ScanView
Program

User's manual

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CONTENTS

1 PROGRAM VIEW

The ScanView program starts automatically when the EM2210 thickness gauge is connected to a tablet or other device with the program installed. The user can start the program manually too. At the first start a window shown in Fig. 1 opens. At the next starts the program opens the window on which it was closed.

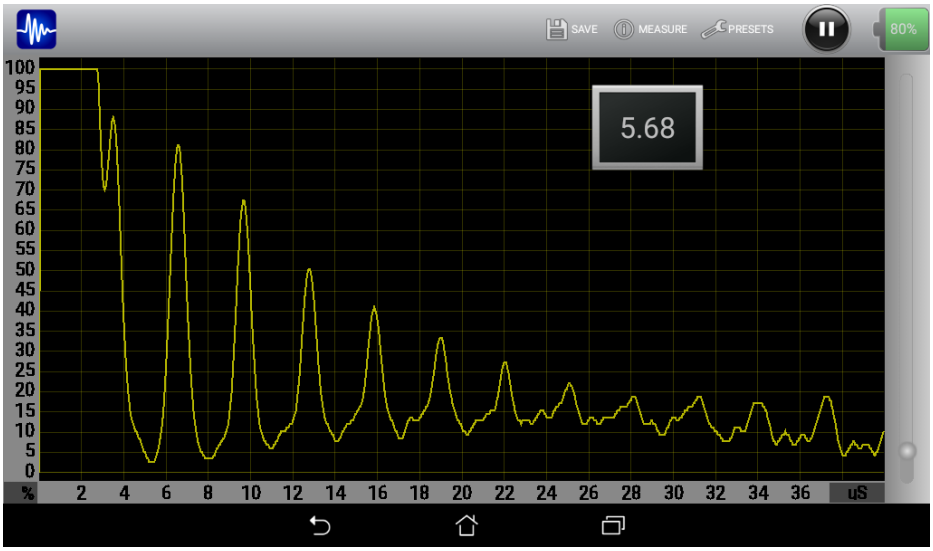

Fig. 1. The ScanView Program

There are the following controls on the top toolbar:

- «SAVE», «MEASURE» and «PRESETS» buttons;
-  button that allows the user to stop the thickness measurement temporarily and to switch the EM2210 thickness gauge to a low-power mode.

Also there is the 

EM2210 battery charge indicator on the top toolbar.
At the top of the program there is a window showing measured thickness.

1.1 Change of Size and Position of Window Showing Measured Thickness

In the ScanView program the user can resize the window showing measured thickness. To resize the window, touch it twice. As a result, the window shown in Fig. 2 opens and the user can choose one of three options for displaying the thickness.

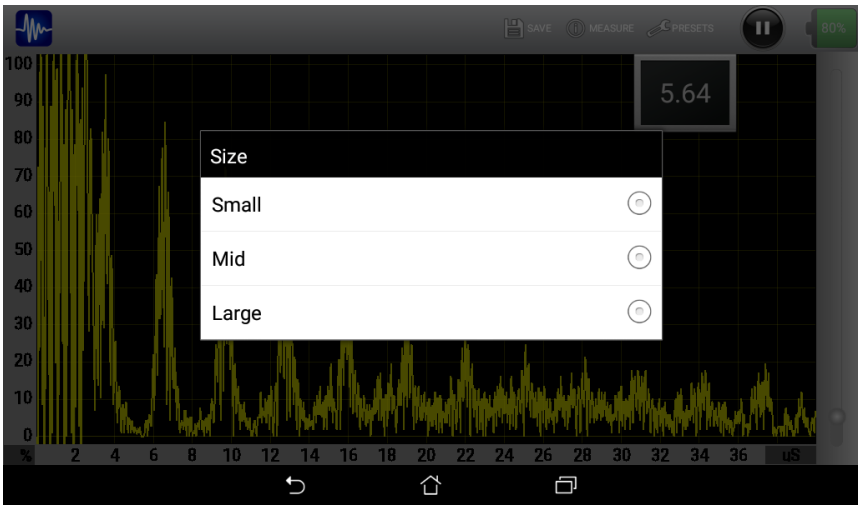

Fig. 2. Selection of size of the window showing measured thickness

By default, the "Small" window size is set. Three options for size of the window showing measured thickness are shown in Fig. 3.

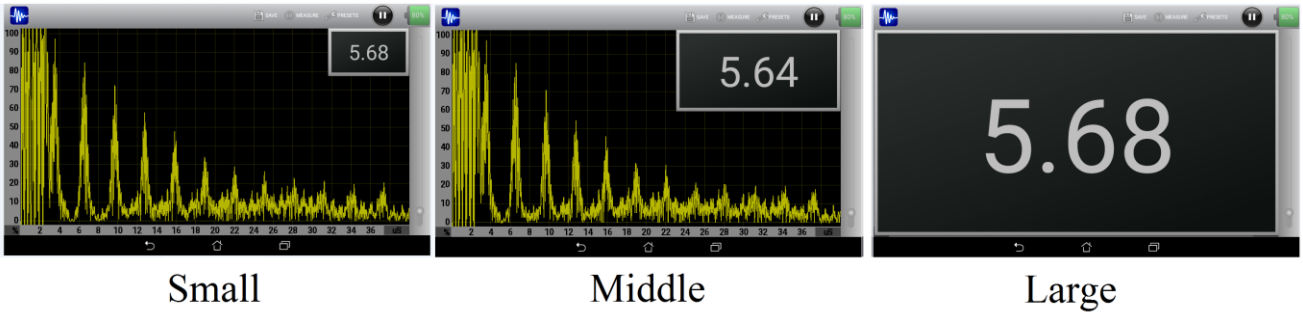

Fig. 3. Options for size of the window showing measured thickness

The position of the window showing measured thickness can be changed. In order to do that, touch the window and move it to any place on the screen holding the touch.

