OPERATING AND ASSEMBLY INSTRUCTIONS

Remote fan monitoring system
RMS

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1. INTRODUCTION

System designed for continuous monitoring of fan parameters (temperature, vibration, speed). In the standard version, the system allows measurement of signals from 2 vibration sensors, 2 temperature sensors on bearings and a speed sensor on the motor shaft. An additional option is to equip the system with sensors for measuring pressure and temperature in the duct. The system enables the presentation of measurements on the HMI panel (placed on the box) and on the monitor screen using the HMI Cloud. In one version, a panel and a remote view are used for imaging measurements, in the second version, only remote viewing. Signals from sensors were brought to the main measuring box in which there is a PLC with extension modules through shielded wires. These wires were terminated with M12 plugs and information plates containing sensor number information.

Each signal from the vibration sensor is processed from an analogue value of 4-20mA to a decimal value via the analog module, PLC and expressed in the form mm/s Vrms.

Signal from bearing temperature sensors (PT100) is fed to a transducer that changes the resistance to a 4-20mA signal, and then on the analog input of the controller. Signal from a magnetic sensor used as a sensor to measure the speed on the shaft it is fed to a binary input to which a high-speed HSC counter is assigned.

The system has been equipped with a router and an access point for WiFi networks. The router connects all network points as well as the WAN port for connection with the Internet. However, the WiFi access point connects the client's devices locally, where it is possible to view system parameters through dedicated software.

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2. TECHNICAL DATA OF THE SYSTEM

Power	230V 50/60Hz
Overcurrent protection	B 10A
Vibration sensor	0-25 mm/s Vrms
Temperature sensor on bearings	-50 do 210°C
Temperature sensor in the duct	0 do 100 °C (option)
Pressure sensor in the duct	0 do 1 bar (outlet option), -1 do 0 bar (inlet option)
Data carrier	Pendrive (standard 8GB)
Time of data registration	30 days
Data presentation	Panel HMI (remotely, locally) or HMI Cloud (remotely)
The degree of protection of the vibration sensor	IP67
Degree of protection magnetic sensor (speed measurement)	IP67
Degree of protection of the housing	IP54

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3. INSTALLATION

The delivered system is configured and ready for use. All you need to do is do the following:

- connect the sensors (Figure 1),
- connect the power supply (according to the supplied diagram),
- connect the Ethernet cable to the Internet, WAN socket (Figure 3),

A. Connecting sensors

In order to connect the sensors, screw the appropriate plug to the sensor in such a way that the marker on the cable at the plug matches the marker at the sensor.

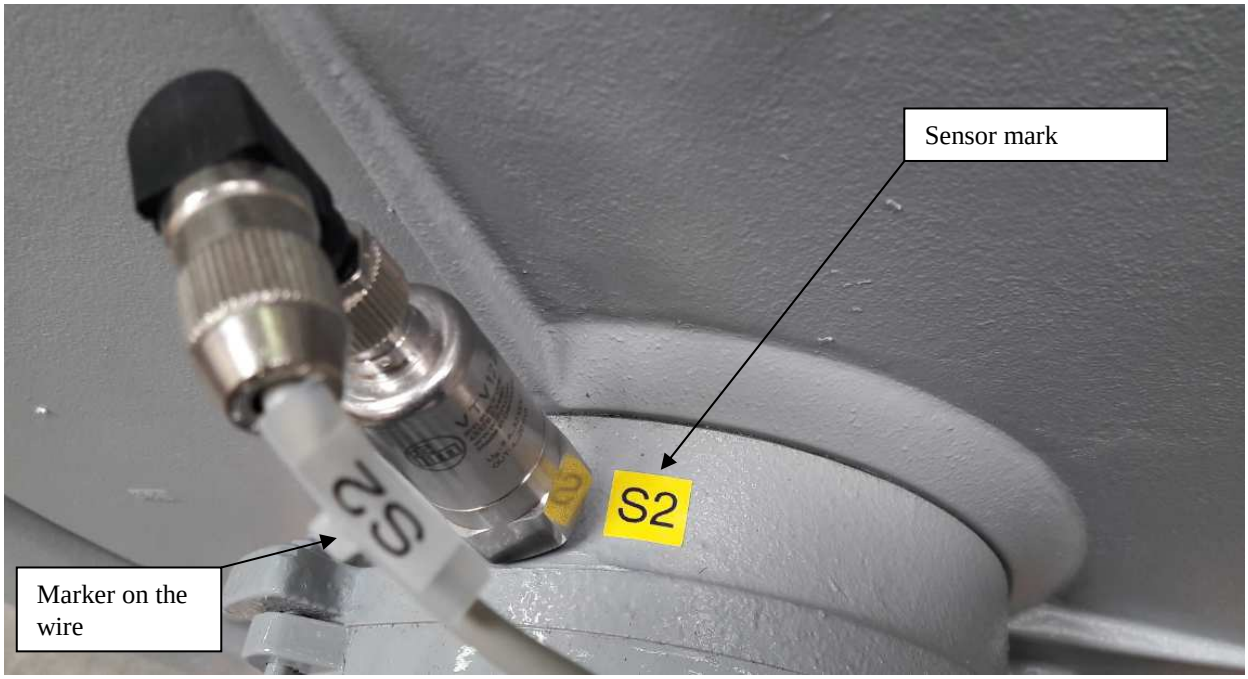

Fig. 1 (sensor connection)

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B. Connecting the power supply

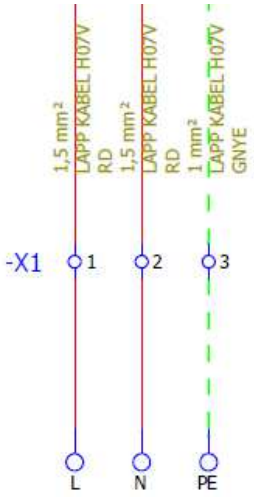

Fig. 2 (Part of the electrical documentation)

WARNING!

Although the overcurrent switch is turned off, there may still be voltage in the cabinet.

C. Connecting the Ethernet cable to the Internet

Fig. 3 (internet connection)

The plug with the cord should be placed in the slot marked with a yellow label with the word "WAN" (the RJ 45 socket is located on the bottom).

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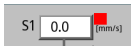
4. COMMISSIONING

After proper connection of sensors, power supply and ethernet cable from the Internet, you can start the system. Turn on the power supply for the circuit under which the system was connected. Without running the fan to which the sensors are installed.

After receiving the power supply, the system is started. When graphics appear on the main HMI screen (model with the HMI panel on the housing) with a fan and windows (Figure 4), you can assume that the system has started. When graphics appear on the screen 

with a red square at the measured value, this indicates that the system is not connected to the sensor. In this case, check the connection between the plug and the sensor again.

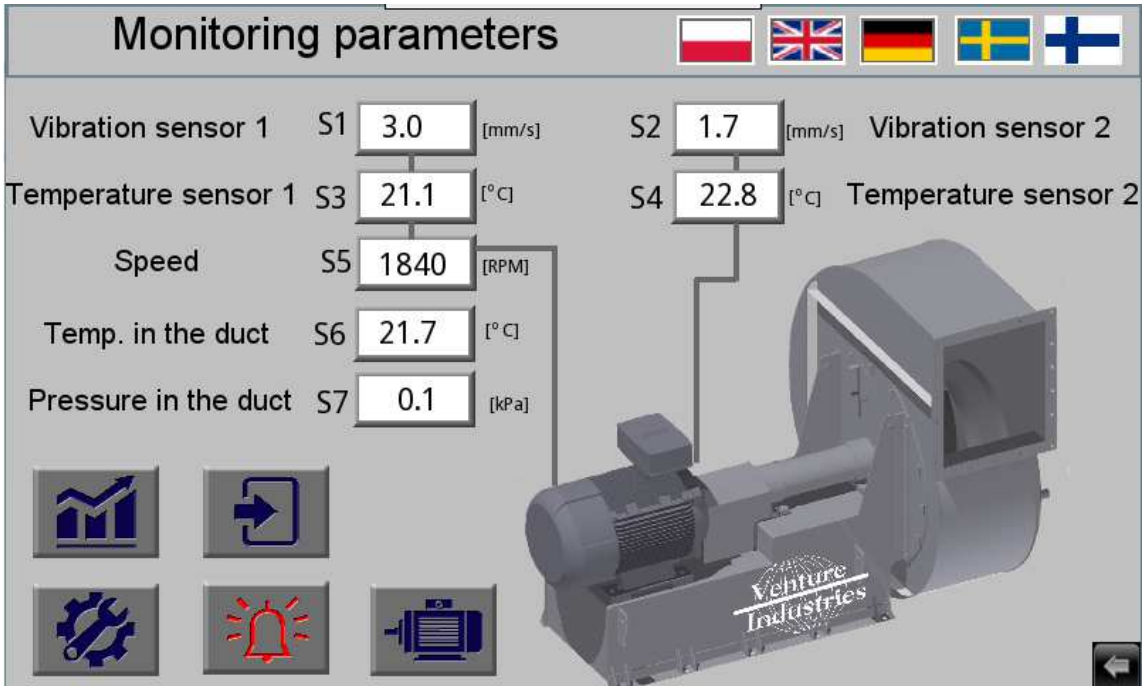


Fig. 4 (Main window on the HMI panel)

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5. OPERATION AND EXPLOITATION

A. Measurements

The system has been adapted for continuous monitoring of the operating parameters of the fan / fans. The system performs measurements from all sensors of a given fan, continuously recording values in constant, 1-second intervals, thus creating trends of changes in measured parameters.

B. Basic screen

After starting the system, the graphic is displayed on the main screen with measuring windows (Figure 5). Changing the language takes place after pressing the key with the country's flag.

