter and the sensor must be aligned for better connectivity as per the Fig. 6.1.

When installing the adapter, be sure to check the **RSSI parameter** in the PC configurator when the adapter is connected to the PC or laptop via the C200M converter. **The range from -40 to -85 dBm is an optimal one.**

If connecting the sensor with a GPS tracker directly via Bluetooth, be sure to check the RSSI in the tracker's software tool.

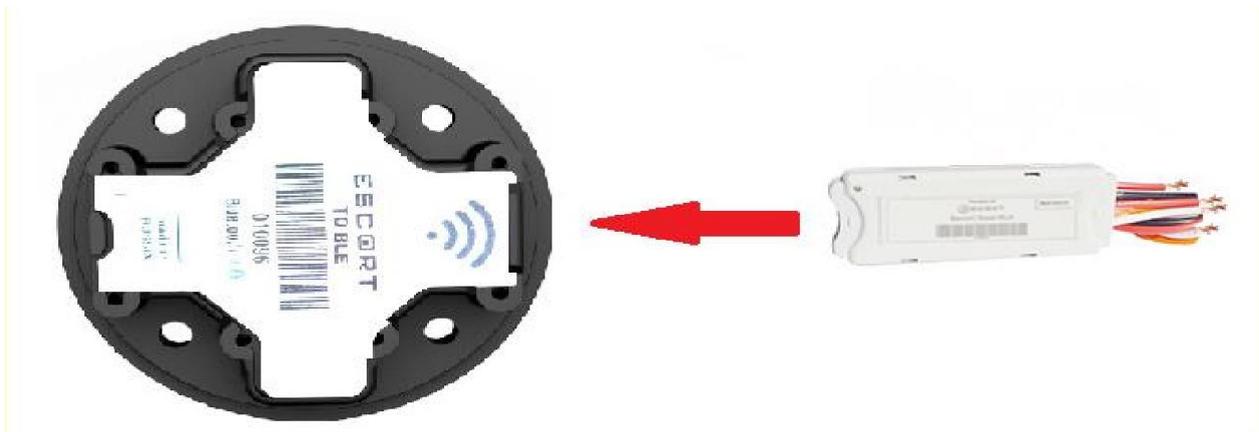


Fig. 6.1. RS485-BLE adapter 'BLE BASE' and wireless sensor's alignment

7. Connecting the sensor

To connect the sensor to the BLE-BASE (or a GPS tracker compatible with the sensor), both devices should be in the proximity of each other, the BLE-BASE must be connected to a power source in accordance with the wiring diagram and certain adjustments must be done in the BLE-BASE's configuration (the sensor's serial number must be introduced into its memory).

In case of any connection issues, it is necessary to check if the sensor is working properly by using a smartphone on Android or iOS and trying to connect the device in the Configurator Escort application (see the **Chapter 9** of this Manual).

When choosing the installation spot for the adapter, be sure to monitor the RSSI parameter in the PC configurator (Fig. 7.1.) If connecting directly via Bluetooth, check this parameter in the GPS tracker's configurator (Fig. 7.2.)

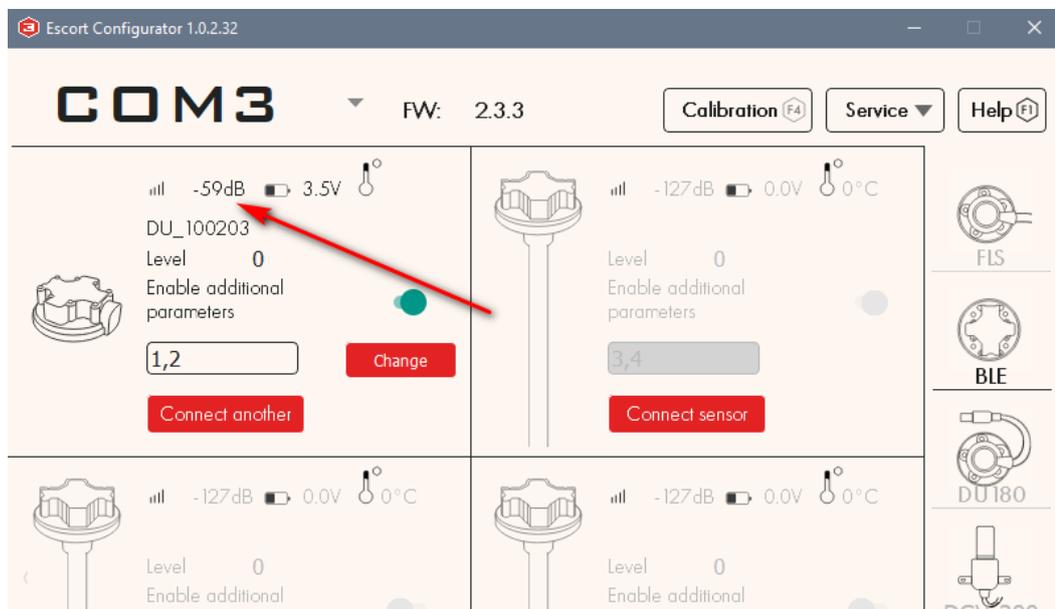


Fig. 7.1. Check the RSSI parameter to select the installation spot for the adapter

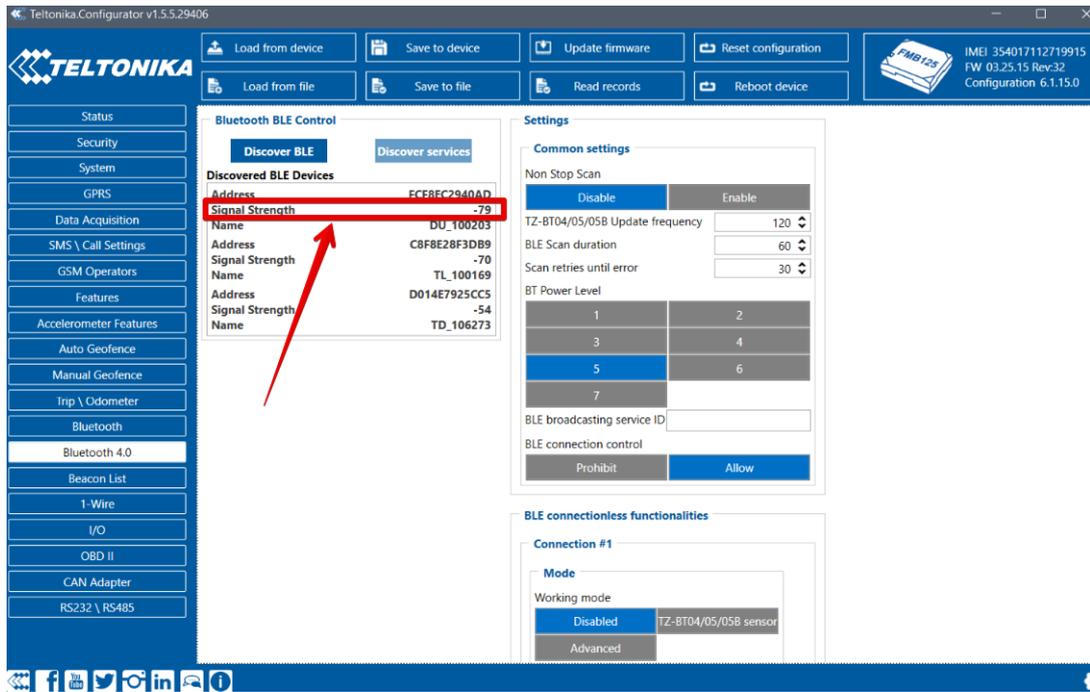


Fig. 7.2. Check the RSSI parameter in the tracker's software

For the sensor to work properly, you need to calibrate its reference point or horizon. To do so, the sensor has to be placed on the installation spot in the way that corresponds to the active/inactive position of the moving part the device is to be installed on, then you need to press the **Set 0** button in the mobile application (see the **Chapter 9** of this Manual, art. 9).

8. Operating mode

8.1. The tilt angle sensor has several operating modes.

If the sensor is connected to a GPS tracker via the BLE - RS485 adapter, the data is transmitted in accordance with the LLS protocol and, by default, is sent to 2 different network addresses:

1 the primary address is used for the tilt angle (transmitted as LEVEL parameter) and «event notification» (transmitted as TEMPERATURE parameter)

2 the secondary address is used for the battery charge (transmitted as LEVEL parameter) and RSSI signal (transmitted as TEMPERATURE parameter)

If connected to the GPS tracker that supports BLE technology directly, the sensor transmits tilt angle, battery charge and “event notification” parameters. **It does not transmit the RSSI parameter as the latter is calculated by the GPS tracker itself.**

How these parameters are processed and represented in the GPS tracker’s software or messages it sends to the server depends on the tracker’s brand and model.

Depending on what operating mode is set, the “event notification” value differs (see the Table 8.1.)

8.2. The sensor has 5 operating modes. The operating modes are described in the Table 8.1.

Table 8.1. Operating modes of the wireless tilt angle sensor

MODE	BRIEF DESCRIPTION	«Event notification»
Transportation	Used during the transportation and storage to save the battery charge	-
Vertical rotation control	Used to determine the direction in which the sensor is rotating relative to the axis perpendicular to the sensor's 0 (horizon) set by the user (except for when the sensor is rotating in parallel to the ground). See Fig. 8.1.	0 – no rotation 1 – rotation to the left 2 – rotation to the right
Horizontal rotation control	Used to determine the direction in which the sensor is rotating relative to the axis perpendicular to the sensor's 0 (horizon) set by the user (except for when the sensor is rotating in parallel to the ground). See Fig. 8.2.	0 – no rotation 1 – rotation to the left 2 – rotation to the right
Angle control	Used to determine the tilt angle of the machinery part relative to the sensor's horizon (0). Event notifications are transmitted once the sensor tilts at the angle equal to or bigger than the reference angle set by the user. See Fig. 8.3.	0 – the reference angle is not crossed 1 – the reference angle is crossed
Bucket	Used to determine if an excavator (or similar machinery) is active or inactive, i.e. if its arm is actively moving and digging the ground. See Fig. 8.4.	0 – inactive 1 – active
Plow	Used to determine if the snow plow of a truck (or any similar vehicle) is active or inactive. See Fig. 8.5.	0 – inactive 1 – active

8.3. Mode descriptions.

8.3.1. Vertical rotation control

This mode is used to control the direction in which a cement-mixer is rotating. The sensor is installed on the mixer's frontal side as shown in the Fig. 8.1. Depending on the direction in which the sensor is rotating, the event notification value will be transmitted as 1 (anticlockwise rotation) or 2 (clockwise rotation). «0» value is transmitted when there is no rotation.



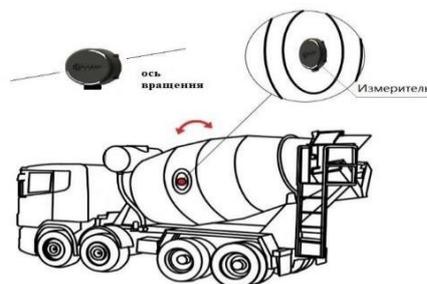
Измеритель - Sensor

Ось вращения - Rotation axis

Fig. 8.1. Installation of the DU-BLE on the cement-mixer in the vertical rotation control mode

8.3.2. Horizontal rotation control

This mode can also be employed to control the direction of the cement-mixer rotation. It differs from the previous mode by where the sensor is installed on the cement-mixer. The sensor must be installed on the mixer's lateral side as shown in the Fig. 8.2. Depending on the direction in which the sensor is rotating, the event notification value will be transmitted as 1 (anticlockwise rotation) or 2 (clockwise rotation). «0» value is transmitted when there is no rotation.



Измеритель - Sensor

Ось вращения - Rotation axis

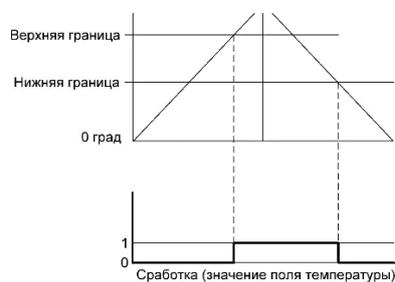
Fig. 8.2. Installation of the DU-BLE on the cement-mixer in the horizontal rotation control mode

8.3.3. Angle control

Angle control mode can be employed to control the activity of a crane, garbage truck arm, dump truck bed or other similar specialized units.

In this mode, the sensor transmits the event notification when it crosses the upper and lower limits at the angles set by the user. Once the device on which the sensor is installed moves from the stowed position to the deploy position and crosses the upper limit angle, the sensor transmits the event notification as 1, which means the device is actively working.

When the device is moving back to the stowed position, the sensor crosses the lower limit angle and transmits the notification event value as 0, confirming that the device is not actively working anymore. The upper and lower limit angles are set in the fields **TOP** and **DOWN**, respectively. The difference between the upper and lower limit angles constitutes the hysteresis (Fig. 8.3). The installation of the sensor is shown in the Fig. 8.4.