1.2 Changing of Units of Measurement along Axes of Time and Amplitude

In the ScanView program the user can change the units of measurement along the time and amplitude axes. To change the units, touch the desired axis with the finger. As a result, the window shown in Fig. 4 opens and the user can select the unit of measurement in it.

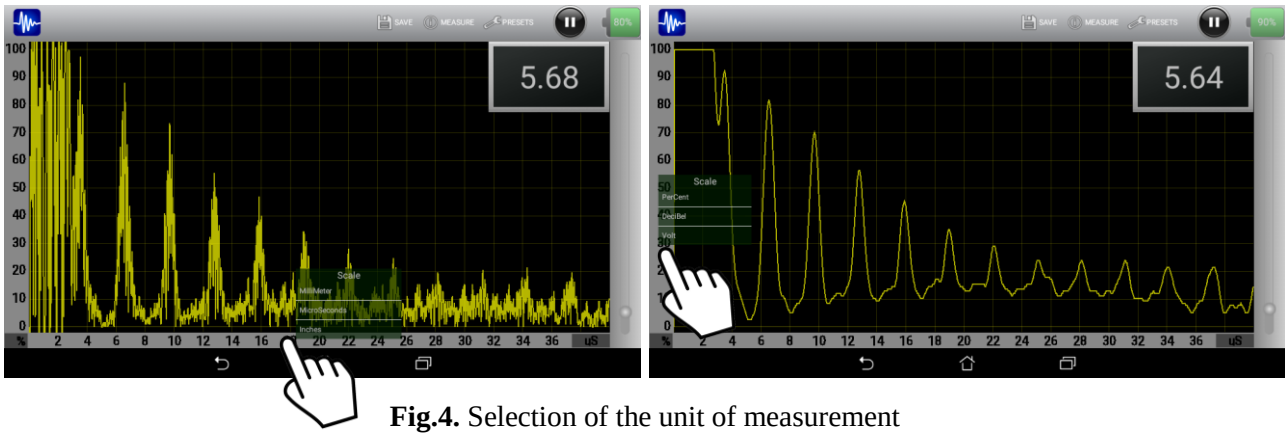

Fig.4. Selection of the unit of measurement

The user can set the following units of measurement:

- For the horizontal axis - time in microseconds, distance in millimetres or inches;
- For the vertical axis - relative units in percent or decibels, absolute units in volts.

1.3 Setting of Parameters of Signal Generation, Processing and Display

In the ScanView program the user can change following parameters of signal generation, processing and display:

- AGC switching off;
- Thickness measurement mode;
- Number of accumulations (coherent integrations);
- Waveform (A-scan) view;
- Number of pulses in the burst of the probing signal;
- Frequency of the probing signal.

To change the parameters, use a settings menu. To open the menu, touch the area with the gain indicator and move this area to the left holding the touch. Thus, the settings menu shown in Fig. 5 pushes.

To hide the menu, move the gain indicator to the right in the same way.

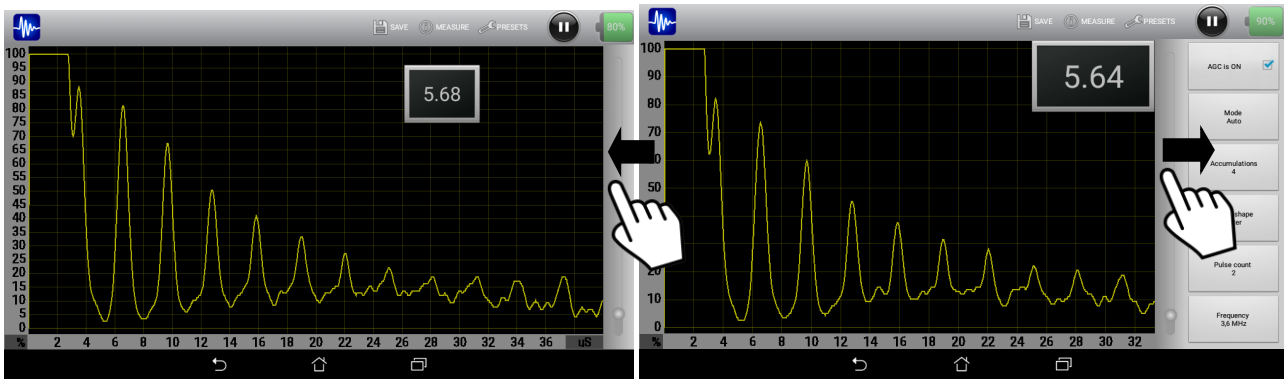

Fig. 5. How to open and hide the settings menu for the parameters of signal generation, processing and display

1.3.1 AGC Switching on/off

To switch off the automatic gain control (AGC), uncheck the "AGC is ON" box in the settings menu. After AGC disabling, the slider in the gain indicator area becomes active and highlights in blue. To change the gain, move the slider up and down (see Fig. 6).