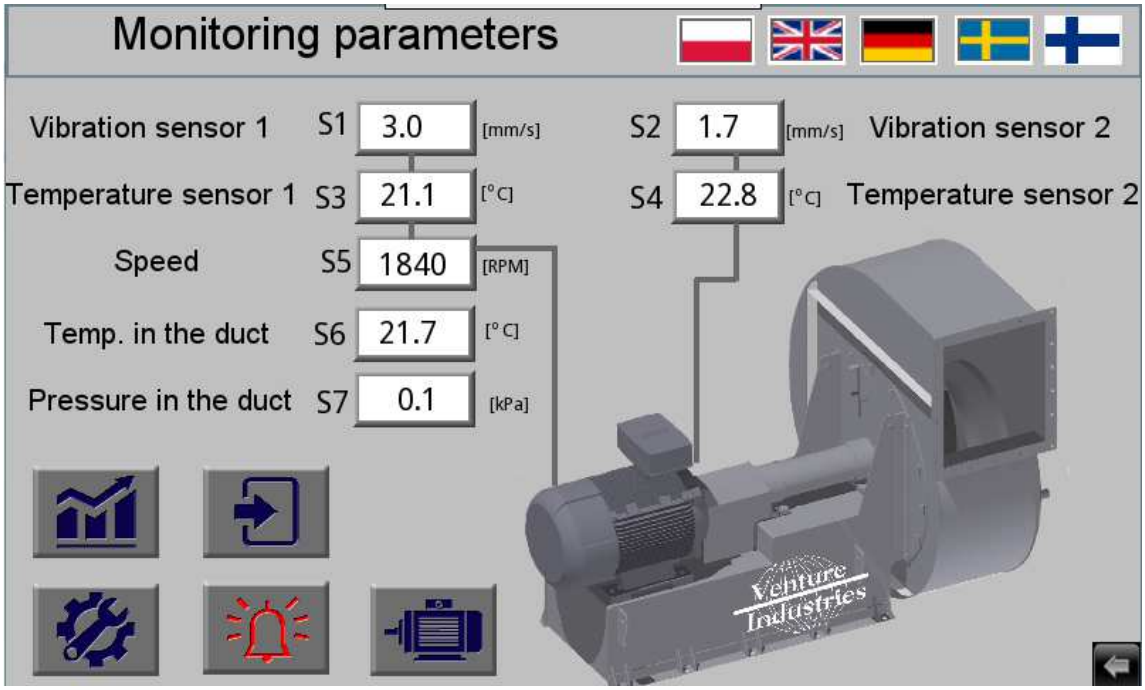

Fig. 5 (Main screen)

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C. Diagrams

The system has the option of presenting graphs with measurements in the time domain. The basis for the time to register is one second. To go to the graph window, start by pressing the button  and the screen will start with 3 buttons (Figure 6).

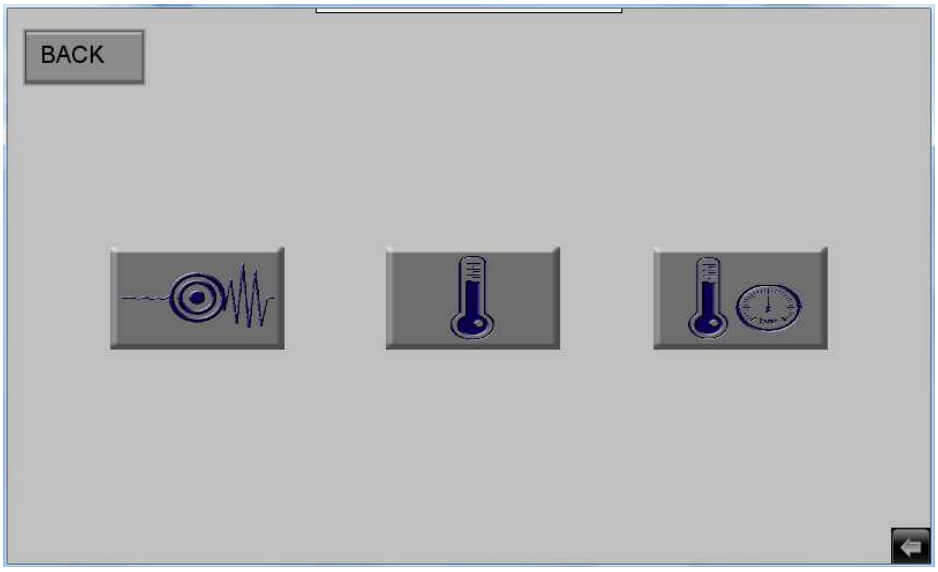

Fig. 6 (Graph menu)

- The button allows to go to the trend presenting the vibrations of the sensor S1, S2 and the speed from the sensor S5.

- The button allows to go to the trend presenting the temperatures on bearings from the sensor S3, S4 and the speed from the sensor S5.

- Button that allows you to go to the trend presenting the temperature and pressure in the channel (the trend is available in the system with temperature measurement and pressure in the duct).

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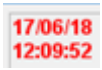
a) The vibration trend

Start-up happens by pressing the key  .

Fig. 7 (Trend with vibration values)

To specify a specific value in the trend, click on the place of interest, the designated point will be determined by the black vertical line. On the left side there will be values in 3 windows from this place. The color of the window border with the value is assigned to the color of the line in the trend.

Switches 0/1 in 3 different colors are used to turn on or off the corresponding line in the trend.

The time reading for the values in the measurement windows is in the trend 

includes date and time.

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Reading values from a period longer than 24 hours, or when there has been a break in recording measurements by disconnecting the system from the power supply, is in the drop-down list, where you should select the time period from which you want to view the trend. When on the drop-down bar you can see 

digits 06171258 should be read in the following way:

- 06 indicates the month of creation of the file with values,
- 17 sets the day,
- The last 4 items indicate the hours and minutes.

b) Temperature trend

Commissioning is performed by pressing the key  . The same principle of reading as for the vibration trend.

Fig. 8 (Trend with temperatures on bearings)

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c) The temperature and pressure trend in the duct

Commissioning is performed by pressing the key  The same principle of reading as for the vibration trend.

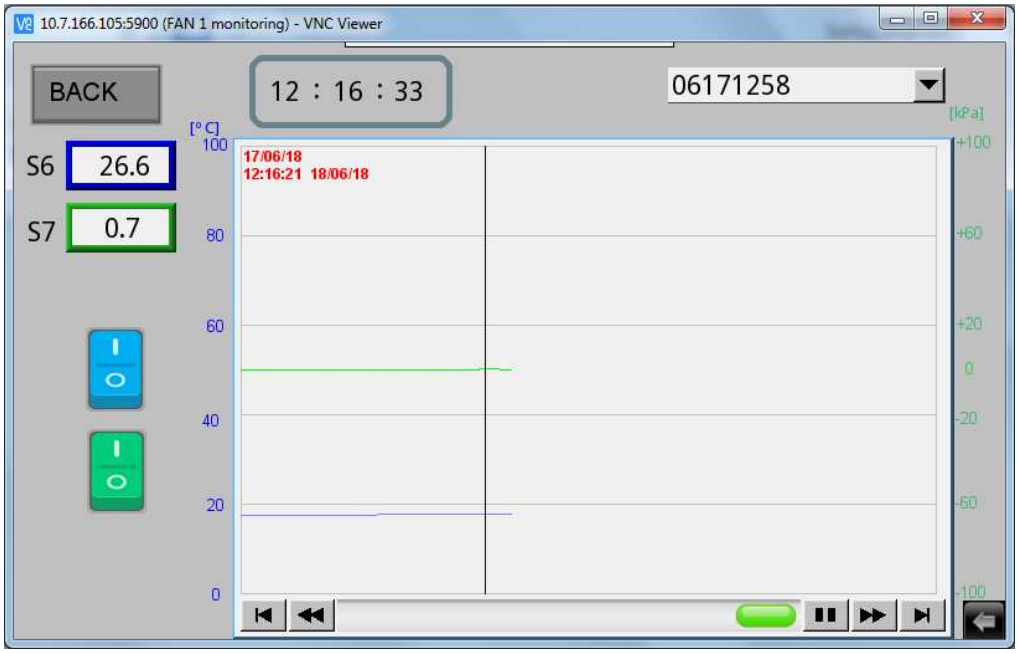

Fig. 9 (Trend with temperature and pressure in the channel)

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D. Alarm thresholds

The system provides for setting alarm thresholds after which an error / failure will be reported. To set alarm levels, press the key on the main screen  . This will allow you to go to the alarm screen.

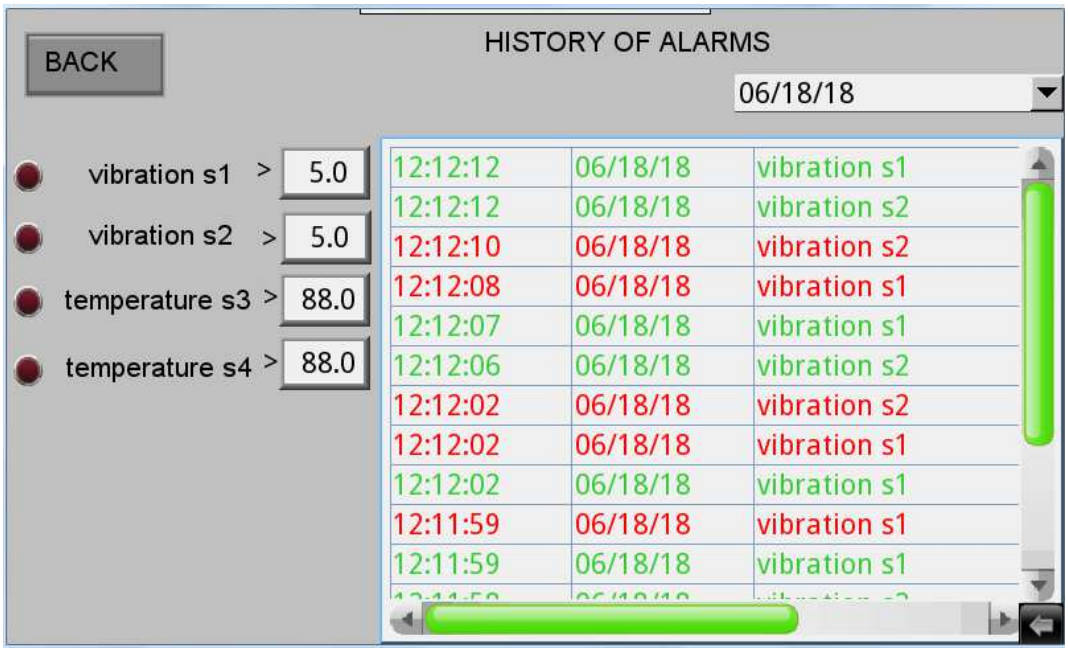
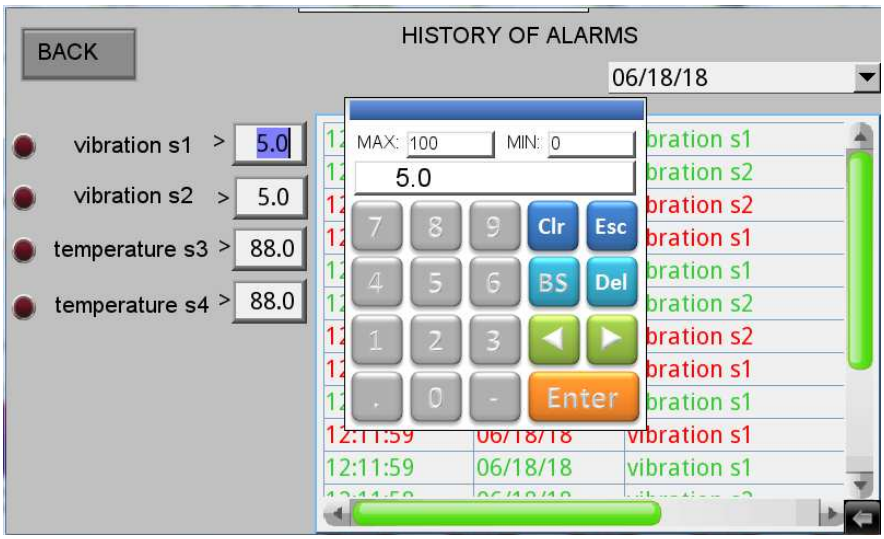


