APPLICATION SOFTWARE FOR

A1207

PenGauge

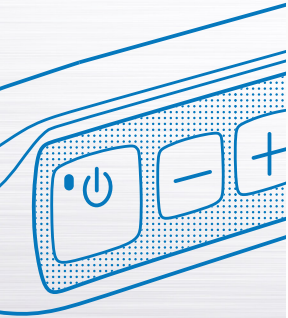
USER MANUAL

Acoustic Control Systems – Solutions GmbH
Saarbrücken 2020

ACS

CONTENTS

1. INTRODUCTION 4
2. INSTALLATION FROM GOOGLE PLAY 4
3. FIRST LAUNCH 7
4. PAIRING DEVICES 9
5. CONNECTION TO DEVICE 11
6. MEASUREMENT 13
    6.1. DIGIT 13
    6.2. A-SCAN 17
    6.3. B-SCAN 20
7. SETTINGS 24
8. SERVICE ADDRESS 28

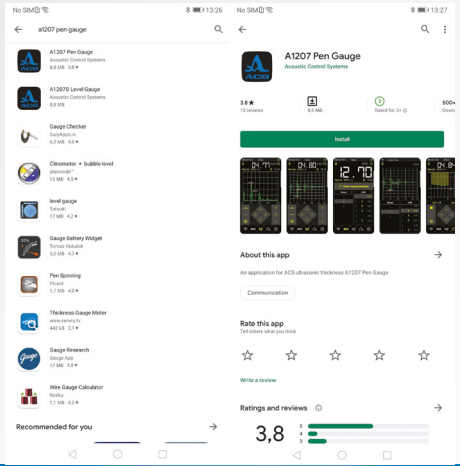


INTRODUCTION

The application software for A1207 PenGauge operates on Android smartphones and tablet PCs connected via Bluetooth with the same-named thickness gauge instrument by ACS. The main purpose of the software is to extend the regular functionality of the A1207 PenGauge to include additional data processing and reporting features for better usability.

INSTALLATION FROM GOOGLE PLAY

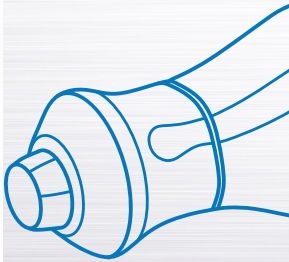
Open the Google Play application on your Android phone.

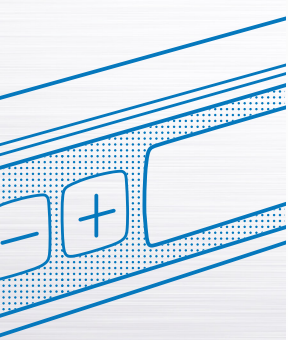


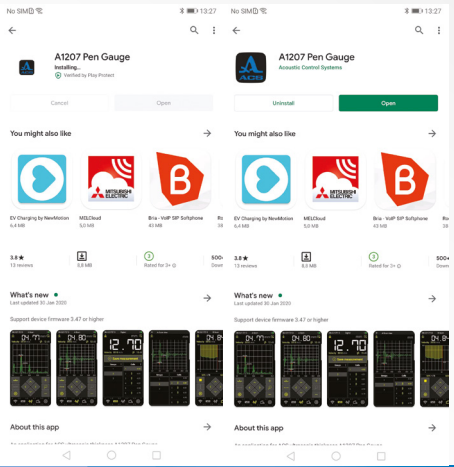
Type “a1207 pen gauge” into the search field and you will find the “A1207 Pen Gauge” application (Fig. 1.1).

Fig. 1.1

ACOUSTIC CONTROL SYSTEMS







Click on the “Install” button. All installation procedures will be performed automatically (Fig. 1.2).

Fig. 1.2

FIRST LAUNCH

The application does not work without activating Bluetooth on Android your device. When the application is launched for the first time, you will be asked to enable Bluetooth (if it was not already enabled in the Android settings directly) (Fig. 2.1). Click on the "Allow" button.

The use of the app requires permission to access storage and the device location.