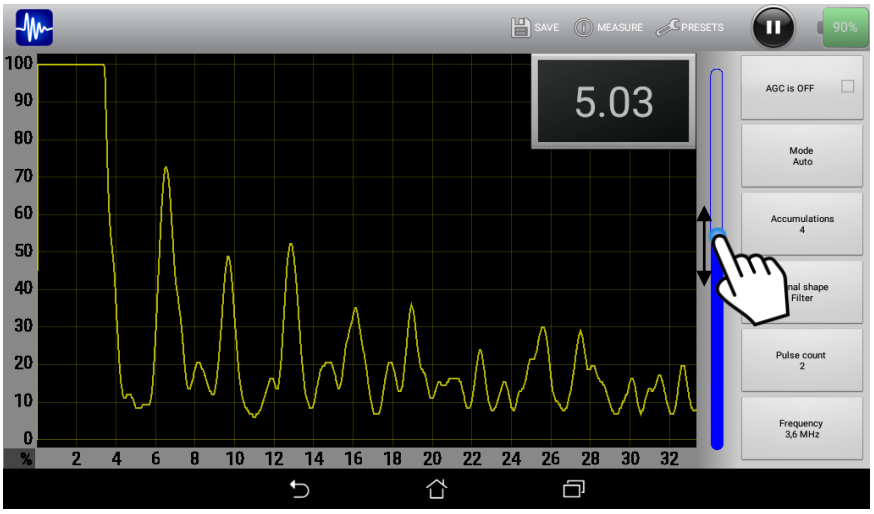

Fig. 6. Manual gain control

1.3.2 Selection of Thickness Measurement Mode and Number of Strobes

By default, the ScanView program measures thickness automatically. In this case, the thickness is calculated according to the algorithm designed by "Oktanta" company and the algorithm eliminates influence of the human factor. In addition to the automatic mode, in the ScanView program the user can enable the following manual thickness measurement modes:

- Thickness measurement mode using one strobe;
- Thickness measurement mode using two strobes.

Thickness measurement mode using one strobe

In this mode the user can locate one strobe. Then the program searches the maximum of the signal envelope for this strobe and calculates the thickness using the found maximum and the specified acoustic speed (the acoustic speed can be changed, see paragraph 2.3.3).

To select the one strobe thickness measurement mode, touch the "Mode" button in the settings menu. Then in the opened window shown in Fig. 7 touch the "1 Strobe" button.

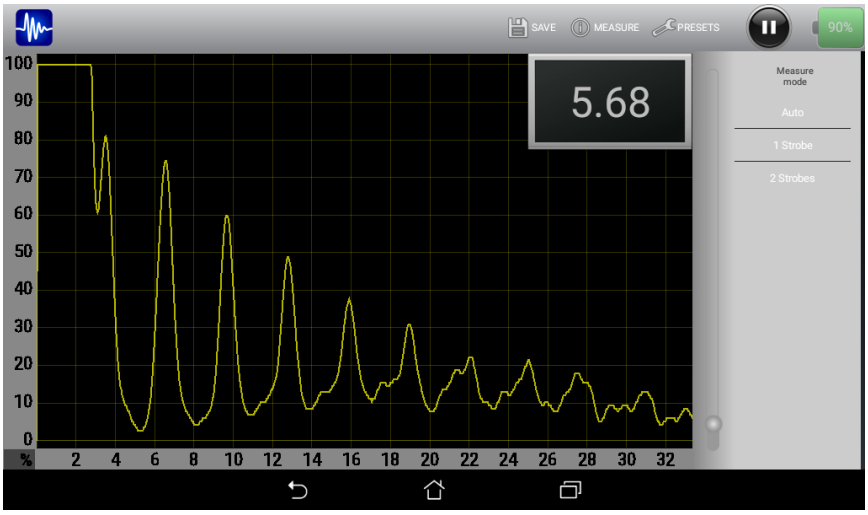

Fig. 7. Thickness measurement mode selection

After selection of this mode, one strobe appears on the screen. The user can move the strobe along the A-scan and change its length. The example of the window with the strobe is shown in Fig. 8.

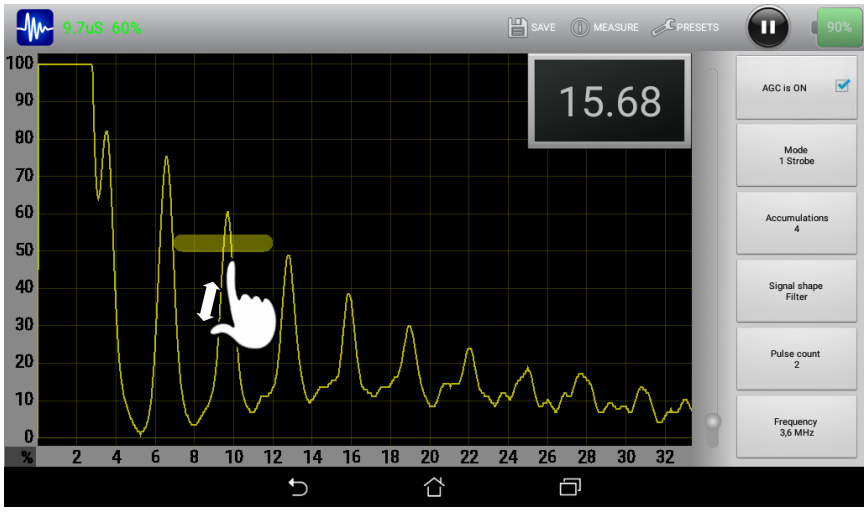

Fig. 8. Operations with the strobe

To move the strobe, touch the centre of the strobe and move the strobe to the desired position holding the touch. To change the length of the strobe, touch the centre of the strobe by one finger and move the other finger horizontally across the screen (see Fig. 8).

The position of the maximum found in the strobe is displayed in the upper left corner of the screen (see Fig. 9).

