**UNI-T**®

UT387S
Wall Scanner User Manual

Product Overview

Thanks for purchasing the new UT387S wall scanner. In order to use this product safely and correctly, please read this manual thoroughly and follow the instructions strictly. Please keep the user manual properly.

1. This product can detect metals (rebars, copper pipes), cables and woods hidden in walls, ceilings, floors and under gypsum boards.
2. This product can be used for laser distance measurement, which can measure the length, area, and volume of houses.
3. This product can measure the moisture of all kinds of wood and building materials.

Safety Information
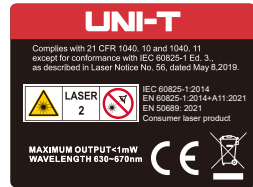
LASER RADIATION DO NOT STARE INTO BEAM CLASS 2 CONSUMER LASER PRODUCT compliance with IEC/EN 60825-1, EN 50689.

LASER 2

IEC 60825-1:2014
EN 60825-1:2014+A11:2021
EN 50689: 2021
Consumer laser product

MAXIMUM OUTPUT<1mW
WAVELENGTH 630~670nm

Complies with 21 CFR 1040, 10 and 1040. 11 except for conformance with IEC 60825-1 Ed. 3., as described in Laser Notice No. 56, dated May 8,2019.

⚠ Before using this product, please read this manual carefully. Otherwise, it may result in laser radiation, electric shock or personal injury.

⚠ Do not change the performance of the laser in any way. It will cause dangerous laser exposure. Turn on the laser only when using this product, and do not look directly at the laser. Please keep the product in a safe place so as not to use it by irrelevant personnel.
Do not direct the laser beam at persons deliberately or in the dark.
Do not irradiate the laser beam on objects with high reflective surfaces.
Do not place the product where children can reach.

⚠ Do not repair this product without authorization. If it is damaged, please contact the local dealer.

⚠ Electromagnetic radiation may cause interference to other devices (such as pacemakers or hearing aids and other medical instruments).
Do not use this product in a flammable and explosive environment, near medical equipment or on an airplane.

⚠ Please dispose of the obsolete instrument in accordance with the local laws and regulations.
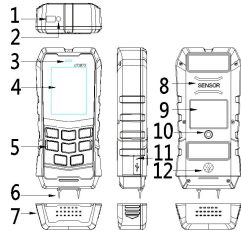
Product Structure

Figure 1

⚠ **Notes:**
Please use a safe charger and cable with a Type-C USB interface, a voltage output of 5V, and a current of ≥500mA.
The company is not responsible for accidents caused by the charger.

No.	Description
1	Receiving lens aperture for distance measurement
2	Laser aperture for distance measurement
3	LED indicator
4	2.4 inch color screen
5	Buttons
6	Probe for moisture detection
7	Probe cover
8	Sensor area (objects around it will be detected)
9	Label
10	1/4 copper nut
11	Protective cover of Type-C USB charging interface
12	Loudspeaker

Buttons

a. Foreign material detection (wooden beam)
b. Long press to power on.
   After the product is turned on:
   Short press: single measurement
   Long press: continuous measurement
c. Metal detection
d/f. Enter/select the distance measurement menu
e. Long press to power off
g. Short press to switch between:
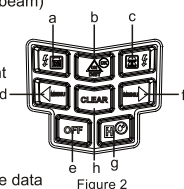   Detect the moisture/lock the moisture data
h. Clear

Figure 2

Technical Indexes

Specifications	
Wood scanning depth (precision mode)*	20mm
Wood scanning depth (depth mode)*	38mm
Metal scanning depth*	100mm
Non-ferrous metal scanning depth*	80mm
Live wire alarm accuracy*	Live 110~220V, 50-60Hz, 50mm
Copper wire (≥4mm²)	40mm
Auto calibration	√
Operating temperature	0~40°C
Operating humidity	Metal mode: 0-85%RH
	AC mode: 0-30%RH
	Wooden beam mode: 0-60%RH
Storage temperature	-20~60°C
Drop proof	1m
LCD	2.4 inch color screen
Auto power off	About 5min
Battery	300mAh lithium battery
Battery life	3000 single measurements
Shutdown current	0 mA
Audio alarm	Voice broadcast
Low battery indication	√
Distance measurement parameters	
Accuracy	$\pm(2.0mm+5\times10^{-5}D)$
Unit	m/ft+in
Range	0.05~40m
Laser auto off	20s
Data storage	30 groups
Moisture measurement parameters	
Maximum detection depth	8mm
Range/accuracy	6%-40%/±2%

The detection result will be affected by factors such as the material, shape, and size of the detected object, as well as the material and condition of the detection surface. If the cable is not live, the detection depth will be reduced.