Fig. 10 (Alarms and limit settings screen)

To set the limit for the vibration sensor, click the window with the value  . After clicking on the window, an alphanumeric keyboard will open to enter the value.



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After entering the value, confirm with the key Enter . Analogously, the thresholds for temperatures on bearings are set.

Current alarms are presented on the main screen by highlighting the values in red Fig. 11.

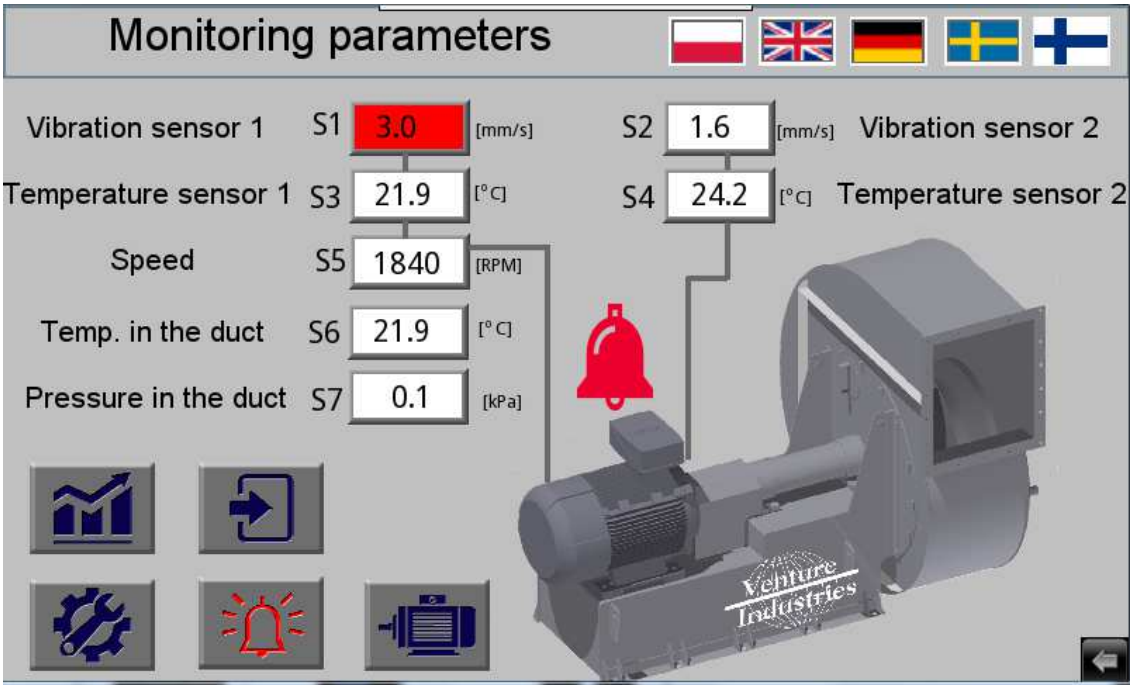

Fig. 11 (Alarm information on the home screen)

E. Fan shutdown thresholds

The fan shutdown alarm thresholds are used to protect against high vibrations and temperature. After exceeding the set limits and delay time, the relay activated by the binary output (Q 0) of the controller will be turned off (the relay contact should be used in the fan control).

It is possible to re-enable the relay after the alarm thresholds have been released by pressing the button RESET. Button RESET on the main screen only visible when there is a signal to turn off the fan. The transition to the thresholds turns off the fan after pressing the key .

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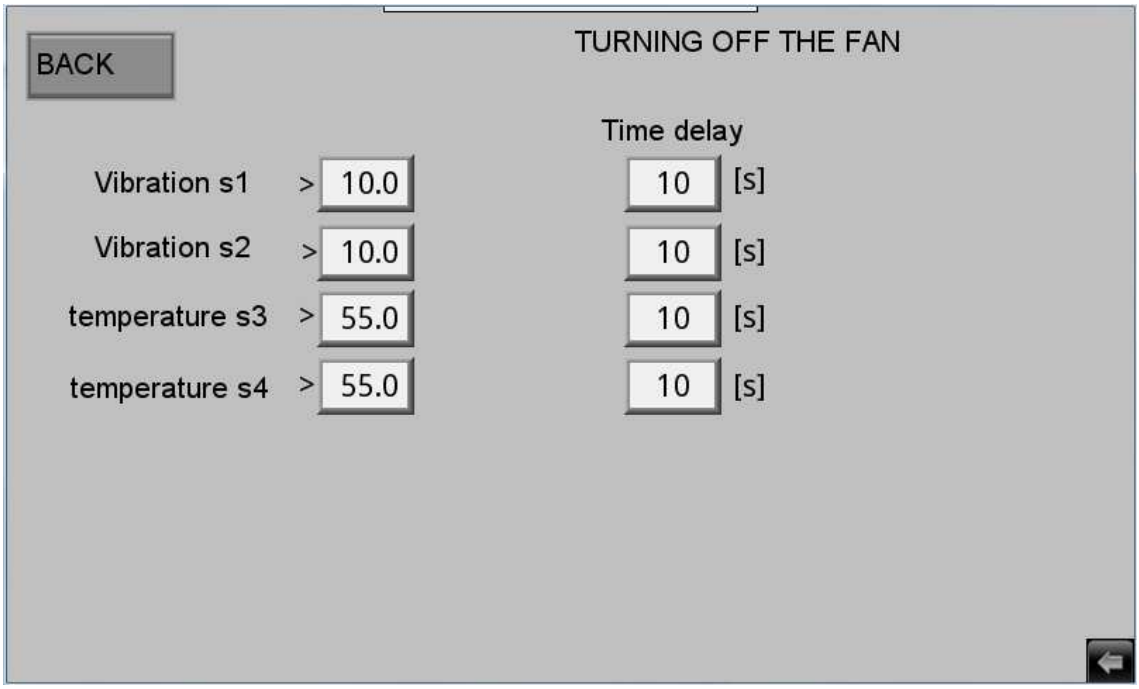
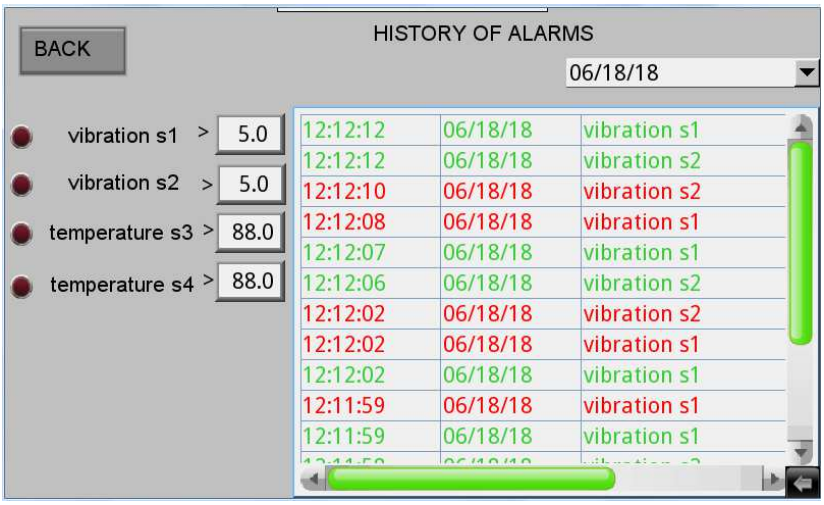


Fig. 12 (thresholds for switching off the fan)

F. Readout of historical and current alarms

The system provides the ability to view and record alarm data. Alarm events are recorded, such as alarms resulting from exceeding the set limits and diagnostic alarms informing about sensor damage.

Transition to read alarms by pressing the key  on the main screen.



Rys. 12 (Screen of historical and current alarms)

Information about the current alarm is indicated by the red LED on the alarm limits 

. In addition, in the alarm table on the right, the alarm time and

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name will be entered in red. When the alarm has disappeared, the red LED will go off and the time and the alarm name will be entered in the alarm table with green color, thus informing about the end of the failure.

To view a historical record above 24 hours, or when the system is interrupted (power outage), select the appropriate date from the drop-down list 

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G. System settings

System settings are possible after prior login. Login takes place after pressing the key  on the main screen.

After starting the login, a window will appear to enter the username and password.

