

SECURITY HANDHELD METAL DETECTOR



INSTRUCTION MANUAL

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Introduction

The Matrix “100” handheld metal detector is a world class security scanner. It was designed to meet and exceed the needs and specifications in today’s security conscious world, and complies with all National Institute of Justice standards for indoor/outdoor operations. The Matrix 100 utilizes the latest in electronic design while retaining a pleasing visual appearance. “Made in the United States”, along with advanced technological features, is the hallmark of White’s Electronics. The Matrix 100 is ISO9001/2000.

Purpose

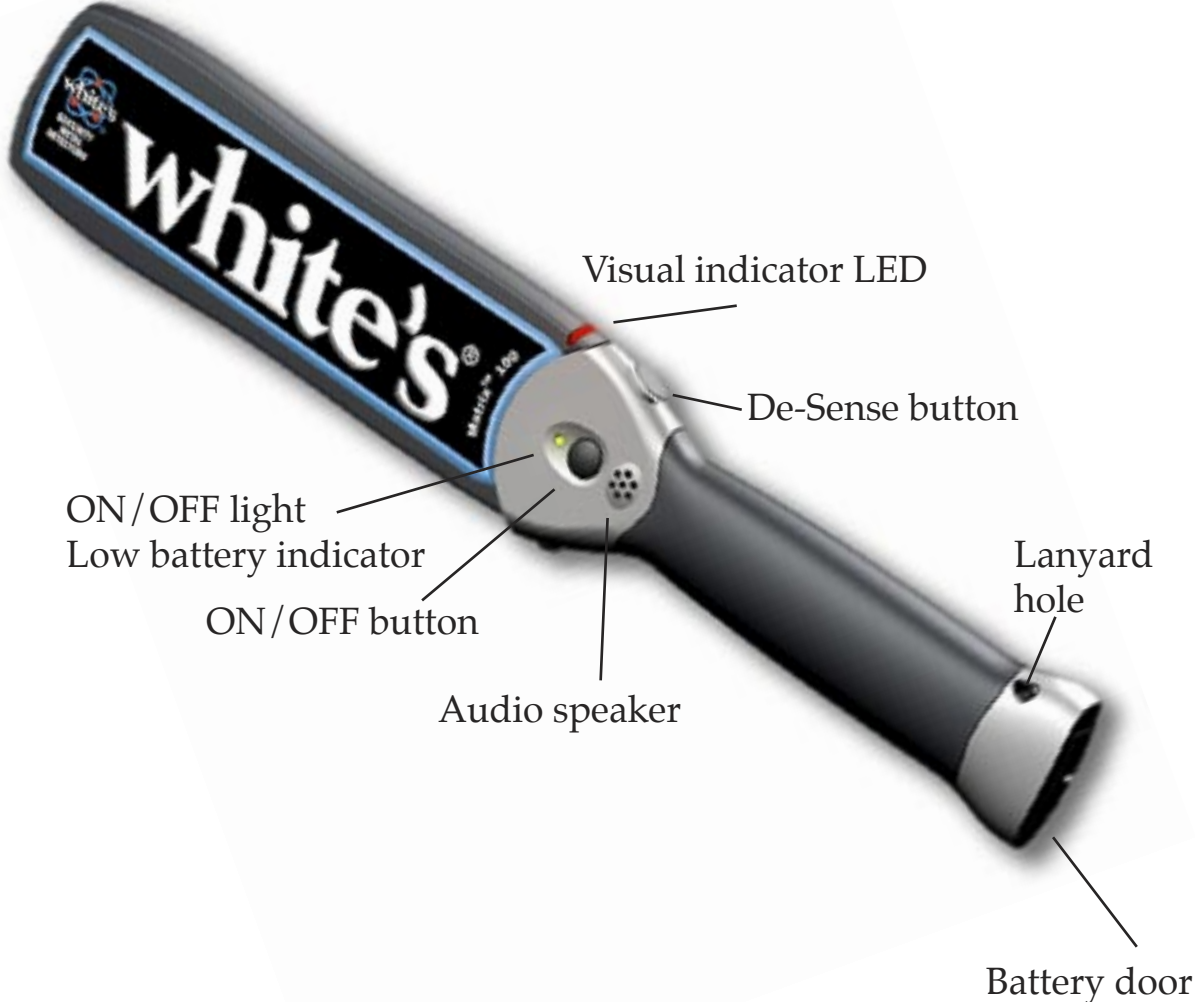
The Matrix “100” handheld metal detector is designed to detect metal, primarily for security applications. It is useful for a myriad of detection applications.