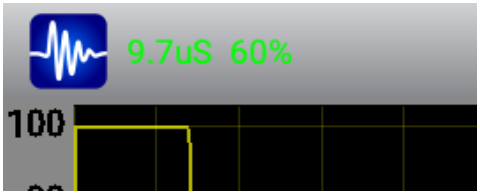

Fig. 9. Display of found strobe maximum position

Thickness measurement mode using two strobes

In this mode the user can locate two strobes on A-scan. The program calculates the thickness using the time difference between the positions of the maximums in the first and second strobes and the specified acoustic speed.

The positions of the maximums found in each of the strobes are displayed in the upper left corner of the screen.

When moving the strobes, the time coordinates of start and end of the strobes are displayed on the screen.

The strobe settings are made in the same way as described in the previous paragraph.

1.3.3 Accumulations Number Selection

By default, the EM2210 thickness gauge uses 32 accumulations (coherent integrations) of the useful signal and calculates thickness using the average values. When the EM2210 measures thickness of a test object with poor surface quality and across a wide gap, it is recommended to increase the number of accumulations and, thereby, to increase the reliability and accuracy of the measurements.

The user can change the number of accumulations from 1 to 1024. To change the number of accumulations, touch the "Accumulations" button in the settings menu. As a result, the window shown in Fig. 10 opens and the user can select the required number of accumulations.

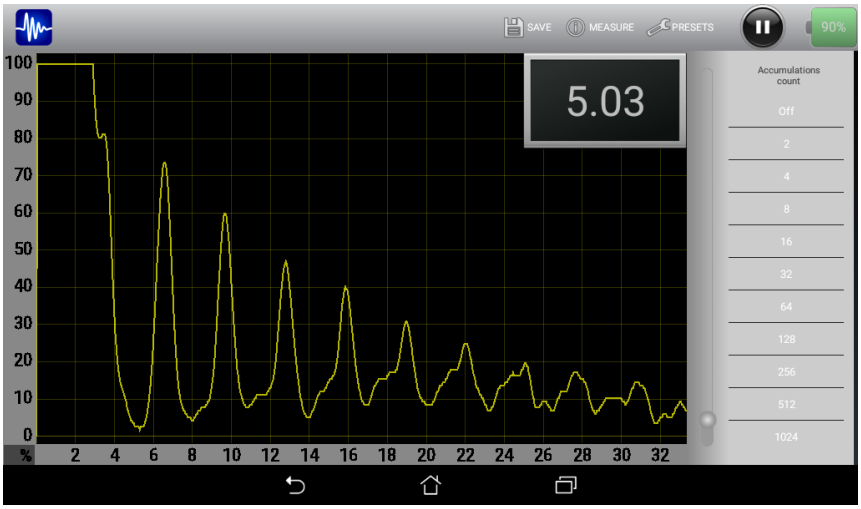

Fig. 10. Accumulations Number Selection

Remember that as the number of accumulations increases the measurement time increases too.

1.3.4 Waveform (A-scan) View Selection

The ScanView program can display the EM2210 time base in three ways: the original signal, the detected signal and the signal after the matched filter. To select the waveform (A-scan) view, touch the "Signal shape" button in the settings menu. All three view options are shown in Fig. 11.

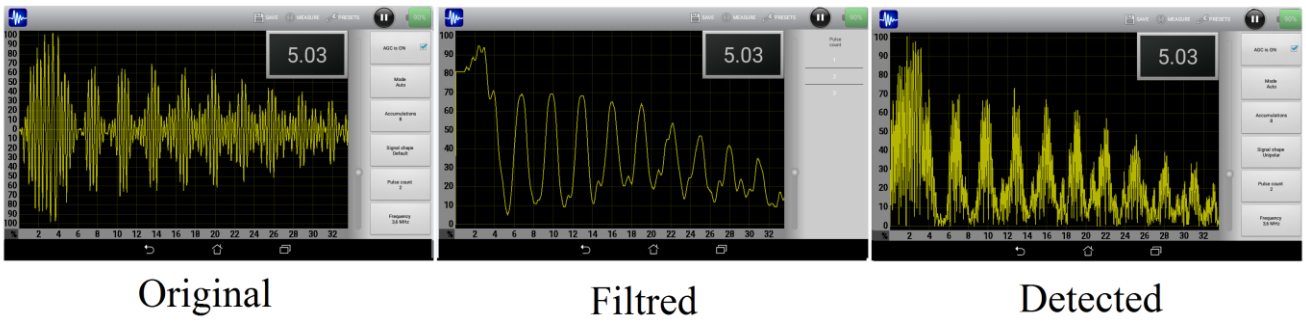

Fig. 11. Waveform (A-scan) View Options

1.3.5 Selection of Number of Pulses in Burst

The user can change the number of pulses in the burst of the probing signal. By default, two pulses in the burst are set in the ScanView program. To measure thickness greater than 40 mm of the test object with poor surface quality, the number of pulses in the burst must be increased to three. To measure thickness less than 2 mm, the number of pulses in the burst must be reduced to one.

To change the number of pulses in the burst, touch the "Pulse count" button in the settings menu. Then in the opened window shown in Fig. 12 select the required number of pulses.