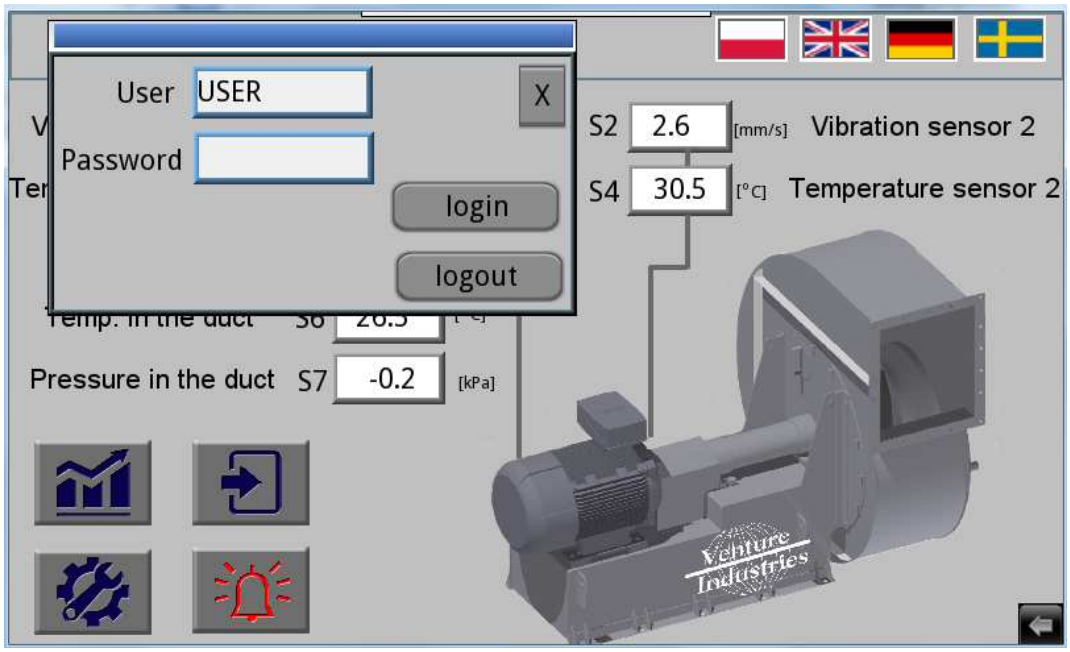

Fig. 13 (User login window)

Click on the user window, enter the name "USER" and confirm with the button 

. Enter "1" in the password window and confirm with the key 

. Then click the button 

to log in to the settings. Now you can close the login window by clicking on 

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After logging in, we can go to the configuration window, to do this click on the icon  .

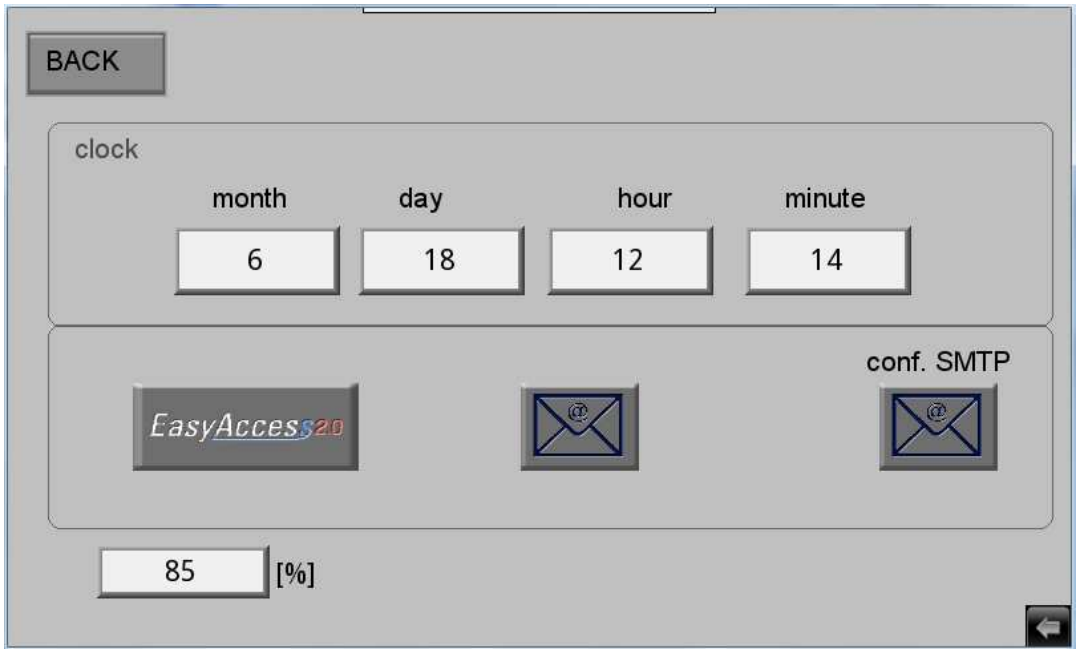

Fig. 14 (Configuration window)

In the configuration window, you can set the system time, enable or disable remote access, configure outgoing mail (notify users about alarms) and configure outgoing mail using pendrive and additional software.

a) Setting the system time

To set the system time, click on individual windows and enter the value and confirm with the key 

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b) Enable / disable remote access

To be able to remotely monitor, after connecting the system to the Internet via a WAN socket, start the EASYACCES system by clicking on the icon 

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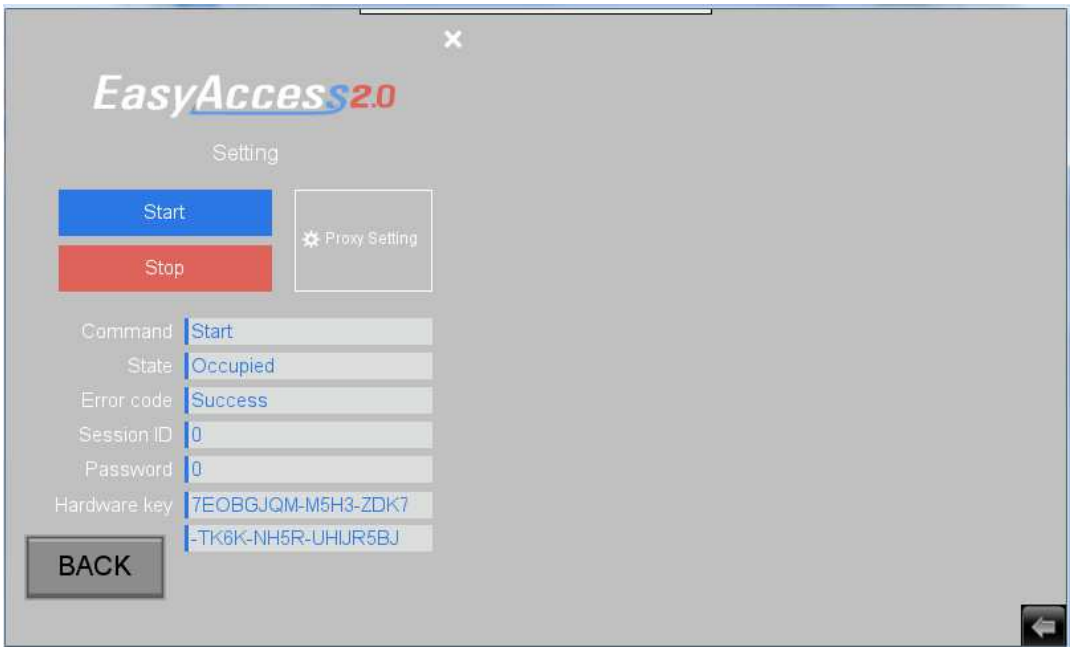
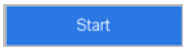


Fig. 15 (Remote access configuration)

Start remote access after clicking on the key 

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c) Mail configuration - notifications

Configuration of e-mail accounts to which any messages will come with alarm notifications. We start the screen by clicking on the icon  .

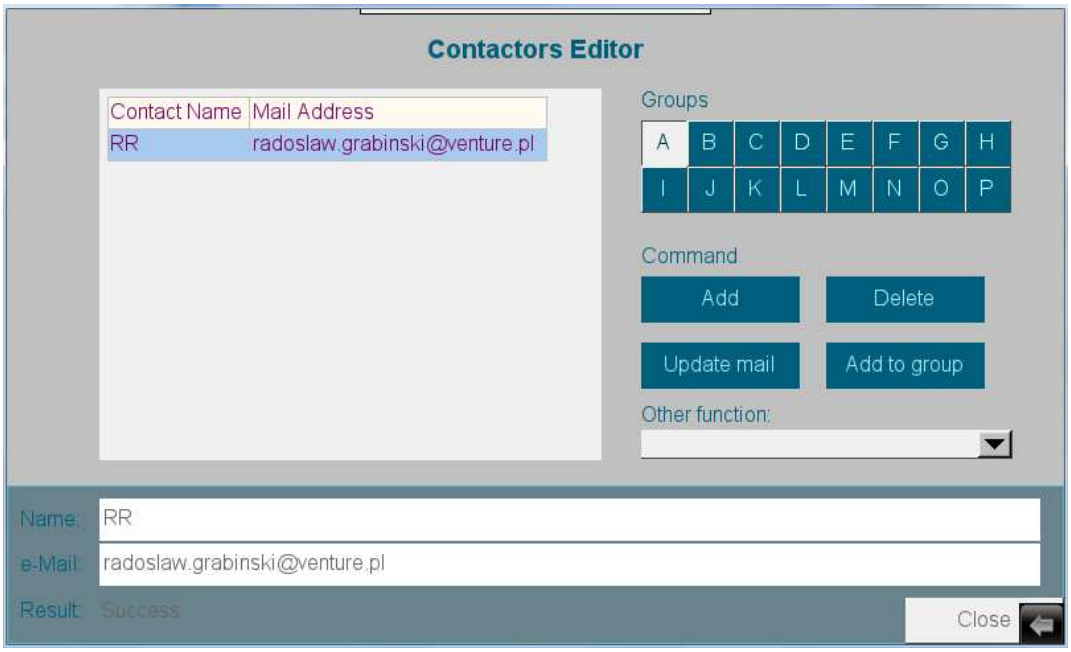
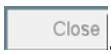


Fig. 16 (Configuring notifications)

Enter the name and e-mail address to which alerts about the alarm event will come, after typing, press the key 

. Then, in the column with e-mail addresses, we choose our e-mail address again and click on the button 

in order to assign to group A and add an email address to this group by pressing the key 

. Closing the window after pressing the key 

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6. STARTING THE REMOTE CONTROL PROGRAM

The system has the ability to remotely control the measured parameters, using the appropriate software installed on a PC or on a smartphone. The program necessary to establish a VPN connection the system is EasyAccess 2.0, which can be downloaded from the Internet or a pendrive included in the set (installed in the USB socket of the HMI panel or HMI cloud).

