GOLDANALYTIX BARSCREENSENSOR Bar Screen Sensor Instruction Manual

GOLDANALYTIX BARSCREENSENSOR Bar Screen Sensor

Contents

Introduction

Congratulations on your purchase of the Goldanalytix Bar Screen Sensor. The Goldanalytix Bar Screen Sensor is a handheld tester which allows the professional authentication of precious metal ingots using precise ultrasonic

measurements.
Goldanalytix, established in 2012, is the leading provider of precious metal testing methods in Germany. With the Bar Screen Sensor, we offer a testing device for the non-destructive authenticity testing of precious metal objects, especially (gold) bars, over one ounce. The measuring principle of the Bar Screen Sensor is based on ultrasonic measurement, which enables the complete penetration of the test objects. Through ultrasonic measurement, the thickness of the test objects is quickly and accurately determined at a given sound velocity, revealing inclusions of foreign metals with other sound velocities.
By the way: On our homepage **www.gold-analytix.com** you will always find the latest version of the instruction manual, so that you can keep up to date with new types of forgery and findings around precious metal testing.

Safety Instructions

IMPORTANT: Please read this instruction manual carefully before using the Bar Screen Sensor for the first time. This is for your own safety and to ensure proper operation of the device. Keep the instruction manual in a safe and easily accessible place and, if necessary, pass it on to subsequent users. When using the Bar Screen Sensor, please follow the safety instructions.

Definition of signal words and warning symbols:

Safety instructions are marked with signal words and warning symbols. Disregarding the safety instructions can lead to personal danger, damage, and malfunction of the device, as well as incorrect results.

Signal words:

CAUTION! Indicates a low-risk hazard which, if not avoided, could result in minor or moderate injury and damage to the device or property.

Warning symbols:

General warning: This warning symbol is intended to alert the user to potential hazards. All instructions following this warning symbol must be followed to avoid possible injury or damage to the device.

Product-specific safety instructions:

Intended use:

CAUTION! Do not use the device for any purposes other than the intended use described in this instruction manual. The protective effect of the device may be impaired if the device is not used as intended. The Bar Screen Sensor must not be used for medical purposes under any circumstances.

- This device is designed for the use in (precious) metal testing and is suitable for ultrasonic measurements of metals. Goldanalytix is not liable for damage resulting from improper use.
- The device may be operated in continuous mode.

Repair and modifications:

CAUTION! To avoid damage to the device and/or personal injury, do not dismantle the device or attempt any modifications or repairs. If you encounter any problems with the Bar Screen Sensor, please contact Goldanalytix (for contact details, see page 26).

- Repairs by unauthorized persons may endanger the user and invalidate the warranty.
  Repairs may only be carried out by Goldanalytix itself.

Operating conditions:

- The device is intended for indoor use only.
- Never use the device near explosive gases, vapors, dust or in a damp and wet environment. Protect the device from moisture and humidity. Make sure that no liquid gets inside the device and wipe off spilled liquids immediately.
- Please operate the device at room temperature and not in direct proximity of heat sources (e.g., next to the fan output of a laptop). Avoid temperature changes and a temperature of the hardware and the test object of more than 60 °C.
- Do not operate the device near sensitive technical devices (e.g., pacemakers, hearing aids, etc.) to avoid personal danger and damage to the technical devices.
- Store the device at room temperature in a dry environment. Avoid storage in an environment with high humidity.

Cleaning and maintenance:

- Please replace the batteries when the low battery indicator appears on the display.
  Proceed as follows: Press the On/Off button to switch off the device. Open the battery compartment on the back of the device. Replace the empty batteries with new batteries of the same type, making sure that the polarity is correct when inserting them.
- Do not use any solvents or alcohols to clean the device, which could damage the casing and LCD display. Clean the instrument with a damp cloth.
- Clean the measuring head with a damp cloth after each measurement to remove the ultrasound gel. Since the measuring head is made of plastic, the surface of the measuring head can get rougher with regular use, which reduces the sensitivity and can lead to incorrect measurement results. In such cases, polishing with commercially available sandpaper is recommended. However, it may be necessary to replace the measuring head.

Precautions regarding alkaline batteries:

 **CAUTION!** Read the precautions regarding alkaline batteries carefully. Neglecting to follow the instructions may result in fire, burns and other hazards or injuries.