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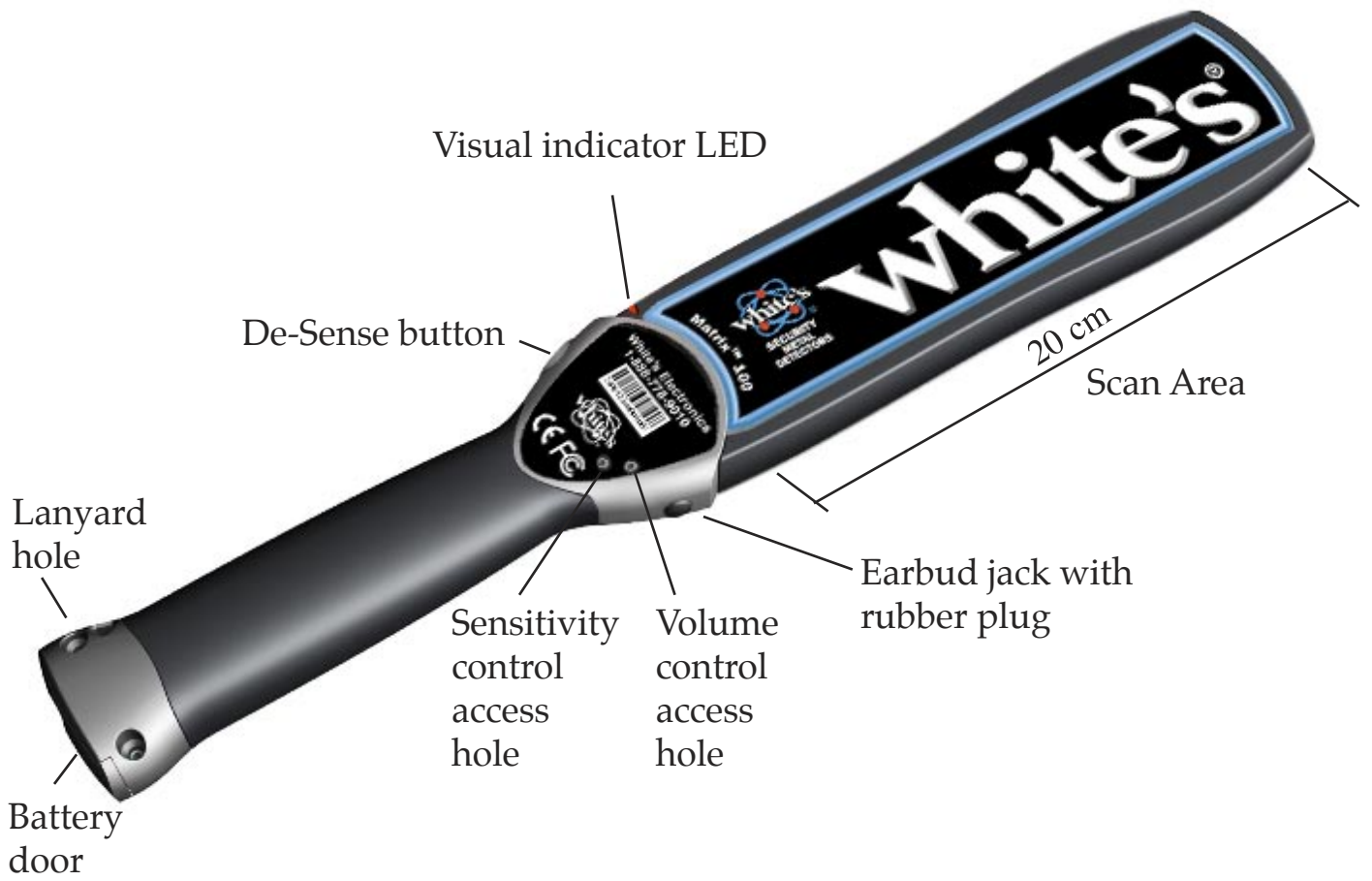
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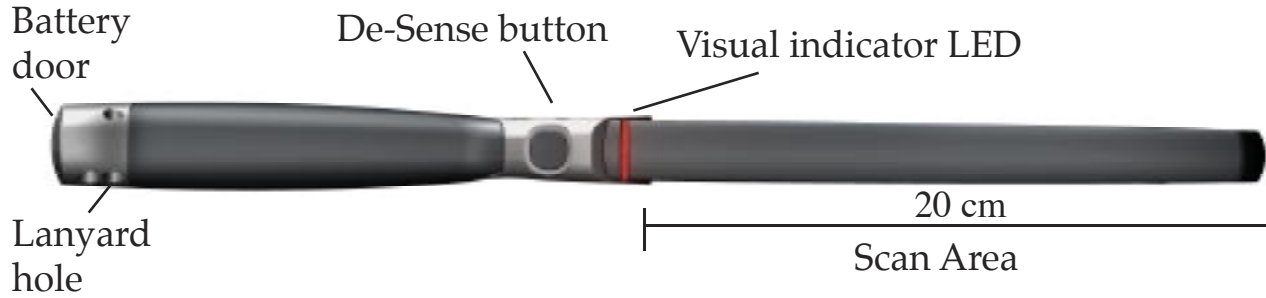
Features – Front view