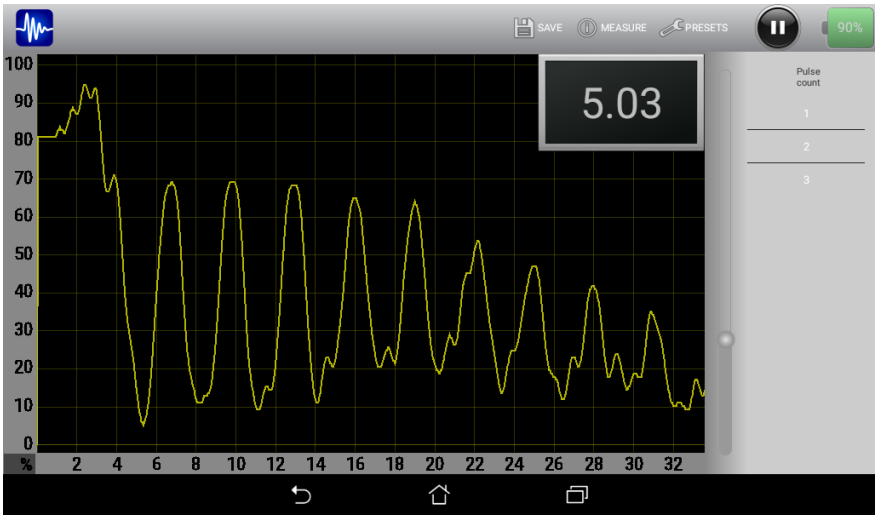

Fig. 12. Selection of the number of pulses in the burst of the probing signal

1.4 Results Saving

The user can save the data from the window showing A-scan and thickness as a picture or as a text file at any time. To save data, touch the "Save" button with the finger (see Fig. 13).

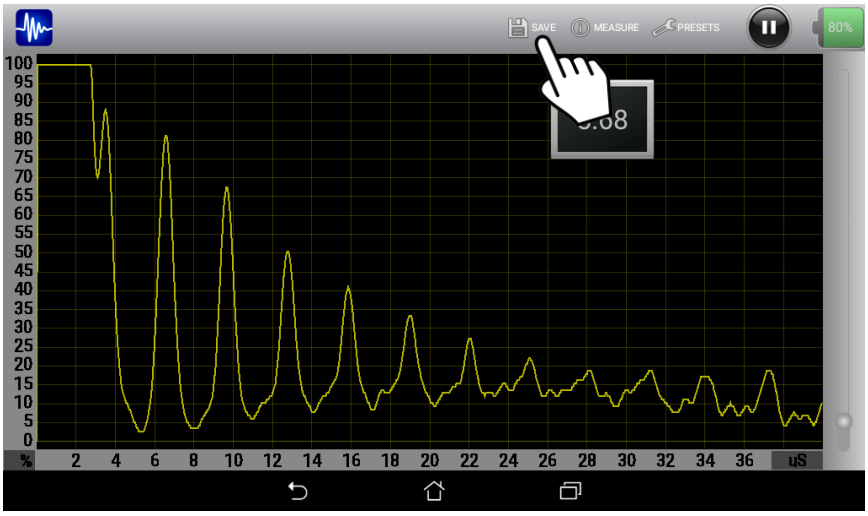

Fig. 13. Results saving. Step 1

As a result, the window shown in Fig. 14 opens and the user can enter the name of the file and select the file format: text file *.crv, picture *.png or both. To select the file format, check the corresponding box.

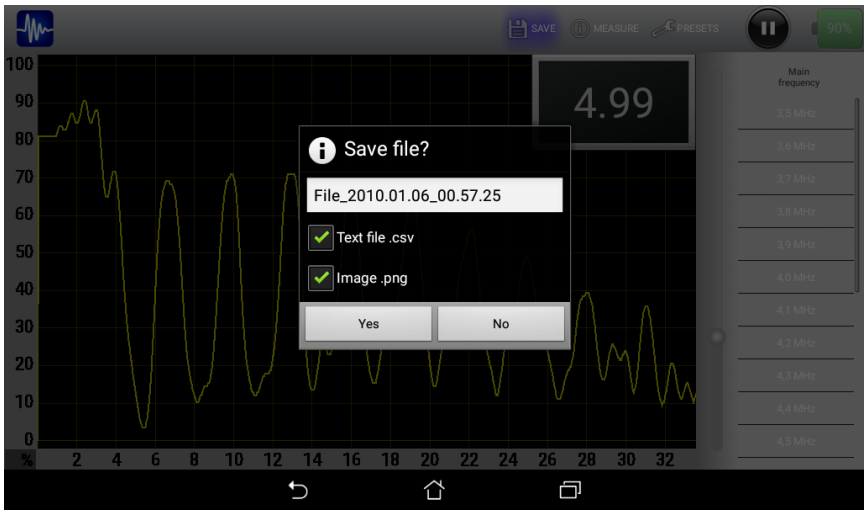

Fig. 14. Results saving. Step 2

The files are stored in "MyFiles" directory in a subfolder with the operator name. The operator name and working directory can be changed in the program settings (see paragraph 3).

1.5 A-scan Scaling and Movement

In the ScanView program the user can easily scale the charts. To enlarge an area on the screen, touch the screen with two fingers and stretch the image (see Fig. 15).

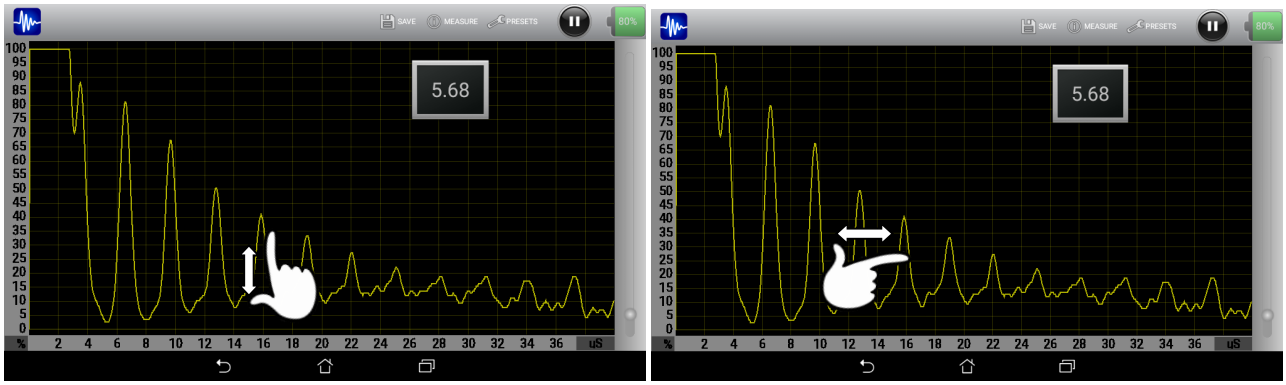

Fig. 15. Chart scaling

To return to normal view, touch the screen twice at any point.