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A. Installation of EASYACCESS 2.0 on a PC

We download the EasyAccess 2.0 program from the website http://www.weintek.com/globalw/Download/Download.aspx or copy the installation files of the program from pendriva located in the USB socket of the HMI / HMI Cloud panel.

We download the VNC Viewer program from the website https://www.realvnc.com/en/connect/download/viewer/ , we install VNC Viewer, and then EasyAccess 2.0.

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B. EasyAccess 2.0 configuration on a PC

We run EasyAccess 2.0

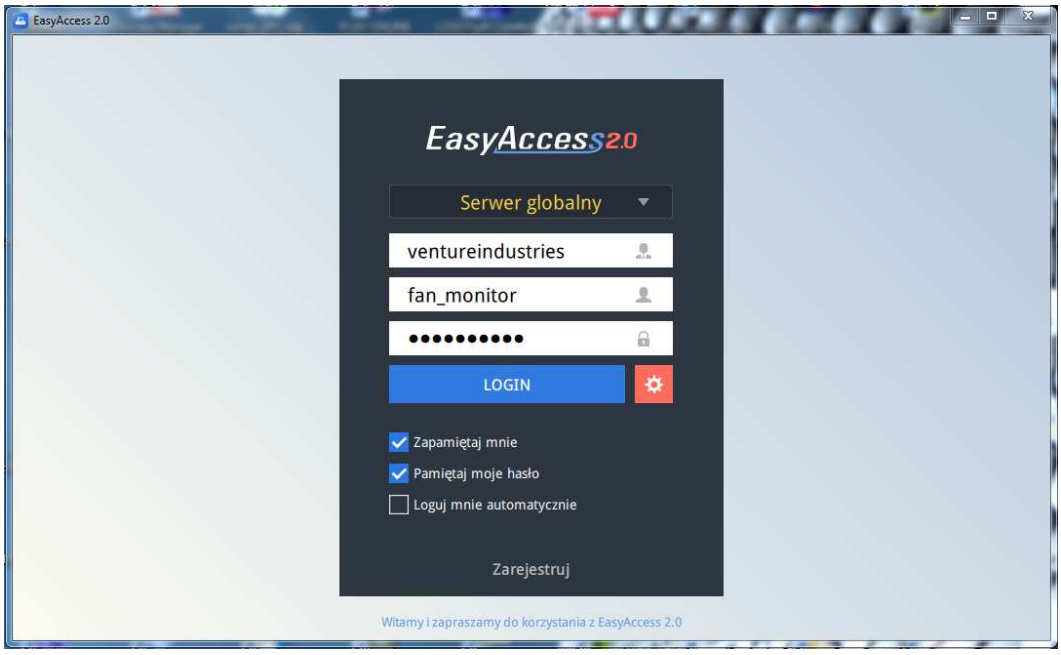

Fig. 17 (EasyAccess logging)

We configure the account as shown in Figure 17. We receive login information from the device's postman. Then log in by pressing the key LOGIN.

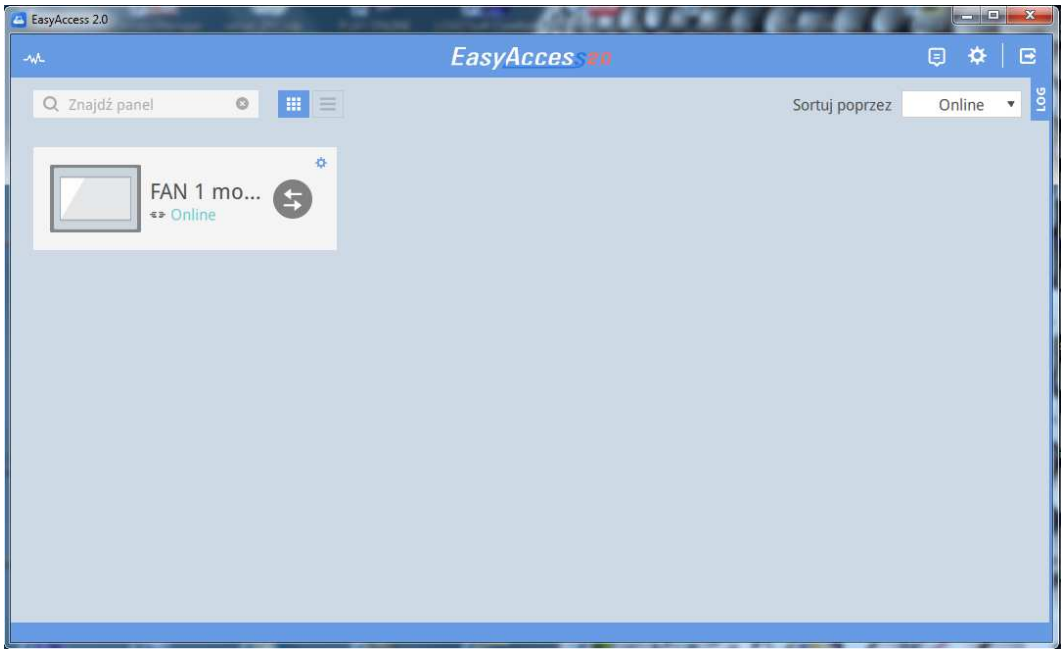

Fig. 18 (EasyAccess configuration)

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After the correct login, the window shown in Figure 18 shows us. We go to the configuration by pressing the icon .

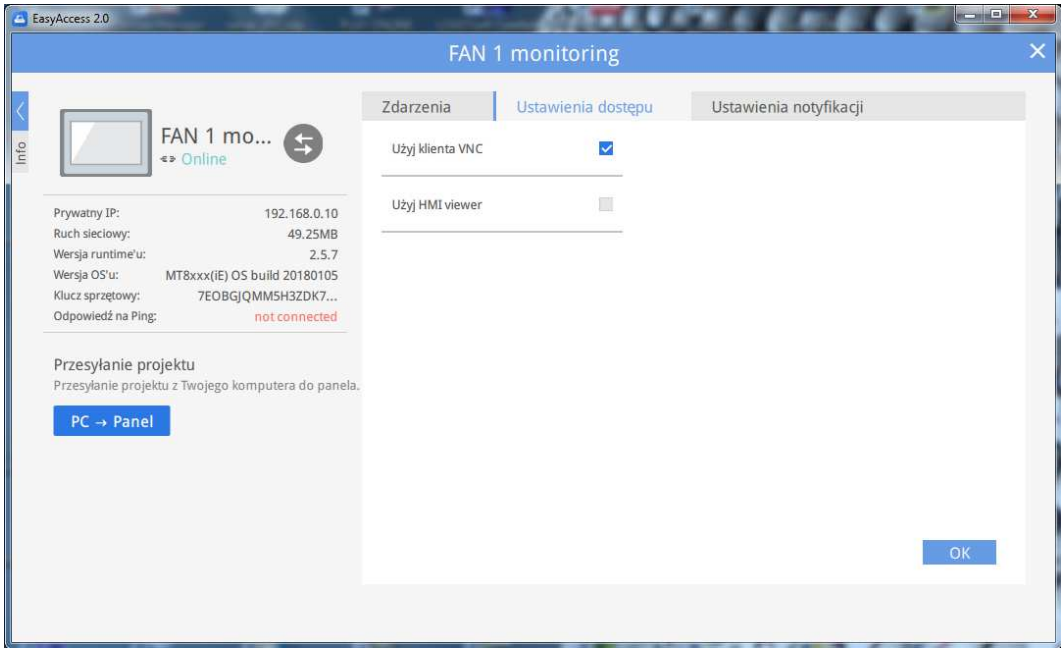

Fig. 19 (EasyAccess configuration)

In the configuration, select the option as in Figure 19 "Use the VNC client" . Then confirm with the button OK , we close the window by pressing . We are waiting for the screen with IP addresses to appear, as shown in Figure 20.

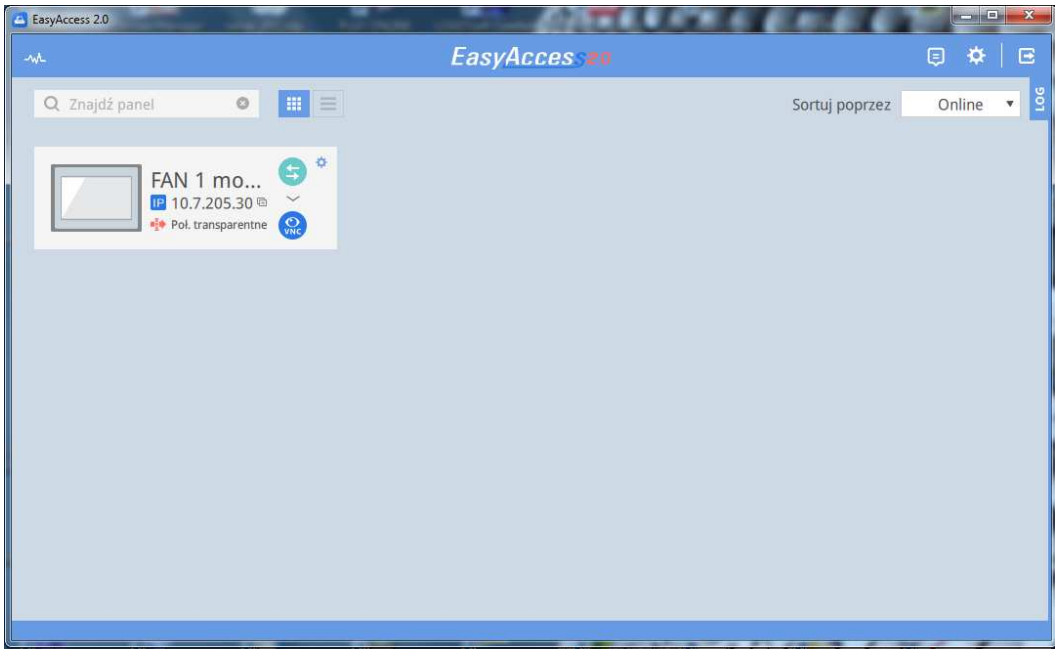

Fig. 20 (Easy Access connection)

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We check the correctness of the path to the VNC Viewer (Figure 21), in the upper right corner click on the icon .