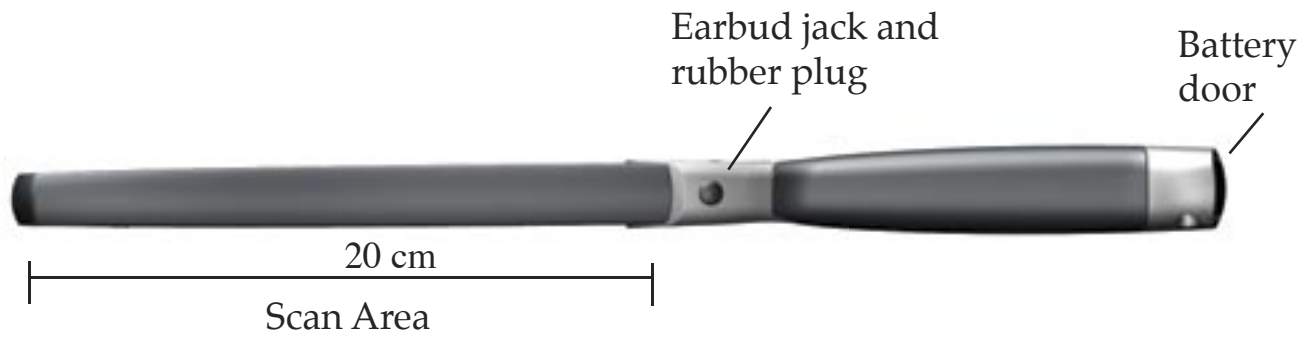
Features – Back view



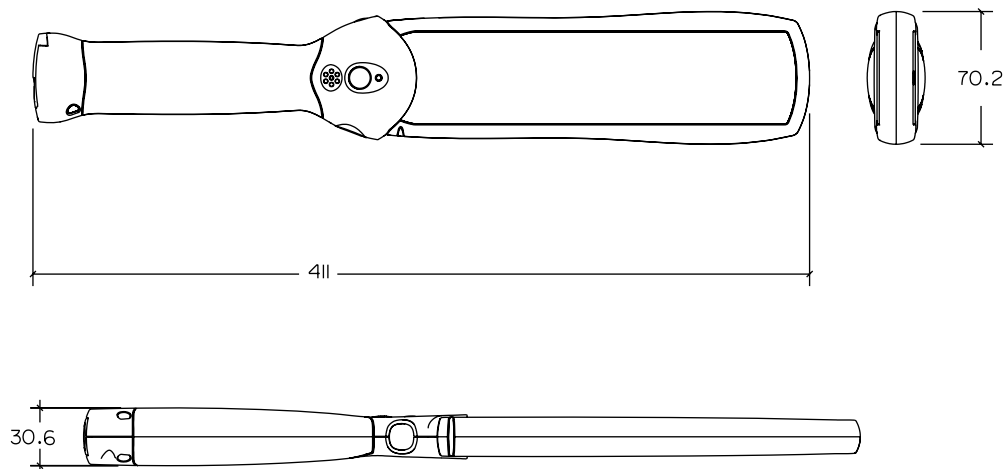
Features - Top edge