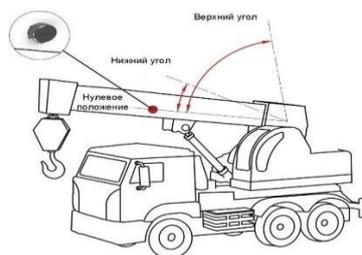


Верхняя граница - Top limit

Нижняя граница - Down limit

Срабатка (значение поля температуры) - Event notification (fuel temperature parameter)

Fig. 8.3. The angle control mode demonstration



Нижний угол - Down angle

Верхний угол - Top angle

Нулевое положение - 0 (horizon)

Fig. 8.4. Installation of the DU-BLE set to the angle control mode

8.3.4. Bucket mode

This mode is designed for excavators (Fig. 8.5.) to control the work of the excavator arm with the bucket.

The Turn ON delay setting is a timer that the sensor sets once it is powered up. When the timer starts, the sensor remembers the current angle value until the time is up. After the Turn ON delay is up, the sensor checks the current angle value once more and compares it with the previous one.

If the difference between those values is bigger or equal to the value of the Delta setting, the sensor transmits the event notification as 1, which means that the excavator arm is active.

If the excavator arm is inactive, the difference between the angles measured before and after the Turn ON delay is up will be less than the Delta value. In this case, the sensor checks the current angle value, sets the TURN OFF delay timer and, after the time is up, checks the current angle value again to compare it with the previous one.

If the difference between those two angle values is lower than the Delta value, the sensor transmits the event notification as 0 which means the arm is inactive.

This algorithm helps you determine if the excavator's arm is active or not and prevents false event notifications.

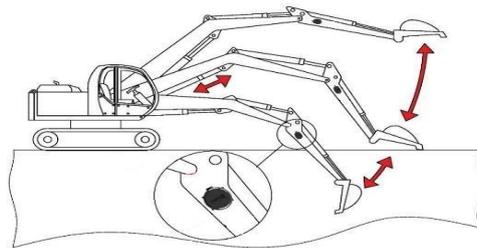


Fig. 8.5. Installation of the DU-BLE on the excavator arm

8.3.5. Plow mode

This mode is designed to control snow plows, graders and similar devices installed on heavy vehicles (see Fig. 8.6).

This mode can be configured as per instructions below. The settings include TURN ON delay timer, TURN OFF delay timer, limit angles TOP and DOWN. The delay timers are set in seconds, limit angles are set in degrees (1 to 179). We set the 0 position (horizon) when the plow is in its deploy position and ready for work.

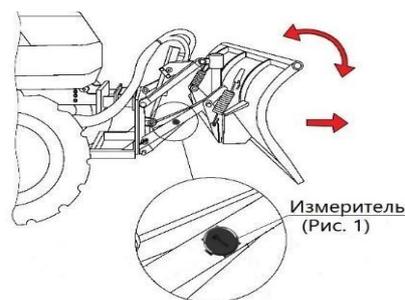
When the plow moves from the stowed position to the deploy one, the sensor installed on the plow crosses TOP and DOWN limits.

Once the plow is lowered past the DOWN limit angle, the sensor sets the TURN ON delay timer. If after the TURN ON delay runs out the plow is still below the DOWN limit, the sensor transmits the event notification as 1, confirming that the plow is working.

If the plow is raised above the DOWN limit, the sensor sets the TURN OFF delay timer. If after the TURN OFF delay runs out the plow is still above the DOWN limit, the sensor transmits the event notification as 0, confirming that the plow is not working.

If then the plow is lowered back to its deploy position, i.e. is below the DOWN limit the Turn OFF delay is deactivated and the sensor keeps reporting the event notification as 1. If then the plow is raised back to the stowed position, which means that the sensor has crossed the TOP limit angle, the sensor transmits 0 value, as the plow is not being used.

This algorithm avails the user more precise data on the plow's work by eliminating false notifications of the plow not working when it is raised temporarily when the vehicle needs to maneuver around obstacles or to turn around.



Измeритель - Sensor

Fig. 8.6. Installation of the DU-BLE on plow-type devices

Note: regardless of the mode selected, after any angle change of the sensor the current angle value will be transmitted as a separate parameter.

9. Connecting sensor via mobile app

In this section, you can learn how to connect and configure the DU-BLE sensor using the mobile app.

1. Make sure that your smartphone supports **BLUETOOTH LE** (BLE 4.0 or higher) by checking its documents and manuals;
2. Install and run the **Escort Configurator** app.
3. When firing the app up for the 1st time, make sure to give it the access to the geolocation service. This access is automatically requested by the app only once.
4. The start screen of the app is shown on the screenshot below (Fig. 9.1.) Tap on the Sensor Settings button to get to the next menu and select the **Bluetooth** connection type and then the **DU-BLE** device type (Fig. 9.2.)



Fig. 9.1. Open **Sensor Settings**

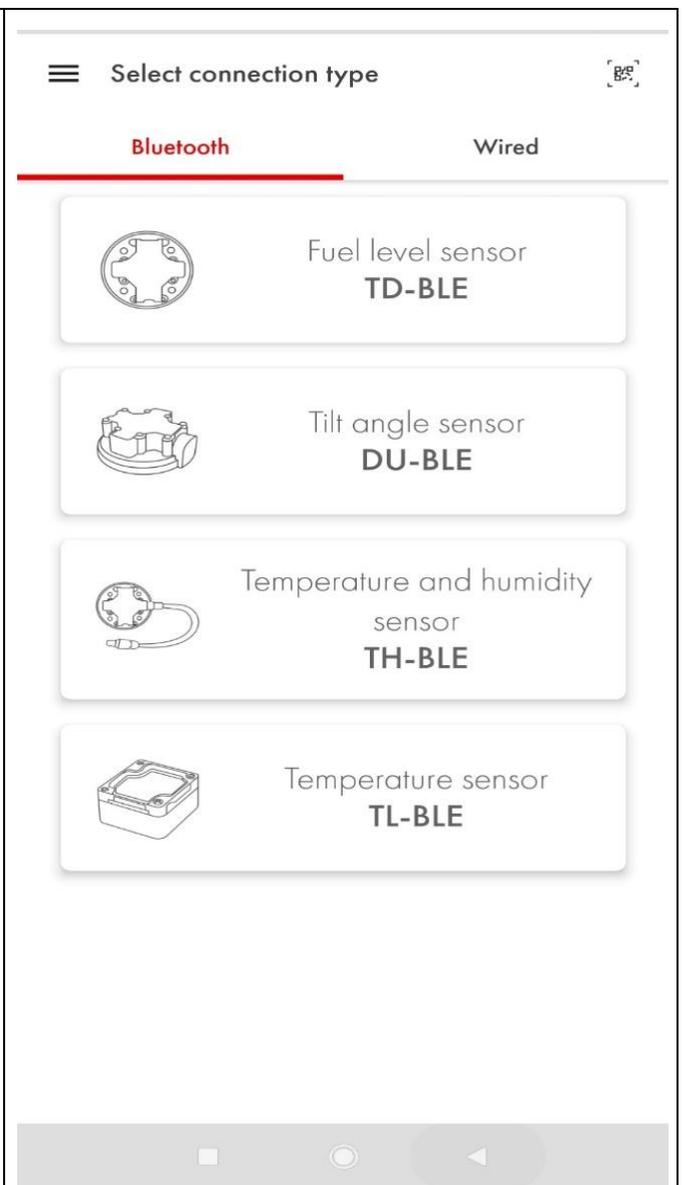


Fig. 9.2. Select **Bluetooth** connection type and **DU-BLE** device type

5. Then search for the sensor on the list of available devices or type in the sensor's 6-digit serial number (visible on the sensor's head) without the 'DU_' letters into the search box and tap on the **Connect** button (Fig. 9.3.) F.e. **100203**.

Initially, the sensor will be set to the **Transportation mode** designed to save the battery charge. Be sure to open the **Settings** menu and switch to the operating mode that you need (Fig. 9.4.)

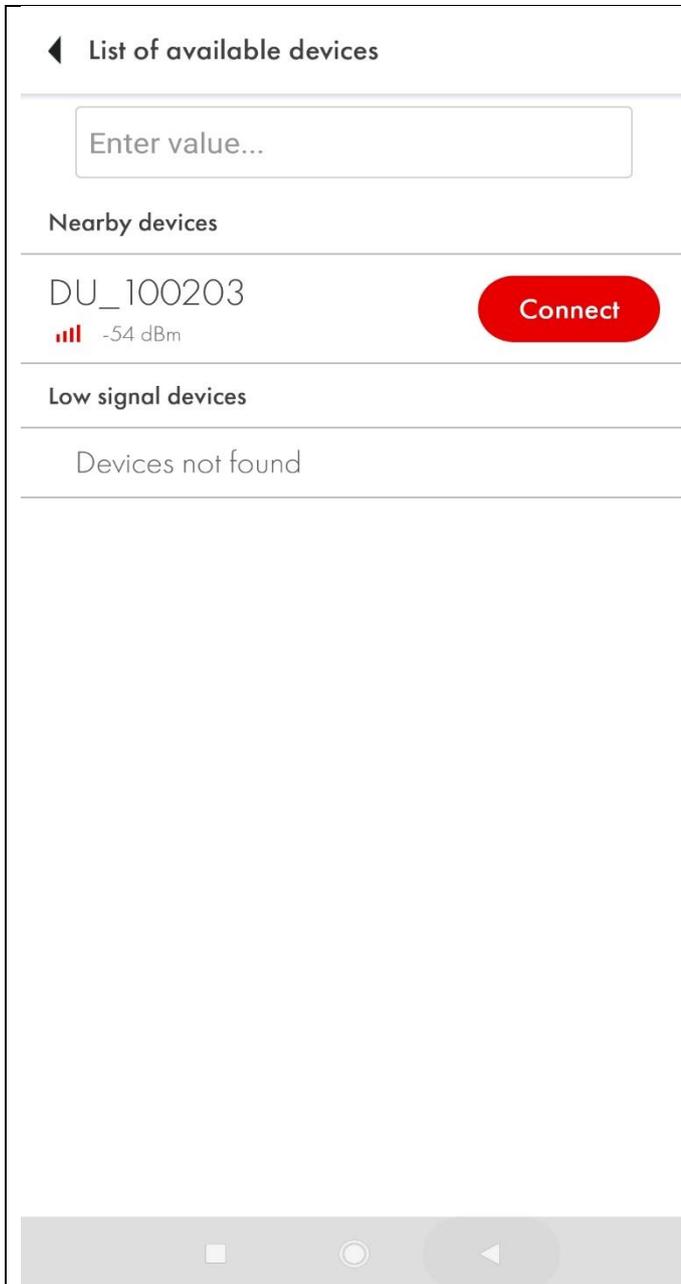


Fig. 9.3. Search for the sensor. Enter the serial number if necessary and tap **Connect**

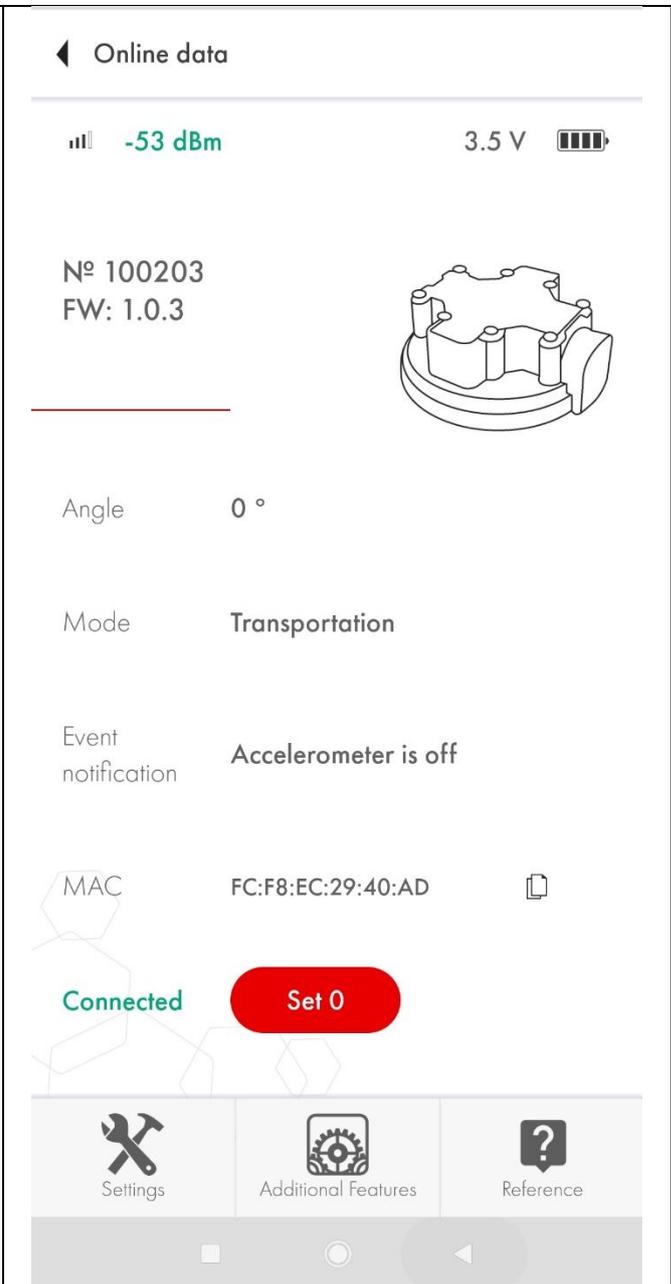


Fig. 9.4. The main screen of the sensor. Open the **Settings**

6. **Swipe** to the right or to the left at the top of the screen of the Settings menu to see all the modes available (Fig. 9.5.) Tap on the mode you want to select it.