2 «THICKNESS MEASURE» MENU

After a touch of the "Measure" button with the finger, the window shown in Fig. 16 opens.

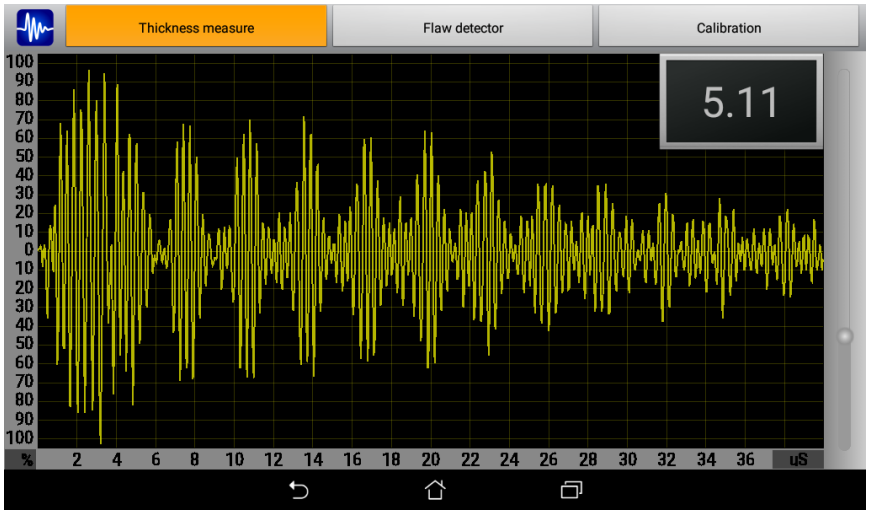

Fig. 16. Selection of thickness measurement, flaw detector or calibration modes

The window allows the user to choose one of three measurement modes:

- Thickness measurement mode (default setting);
- Calibration mode;
- Flaw detector mode.

2.1 Thickness Measurement Mode

The thickness measurement mode is set by default and allows to measure the thickness of the test object.

2.2 Flaw Detector Mode

With the ScanView program the EM2210 thickness gauge can operate as a flaw detector and can search the pitting corrosion.

The ScanView program operating in the flaw detector mode is shown in Fig. 17.

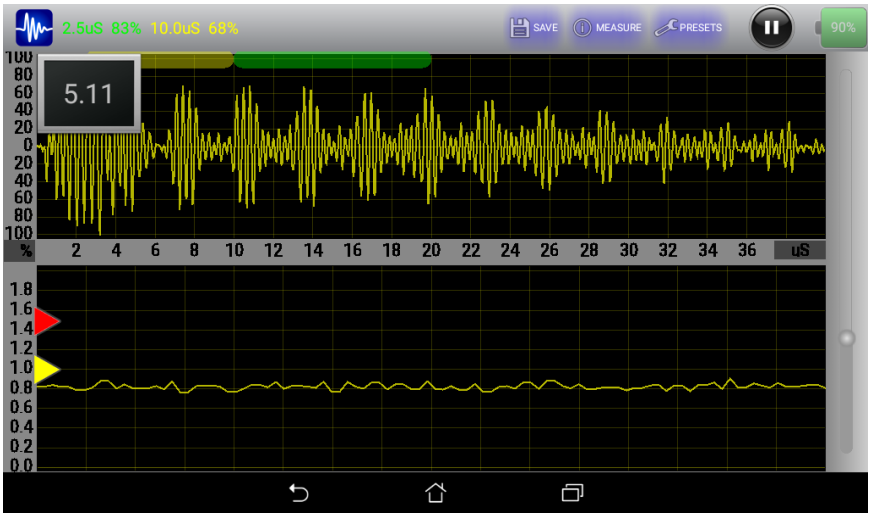

Fig. 17. The flaw detector mode

In the flaw detector mode there are two windows located one under another:

- Top window displays A-scan and two strobes;
- Lower window displays a "P" parameter.

Search of the presence of the pitting corrosion is carried out for a test object of a fixed thickness. The first strobe must be located so that it overlaps the first back-wall echo. The second strobe must be located between the first and second back-wall echoes so that it does not overlap them.

The "P" parameter is the ratio of the amplitude of the second strobe maximum to the amplitude of the first strobe maximum. In the absence of defects, this ratio is close to 0 since there are no echo signals between the back-wall echoes. In the presence of a defect corresponding to the pitting corrosion, the amplitude of the back-wall echo decreases and weak signals appear between the back-wall echoes due to reflection from the defect. In this case, the value of the "P" parameter increases.

There are two thresholds that can be set by the user (red and yellow triangles) in the lower window. Exceeding the threshold due to the presence of a defect is accompanied by an audio warning. Sound for the thresholds can be set in the program settings.

2.3 Calibration Mode

The ScanView program operating in the calibration mode is shown in Fig. 18.