Features - Bottom Edge

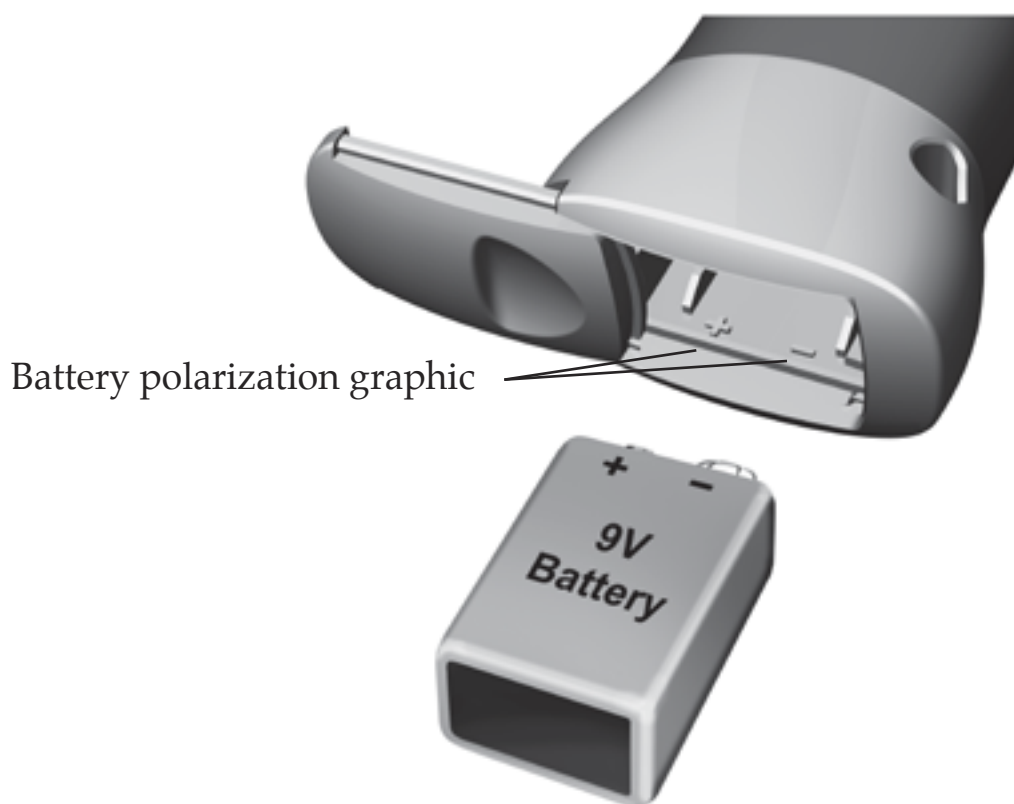
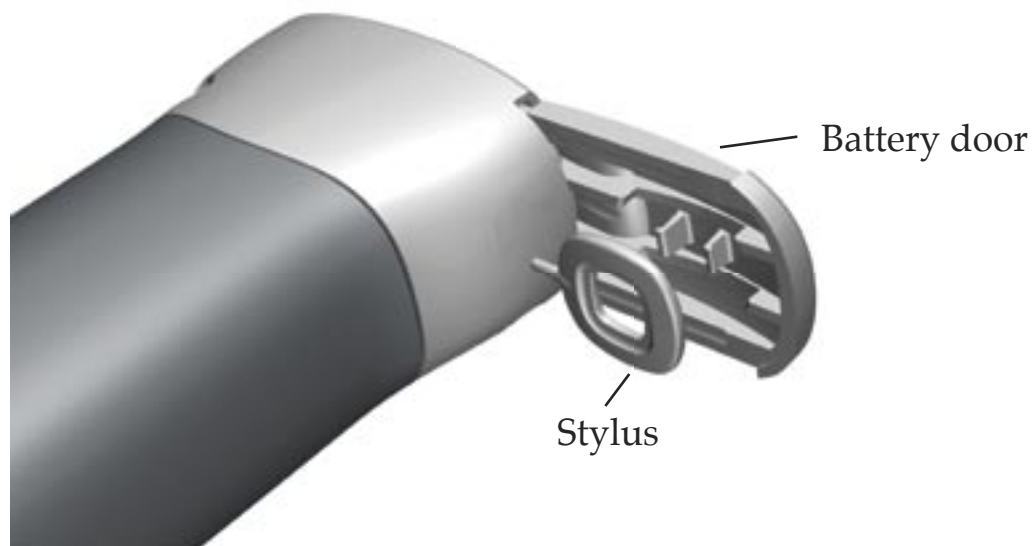