The app will require you to set the password or enter the one you installed previously (if you are connecting the sensor you already have connected before) (Fig. 9.6.) The same happens if you tap on the Set 0 button on the main screen of the sensor.

After setting the password, a message 'Password successfully saved' must appear near the bottom of the screen.

Attention! Without setting or entering the password, you will not be able to configure the sensor!

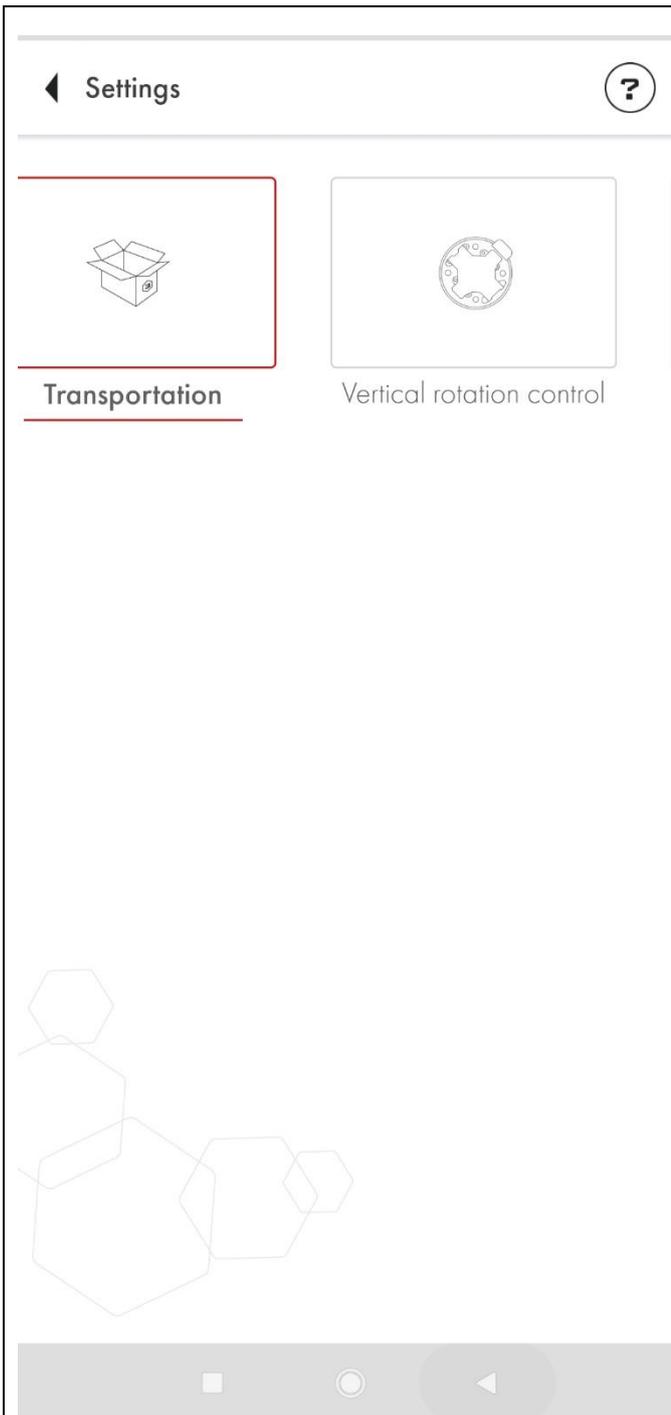


Fig. 9.5. **Swipe** at the top of the screen to select the operating mode of the sensor

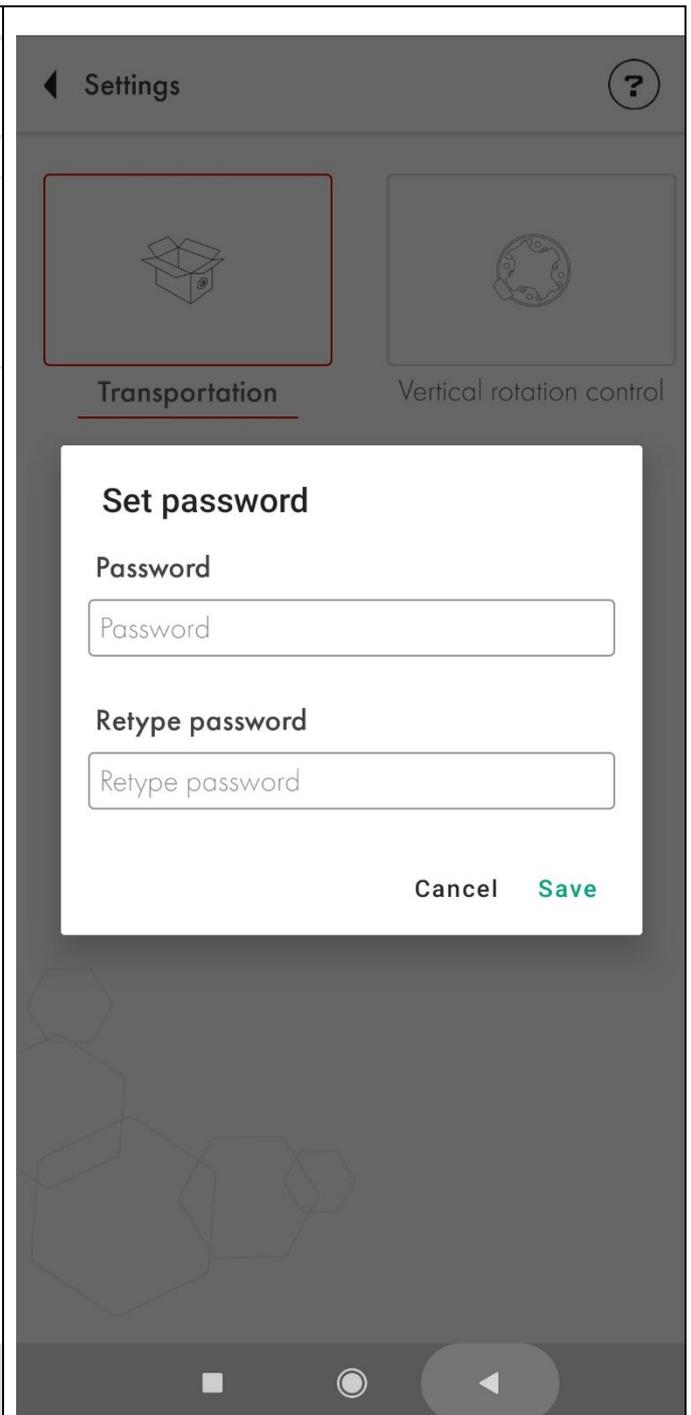


Fig. 9.6. **Set the password** after the mode is selected

7. From now on, whenever you connect the sensor, you will see the message reading '*Attention Sensor is password-protected*' (Fig. 9.7.) And whenever you try to change anything in its configuration, you will be asked to enter the password (Fig. 9.8.)

A message informing you of the password being accepted should appear near the bottom of the screen after you type it in and tap **Enter**.

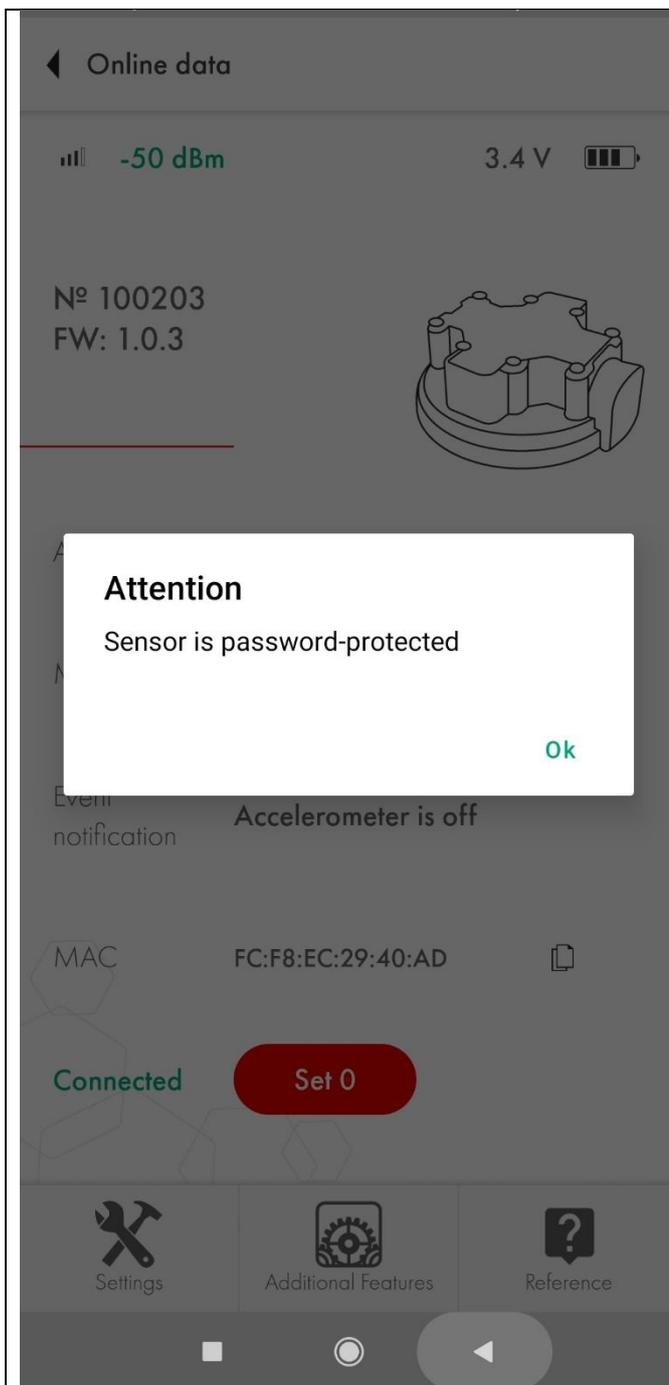


Fig. 9.7. Sensor is password-protected

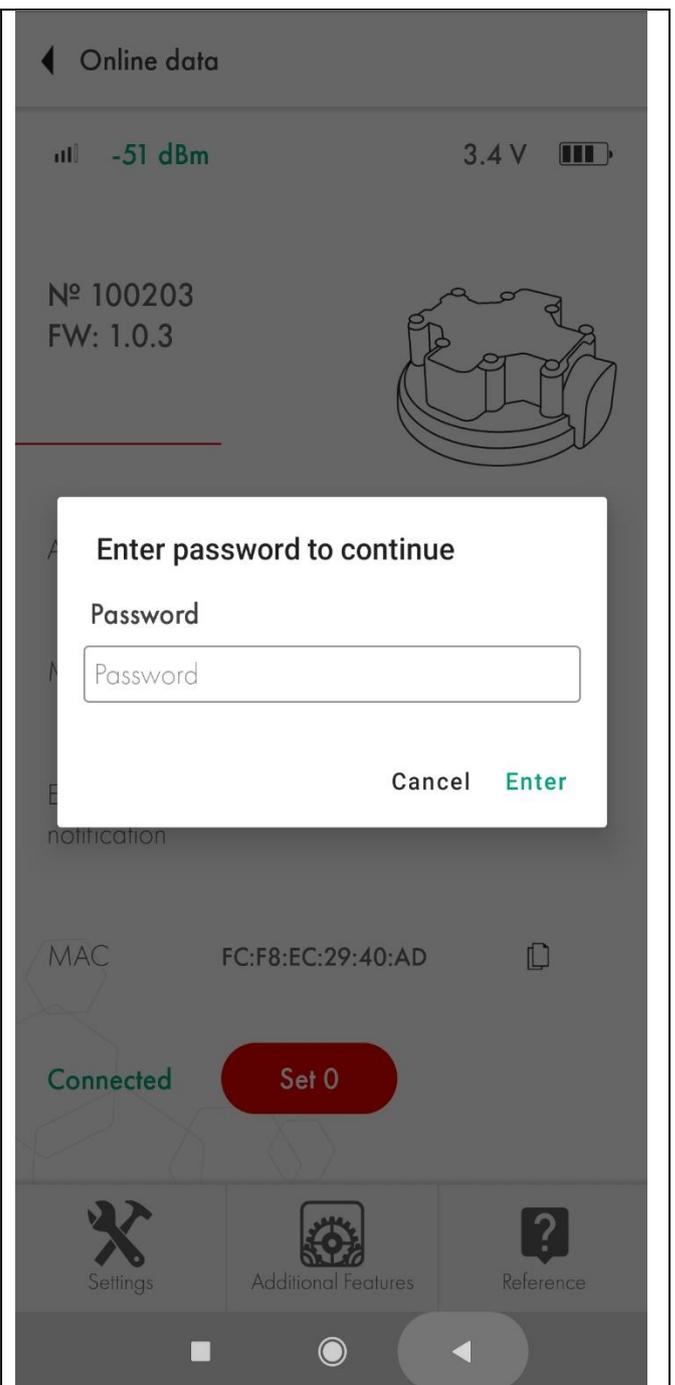


Fig. 9.8. Enter the password

8. In the Setting menu, you can select one of the following operating modes: «**Transportation**», «**Vertical rotation control**», «**Horizontal rotation control**», «**Angle control**», «**Bucket**», «**Plow**».