For a distance of 20-30m, it is recommended to use a reflector. For a distance of 30-40m, a reflector is needed to ensure the normal measurement. In the case of strong sunlight or poor reflection of the target, please use the reflector.

Distance Measurement

1. Battery status
2. Measurement reference
3. Measurement mode
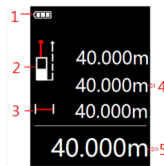4. Secondary display
5. Primary display

Figure 3   Figure 4

1. Single measurement:
Long press the button b to power on. It will automatically enter the single measurement interface, and the loudspeaker will broadcast the current mode. Aim the laser at the target to be measured, and then short press the button b to take a single measurement. The result will show on the primary display (Figure 3), and the loudspeaker will broadcast the value.

2. Continuous measurement:
Long press the button b to enter the continuous measurement mode. The maximum and minimum values will show on the secondary display. Press the button h twice to exit this mode.

3. Menu:
Press the button d or f to enter the function menu interface (Figure 4). Select a measurement mode, and then press the button g to enter its interface. The left-to-right, top-to-bottom order in the menu interface is: addition measurement, subtraction measurement, area measurement, single Pythagorean measurement, double Pythagorean measurement, historical measurement data, reference setting (front/rear reference), unit conversion (m, inft), voice broadcast off/on.

Addition measurement:
In this mode, the values of multiple single measurements will be added, and the result will show on the primary display.

Subtraction measurement:
In this mode, the values of multiple single measurements will be subtracted, and the result will show on the primary display.

Area measurement:
Measure the length and width of the rectangle respectively, and the area will show on the primary display.

Single Pythagorean measurement:
Measure a hypotenuse and a leg respectively, and the product will automatically calculate the length of the other leg and display it on the primary display.
When measuring two sides, the measurement reference point must remain unchanged, and the connection between the two laser irradiation points and the three reference points must be a right triangle, otherwise the calculation result will be very different from the actual.

Double Pythagorean measurement:
This mode is similar to the single Pythagorean measurement. Users should measure two hypotenuses and a leg respectively. The reference point of the three measurements must remain unchanged, and the leg must be perpendicular to the target side to be measured, otherwise the calculation result will be very different from the actual.

Historical measurement data:
In this mode, users can press the button d or f to view historical measurement data (up to 30 groups).

Reference setting:
The reference can be the front, middle, or rear of the product. The default setting will be the last reference when turning on the product.

Unit conversion:
The unit of distance measurement can switch between m and inft.

Voice broadcast off/on:
There are three states: voice broadcast, buzzer, silent mode. After the voice broadcast is turned off, only the buzzer will beep. After turning off the buzzer, it enters the silent mode. The default setting will be the last mode when turning on the product.

Error Code

No.	Error code	Error reason
1	ERR00	No error
2	ERR01	Battery voltage < 2.2V
3	ERR02	Internal error, ignore
4	ERR03	Low temperature (< -20°C)
5	ERR04	High temperature (> 40°C)
6	ERR05	Over range
7	ERR06	Invalid measurement result
8	ERR07	Strong ambient light
9	ERR08	Weak signal
10	ERR09	Strong signal
11	ERR10	Internal hardware failure 1
12	ERR11	Internal hardware failure 2
13	ERR12	Internal hardware failure 3
14	ERR13	Internal hardware failure 4
15	ERR14	Internal hardware failure 5
16	ERR15	Unstable laser signal
17	ERR16	Internal hardware failure 6
18	ERR17	Internal hardware failure 7
19	ERR18	Invalid frame

Scanning Function--Notes

Caution:
● Do not let moisture penetrate the product or expose it to direct sunlight.
● If the product was in an environment with extremely different temperature before, it is necessary to wait for its temperature to rise before turning on it.
● Using a microwave oven and other transmitting equipment near the wall scanner will affect the detection result.
● Basically, the detection result will be affected by surrounding environmental factors. The factors refer to whether the product is close to a machine that generates a strong magnetic or electromagnetic field during detection. In addition, moisture, metal-containing building materials, aluminum-coated insulation materials, wallpapers with good conductivity, carpets or tiles with conductivity will also affect the detection results. Therefore, users must pay attention to the relevant information (such as architectural drawings) before drilling and sawing on the wall, ceiling and floor.