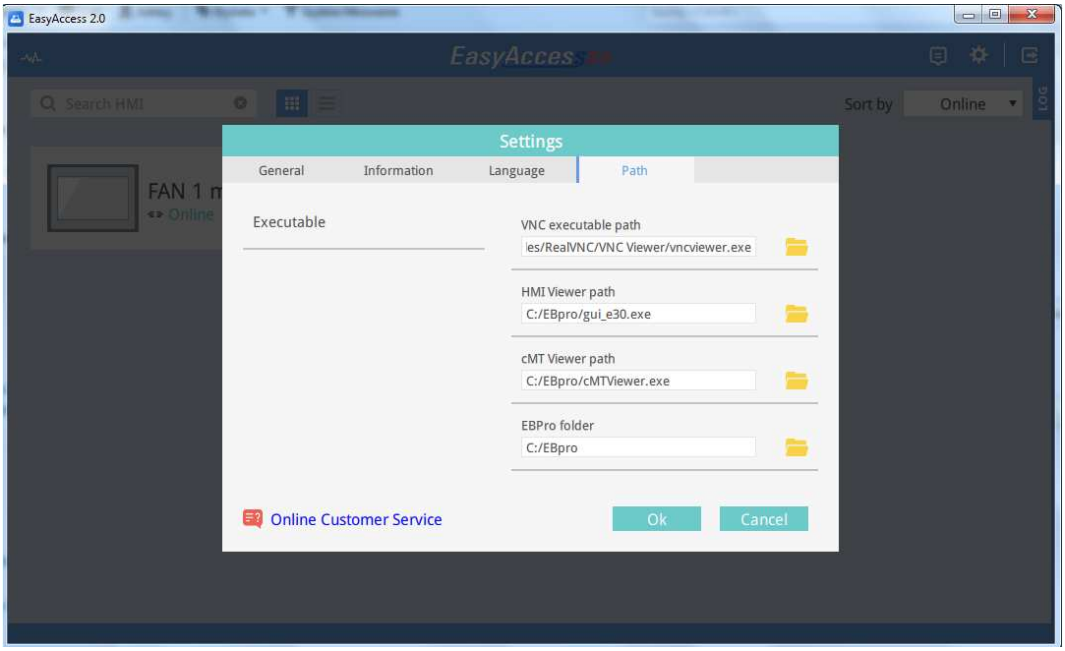

Fig. 21 (Path to the VNC Viewer)

If we agree, we approve Ok. After displaying the assigned IP address, we can go to the preview of system parameters by launching the VNC Viewer with the key .

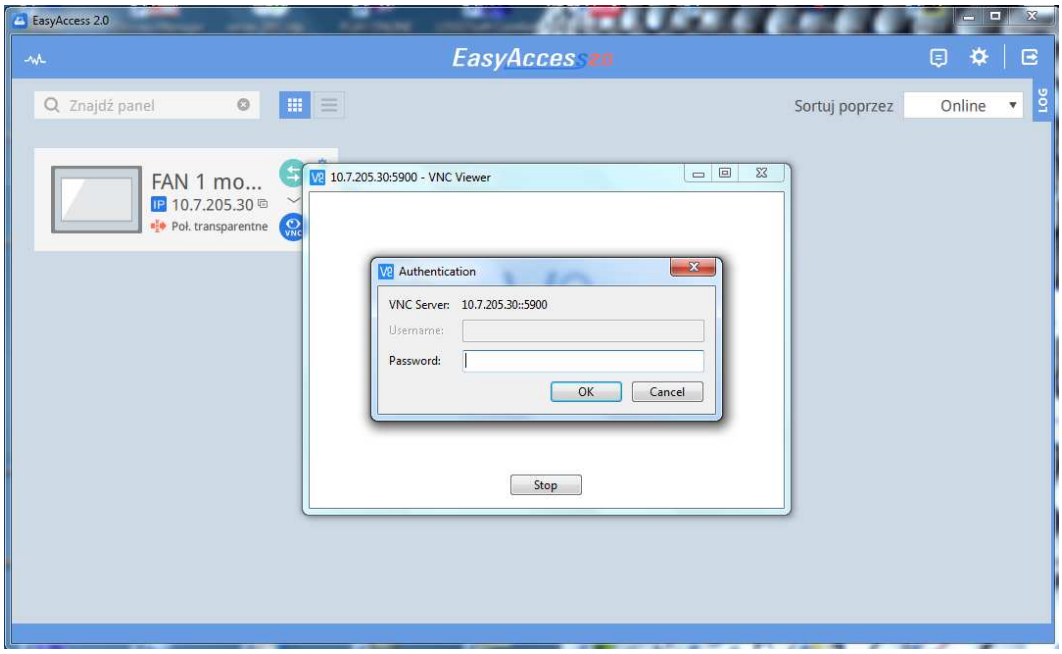

Fig. 22 (VNC Viewer)

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VNC Viewer will ask for a login password (Figure 22), default password 111111 set by the provider. After correct login, we can already use the system remotely in Fig. 23.

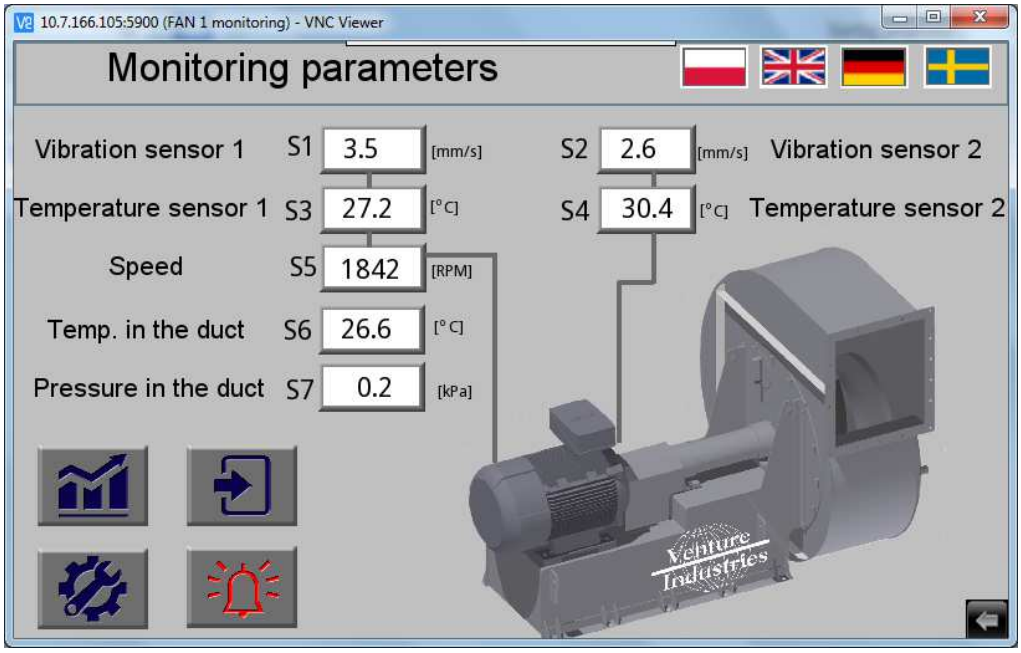

Fig. 23 (Main screen after remote logging)

C. EasyAccess 2.0 configuration for your smartphone

In order to operate the remote system on a smartphone, you must download the EasyAccess 2.0 application for android and the VNC Desktop 169 or similar application. We run Easy Access 2.0 enter the login data in the same way as for the PC application. After the correct login, the screen Fig. 24 will appear.

Rys. 24 (EasyAccess w wer. na Android)

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EasyAccess 2.0 configuration, click on the icon which will allow us to go to the configuration screen.

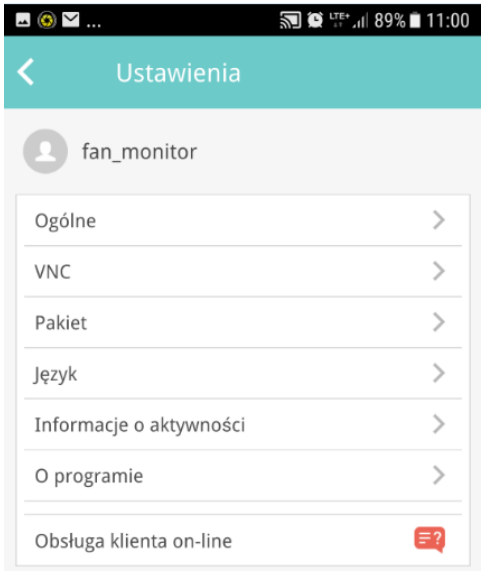

Fig. 25 (EasyAccess 2.0 configuration)

We choose our VNC program by clicking (Fig. 25) located next to the VNC name. We choose our VNC program "Desktop 169" (Figure 26).

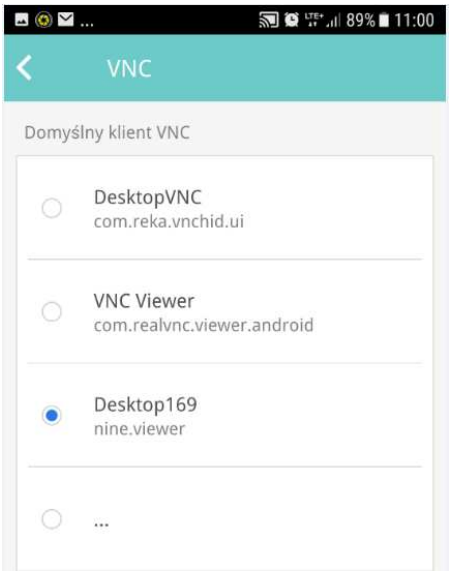

Fig. 26 (Easy Access 2.0 configuration)

After leaving the configuration (Figure 27), copy the assigned IP address by clicking on the icon located behind the IP address.