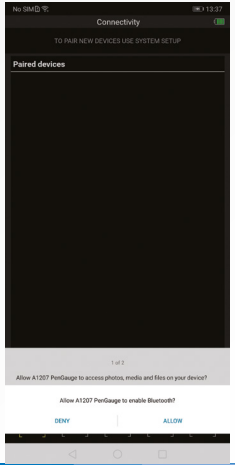
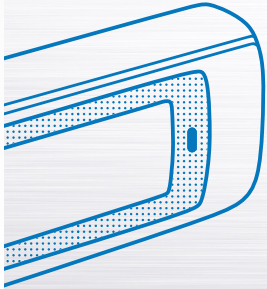


Fig. 2.1

ACOUSTIC CONTROL SYSTEMS



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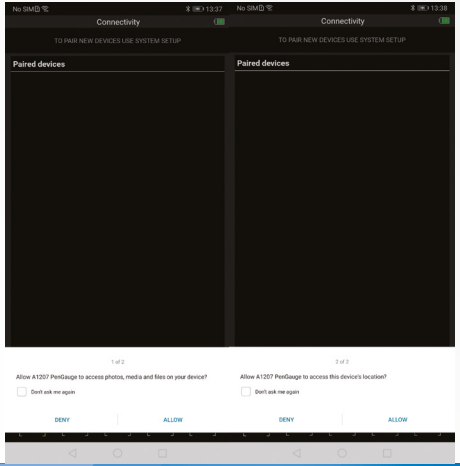


Fig. 2.2

The access to storage permission is only required for saving and reloading data files, images and setting files on your Android internal storage. The location permission is required only for using Bluetooth to discover nearby devices (Fig. 2.2).

PAIRING DEVICES

The application does not work without activating Bluetooth on Android your device. When the application is launched for the first time, you will be asked to enable Bluetooth (if it was not already enabled in the Android settings directly) (Fig. 2.1). Click on the "Allow" button.

The use of the app requires permission to access storage and the device location.

1. Turn on the A1207 device.

2. Navigate to your Bluetooth settings and start the search. The A1207 device will appear in the Available devices section. (Annotation: The device number given on the label on the back of the device will also be part of the Available Devices name) (Fig. 3.1).

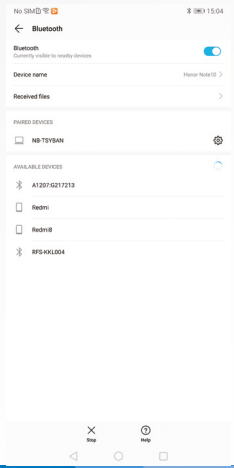
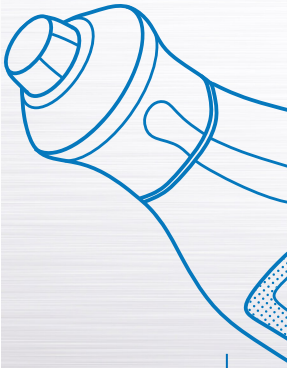
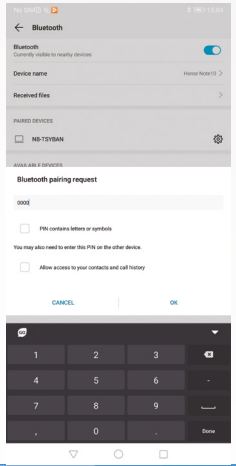


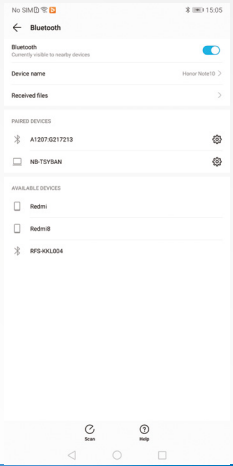
Fig.3.1

ACOUSTIC CONTROL SYSTEMS



User Manual





3. Click on the A1207 device. A pop-up window will be shown. Enter the pin "0000" and click "OK" (Fig 3.2).

4. The device will be paired and shown in the Paired devices section (Fig. 3.3).

Fig. 3.2 - Fig. 3.3

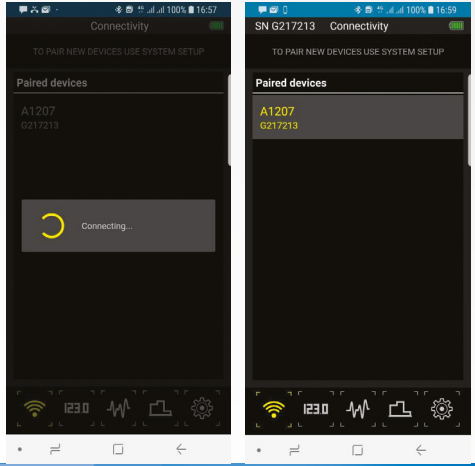
CONNECTION TO A BLUETOOTH DEVICE

Open the application. It starts with the Connectivity tab. Under the Paired devices section, you will see a list of all A1207 paired devices (Fig. 4.1).

