Graigar AR850+

Ultrasonic Thickness Gauge Smart Sensor AR850+

User Manual

1. Introduction

The Smart Sensor AR850+ Ultrasonic Thickness Gauge is an advanced handheld instrument designed for accurate and rapid measurement of material thickness. It operates on the principle of ultrasonic sound waves, making it suitable for a wide range of industrial materials including steel, cast iron, aluminum, copper, brass, zinc, quartz glass, polyethylene, PVC, gray cast iron, and ductile iron.

This device is controlled by a microprocessor, ensuring precise and reliable measurements. Its robust design and intuitive interface make it an essential tool for quality control, maintenance, and inspection tasks.

2. Product Features

- Suitable for measuring thickness of various hard materials.
- Data storage function for up to 10 test results, retaining data even without power.
- High-precision linear compensation circuit for accurate measurements.
- Sound test speed measurement (m/s) with 12 storage memories.
- Adjustable units between millimeters (mm) and meters per second (m/s).
- Automatic Zero Adjustment for consistent readings.
- Automatic Power Shut Off function to conserve battery life.

3. Package Contents

Upon unpacking, please verify that all items listed below are present and in good condition:

- 1 x AR850+ Ultrasonic Thickness Gauge Host
- 1 x Aluminum Carrying Case
- 1 x Instruction Manual
- 1 x Calibration Block

- 2 x Probes (Transducers)
- 1 x Coupling Agent (50ml)

Figure 3.1: Complete AR850+ Kit Contents

4. Setup

4.1 Battery Installation

The AR850+ requires 3 x 1.5V AAA batteries (not included). To install:

1. Locate the battery compartment on the back of the device.
2. Slide the battery cover downwards to open.
3. Insert 3 AAA batteries, ensuring correct polarity (+/-) as indicated inside the compartment.
4. Replace the battery cover, sliding it upwards until it clicks into place.

Figure 4.1: Battery Compartment

4.2 Probe Connection

Connect the desired probe to the two ports located at the top of the device. Ensure a secure connection for accurate readings.

Figure 4.2: Probe Connection Ports

Figure 4.3: Ultrasonic Probes

5. Operating Instructions

5.1 Powering On/Off

Press the **Power** button (red button with power symbol) to turn the device on or off.

Figure 5.1: Device Front Panel

5.2 Basic Measurement

To perform a thickness measurement:

1. Ensure the probe is securely connected and the device is powered on.
2. Apply a small amount of coupling agent to the surface of the material to be measured. This ensures proper ultrasonic transmission.
3. Place the probe firmly and flatly on the prepared surface.
4. The thickness reading will appear on the LCD display.

Figure 5.2: Displaying a Reading

5.3 Changing Units (mm/m/s)

Press the **UP** or **DOWN** arrow buttons to switch between millimeters (mm) for thickness readings and meters per second (m/s) for sound velocity readings.

5.4 Sound Speed Adjustment

The device allows for adjustment of sound speed to match the material being measured. Refer to the manual's sound speed table for common materials or use the calibration block for precise adjustment.

1. Press the **VEL/Enter** button to enter sound velocity adjustment mode.
2. Use the **UP** and **DOWN** arrow buttons to adjust the value.
3. Press **VEL/Enter** again to confirm and exit.

5.5 Data Storage and Recall

The AR850+ can store up to 10 sets of measurement data. To save a reading, press the**Memory** button after a stable reading is obtained. To recall stored data, press the **Memory** button repeatedly to cycle through the stored values.

6. Maintenance

6.1 Cleaning

Regularly clean the device and probes with a soft, dry cloth. Do not use abrasive cleaners or solvents. Ensure no coupling agent residue remains on the probe surface after use.

6.2 Storage

When not in use, store the AR850+ in its aluminum carrying case in a cool, dry place, away from direct sunlight and extreme temperatures. Remove batteries if the device will not be used for an extended period to prevent leakage.

6.3 Battery Replacement

A low battery indicator will appear on the display when the battery voltage drops to 3V +/- 0.2V. Replace all three AAA batteries promptly to ensure accurate operation.

7. Troubleshooting

Problem	Possible Cause	Solution
No reading on display	No coupling agent; Poor probe contact; Incorrect material setting; Damaged probe.	Apply coupling agent; Ensure firm, flat probe contact; Verify sound speed setting; Check probe for damage.
Inaccurate readings	Improper calibration; Incorrect sound speed; Surface irregularities.	Perform calibration using the provided block; Adjust sound speed for the specific material; Ensure smooth measurement surface.

Problem	Possible Cause	Solution
Low battery indicator	Batteries are low.	Replace all 3 AAA batteries.
Device does not power on	No batteries; Incorrect battery polarity; Dead batteries.	Install batteries; Check polarity; Replace with new batteries.

8. Specifications

Parameter	Value
Measuring Range	1.2 - 225.0 mm (Steel)
Accuracy	+/- (1% H + 0.1) mm (H denotes measured thickness)
Minimum Limit for Tube Measuring	20 * 3 mm (Steel)
Sound Speed Range	1000 - 9999 m/s
Operating Frequency	5 MHz
Operating Temperature Range	0 - 40 degrees Celsius
Probe Operating Temperature	0 - 60 degrees Celsius (at normal temperature)
Low Battery Indication	3V +/- 0.2V
Power Supply	3 x 1.5V AAA Batteries (Not Included)
Dimensions	Approx. 153 x 75 x 35 mm (6.02 x 2.95 x 1.38 inches)
Weight	Approx. 2 pounds (including packaging)
Material	Plastic

9. Warranty and Support

This product is covered by the manufacturer's standard warranty. For specific warranty terms, duration, and conditions, please refer to the warranty card included with your purchase or contact Graigar customer support directly.

For technical assistance, troubleshooting not covered in this manual, or service inquiries, please contact the manufacturer or your authorized dealer.

Manufacturer: Graigar