To get the best detection effect:

- When using this product, avoid wearing jewelry such as rings or watches. Metal may cause inaccurate detection.
- Move the product evenly to the surface, and do not lift it or change the pressure applied.
- During detection, the product must always be in contact with the surface.
- Make sure that the fingers holding the product do not touch the surface being scanned.
- Do not touch the wall scanner or the scanned surface with the other hand or any other part of the body.
- Keep moving the product slowly when detecting for maximum accuracy and sensitivity.

Scanning Function--Calibration in Metal Detection Mode

- Before performing the detection function, there must be no moisture on the product housing. Dry the scanner with a cloth if necessary.
- After turning on the product, press the button c to enter the metal detection interface, and the loudspeaker will broadcast the current detection mode (if the broadcast function is turned off, there will be no sound). At this time, if one of the three icons of rebars, copper pipes, and stainless steel pipes shows on the display without metal interference, it indicates that calibration is required. The calibration method is to place the product in an environment without interference from metals and strong magnetic fields (such as lifting the product into the air, etc.). And then press and hold the button c until only the battery status icon and "Detect metal" are displayed on the screen.

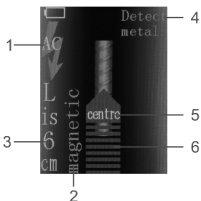## Scanning Function--Metal Detection (Detect Metals around the Product)

Figure 5

1. Alternating current
2. Magnetic or non-magnetic metal
3. Depth of metal
4. Detection mode
5. Center
6. Signal strength

1. The maximum detection depth of metal is 100mm.
2. After turning on the product, press the button c to enter the metal detection interface.
3. Place the product on the surface of the detection object and move the product to the left or right. When the product detects a metal object, the signal strength area on the display will gradually light up as the product gradually approaches the metal. When the product is closest to the metal, the center icon will appear on the display.
4. When the product can detect whether the metal being measured is a magnetic metal or a non-magnetic metal, the screen will display the words "magnetic metal" or "non-magnetic metal", and the depth of the measured metal will be displayed below. Otherwise, the preceding information will not be displayed.
5. When the metal and AC signal are detected at the same time, the product will beep.
6. When the AC symbol shows on the display, it means that there is an AC signal nearby.

Note: When detecting metal, the detection depth on the display will change synchronously with the movement of the product. The accuracy of the depth is related to the shape, material and distribution of the measured metal, and the properties of its surrounding medium. When the measured object is a rebar or a copper pipe with a diameter of 18mm, the accuracy of the depth is the best. On the contrary, the accuracy is low, and the depth value can only be used as a rough reference value.

⚠ Caution !

- If the internal equipment malfunctions or operates improperly, the product may not be able to accurately detect live wires in the wall. Therefore, users should not only rely on the product to identify the existence of dangerous live wires, but also refer to other evidence, such as construction drawings or visual identification of wiring or pipeline entry points.
- If there are live wires in the wall, do not take measures that may cause danger. Before turning holes or nails to penetrate the wall surface, be sure to turn off the power, gas and water.
- Concrete, bricks, and ceramics have a shielding effect on the electric field signal from the live wires, so when the AC signal is detected on their surface, the detection will be affected.
- When the electric appliance is connected to the required conductor and turned on, the AC signal can be detected more easily.
- The signal of the "live" wire will spread from both sides of the actual wire, so sometimes the area of the "live" wire alarm looks much larger than the actual wire.

- AC signals mainly come from live wires, and may also come from static electricity or induced electricity in the environment. Placing the hands on the wall next to the detector may help to eliminate static electricity and induced electricity.
- The signal strength of a "live" wire depends on the location of the cable. Therefore, please take further measurements nearby or use other information to check for the presence of "live" wires.
- Wires that are not "live" may be detected as metal objects, and thin wires may not be detected.