- Do not charge, short-circuit, deform, disassemble, heat over 85 °C, incinerate, or expose the battery content to water. Keep batteries away from small children.
- Protect the device from extreme heat (e.g., from continuous sunlight, proximity to hot stoves or microwaves) and severe cold, as well as from water and moisture. Extreme temperatures can affect battery performance and shorten battery life.
- Follow the applicable transport instructions for alkaline batteries.
- Before disposing of the device and the batteries, inform yourself about the applicable guidelines and regulations and follow them. If a battery leaks, dispose of it in a safe way and avoid contact with skin and eyes. More information on battery disposal and disposal of the device and be found in Chapter 8: Recycling and

Disposal.

Conformity:

CE The Bar Screen Sensor from Goldanalytix complies with the relevant European Directives regarding health, safety and environmental protection.

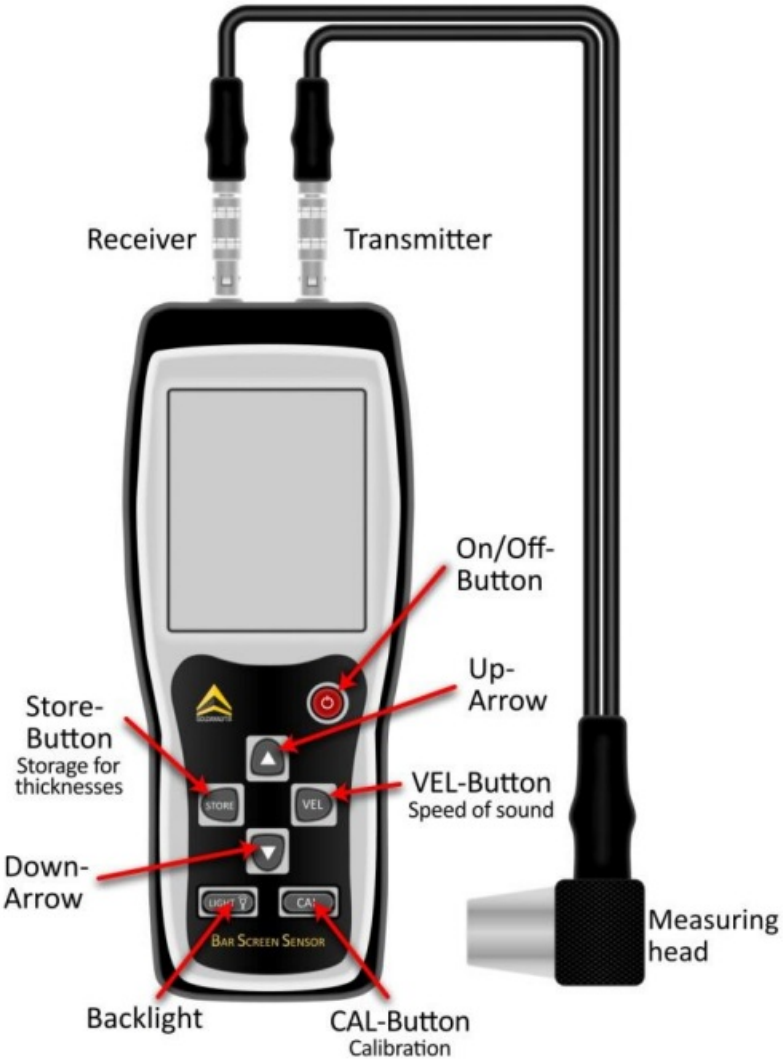
Scope of Supply

Your Bar Screen Sensor set includes the following components:

Ultrasonic measuring device
Ultrasonic measuring head
Ultrasonic gel
Calibration piece
3x AA batteries
Instruction manual
Carrying case with inlay
Shipping carton

