GOLDANALYTIX

BarScreenSensor

The Ultrasound Scanner By Goldanalytix

Instruction manual

September 2020, Rev. 1, 05/21

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1. About Goldanalytix / Contact

Goldanalytix, established in 2010, nowadays is the leading provider of precious metal testing methods in Germany. In our team we are working on the development of safe and reliable testing methods for each kind of precious metal. Thanks to the close synergy of analytics knowhow and device development, we are always up to date. Due to continuous improvements we achieve and guarantee highest standards of quality.

Do you need support with product data, service assistance or customer service? Feel free to contact us through one of the following channels:

Homepage: www.gold-analytix.com

E-Mail: gold-analytix@marawe.eu

Phone: +49 941 29020439

We are looking forward to your contact!

2. 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.

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3. 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. Therefore it does not matter what plug is in which connector. Now the device is ready to use.

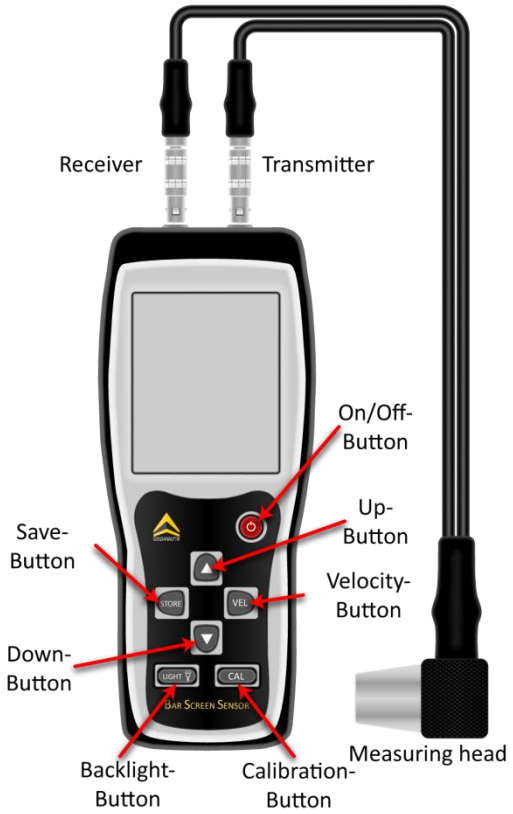
Attention: When you would like to remove the plugs please be careful and use the mechanism (pushing back the silver button). If you remove the plug with force this can damage the cable and the connector!

4. Ultrasound scanning

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



5. Scanning bars

In this chapter, we briefly explain the scanning of bars with the ultrasound measuring device. The bar has been divided by the middle and provided with drill holes 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

1.) 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 “6. 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 oft he 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 of unusual forms, 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 <u>UNKNOWN</u> 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. The measurement head is laid on 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 2 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 2 seconds when in normal mode and you will obtain the saved data. Push STORE to exit the save mode.

6. Tips & Tricks

Surface quality

Surfaces which 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 arise.

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

7. 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 to protect the environment. Please asure that in case of not using the device anymore to 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

[1] Regulation 2002/95/EG of the European Parliament and Council for electronic old equipment

8. 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

GoldScreenCard

The GoldScreenCard tests coins and ingots by utilising the eddy current method. The penetration depth is up to 4 mm depending on the metal species. The database, included in the purchased software, features values of most common coins and can be extended by the user with own values – the perfect solution for numismatists.

www.gold-analytix.com/goldscreencard-gsc

GoldScreenBox

The GoldScreenBox 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 bilsters up to a thickness of 3 mm.

www.gold-analytix.com/goldscreenbox

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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