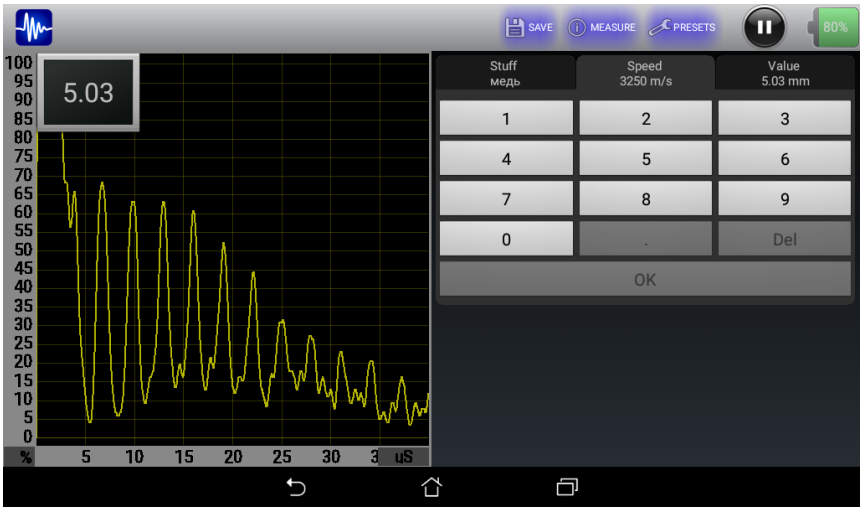

Fig. 18. The calibration mode

The ScanView program has three calibration modes:

- Selection of the test object material from the list;
- Calibration using the specified thickness of the test object;
- Calibration using the specified acoustic speed.

2.3.1 Selection of Material from List

To select the test object material from the list, touch the "Stuff" label with the finger (see Fig. 18). As a result, the window shown in Fig. 19 opens and the user can select the material from the list.

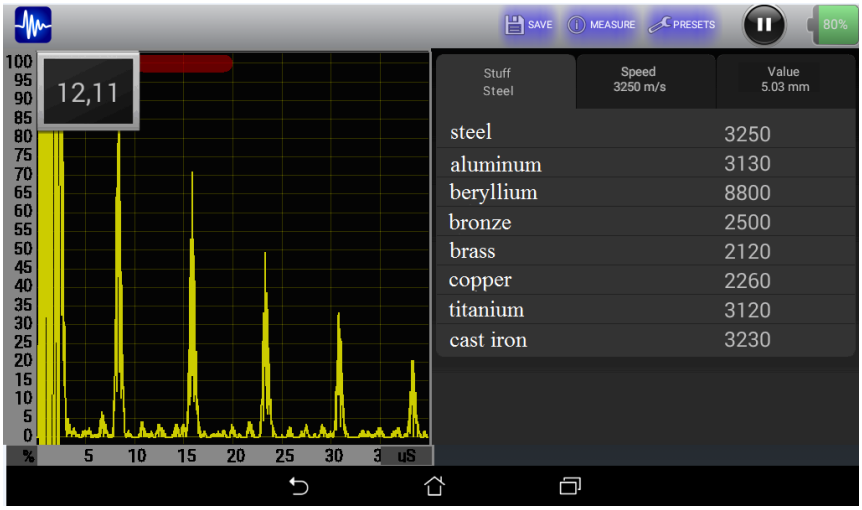

Fig. 19. Selection of the test object material

The EM2210 measures thickness using **shear wave**. The typical value of the propagation speed of a shear wave in steel is **3250 m/s**.

The program allows the user to add materials to the list.

2.3.2 Calibration using Specified Thickness

To calibrate the acoustic speed using the specified thickness of the test object, place the EM2210 thickness gauge on a test sample with the specified thickness. Then touch the "Value" label in the window shown in Fig. 18. As a result, the window shown in Fig. 20 opens.

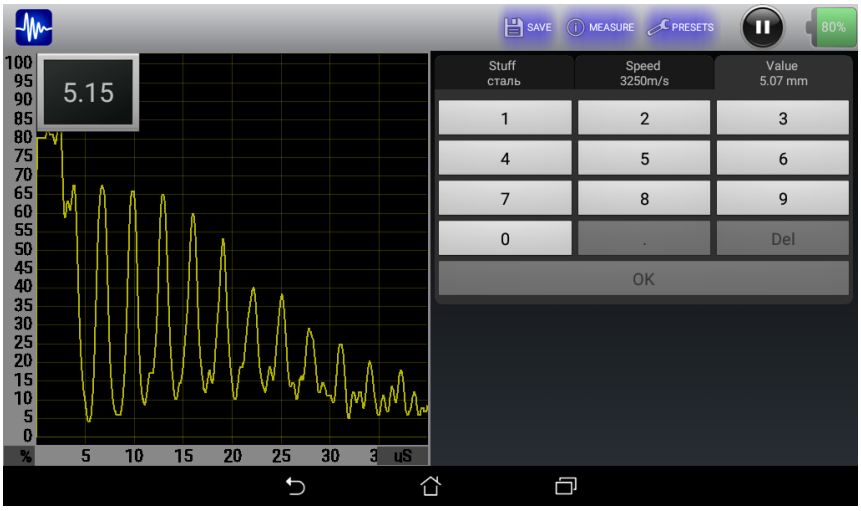

Fig. 20. Calibration using the specified thickness

Enter the specified thickness of the test object in the window using the virtual numeric keypad and touch the "OK" button. In this case, the program calculates the acoustic speed of the material and saves it to the EM2210 memory.

CAUTION!

To increase the accuracy of calibration, increase the number of accumulations (see paragraph 1.3.3).