Establish the operating mode by pressing on the corresponding icon. In the settings boxes, below the mode selection bar, you can change the settings and then press the **Set parameters** button (Fig. 9.9.)

The settings of each mode are different. To learn more on them, please, check the **Chapter 8** of this Manual.

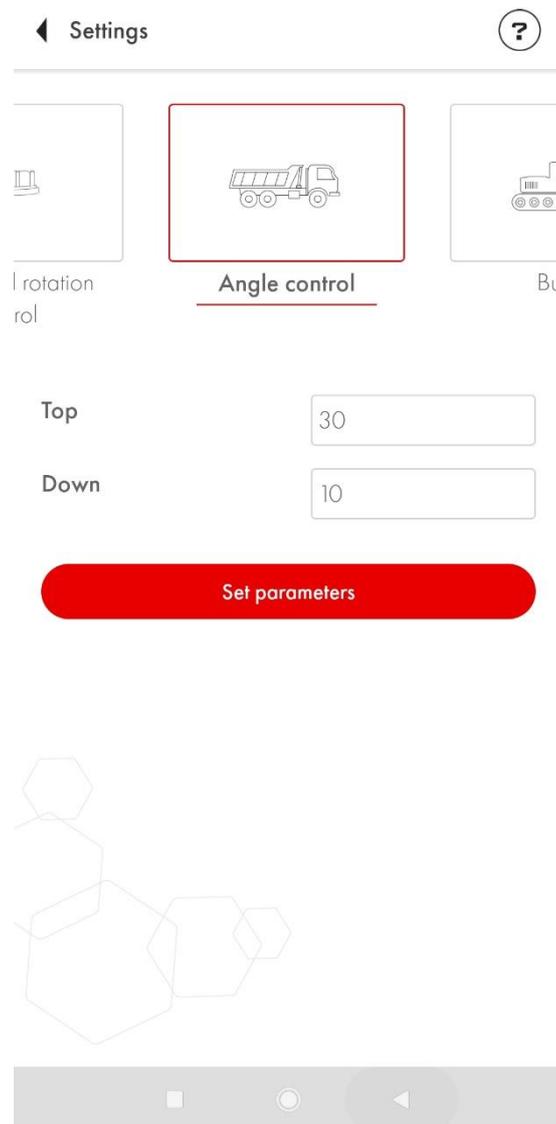


Fig. 9.9. Change the settings of a mode then tap **Set parameters**

9. After the sensor is installed on the vehicle's part that is to be monitored in its inactive position (except for the Plow mode – there the sensor must be installed on the moving part in its active position), you need to calibrate its reference point or 0 (horizon). Simply tap on the **Set 0** button (Fig. 9.10.)

After that, the reference point of the sensor is calibrated automatically. The 'Angle' parameter then will be shown as 0° (Fig. 9.11.) After the reference point is established, you can see the 'Angle' parameter change whenever the sensor tilts from its reference point.

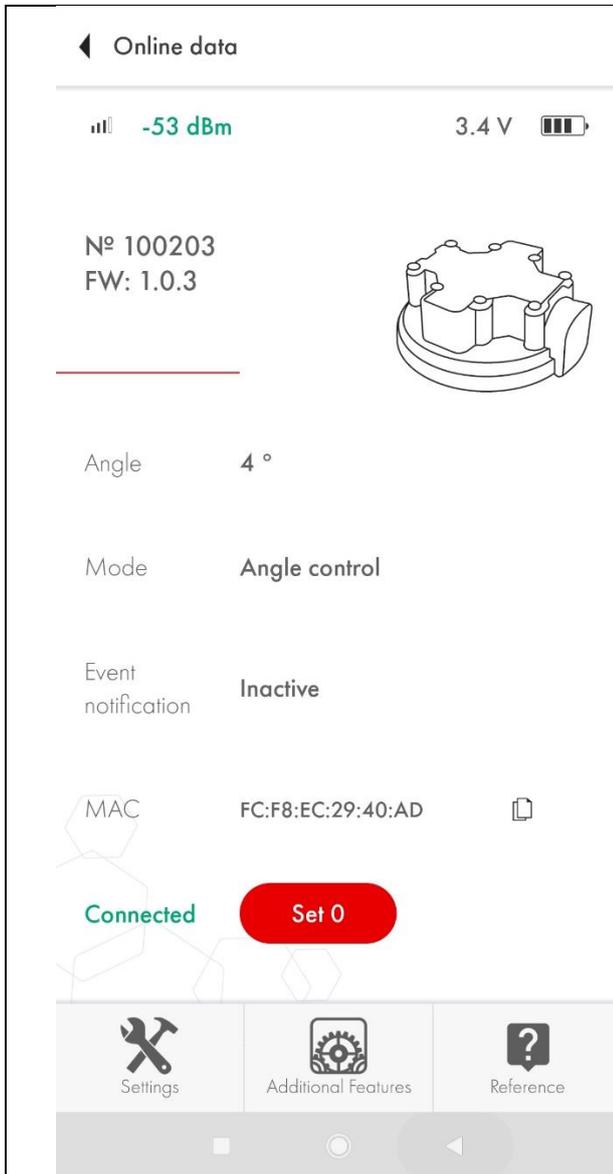


Fig. 9.10. Tap on the **Set 0** to establish the reference point

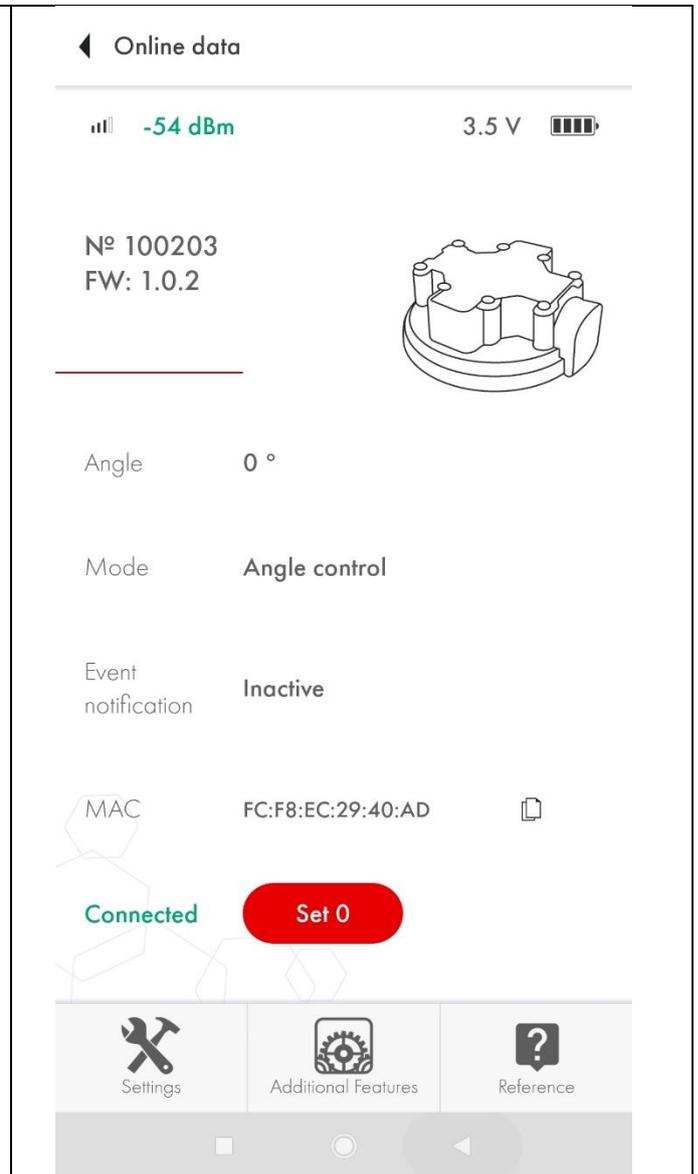


Fig. 9.11. The angle reading will change. If the sensor is tilted, the angle reading will increase

10. After pressing the **Additional Features** button, you will see the menu, where the password can be set or removed. Also, you can find the **FW Update** button there. To set the password, simply introduce a combination of up to 6 digits and press **Install** (Fig. 9.12.)

To remove a previously set password, enter it in the corresponding box and then press the **Enter** and then the **Remove** buttons (Fig. 9.13.) A message informing of the password being deleted should appear near the bottom of the screen.