Fig. 4.1

ACOUSTIC CONTROL SYSTEMS

User Manual



Click on the desired device name to connect (Fig. 4.2).

If the device is switched on, the connection will succeed. As long as the Bluetooth connection is active, you will see the serial number of the connected device and the battery level at the top of the application (Fig. 4.3).

Now you can start the measurement.

If the Bluetooth connection is lost, the application will switch to the Connectivity tab again.

Fig. 4.2 - Fig. 4.3

THICKNESS MEASUREMENT

There are three modes of the thickness measurement provided by the A1207 PenGauge in combination with the application software:

1. Digit: The measurement proceeds only in auto mode; you will see the results in digital form.

2. A-Scan: Besides the digital results, you can see the signal plot, which can be scaled to view more details.

3. B-Scan: Continuous measurement to create a thickness profile of the object under test.

1. DIGIT mode

A standard view of the Digit tab is shown in Fig. 5.1.1.

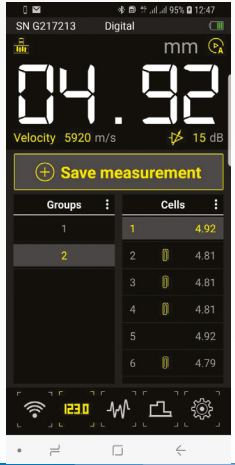
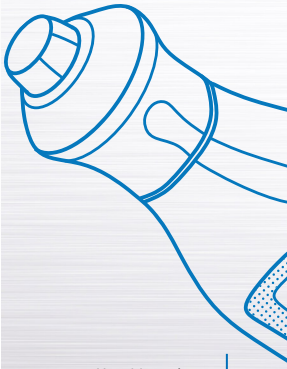


Fig. 5.1.1

ACOUSTIC CONTROL SYSTEMS



The top part of the view contains the digital result of the thickness measurement in corresponding units (mm or inch). Clicking and holding on the unit symbol switches between metric and the imperial system of measurement. This panel also contains some informational pictograms:

1. An automatically chosen data-processing algorithm used for thickness value computation (ACF – Auto Correlation Function, One peak, Two peaks, or No measurement).
2. - Automatic mode.
3. Applied sound velocity value.
4. - Applied gain value.

Under this panel, there is the “Save measurement” button. All saved results are organized in groups and cells. In the lower part of the view, the table containing all results is shown. Both groups and cells have a three-dot menu, which will give you further configuration options (Fig. 5.1.2).

For managing the measurement groups, you have the following options:

1. **Add** – Add a new empty group.

2. **Delete** – Delete the currently selected group.

3. **Delete all** – Delete all groups.

For the value cells, you have the following options:

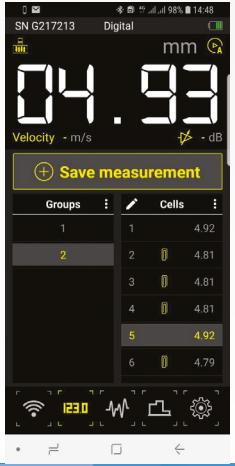
1. **Edit** – The next result to save will replace the currently selected group.

2. **Show A-Scans** – Allows you to see saved A-Scan pictures.

3. **Delete** – Delete currently selected cell.

4.**Delete all** – Delete all cells in the current group.

Fig. 5.1.2



When the saved data is in editing mode, you can see a pencil icon on top of the cells (Fig. 5.1.3).

Clicking on the **Show A-Scans** option opens a separate page where you can see the signals (if the result was saved from the **A-Scan** tab) and the calculated method for each result. See more details at the end of the following section.

Fig. 5.1.3

ACOUSTIC CONTROL SYSTEMS

2. A-SCAN mode

A standard view of the A-Scan tab is shown in Fig. 5.2.1.

The top part of the view contains the digital result of measurement in corresponding units. Clicking and holding on the unit label switches between metric and the imperial system of measurement. The panel also contains some informational pictograms:

1. – Algorithm used for result computation (ACF, One peak, Two peaks, or No measurement).

