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GOLDANALYTIX GAX1000 Bar Screen Sensor Instruction Manual

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GOLDANALYTIX GAX1000 Bar Screen Sensor

Product Information

The Goldanalytix BarScreenSensor is an ultrasound analysis device that allows for quick and precise measurement of the thickness and sound speed of materials. The device consists of a transmission circuit, a receive circuit, a high-frequency oscillator, a CPU, a screen, and an operating surface. It is controlled by a microprocessor and comes with a measuring frequency of 5 MHz, a measuring head with a radius of 5 mm, and an ultrasound speed range of 1000-9999 m/s. The device is powered by 3 AA-batteries and has a working temperature range. The set includes 100 ml of coupling gel for the connections between the sample and measuring head.

Product Usage Instructions

1. Step 1: Calibration

Before using the BarScreenSensor, it is important to calibrate the device. Follow the instructions provided in the user manual to calibrate the device properly.

1. Step 2: Measurement

To measure the thickness of a bar, follow these steps:

1. Using calipers, measure the thickness of the spot on the bar you want to test. Note down the value.
2. Apply enough ultrasound gel on the spot you want to measure.
3. Lay the measurement head of the BarScreenSensor onto the gel-covered spot.
4. The device will provide you with the object's thickness value.
5. Compare the measured thickness with the previously established thickness to ensure accuracy.

Step 3: Scanning

To scan the bar for inclusions of foreign material, follow these steps:

1. Lay the measurement head of the BarScreenSensor on different spots of the bar.
2. Observe and compare the thickness values obtained from different spots.
3. If there is a significant difference in thickness values, it may indicate the presence of foreign material or a fake bar.

Introduction

- Congratulations on your purchase of the Goldanalytix BarScreenSensor, the professional scanning device for precious metal bars and coins.
- **Important!** Please read this instruction manual thoroughly prior to the first use of the BarScreenSensor. Please keep in mind that no testing method can detect every fake. We will not assume any responsibility for false identifications. The most recent instruction manual can be found on www.gold-analytix.com/BarScreenSensor by clicking on "information" in order to always be up-to-date after your purchase.
- The ultrasound test is used to examine the authenticity of bigger objects. An important characteristic for exact examination is that opposite surfaces are arranged in a parallel order. The value can differ because of strong hallmarks, flutings or scratches.
- The density test allows the detection of all common and currently known material counterfeits of gold- and silver bars with a very high probability. However, please keep in mind that the very small differences in density of some alloys compared to precious metal cannot be perceived by the DensityScreenScale and a gold bar counterfeit with tungsten, for example, has to be tested with a further method. The BarScreenSensor is not suited for medical purposes.

Scope of supply

Your Goldanalytix BarScreenSensor set is delivered with the following elements:

Ultrasound measuring device

Ultrasound measuring head

Ultrasound gel

3x AA-batteries

Instruction manual

Small suitcase

- In the unlikely event that something is damaged or missing, please contact Goldanalytix immediately (for contact data see page 2).
- In order to get the device ready to use, please connect the measurement head and the ultrasound measuring device. It does not matter which plug is in which connector. Now the device is ready to use.
- **Attention:** When you would like to remove the plugs, please be careful and use the mechanism (pushing back the silver button). If you remove the plug with force this can damage the cable and the connector!

Technical properties and structure

Functions of the ultrasound analysis device
The ultrasound measuring device is controlled by a microprocessor and allows quick and precise measurement of the thickness and sound speed of materials. This device consists of a transmission circuit, a receive circuit, a high-frequency oscillator, a CPU, a screen and an operating surface. For the connections between sample and measuring head, the set contains 100 ml of coupling gel.