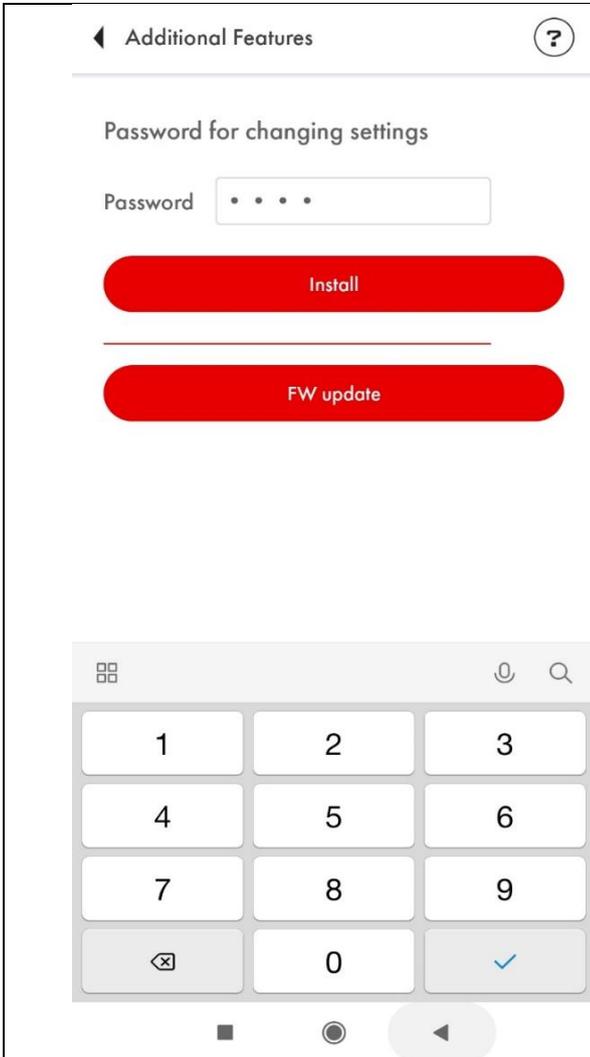


Fig. 9.12. Set the password via the **Additional Features** menu

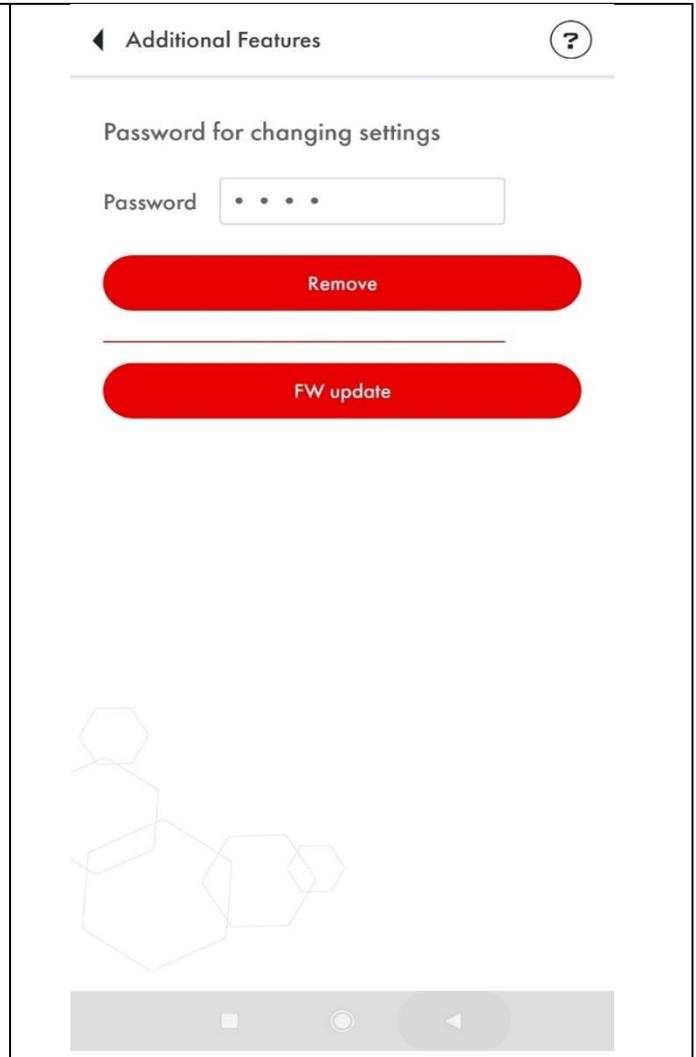


Fig. 9.13. **Remove** the password to set a new one

PLEASE, DO NOT FORGET THE PASSWORD. WHILE IT IS POSSIBLE TO RESET IT BUT THE RESET PRECEDURE CAN BE TIME CONSUMING

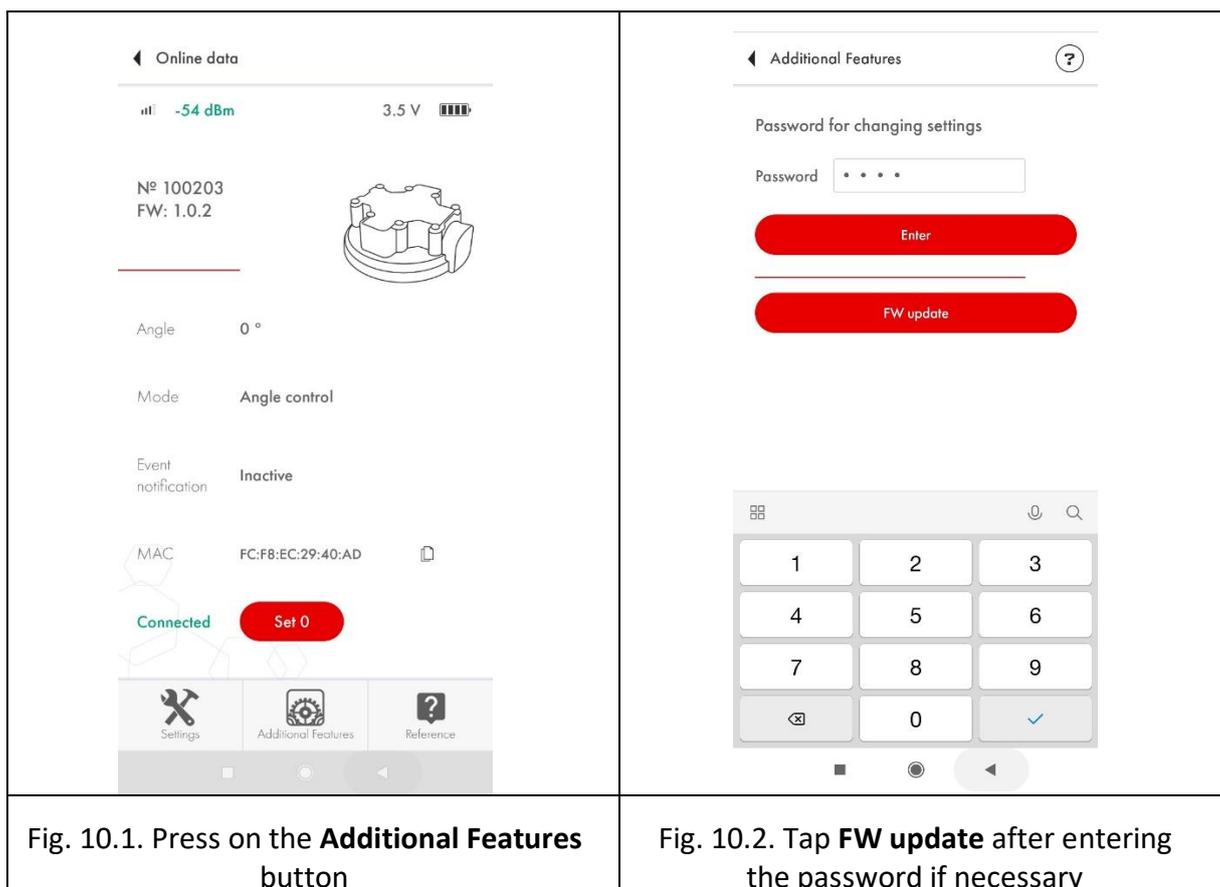
11. When you press the **FW Update** button, the sensor initiates the firmware update procedure. More on that in the **Chapter 10** of this Manual.

10. Firmware (FW) Update

There are two ways to update the firmware of the sensor. One of them requires you to use the NRF Connect App alongside the Escort Configurator app and the other one – to use only the Escort Configurator mobile app.

If you use both the NRF Connect and the Escort configurator app, be sure to follow the steps listed below:

1. Make sure that your smartphone supports Bluetooth LE (BLE 4.0 or higher) by checking its datasheet and manuals
2. Make sure the sensor is within the connectivity range and can be detected in the nRF Connect app (available in the Google Play Market and AppStore)
3. Download the FW file onto your smartphone beforehand
4. Connect the sensor and initiate the FW update procedure by pressing the **FW Update** button in the **Additional Features** menu of the **Escort Configurator** app available in the Google Play Market and AppStore (Fig. 10.1. and Fig. 10.2.)



5. After the sensor is set to the update mode, the FW update can be executed within the following 30 seconds

6. During those 30 seconds, you need to open the nRF Connect app, tap **Scan** and find the **DU_UPDATE_N** device on the list and tap **Connect** (Fig. 10.3.) Then press **DFU** (Fig. 10.4.) in the upper right corner

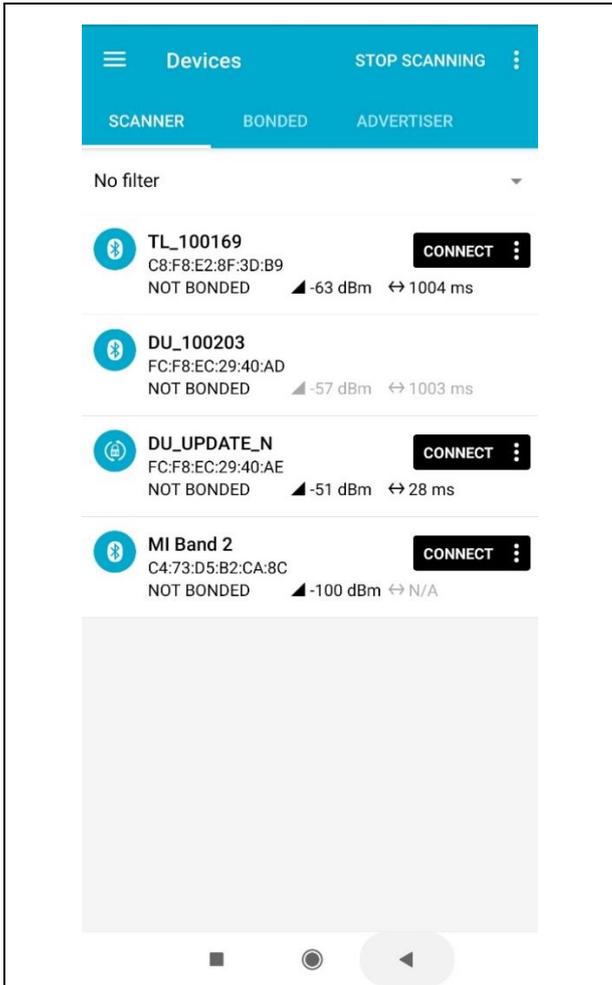


Fig. 10.3. Find DU_UPDATE_N and **Connect** it

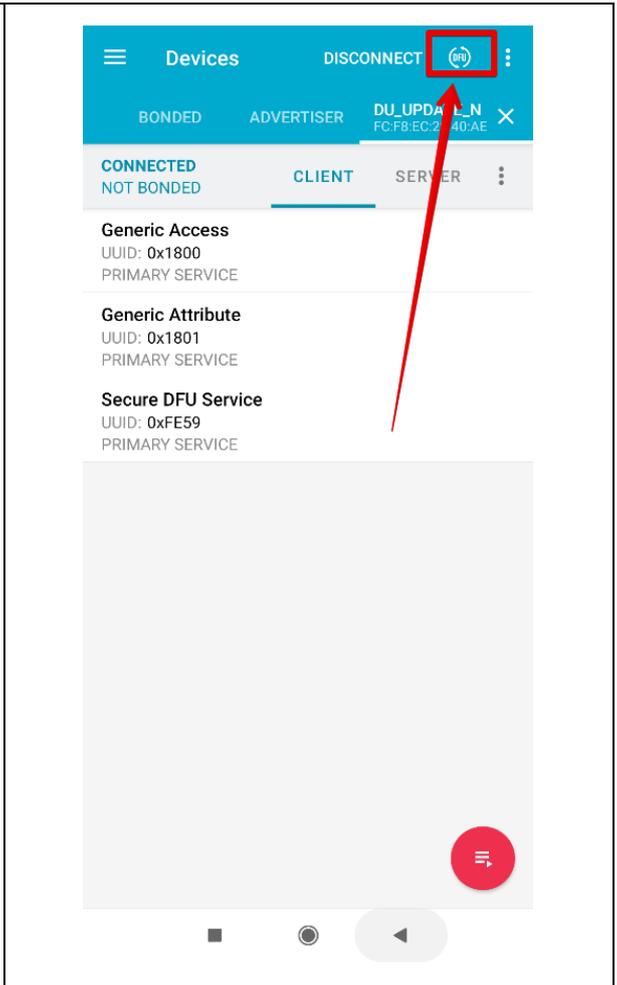


Fig. 10.4. Tap on the **DFU** button

7. After pressing the **DFU** button, you will see the dialog window where the **Distribution packet (ZIP)** has to be selected (Fig. 10.5.)

Then in the file manager of your smartphone, you need to find the **previously downloaded FW file and select it** (Fig. 10.6.)

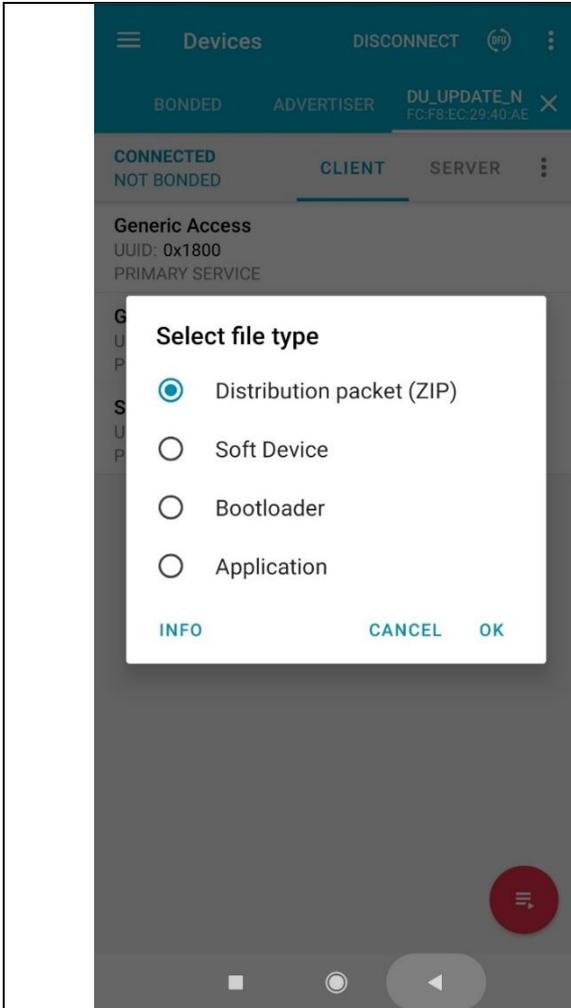


Fig. 10.5. Select the **ZIP** file type

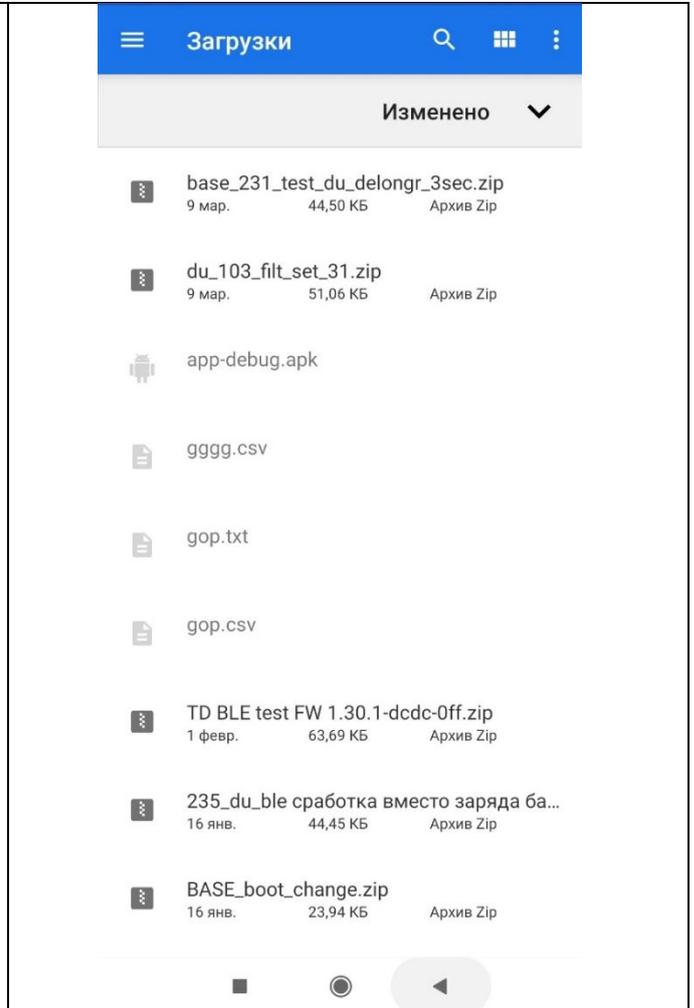


Fig. 10.6. Select the **FW file** on your smartphone

8. If everything is done correctly, you will see the loading progress bar displayed as a line chart (Fig. 10.7.) Wait for the progress bar to reach the 100%