2. – Mode of device, clicking and holding on the pictogram switches between manual and automatic modes. In manual mode, you can manually change the signal evaluation parameters.

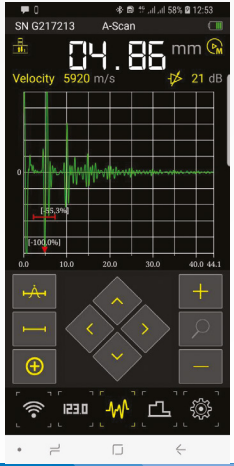
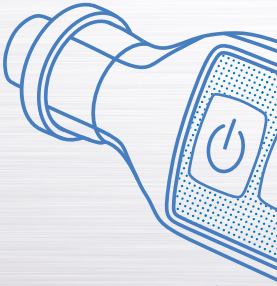


Fig. 5.2.1



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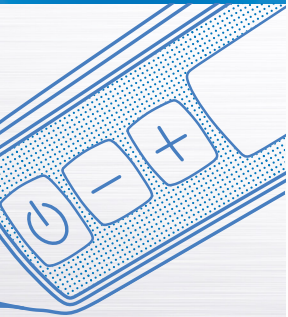


3. Applied sound velocity value.
4. - Applied gain value.

Under this panel, you can see the plot where the ultrasonic pulse-echo signal is shown.

In the lower part of the view, there are several buttons to control the measurement.

1. - Chosen algorithm for calculating the result (ACF, One peak, Two peaks). Available only in manual mode. Clicking on the corresponding button opens the dialog for algorithm selection.

2. - Allows you to save the current measurement result with a plot (A-Scan).

3. - Selects gate as the active control element to interact on A-Scan or apply joystick actions. In case of manual mode and if the ACF algorithm is selected, the click and hold enables you to reset the gate.

4. - Selects signal as the active control element to interact on A-Scan or apply joystick actions. Clicking and holding on this button opens the dialog for selection gain instead of zoom (and vice versa). In this case, the joystick action is applied to the gain.

5. - Joystick actions to zoom/pan the signal, to resize/move the gate or to increase/decrease the gain.

When the results in the **A-Scan** tab are saved, the plot image is saved at the same time. In the cell table, such results are marked with a paperclip symbol. The “Show A-Scans” command allows you to see the signal image connected to the corresponding result (Fig. 5.2.2).

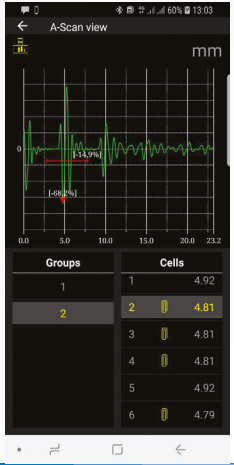


Fig. 5.2.2

ACOUSTIC CONTROL SYSTEMS

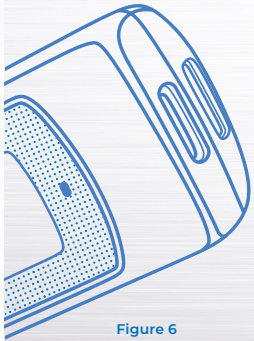
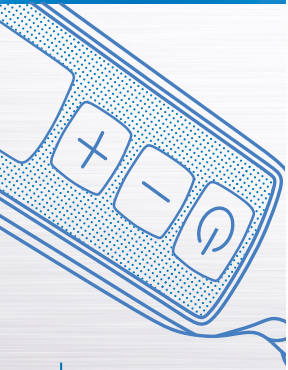


Figure 6



3. B-SCAN

Common view of the B-Scan tab is shown in Fig. 5.3.1.

The top part of the view contains the digital result of measurement currently selected by cursor the position in corresponding units. Clicking and holding on the unit label switches between metric and the imperial system of measurement. The panel also contains some informational pictograms:

1. – Algorithm used for result computation (ACF, One peak, Two peaks, or No Measurement).

2. – Mode of device, changing the mode is allowed only in the A-Scan tab.

3. Applied sound velocity value.

4. – Applied gain value.