Specification	Description
Measuring frequency	5 MHz
Measuring head (Radius)	5 mm
Ultrasound speed range	1000-9999 m/s
Display	4-digit visualization
Minimum unit	0.1 mm
Measuring range	1.2-225.0 mm (steel)
Precision	+/- (1% D +0.1) mm, D describes the measured thickness, for thicknesses inferior to 20 mm, the precision is of +/- 5%
Working temperature	0 to 40 °C
Power supply	3x 1.5 V AA-batteries
Exterior dimensions	70 x 145.5 x 28 mm
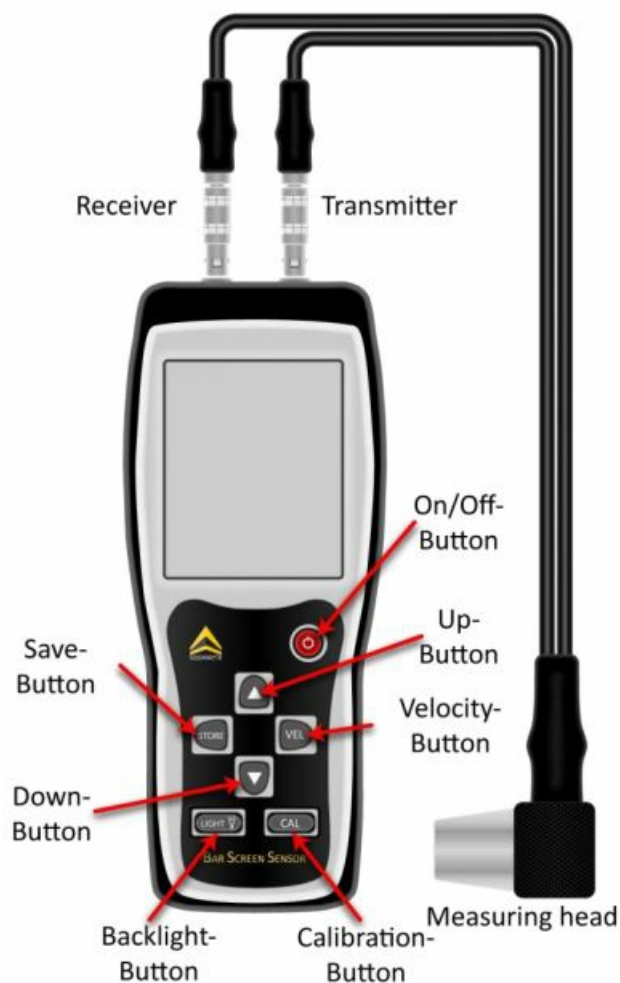
Calibration, measurement and scanning of bars

- In this chapter, we briefly explain the scanning of bars with the ultrasound measuring device. The bar (see below) has been divided by the middle and provided with drill holes and then filled with lead.

- This method is used frequently to fake silver bars using lead-tin alloys.

Preparation of measurement: Calibrating the BarScreenSensor

- The first step consists of the calibration of the measurement unit by using the included stainless steel measurement plate. The calibration should be done at least after every replacement of the measurement head and/or the batteries. Apply enough coupling gel on the measurement head and/or the stainless steel plate and press the measurement head on the test block on the device. Press CAL to get to the calibration mode. Wait until the display shows 4.0 mm, which indicates that the calibration has finished.
- After that, the device will turn back to the selected speed and the measurement can begin.
- **Measurement** 1: Testing with already known sound speed (main method)

Establishing the speed value

- We have summarized some values of the most important (precious) metals for you in an overview that you can find in "Tips and tricks". If you know the material you want to test, you can read the values in this overview. After starting the device, please adapt the sound speed in the menu by pressing the VEL-button. You can now use the arrow keys up and down to switch between the saved sound speeds. If the sound speed is close to your desired value, push the VEL-button again. This allows fine adjustment of the sound speed. In this example, we have selected 4329 m/s for the brass bar.

- The next step is measuring the bar's thickness at the spot you want to test by using calipers. Over its complete length, our bar has a thickness of 20 mm. In case of bars in unusual shapes, you might have to measure the thickness of various spots.