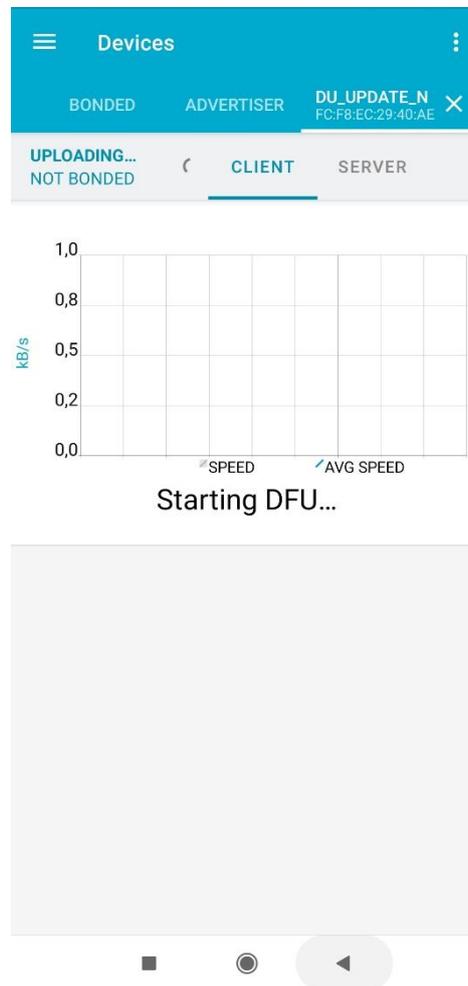


Fig. 10.7. DFU loading chart

9. After the FW is installed, the sensor will automatically reboot. You will need to reconnect it and reconfigure it if necessary.

If you use only the Escort Configurator app, be sure to do the following:

1. Connect the sensor, open the **Additional Features** menu, enter the password if you have not done it yet and then tap on the FW update button (Fig. 10.8.)

On the next screen, tap FW file (Fig. 10.9.)

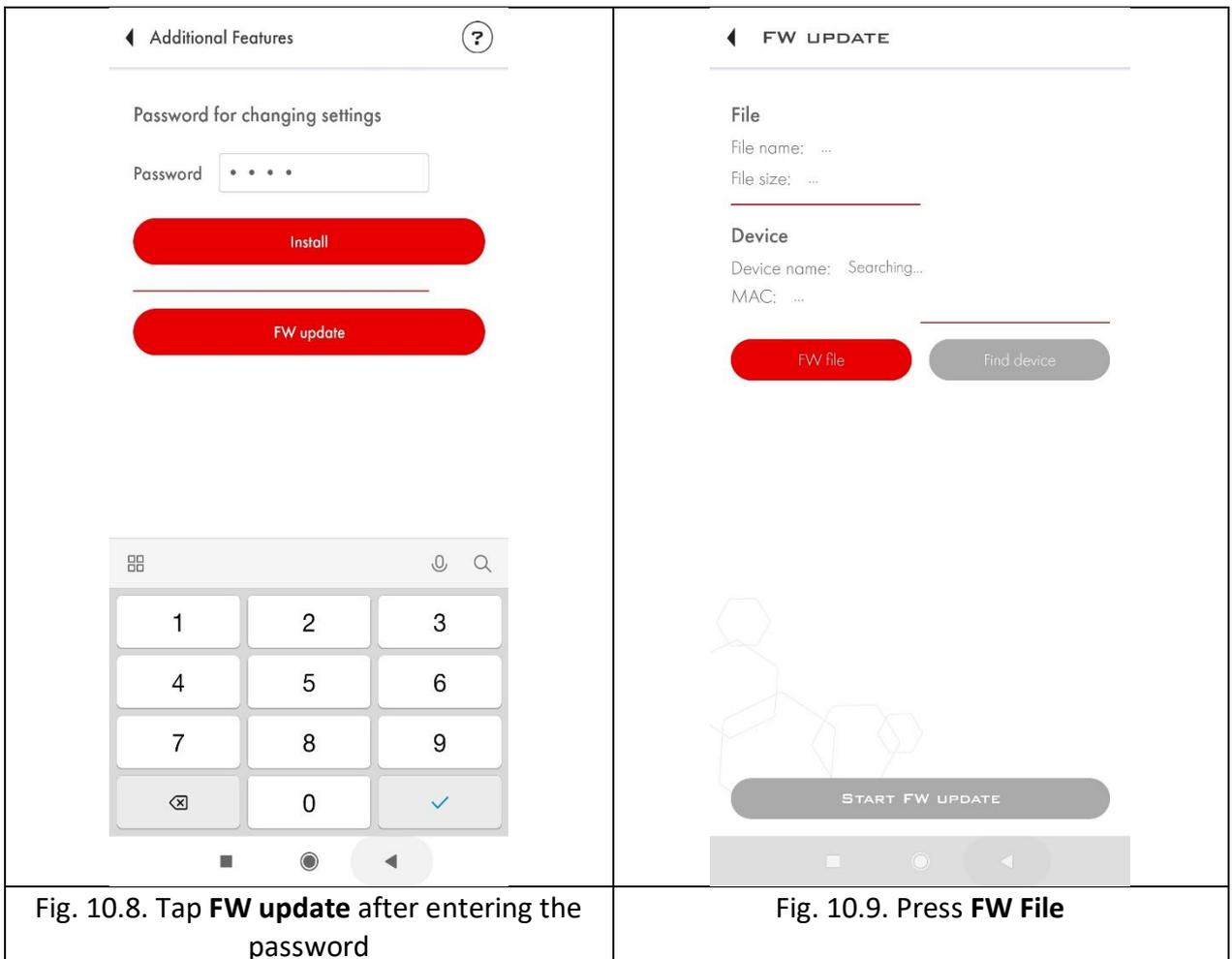


Fig. 10.8. Tap **FW update** after entering the password

Fig. 10.9. Press **FW File**

2. Find the firmware file that you should have previously downloaded onto your smartphone (Fig. 10.10.) Then press **Start FW update** (Fig. 10.11.)