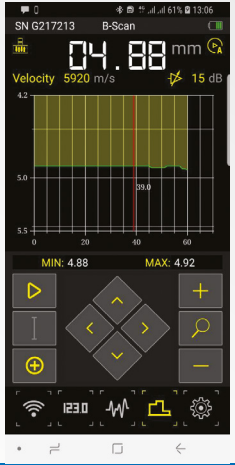


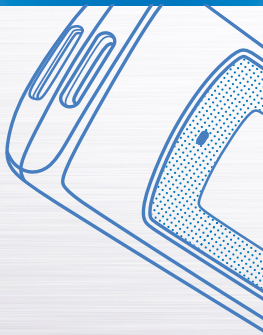
Fig. 5.3.1

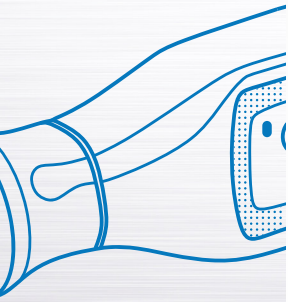
Under this panel, you can see the plot where the set of consistently received signals are combined into a B-Scan image (thickness profile).

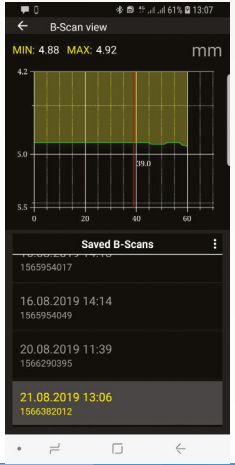
Under the plot, you can see the information about minimal and maximal values in the measurement.

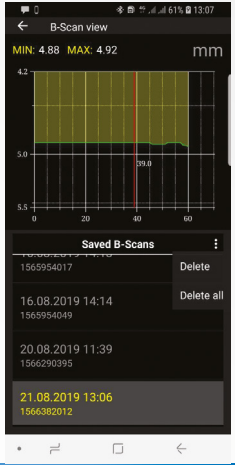
In the lower part of view, there are several buttons to control the measurement.

1. – Starts or stops the measurement process.
2. - Allows you to save the current result with a plot. Clicking and holding on this button shows the dialog, where you can choose two additional options: clear plot or show saved B-Scans.
3. - Selects the cursor as the active object to interact on the plot or apply joystick actions.
4. - Selects B-Scan image as the active object to interact on the plot or apply joystick actions.
5. - Joystick actions to zoom/pan the image or to move the cursor.









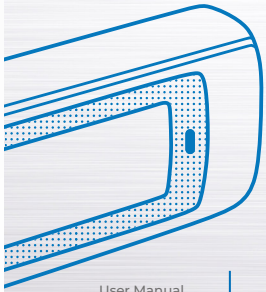
Selecting the option to show saved B-Scans switches to the table containing all saved B-Scans (Fig. 5.3.2).

By clicking on the desired item, you can see the image connected to this item and the minimum/maximum information as well. The table has a three-dot menu (Fig. 5.3.3) with the following options:

Fig. 5.3.2 - Fig. 5.3.3

1. **Delete** – Delete files connected to the currently selected B-Scan item.
2. **Delete all** – Delete all B-Scans.

You can also pause data acquisition from the A1207 PenGauge instrument. This could be done by clicking and holding on the result value in all three measurement tabs: Digit, A-Scan or B-Scan. The pictogram ⏸ will be added to the information panel.



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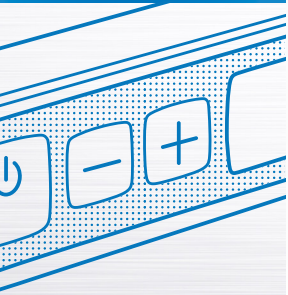


SETTINGS

The list of the available measurement settings in the application is shown in Fig. 6.1

The Main setting category consists of the following items:

1. **Velocity** – Applied ultrasound velocity.

2. **Measure unit** – Used system of measurement: metric or imperial.

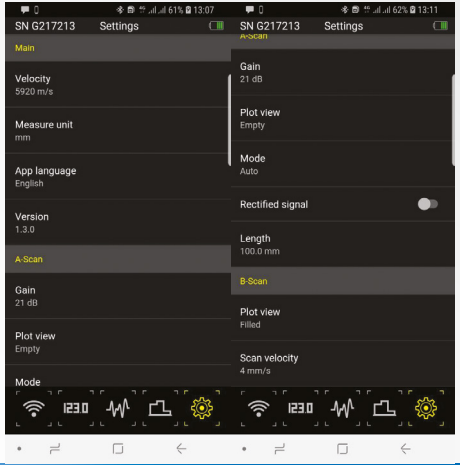


Fig. 6.1

3. **App language** – Used language in the application: English or Russian.