- Now you can carry out the actual ultrasound measurement. Apply enough ultrasound gel on the spot you want to measure and lay the measurement head onto it. Now the device will give you the object's thickness. In our example, the value matches exactly with the previously established thickness. This means that the selected sound speed of 4329 m/s for this object at this spot is correct.

- After this, you should „scan" the bar. To do so, you lay the measurement head on different spots to exclude inclusions of foreign material. In case of a fake, the value of the thickness can differ significantly.

Measurement 2: Examination of UNKNOWN sound speeds

- There are several situations where the sound speed is not exactly known. Some bars are made of alloys, others of uncommon materials. The sound speeds for those are not listed in our overviews and the online data sources sometimes differ significantly from each other. In this case, you have to choose the procedure that is explained as follows.
- If you know that the material (for example on the exterior edge) is not pervaded by the normally centrally situated foreign metal bars, you can establish the speed of sound here. However, you will have to check various properties and having experience is important for a successful interpretation. The measurement head is laid on the spot in question with the ultrasound gel. In this case, it is irrelevant which speed of sound is selected.

- The device now gives you a value for the object's thickness.

- Of course, this value is incorrect because the previously selected sound speed is wrong. This is why you now take off the measurement head from the bar and measure the objects thickness with calipers. Use the arrow keys to adjust the thickness for the BarScreenSensor in a way that it matches with the actual thickness.

- As a last step, you press the VEL-button once again. The device then calculates the correct speed of sound. Having done this, you can scan the rest of the bar like you did in measurement 1.

Saving the data

- The established value can now be saved on the device's memory. In order to do so, push STORE for two seconds to get to the save mode. Push the up / down buttons to select the save file. In order to look at the saved data, push STORE for two seconds when in normal mode and you will obtain the saved data. Push STORE to exit the save mode.

Tips & Tricks

Surface quality

- Surfaces that are too rough will cause measurement errors. Please only use smooth and plane surfaces for the investigation. In case of bars, please do not adapt the measuring head on the hallmark but on the smooth area of the bar.

Non-parallel surface

- The contact area should be parallel to the opposite side in order to avoid wrong measured values.

Temperature

- Please be aware of a constant environmental temperature as well as the temperature of the testing object.

Calibration

- Calibrate the device regularly with the integrated circular blank (4 mm thickness).

Thin testing objects

- In case of the testing object features a thickness <20 mm measurement errors can occur.

Rough surfaces

- On rough, embossed or otherwise uneven surfaces on the opposite side of the measured area, inaccurate measured values can occur.

Wear of the measuring head

- Since the measuring head is made from plastics, wear marks can appear after long-term use of the device. Sometimes, polishing with sandpaper might help. In some cases it is inevitable that the measuring head has to be replaced.

Metal	Longitudinal Sound Velocity [m/s]
Aluminum	6250-6350
Antimony	3420
Beryllium	12900
Lead	2160
Cadmium	2770
Chromium	6200
Iron	5170
Gold	3240
Copper	4700
Magnesium	5800

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Metal	**Longitudinal Sound Velocity [m/s]**
Manganese	4660
Molybdenum	6250
Nickel	4900
Palladium	3250
Platinum	3960
Mercury	1450
Silver	3607
Titanium	6100
Uranium	3380
Bismuth	2000
Tungsten	5180
Zinc	4170
Tin	3300

Table 1 – Ultrasound velocity in pure metals

Environmental and Disposal Instructions

- Used electronic devices are not allowed to be deposited in the household waste according to European regulations [1], but have to be disposed separately. The symbol on the dustbin indicates on the necessity of the separation from the household waste. Please help protect the environment. Please assure that, in case of not using the device anymore, you give it to the corresponding garbage pick-up.