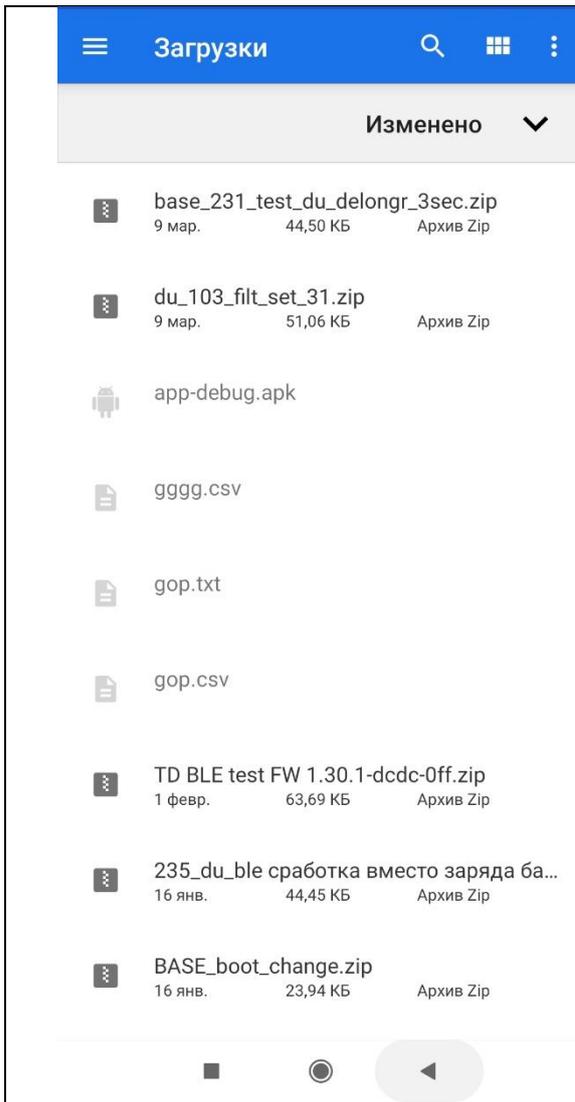


Fig. 10.10. Select the **DU FW file** on your smartphone

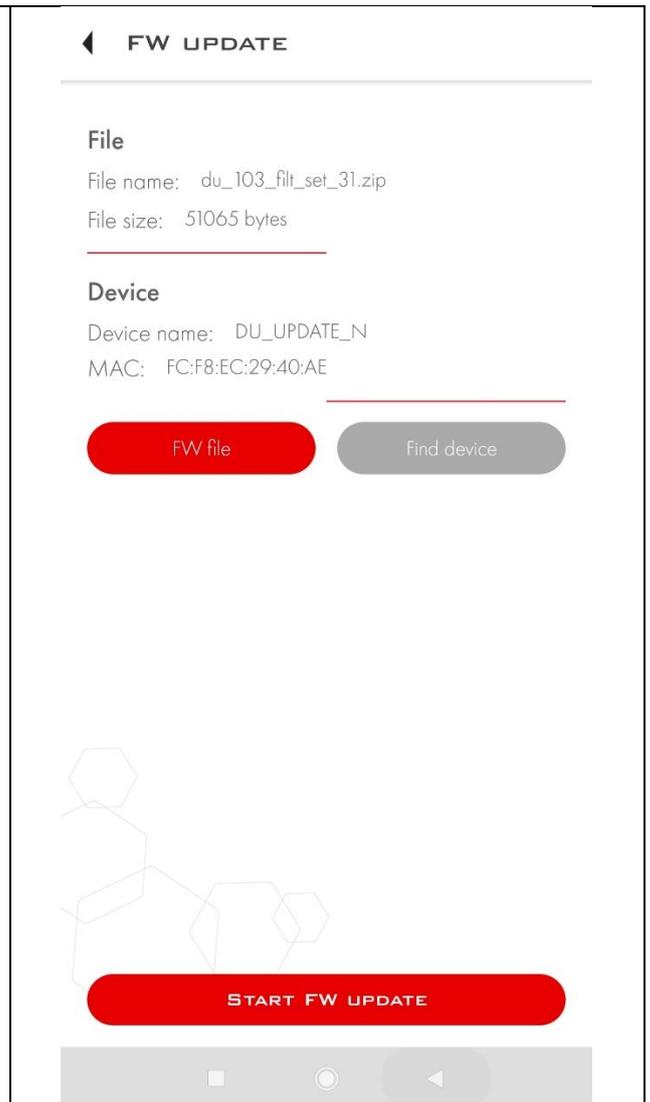


Fig. 10.11. Tap **Start FW update**

3. Wait for the progress bar to hit 100% (Fig. 10.12) and then tap on the **OK, I got it** (Fig. 10.13.)

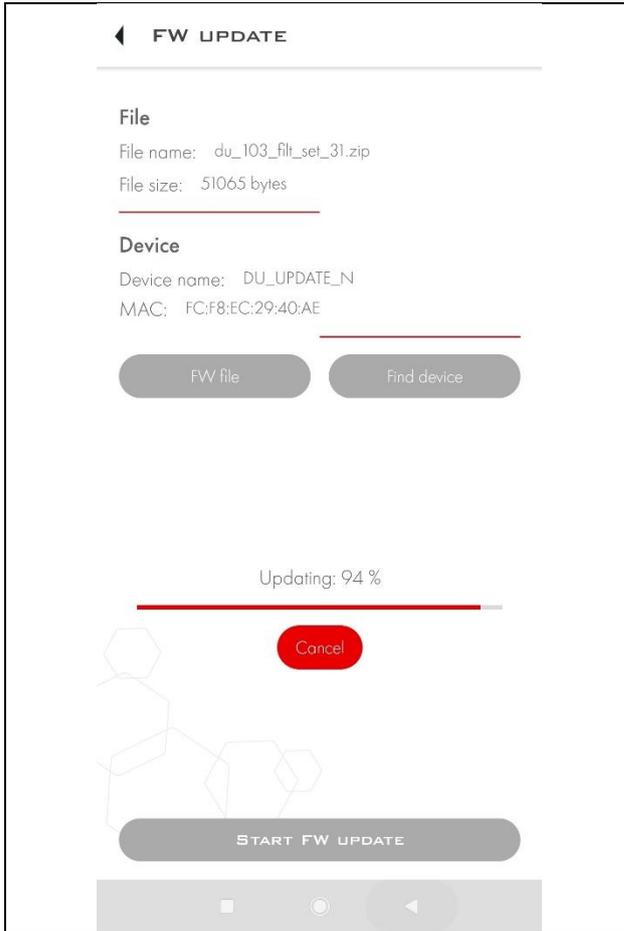


Fig. 10.12. Wait for the update to finish

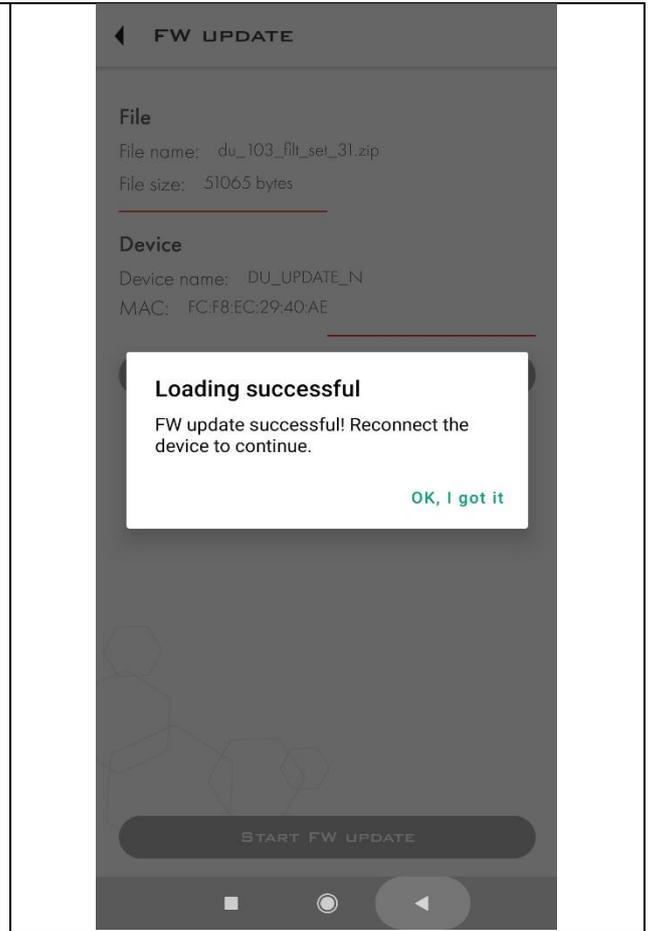


Fig. 10.13. Tap **OK, I got it**

4. Reconnect the sensor and reconfigure it if necessary.

11. BLE-BASE FW update

1. Connect the BLE-BASE RS485-USB adapter to the C-200M converter and the converter to your PC or laptop.
2. Fire up the configurator program for the PC, select the COM port with the number that corresponds to the C-200M, click BLE (Fig. 11.1.)

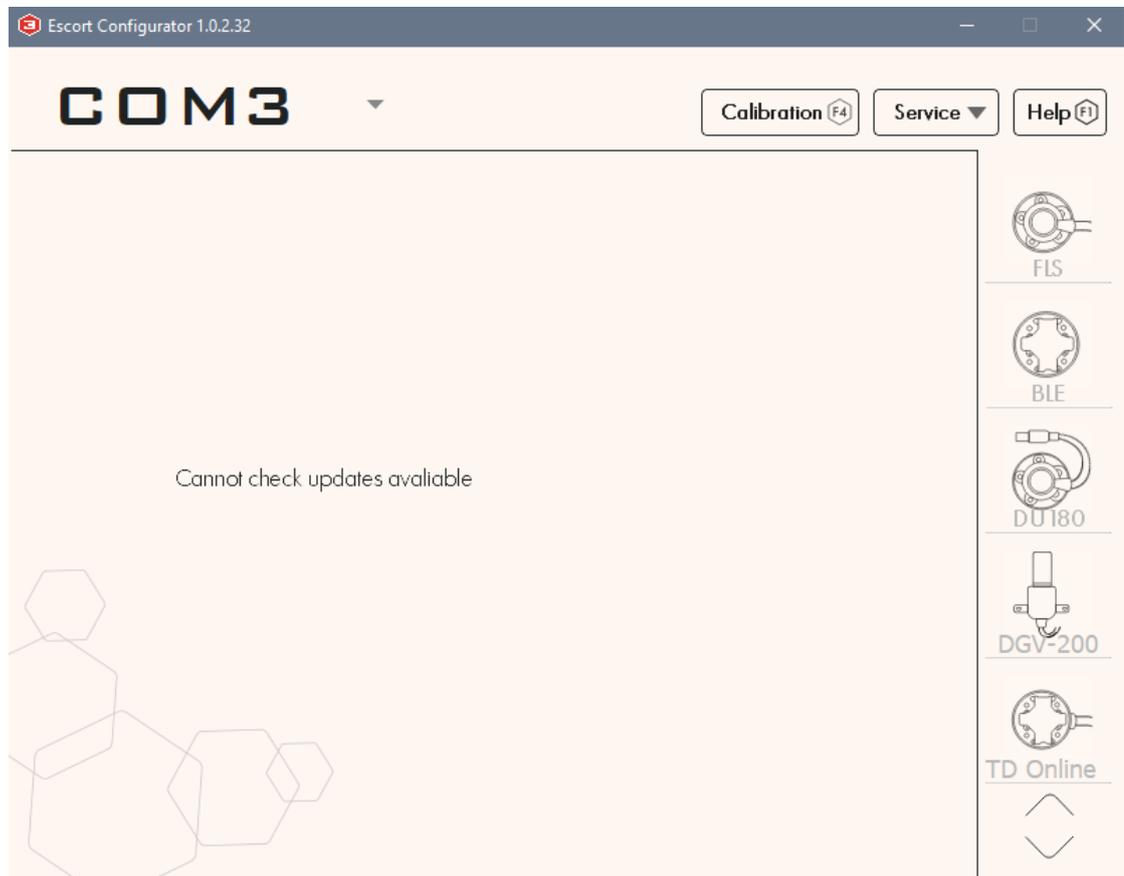


Fig. 11.1. Open the **BLE** section

3. Click **BLE adapter settings** (Fig.11.2.)

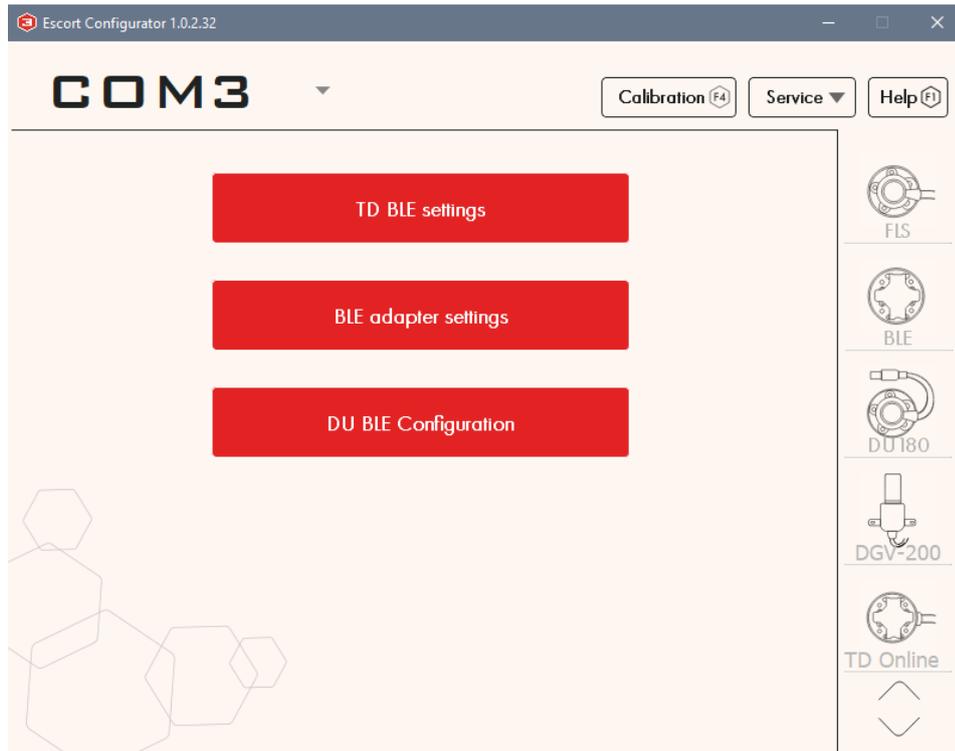


Fig. 11.2. Connect the adapter to configure it

4. Click on the *Service* → and then the **Firmware update** buttons (Fig.11.3.)

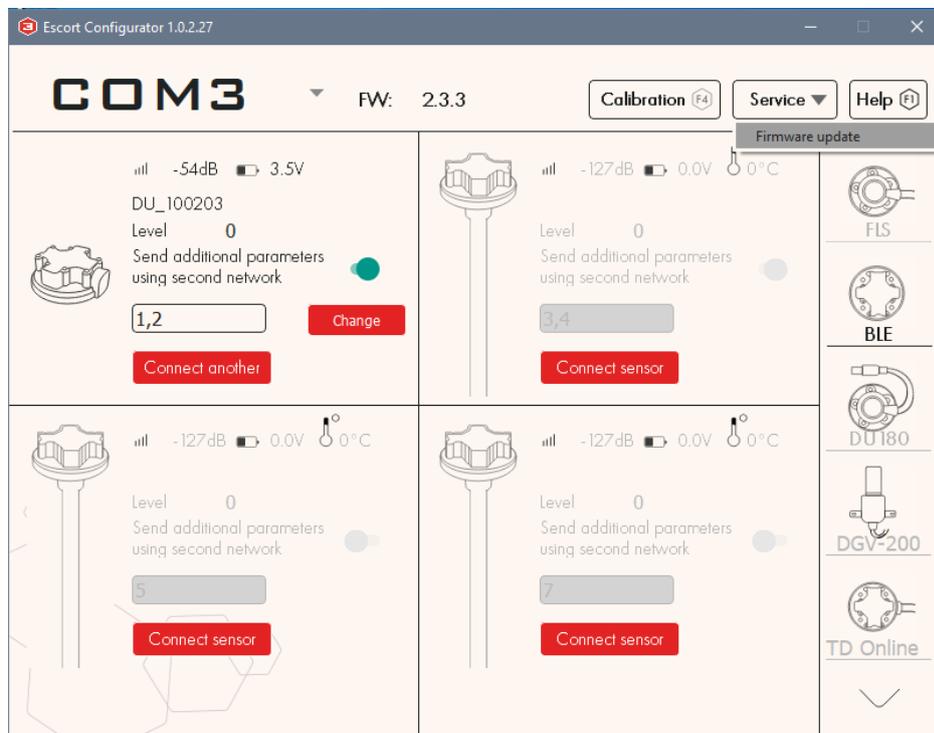


Fig. 11.3. Open the **Firmware update** menu

5. Click on the **Start adapter's firmware update** button (Fig. 11.4.) The 30 second timer will start off.

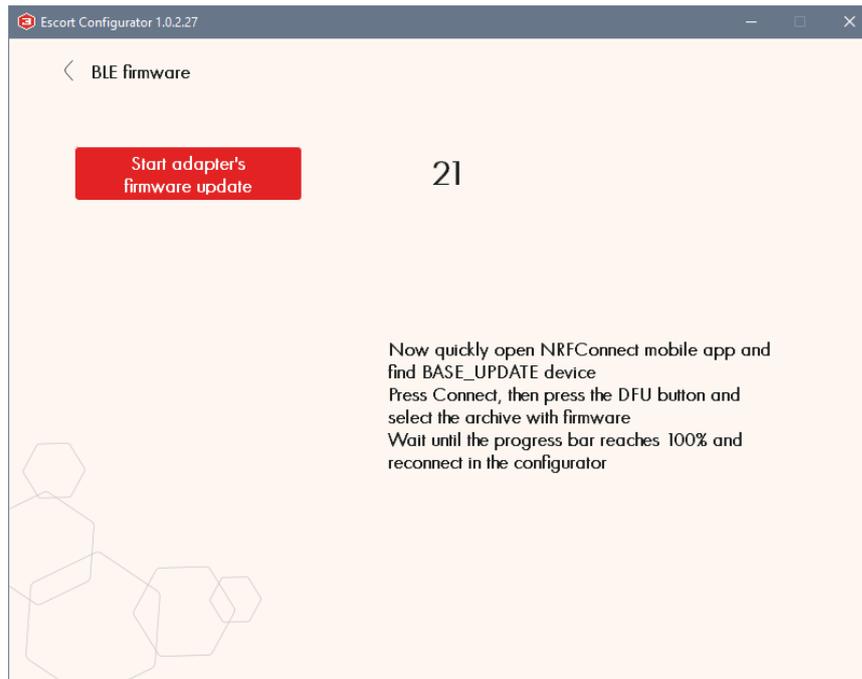


Fig. 11.4. Initiate the **Firmware update**

6. During those 30 seconds, you need to open the NRF Connect app, tap on the Scan button and find the **BASE_UPDATE** device on the list (Fig. 11.5.) Press **Connect** and in the next menu tap on the **DFU button** in the upper right corner (Fig. 11.6.)