4. **Version** – Version of the used application.

The ultrasound velocity can be changed directly on the A1207 device or in the application. For that purpose, the material editor is used (Fig. 6.2).

The Material editor contains a table with several typically used materials, along with their values for the sound velocity. The material list can be extended or changed with the velocity values for individual materials.

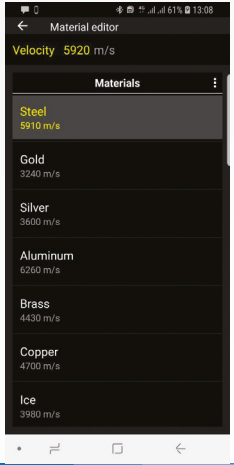
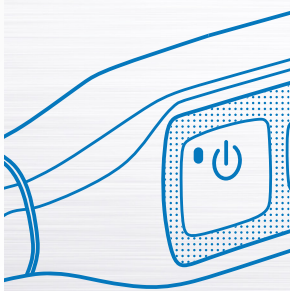


Fig. 6.2

ACOUSTIC CONTROL SYSTEMS



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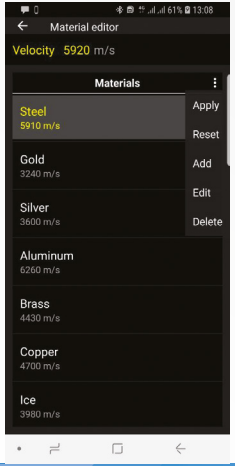


The table has a three-dot menu (Fig. 6.3) with the following options:

1. **Apply** – Set the sound velocity of the currently selected material to the device.
2. **Reset** – Reset the material list to default.
3. **Add** – Add new material with a new sound velocity value.
4. **Edit** – Edit the sound velocity value of the currently selected material.
5. **Delete** – Delete the currently selected material.

The **A-Scan** configuration consists of the following parameters:

1. **Gain** – Gain value applied in the manual measurement mode.
2. **Plot view** – Representational view of the A-Scan (empty or filled).
3. **Mode** – Measurement mode (auto or manual).
4. **Rectified signal** – Switch on/off the signal rectification.
5. **Length** – The upper boundary of the shown A-Scan length.

Fig. 6.3

The difference in plot view types and rectification can be seen in Fig. 6.4.

The **B-Scan** configuration consists of the following parameters:
1. **Plot view** – View of the B-Scan image, empty or filled, similar to A-Scan,
2. **Scan velocity** – Velocity of the device during the scanning, moving from 1 to 10 mm/s.
The resolution of the B-Scan plot is constant and represents one measurement result per millimeter.

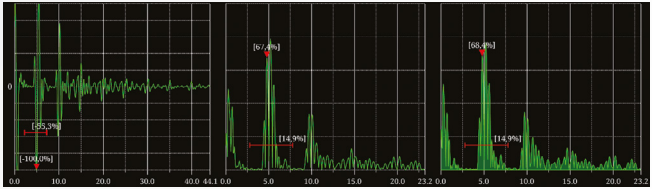
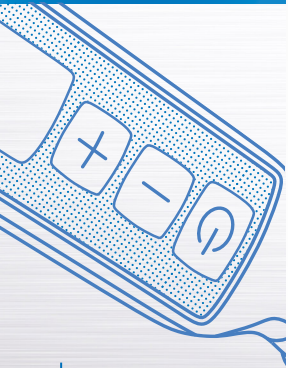


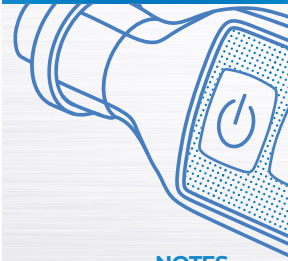
Fig. 6.4



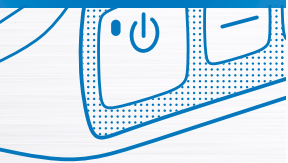
SERVICE ADDRESS

Acoustic Control Systems is always available at **info@acs-international.com** for support if you have any questions regarding installation or usage of the A1207 PenGauge mobile application.

ACOUSTIC CONTROL SYSTEMS



NOTES



NOTES

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Ultrasonic Thickness Gauge PenGauge

USER MANUAL

Revision: February 2020