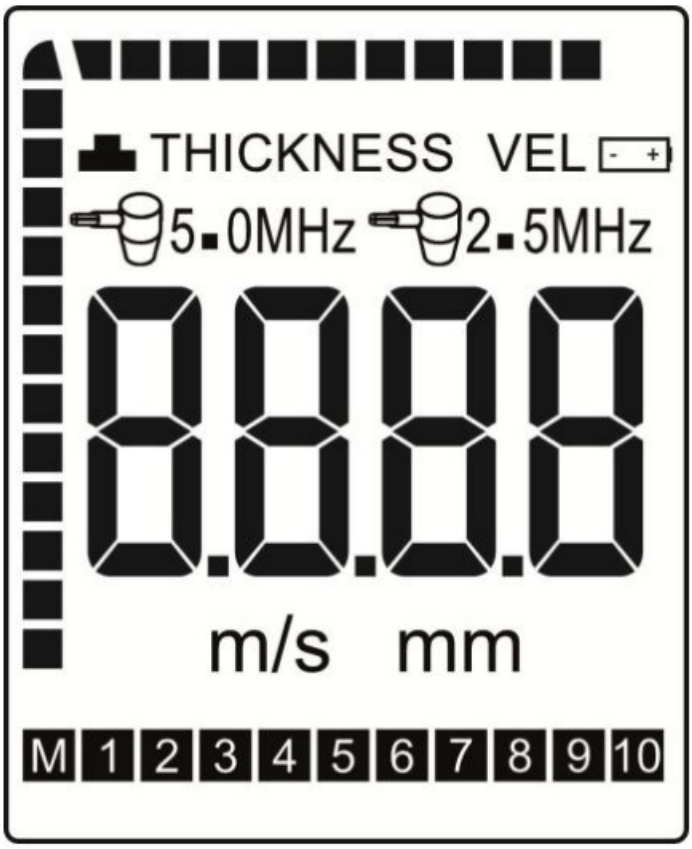
Before initial start-up, please check that the components mentioned above are included in the scope of delivery of the Bar Screen Sensor set and that there is no obvious transport damage. In case of any defects, please contact Goldanalytix immediately (for contact details, see page 26).

Operation and Display Elements



The ultrasonic analyzer is controlled by a microprocessor and enables fast and precise measurement of the thickness and sound velocity of materials based on the ultrasonic reflection sound method. For coupling between the measuring head and the test object, the Bar Screen Sensor set contains 100 mL of ultrasonic gel.

LCD display:



Display	Procedure
	Low battery indicator
	Coupling indicator
THICKNESS	Thickness
VEL	Sound velocity
m/s	Unit of sound velocity in m/s
mm	Unit of thickness in mm
	Thickness memory mode

Starting and Operating the Device

Preparing the device:

Connect the measuring head to the ultrasonic analyzer to prepare the device for measurement.
It does not matter which plug is connected to which socket. In order to switch on the device, please press the On/Off button.

CAUTION: Please be extremely careful when disconnecting the measuring head after using the device. Use the mechanism by pushing back the silver cap. If the plug is forcibly removed without using the mechanism, damage to the cables and sockets may result.

Calibrating the device:

The first step is to calibrate the device using the included stainless steel calibration piece. The calibration should be performed each time the device is switched on, as well as after replacing the measuring head and/or the batteries. Apply a sufficient amount of ultrasound gel onto the stainless steel calibration piece and/or the measuring head, and gently press the measuring head onto the probe. Press the CAL button on the device for 2 seconds to enter the calibration mode.
Please wait until the display shows 4.0 mm. This signals the completion of the calibration.

Performing measurements:

In this section, the use of the ultrasonic analyzer for the authentication of precious metal ingots is explained. The bar in the selected example was divided in the middle and drilled holes were made, which were then filled with lead. This method is frequently used in the counterfeiting of silver bars with lead-tin alloys.

IMPORTANT: Direct contact between the measuring head and the test object is required to perform a measurement. Measurements through blisters, capsules, or foils are not possible.
Therefore, the test objects must be removed from their packaging for the ultrasonic measurement.

Authenticity testing for a known speed of sound (main method):

Display	Procedure
	**Adjusting the speed of sound:** The speeds of sound for common (precious) metals can be found on page 28. To adjust the speed of sound, press the VEL button twice in the menu until the VEL icon starts flashing. Use the Up and Down arrows to navigate between the preset speeds of sound and select the appropriate value. If your required speed of sound is not included in the preset values, select the one closest to your required value. Press the VEL button again so that the m/s unit also starts flashing. This allows you to fine tune the speed of sound using the Up and Down arrows. Confirm the adjusted value by pressing the VEL button again. Note that this will overwrite the selected speed of sound with the adjusted value. In the example, a speed of sound of 4329 m/s has been selected.
	**Measuring the thickness:** Measure the thickness of the bar by using a caliper. In the example, the thickness of the bar is 20 mm over the entire length. For unusually shaped ingots, you may need to determine the thickness at several spots.