2.3.3 Calibration using Specified Acoustic Speed

To calibrate the EM2210 using the specified acoustic speed, touch the "Speed" label in the window shown in Fig. 18. As a result, the window shown in Fig. 21 opens.

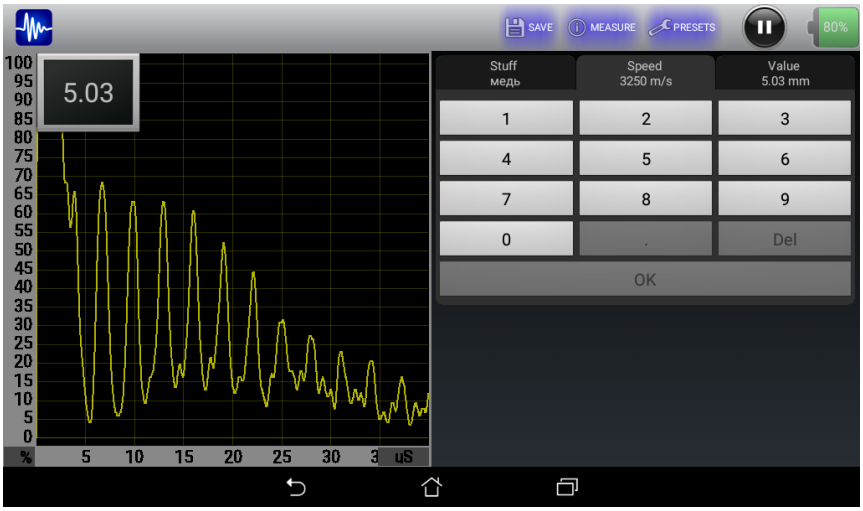

Fig. 21. Calibration using the specified acoustic speed

Enter the specified acoustic speed for the material of the test object in the window using the virtual numeric keypad and touch the "OK" button. In this case, the program saves acoustic speed value to the EM2210 memory.

CAUTION!

The EM2210 measures thickness using shear wave. The typical value of the propagation speed of a shear wave in steel is 3250 m/s.

3 «PRESETS» MENU

To open the main program settings menu, touch the "Settings" button with the finger (see Fig. 22). As a result, the window shown in Fig. 23 opens.

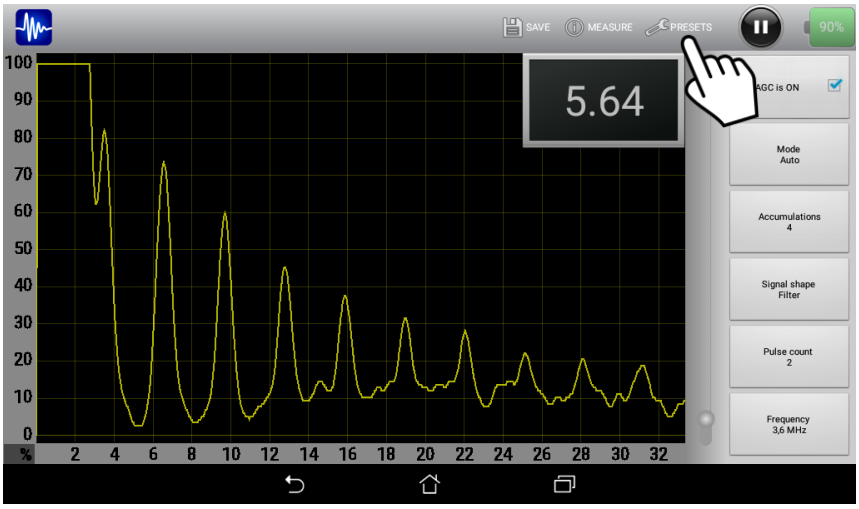

Fig. 22. How to open the main program settings

The window allows the user to set the following program settings:

- Operator name (account name);
- Name of the working directory where the monitoring results are saved;
- Colour for A-scan and strobes displaying;
- Alarm sound of exceeding the thresholds for the flaw detector mode.

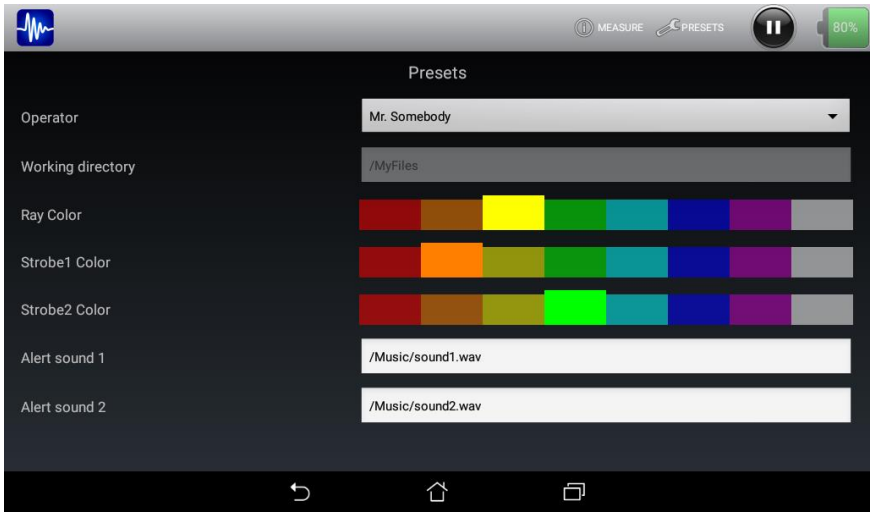

Fig. 23 Program settings

To switch from the setting mode to the measurement mode touch the "Measure" button.