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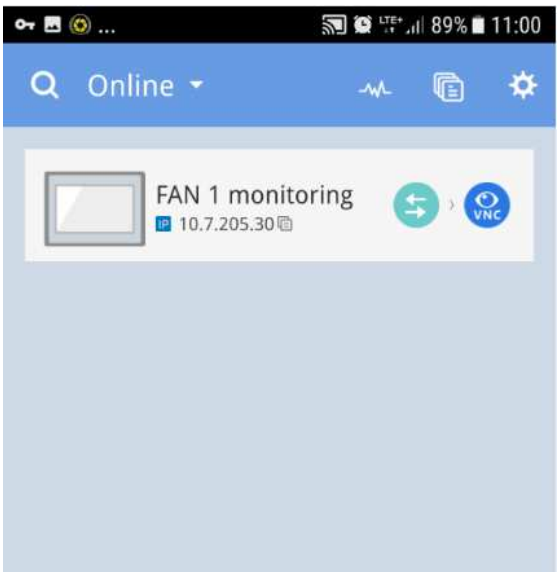

Fig. 27 (EasyAccess)

We click on the icon  to run the VNC Desktop 169 program.

After launching the VNC Desktop 169 (Figure 28), click on  to add a connection.

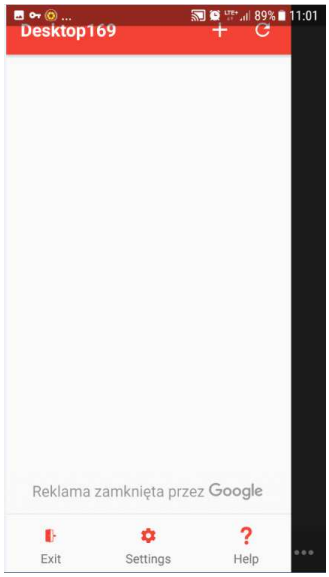

Fig. 28 (VNC Desktop 169)

We complete the data in the first IP address field and click and hold in order to paste the address that we have previously copied to the clipboard, in the 2nd field enter the default password assigned by the system provider (password "1111111").

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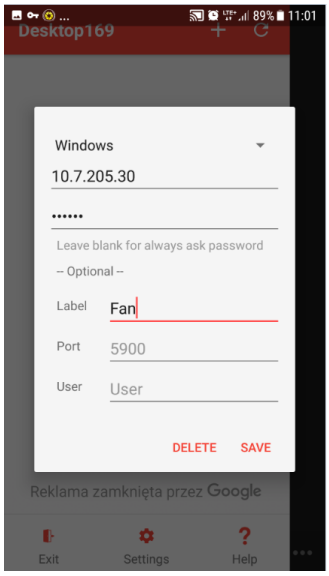

Fig. 29 (VNC Desktop 169 configuration)

Enter in the "label" field the label that will be displayed on the main screen of the VNC Desktop 169. Save the settings by clicking the key SAVE.

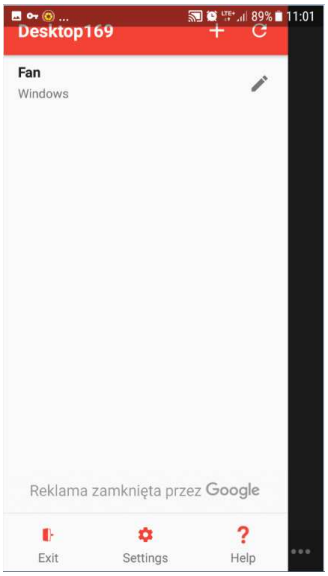

Fig. 30 (VNC Desktop 169 home screen)

Addition new account is shown in Fig. 30. We can now connect with the system remotely by clicking on the newly created account.

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7. SERVER FTP

The remote monitoring system has the ability to download data from the memory of the flash drive through the FTP server using EasyAccess 2.0, and then using an additional program to convert data to the EXCEL file.

A. Downloading data from the FTP server

In order to download data from an FTP server, we run EasyAccess 2.0

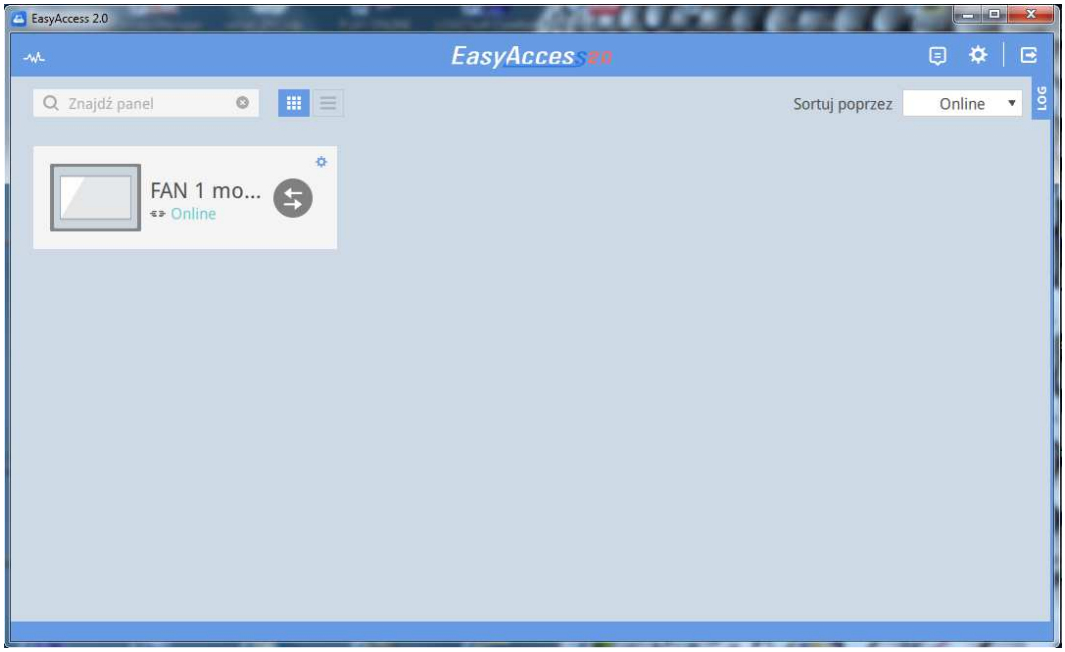

Fig. 31 (EasyAccess 2.0)

We establish a connection by clicking on the icon Fig. 31. After correct connection, copy the assigned IP address by clicking and holding the icon located behind the IP address (Figure 32).

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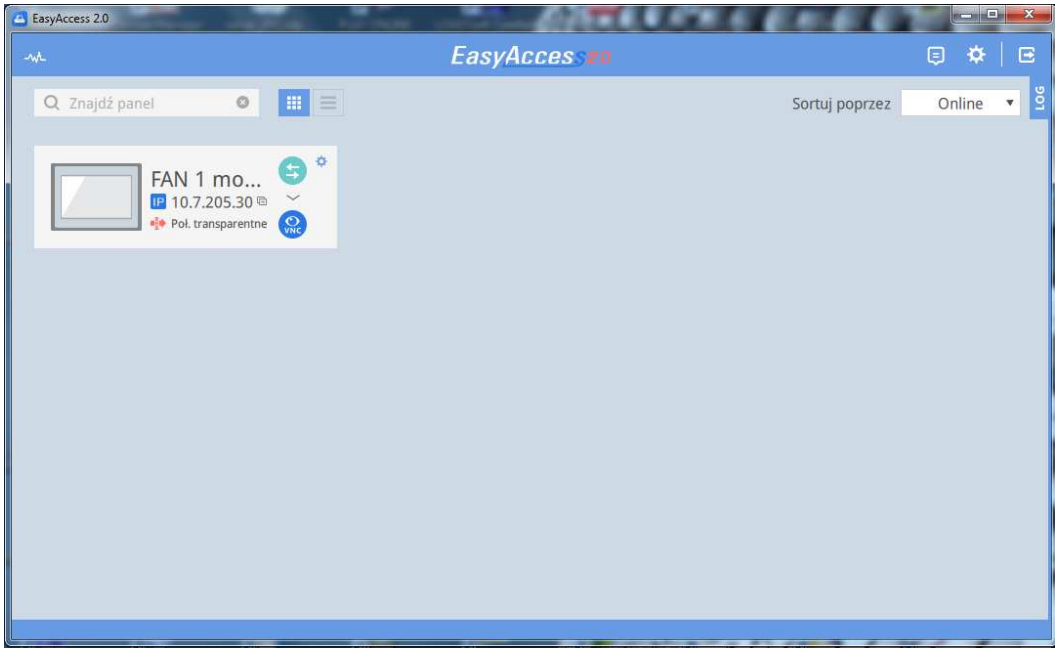

Fig. 32 (EasyAccess 2.0 connection)

Open the web browser and enter ftp: // ... in the address bar. in the place of dots, we paste our previously copied IP address. In the browser you will see a window for entering your username and password (Figure 33).

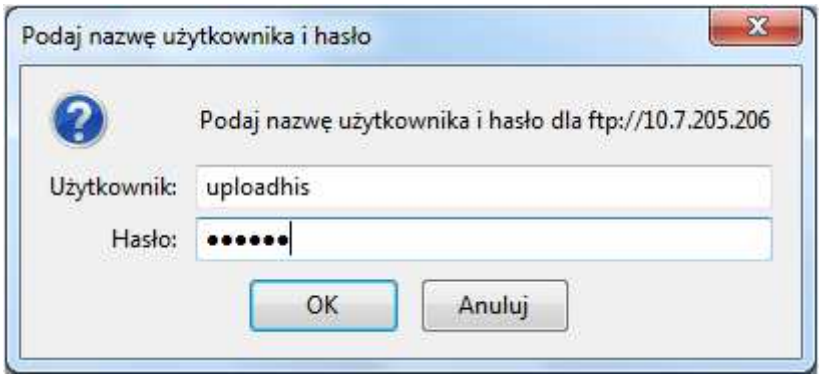

Fig. 33 (Login to the FTP server)

In the "User" field, enter "uploadhis", and in the "password" field, enter the password assigned by the system provider, by default "111111" and confirm.