Mechanical Drawing-Metric Dimensions



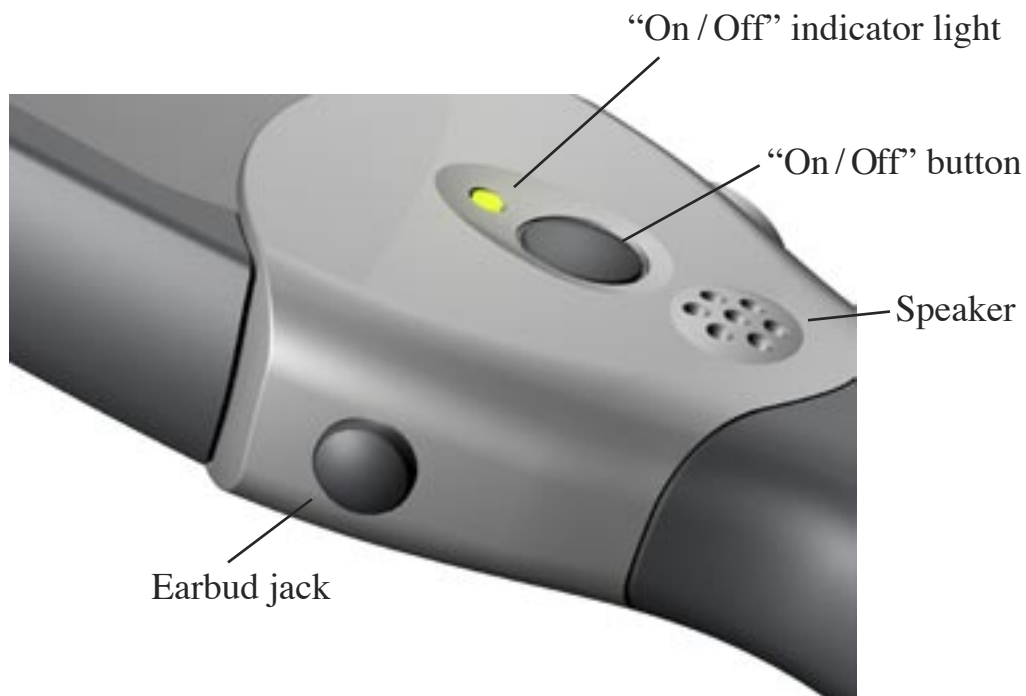
SCALE 1:4.16
UNITS: MM

Features – Battery door



“ON/OFF” button

- There are three selections for the ON/OFF button: “On Audio”, “On Vibrate”, “Off”.
- “On Audio” - press the ON/OFF button once. This will be followed by a single, double or triple beep to indicate the current sensitivity level setting and the green ON indicator light will emit a single flash for low sensitivity, double flash for medium sensitivity or a triple flash for high sensitivity.
- Turn the unit off by pressing the ON/OFF button once. The ON indicator light will disappear.
- “ON Vibrate” - press the ON/OFF button rapidly twice. This will be followed by a single vibration burst and the ON indicator light will emit a single flash for low sensitivity, double flash for medium sensitivity or a triple flash for high sensitivity. The audio alarm is deactivated when the vibrate alarm is activated.
- Turn the unit off by pressing the ON/OFF button once. The ON indicator light will disappear.