Scanning Function--Foreign Material Detection (Wooden Beam)

- Maximum detection depth: precision mode: 20mm; depth mode: 38mm. Long press the button a to switch between the precision/depth mode.
- The foreign material detection mode can detect objects in gypsum drywalls, plywood, solid wood boards, and coated wood walls.
- The foreign material detection mode will not detect objects in concrete, mortar, blocks, bricks, carpets, foil materials, metal surfaces, tiles, glass or any other materials with uneven density.
- Due to differences in moisture, material content, wall texture and paint, the scanning depth and accuracy will be different.
- In addition to wooden beams, the foreign material detection mode can also detect metals and other dense materials.
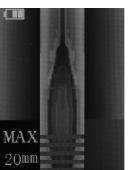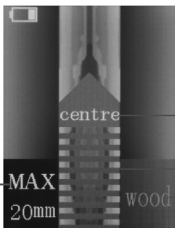
| Figure 6 | Figure 7 | Figure 8 |

Figure 9

1. Wooden beam detection mode (precision/depth mode)
2. Center
3. Signal strength
4. Property of measured object: when the center icon is displayed, the property of the measured object will show on the screen:
   - The measured object is non-metallic, usually a wooden beam.
   - The measured object is a small metal material, usually iron nails.
   - The measured object is a large metal material, usually a steel frame.
   - The measured object is a small non-magnetic metal, usually a cable.
   - The measured object is a small amount of metal materials, usually cables or nails.

Operating instructions

1. After turning on the product, press the button a to enter the foreign material detection interface (Figure 6), and the loudspeaker will broadcast the current detection mode (if the broadcast function is turned off, there will be no sound).
2. When detecting foreign materials, users must hold the product upright to the wall and then short press the foreign material detection button. And then keep the product still for 1-3 seconds, and wait for the calibration (Figure 6) to be completed. When the interface shown in Figure 7 appears, perform the detection operation. Place the product on the surface of the detection object and move the product to the left or right. Move the product evenly to the surface, and do not lift it or change the pressure applied.
3. When the product detects a foreign material, the screen will display the signal strength synchronously (Figure 8).
4. Continue to move the product in the same direction. When the wall scanner is in the middle of the wooden beam, the screen will display the center icon and the property of the measured object (Figure 9).
5. At this time, keep moving the product in the same direction. When the product leaves the center of the measured object, the display will show the interface as shown in Figure 8. Continue moving the product until it is far from the wooden beam. The signal will gradually decrease until there is no signal, and the display will only show the battery status and detection mode. The detection is complete.

Note: After repeated detections, the position will be more accurate.

Please note:

- Sometimes due to environmental factors, the product may not be automatically calibrated, and an error alarm signal may appear. Please calibrate it manually. The calibration method is to short press the button a again and wait for the calibration to be completed.
- If the product has just been calibrated on the wooden beam, users need to move it out of the scope of the wooden beam, and the wooden beam can be detected again.
- If the scanning results are unstable, it may be caused by moisture in the wall cavity or dry wall, or paint or wallpaper that is not completely dried. Moisture can interfere with the sensor of the product, so please let the wall dry for a few days.
- In some environments or on uneven surfaces, it is difficult to detect wooden beams using the foreign material detection mode. Users can switch to the metal detection mode to locate nails on the wooden beams.
- Depending on how close the wires or pipes are to the wall, they can be detected by the foreign material detection method. Always be careful when nailing, cutting or drilling holes on walls, floors, and ceilings that may contain these items.

Maintenance

In order to ensure the good performance of the product, please maintain it as follows:
- Please do not expose the product to extremely cold or hot environments, and do not subject the product to external force or vibration for a long time.
- The product should be stored indoors. Please put the product in the box when not in use.
- Do not use this product in dusty and humid environments. When cleaning the product and optical components (such as laser receiving lens and laser beam emitting apertures), users can use a soft cloth dipped in clean water to squeeze dry and wipe, do not use corrosive or volatile substances.
- Do not touch the lens of this product.
- Please do not disassemble or assemble this product to avoid laser damage.
- Please do not change any optical parts of this product.
- Do not post any labels or nameplates on the front and back of the detection area and do not stick metal nameplates.
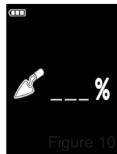- Use the attached protective cover to store and carry the product.

Moisture Detection

| Figure 10 | Figure 11 | Figure 12 |

- Press the button g to enter the wood moisture detection mode (Figure 10). At this time, long press the button g to enter the building material moisture detection mode (Figure 11). In the moisture mode, long press the button g to switch between two modes mentioned above and short press the button g to lock the data (Figure 12).

- Pull out the probe cover, then turn and hold the product, and pierce the probe into the target to be tested. The test data will be displayed on the screen. Short press the button g again to lock the test value. At this time, users can pull out the product to record the data. The moisture measurement is complete.

Troubleshooting

Phenomenon	Reason	Solution
Fail to power on	Low battery	Charge
	Bad button contact	Try to press the power button harder or send for repair.
Error codes displayed on the screen	Please refer to the Error Code section.	Please refer to the Error Code section.