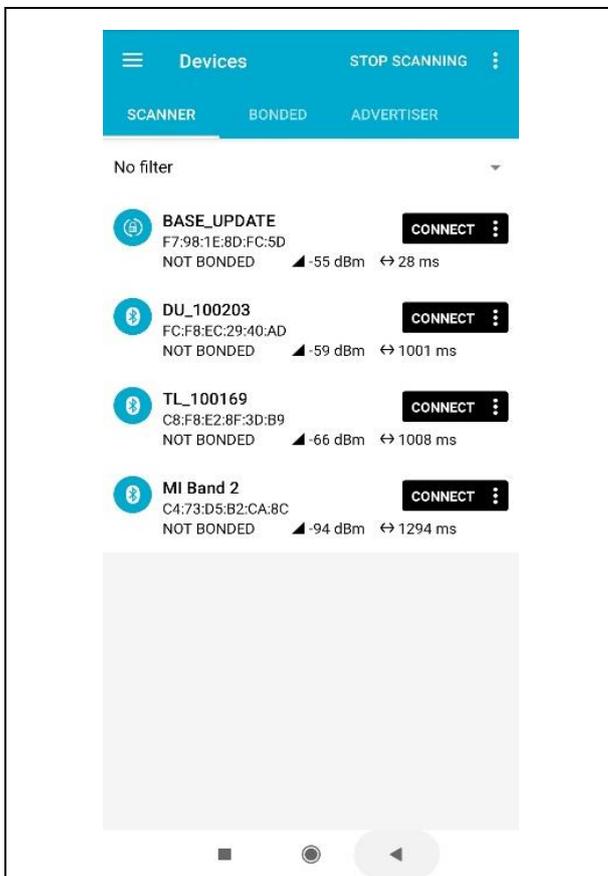


Fig. 11.5. Find the **BASE_UPDATE** device and **Connect** it

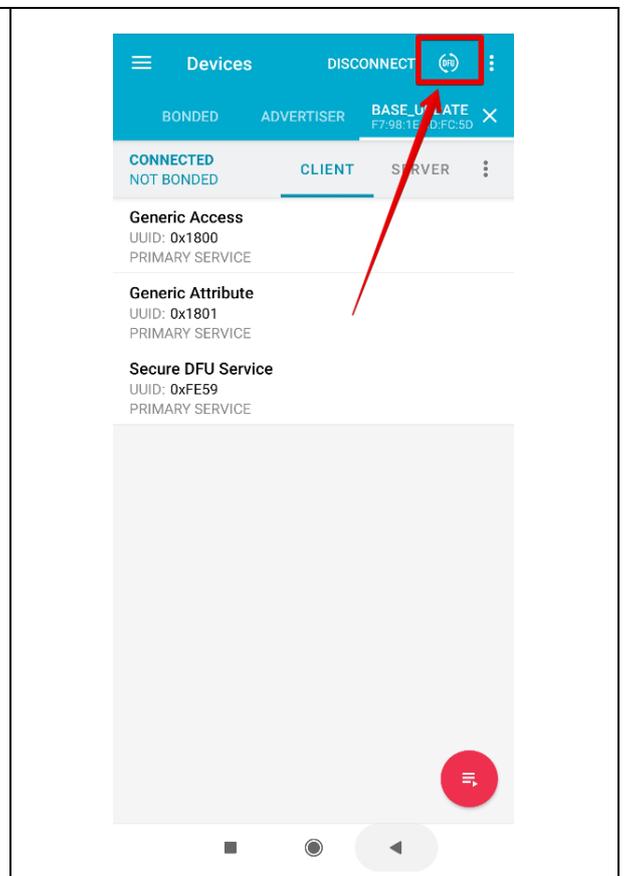


Fig. 11.6. Tap on the **DFU** button

7. After pressing the **DFU** button (Fig. 11.6.), you will see the dialog window where the Distribution packet (ZIP) must be selected (Fig. 11.7.)

Then in the file manager of your smartphone, you need to find the previously downloaded FW file on your smartphone and select it (Fig. 11.8.)

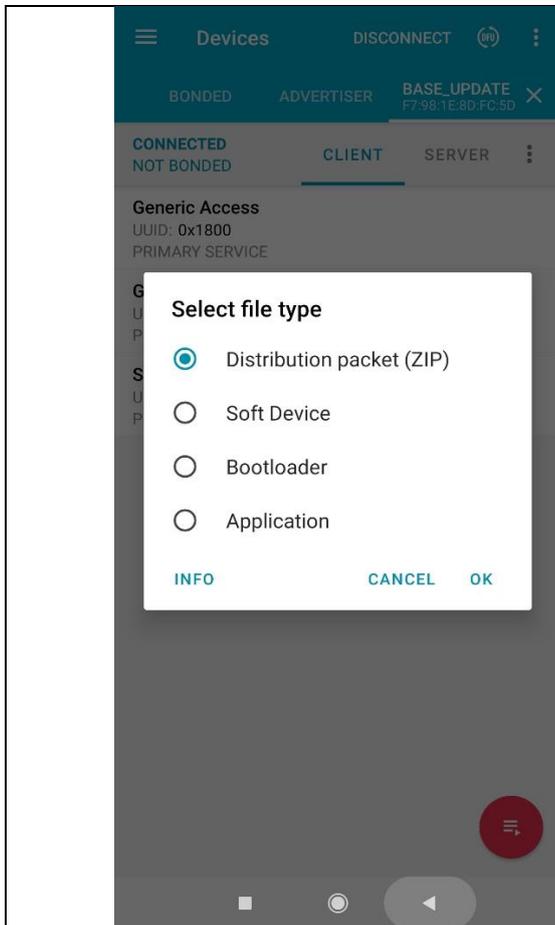


Fig. 11.7. Select the **ZIP** file type



Fig. 11.8. Select the **FW** file on your smartphone

8. If everything is done correctly, you will see the loading progress bar displayed as a line chart. Wait for it to reach the 100% (Fig. 11.8.)

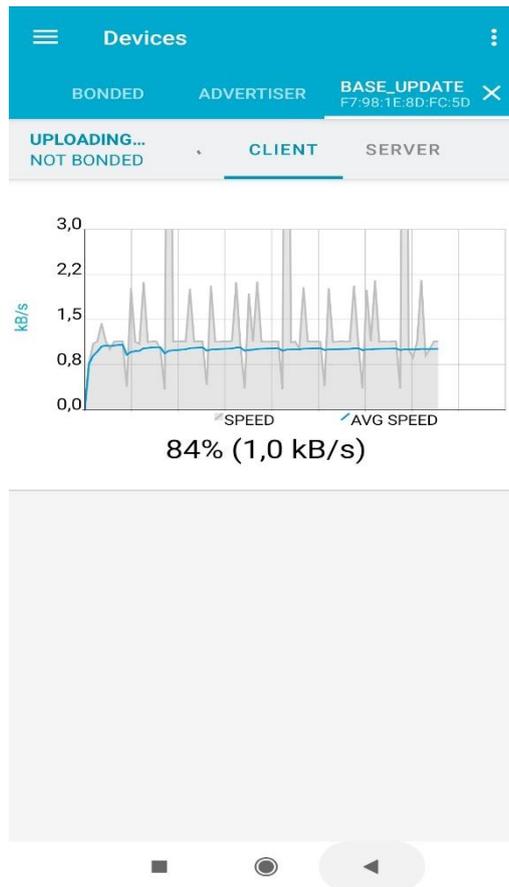


Fig. 11.8. Wait for the DFU progress bar to hit 100%

9. After the FW is installed, the base will automatically reboot.
10. The FW update can affect the previous settings of the base, make sure to check if the previously connected sensors are still connected to it.

12. Mounting the sensor

The most common way to mount the sensor is by means of the self-tapping screws with washers.

It is also possible to install the sensor using threaded stover nuts, welded bushings and other types of fittings. The sensor can be fixed on the installation spot with bolts and screws that have the 4.8 class.

To prepare the installation spot be sure to use:

✓ a $\varnothing 4,8$ mm drill

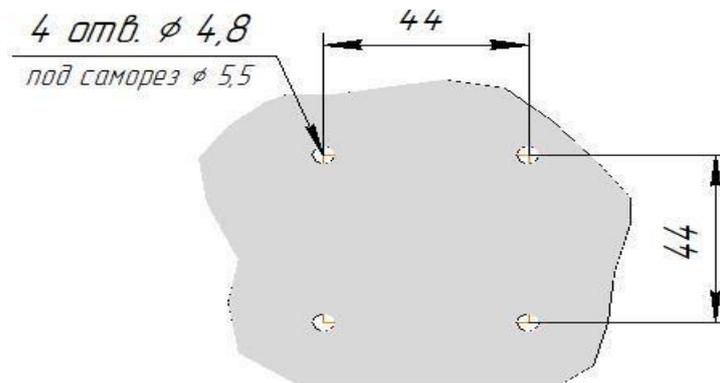


Fig. 11.1. Mounting dimensions

* The \varnothing is given for the self-tapping screws from the installation kit.

4 отв. $\varnothing 4,8$ под саморез $\varnothing 5,5$ - 4 отв $\varnothing 4,8$ for $\varnothing 5,5$ screws

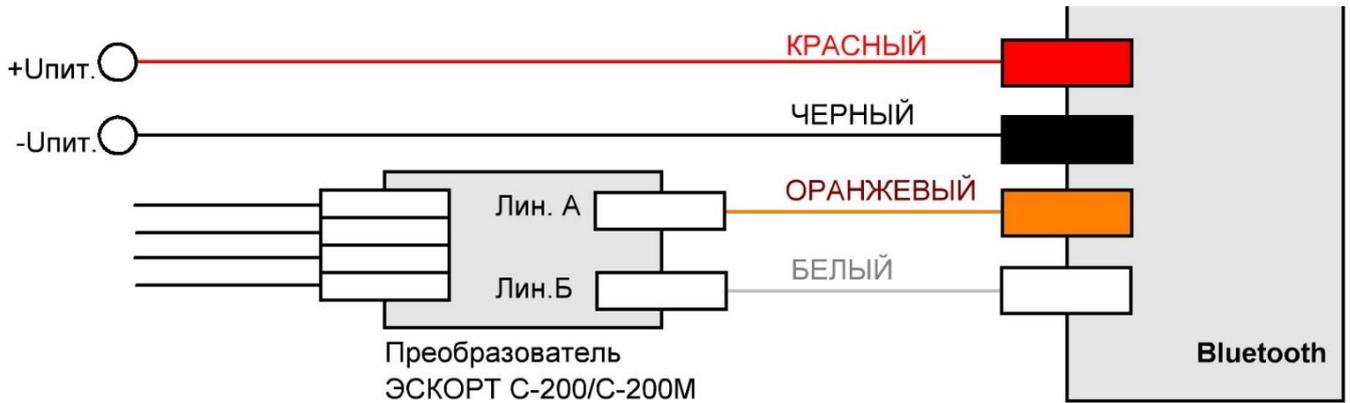
13. Possible issues and how to fix them

The RSSI parameter equal to -127 dBm means that the connection with the sensor is lost.

In this case, you need to check if the settings are correct and if the sensor and the base (or a GPS tracker) are installed properly. If the issue persists, contact our tech support.

ANNEX 1 Wiring diagrams

Wiring diagram of the 'BLE-BASE' BLE-RS485 adapter's connection to PC



+Упит +Uprw
-Упит -Uprw
Красный Red
Черный Black
Оранжевый Orange
Белый White
Преобразователь ЭСКОРТ С-200М Converter Escort C-200M
Лин А Line A
Лин Б Line B
Bluetooth лучше заменить на **Adapter**

Wiring diagram of the 'BLE-BASE' BLE-RS485 adapter's connection to PC



+Упит +Uprw
-Упит -Uprw
Красный Red
Черный Black
Оранжевый Orange
Белый White
Навигационный терминал GPS tracker
Лин А Line A
Лин Б Line B
Bluetooth лучше заменить на **Adapter**