- Please inform yourself about the local waste calendar and your city or municipal administration respectively, about the opportunities of returning old equipment.
- If you need more information please contact us at **gold-analytix@marawe.eu**. WEEE- number: DE70793505
- [3] Regulation 2002/95/EG of the European Parliament and Council for electronic old equipment

Warnings about the use of the BarScreenSensor

- The BarScreenSensor is only suited for testing metal and should only be used as described in the manual
- The BarScreenSensor should in no occasion be used for medical purposes.
- In proximity to sensitive technical devices (e.g. pacemakers, hearing aids, …), the BarScreenSensor should not be used. Otherwise, there are risks for personal health and damage of the devices.
- Do not open the case.
- Protect your device against external influences (e.g. temperature, humidity, solar radiation, other devices, gases, etc.).
- Not respecting these warnings can lead to injuries or damages.
- Please check your device on possible damages before use.

More non-destructive Gold-Testing Devices by Goldanalytix

GoldScreenPen

The GoldScreenPen is one of the most versatile electronic precious metal testers. The world´s smallest probe tip enables the user to measure of coins, ingots and jewellery (even through films and blisters). The measured conductivity value, which is detected up to a depth of 0.5 mm, is displayed on the digital screen **www.gold-analytix.com/goldscreenpen-electronic-gold-tester**
CaratScreenPen
The CaratScreenPen allows you to establish the fineness of gold (number of carats) of jewellery or any other gold-bearing object within seconds. Thanks to the elaborate measurement design the investigation of almost any gold-bearing object is possible. Additionally, the handling of the device and the visualization of the results are intuitive **www.gold-analytix.com/caratscreenpen**.

GoldScreenSensor

The GoldScreenSensor measures the conductivity of coins and ingots by using the eddy current method with penetration depths up to 650 μm. You can characterise the authenticity of those precious metal objects even through capsules, films and blisters up to a thickness of 3 mm. **www.gold-analytix.com/goldscreensensor**.

DensityScreenScale

The Goldanalytix DensityScreenScale is a great device for testing precious metals of different sizes for their authenticity. Most fake coins, ingots or jewellery can be detected by using the DensityScreenScale because of different densities of the objects. The density of gold, for example, is higher than the density of many counterfeit alloys **www.gold-analytix.com/density-balance**.

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Documents / Resources

GOLDANALYTIX GAX1000 Bar Screen Sensor [pdf] Instruction Manual
GAX1000, GAX1000 Bar Screen Sensor, Bar Screen Sensor, Screen Sensor, Sensor

References

- **Statistische Datenanalyse und Marktforschung - analytix.de**
- **Gold tester, gold testing machine and precious metal tester | Goldanalytix.com - Gold Analyzer**

- **Gold tester, gold testing machine and precious metal tester | Goldanalytix.com - Gold Analyzer**
- **BarScreenSensor - Ultrasound Scanner | Goldanalytix.com - Gold Analyzer**
- **CaratScreenPen | Goldanalytix.com - Gold Analyzer**
- **DensityScreenScale | Goldanalytix.com - Gold Analyzer**
- **GoldScreenPen | Goldanalytix.com - Gold Analyzer**
- **GoldScreenSensor | Goldanalytix.com - Gold Analyzer**
- **Goldanalytix - Goldprüfgeräte & Gold Tester - Echtes Gold erkennen & Silber testen | Goldanalytix.de-Online-Shop**
- **Goldanalytix - Goldprüfgeräte & Gold Tester - Echtes Gold erkennen & Silber testen | Goldanalytix.de-Online-Shop**
- **CaratScreenPen | Goldanalytix.de-Online-Shop**
- **Dichtewaage - DensityScreenScale | Goldanalytix.de-Online-Shop**
- **Entsorgung von Altgeräten Goldanalytix | Goldanalytix.de-Online-Shop**
- **GoldScreenPen | Goldanalytix.de-Online-Shop**
- **GoldScreenSensor | Goldanalytix.de-Online-Shop**
- **Tifoo - Selber galvanisieren, vergolden, brünieren & eloxieren | Tifoo Shop**

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