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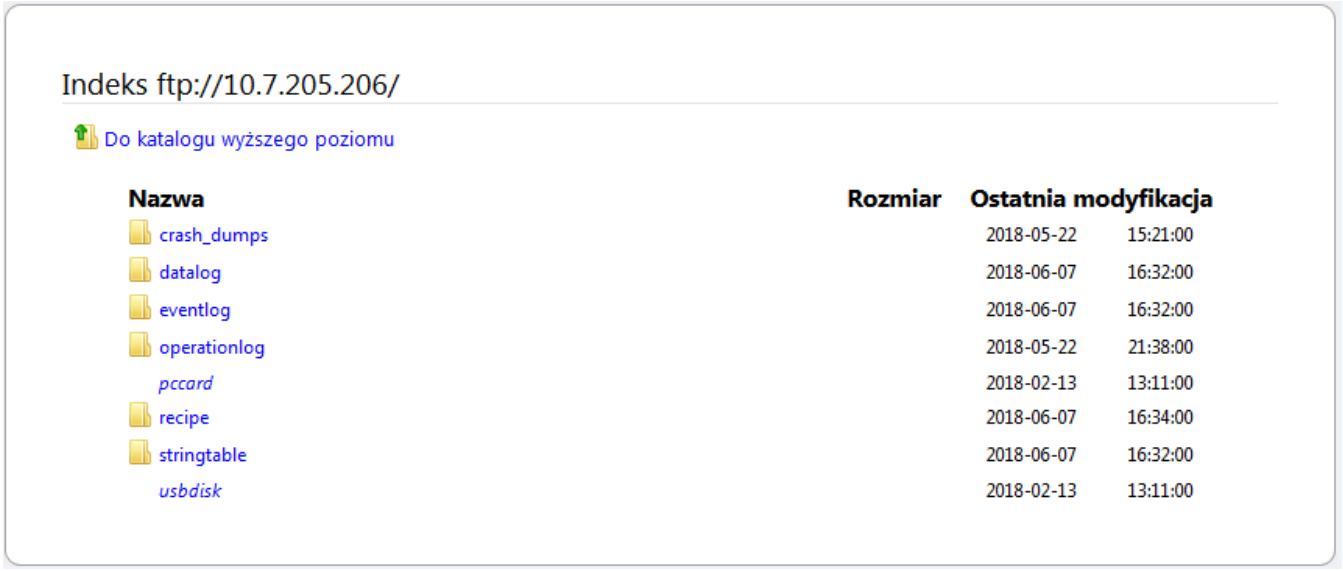

Rys. 34 (Server FTP)

Then go to the data files containing the measurements. Click on the "usbdisk" folder, then "disk_a_1" (fig. 35)

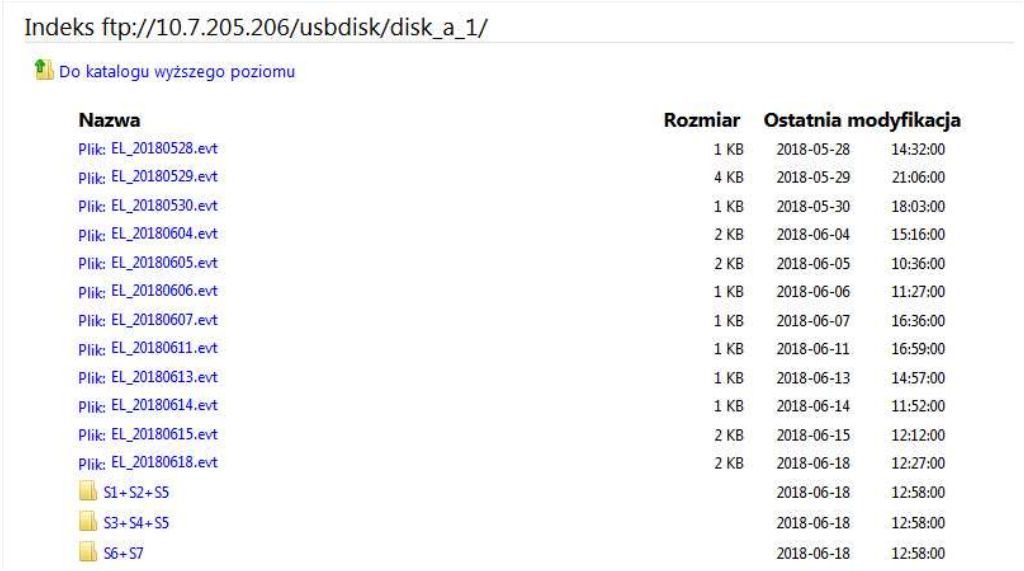

Fig. 35 (FTP server contents of files with measurements)

Files with the .evt extension are files containing crash information and events. Files with the .dtl extension, which can be found in folders such as S1 + S2 + S3, contain measurement data from sensors.

In order to download data, save the selected file to the local disk by clicking the right mouse button and selecting the option "Save target as" (Figure 36).

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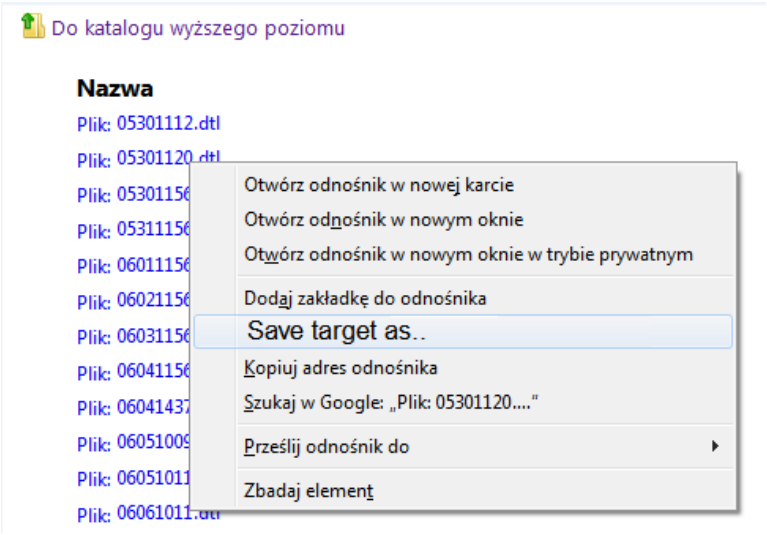

Fig. 36 (FTP server to save the file)

It is possible to download data via an FTP client included in other programs, eg Total Commmander.

B. Converting a file to EXCEL format

In order to convert files with the extension .dtl or .evt, you must install the EasyConvert program on the pendrive included with the system or download it from the website http://www.weintek.com/globalw/Download/Download.aspx .

After installation, we run the EasyConvert program.

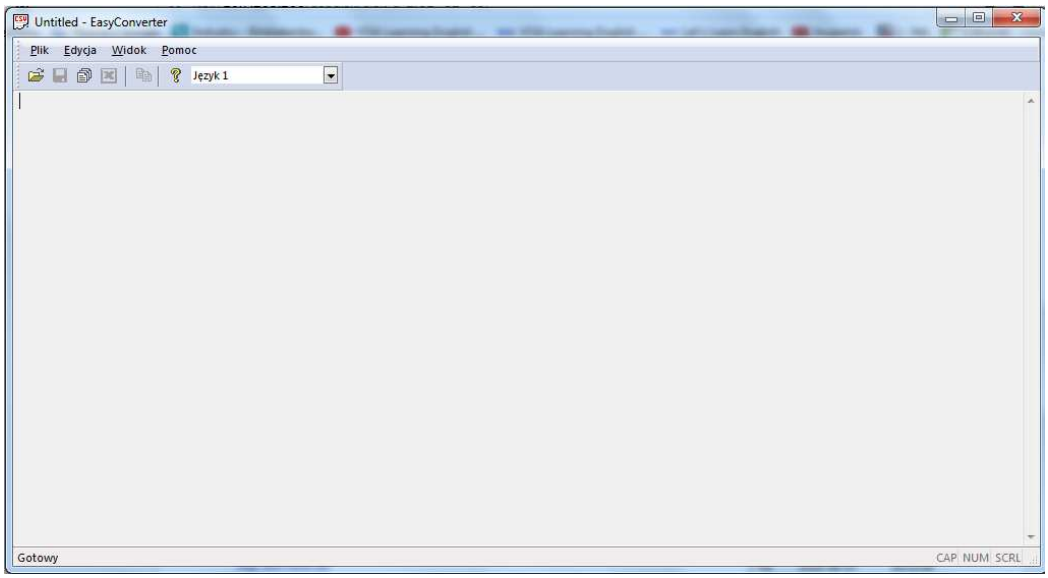

Fig. 37 (EasyConvert)

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We load the file that interests you through a key that has previously been saved to the local disk. We approve by clicking on OK.

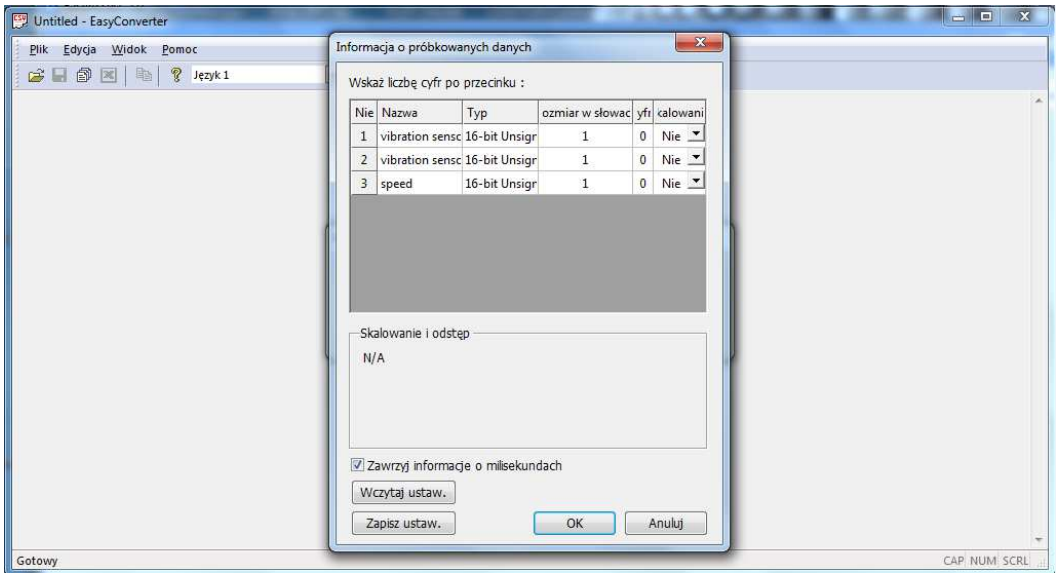

Fig. 38 (EasyConvert opening files)

After loading the files, we can convert them to a format supported by Microsoft EXCEL. To do this, click on the icon . All data does not contain a comma, so it should be divided by 10, in addition to the data containing the speed (the data containing the speed should not be divided by 10).

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