	**Performing the ultrasonic measurement:** Apply a sufficient amount of ultrasound gel onto the spot you w ant to measure and place the measuring head. The device outp uts the measured thickness on the display. In the example, this value matches exactly the previously determined thickness. Th e selected speed of sound of 4329 m/s is therefore correct at th e measured spot. At this spot, there is no foreign metal inclusion.
	**Scanning:** We recommend to carefully scan the bar. In doing so, the meas uring head is placed at various spots to ensure that no foreign materials are enclosed in the ingot. In case of a fake, the meas ured thickness would deviate significantly from the expected thi ckness. In the example, a thickness of only 3.3 mm was indicat ed at the measured spot instead of the expected 20 mm. The ul trasonic measurement thus detected a foreign metal inclusion a nd identified the counterfeit.

Authenticity testing for an unknown speed of sound:

There are several situations in which the speed of sound oft the test object is not precisely known. Some ingots are made of alloys or of uncommon materials whose speeds of sound are not included in our table and whose values on the Internet sometimes differ considerably. In such cases, we recommend the following procedure.

Display	Procedure

Determining the speed of sound:
To determine the speed of sound of the bar, select a spot (e.g., on the outer edge of the ingot) where the material is not pierced by a foreign metal inclusion (foreign metal rods are usually inserted centrally). Apply a sufficient amount of ultrasound gel o nto the spot you want to measure and place the measuring hea d. During the measurement, it does not matter which speed of s ound is selected. Not, however, that the selected speed of soun d will be overwritten.
Please note: When following this procedure, experience is impo rtant for interpreting the results. In addition, other properties, su ch as the density of the ingot, should be carefully checked.

Measuring the thickness:
After the measurement, the device displays a value for the thick ness of the bar. This value for the thickness is incorrect becaus e also the previously selected speed of sound was incorrect. Therefore, determine the correct thickness of the ingot with a caliper.

Adjusting the thickness:
To adjust the thickness value shown on the display, remove the measuring head from the ingot. The thickness remains visible o n the display. Use the Up and Down arrows to adjust the thickn ess until the displayed value matches the actual thickness of th e bar. Confirm the value by pressing the VEL button. The devic e automatically calculates the appropriate speed of sound for th e bar based on the adjusted thickness.

Scanning:
Test the bar with the calculated, correct speed of sound, which i s shown on the display. It is advisable to scan the bar as descri bed in the main method. In doing so, the measuring head is pla ced at various spots to ensure that no foreign materials are encl osed in the ingot. In case of a fake, the measured thickness wo uld deviate significantly from the expected thickness.

Evaluation and Interpretation of the Results

The speed of sound is a material-specific property and can be used for the authentication of precious metal bars. The ultrasonic measurement allows the complete penetration of all common precious metal bars over 1 ounce. Through the ultrasonic measurement, the thickness of the test object is quickly and accurately determined at a given speed of sound, thus detecting inclusions of foreign metals with other speeds of sound. In this way, fake precious metal bars can be reliably identified. We recommend the ultrasonic measurement with the Bar Screen Sensor as a combined testing method for precious metal bars over 1 ounce.

The following procedure is recommended for precious metal bars:

Step 1: Density determination – Determine the density of the bar using a density scale (for irregular shaped objects) or check the dimensions and weight of the bar using a digital caliper and a precision balance. In this way, counterfeits made of materials with different densities can already be detected in the first step, and in the following it can only be a counterfeit with materials of the same density – these are for example metals like tungsten in the case of fine gold or for silver, for example, lead-tin alloys or molybdenum.
Step 2: Conductivity measurement with the Gold Screen Sensor – Verify the authenticity of the precious metal ingot by determining the electrical conductivity using the Gold Screen Sensor and thus detect under alloys and counterfeits. Due to the limited penetration depth of the Gold Screen Sensor, it is essential to use another testing method for objects over 1 ounce in order to detect any foreign metal inclusions that may lie deeper.
Step 3: Ultrasonic measurement with the Bar Screen Sensor – Perform ultrasonic measurements with the Bar

Screen Sensor to ensure complete penetration of the precious metal ingot and to detect foreign metal inclusions. Please also have a look at our website **www.gold-analytix.com**/knowledge for more information about the correct procedure for the non-destructive testing of precious metals.
However, absolute certainty, especially regarding the exact composition of the test objects, can only be provided by a destructive, chemical analysis.

Conditions for optimum measurement results:

- **Surface condition**: If possible, measure only on smooth, flat surfaces and not, for example, on hallmarked areas. Rough or irregularly shaped surfaces can cause measurement errors and result in inaccurate measurement values. Strongly defined embossing, creasing or scratches can also lead to value deviations. Always apply a sufficient amount of ultrasound gel onto the spot you want to measure.
- **Parallel surfaces**: Make sure that the opposing surfaces of the test objects are always parallel. The measuring surface must be parallel to the opposite side, otherwise inaccurate or false measurement values will result.
- **Temperature**: Ensure that the temperature of the environment and the test object is constant. It is best to perform measurements only at room temperature.
- **Calibration:** Perform the calibration regularly with the included calibration piece of 4 mm thickness to ensure reliable and precise measurement results.
- **Thin test objects**: The following applies to ultrasonic thickness gauges: If the test object has a thickness of less than 20 mm, the measured values deviate more strongly from the actual thickness in percentage terms. Nevertheless, in combination with the Goldanalytix Gold Screen-devices, it is no problem to distinguish between authentic and false.

Warranty and Support

Do you need more information about our devices, support in using the Bar Screen Sensor or the 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

Our high quality precious metal testers are designed for a long lifetime. However, if any problems should occur with a device, it is good to know that we offer a legal warranty of 2 years.
The warranty period starts with the receipt of the product. In case of a warranty claim, after repair or replacement of the device, the warranty period starts again with the receipt of the product.
IMPORTANT: The warranty applies only to devices that have been properly used as described in this instruction manual and have not been misused, repaired by unauthorized persons, or modified.
The Bar Screen Sensor is a good tool for verifying the authenticity of precious metals – however, in the end you are responsible for your own transactions. We assume no liability for any possible financial losses that may result from the use of the Bar Screen Sensor.

Recycling and Disposal

The Bar Screen Sensor is subject to the regulations of the European Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE). The symbol of the crossed-out trash can indicates that this electrical or electronic device must not be disposed of with normal household waste at the end of its lifetime, but must be taken for separate collection by the end user. Please follow your country's rules for the separate collection of electrical and electronic equipment. For more information on recycling, please contact your local authority.

The Bar Screen Sensor is subject to the regulations of the European Directive 2006/66/EC on batteries and accumulators. The symbol of the crossed-out trash can on batteries and accumulators indicates that this device contains a built-in battery or accumulator which must not be disposed of with normal household waste at the end of its lifetime, but must be taken for separate collection by the end user. Please follow your country's rules for the separate collection of batteries and accumulators. For more information on recycling, please contact your local authority.

The following batteries or accumulators can be found in this electrical device: Non-rechargeable (primary) batteries [AA] with the chemical system [alkaline-manganese]. Instructions for safe removal: Open the battery compartment, remove the batteries, and replace them with batteries of the same type.

Thank you for your contribution to the protection of the environment!

Technical Data

Technical Data:
Article number: G-01-0010
Dimensions (L x W x H): 7,0 x 14,6 x 2,8 cm
Dimensions incl. packaging (L x W x H): 29,5 x 26,2 x 11,0 cm
Weight: 200 g Weight incl.
packaging: 1115 g
Frequency: 5 MHz
Measuring range: 1,2 – 225,0 mm 1000 – 9999 m/s
Accuracy (thickness measurement): +/- (1%D+0,1) mm (D denotes the measured thickness)
Accuracy +/- 1mm/D*100% for thicknesses <20 mm
(ultrasonic measurement): +/- 5 % for thicknesses >20 mm
Battery type: 3x 1,5 V AA alkaline batteries
Operating temperature: 0 – 40 °C
Relative humidity: <90 % RH
Maximum operating altitude: 2000 m a. s. l.
Pollution degree: PD2

Appendix: Sound velocities of selected (precious) metals

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
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

Customer Support

Tel.: +49 941 29020439
Fax.: +49 941 29020593
E-Mail: gold-analytix@marawe.de / gold-analytix@marawe.eu
www.gold-analytix.de / www.gold-analytix.com

Documents / Resources

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

References

- STRATO - Domain reserved
- Das neue Batteriegesetz (BattG)
- 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
- Knowledge of gold and silver counterfeiting | 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
- Entsorgung von Altgeräten Goldanalytix | Goldanalytix.de-Online-Shop
- Wissen zu Gold- und Silberfälschungen | Goldanalytix.de-Online-Shop
- Goldanalytix Shop - Pruebas de metales preciosos
- Goldanalytix Shop - Pruebas de metales preciosos
- Conocimiento sobre las falsificaciones de oro y plata | Goldanalytix Shop - Pruebas de metales preciosos
- Goldanalytix Shop - Testeurs de métaux précieux
- Goldanalytix Shop - Testeurs de métaux précieux
- Connaissances sur les contrefaçons d'or et d'argent | Goldanalytix Shop - Testeurs de métaux précieux
- User Manual