Sensitivity control

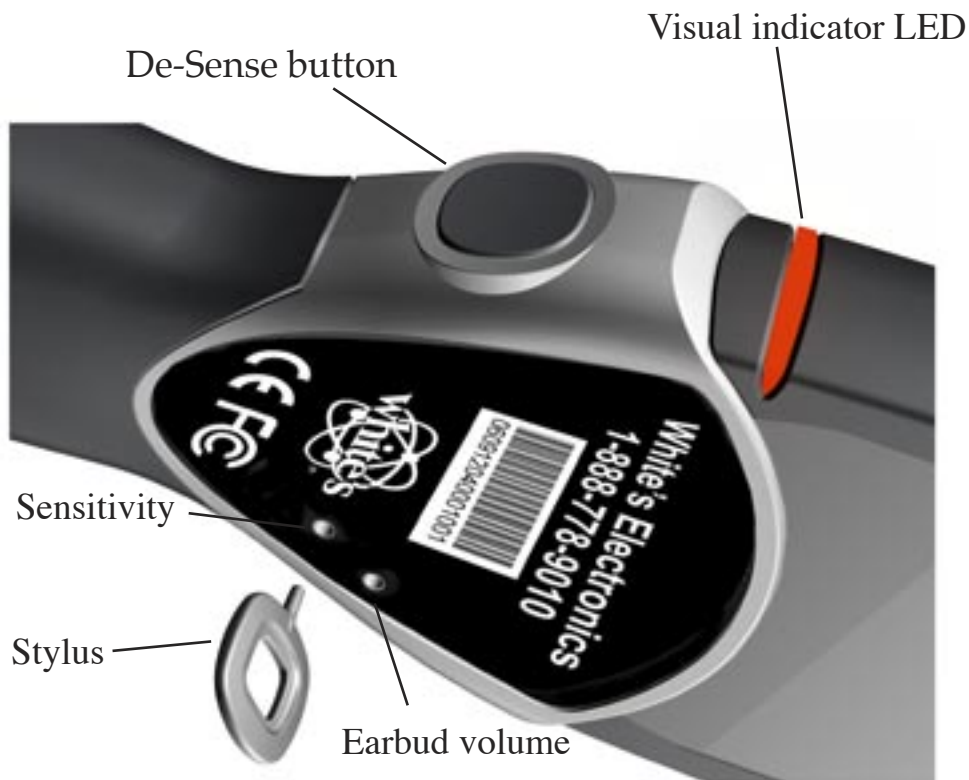
The unit is preset, at the factory, to medium sensitivity. You can change sensitivity to the low, medium or high level.* The Specifications list (page 19) shows the effect of the different sensitivity levels for detecting objects of various sizes. Open the battery door and remove the stylus from inside the battery door (see page 6.) Use the stylus to press the elastomeric keypad to cycle through the sensitivity levels, medium, high, low, etc. The unit will beep or vibrate and will flash the red visual indicator to announce the new sensitivity level:

One beep / vibration / flash = low sensitivity

Two beeps / vibrations / flashes = medium sensitivity

Three beeps / vibrations / flashes = high sensitivity

When the unit is turned off or the battery is removed, the sensitivity level setting is retained in the memory.



* To be determined by administration policy and supervisor control.

Volume control for the earbud

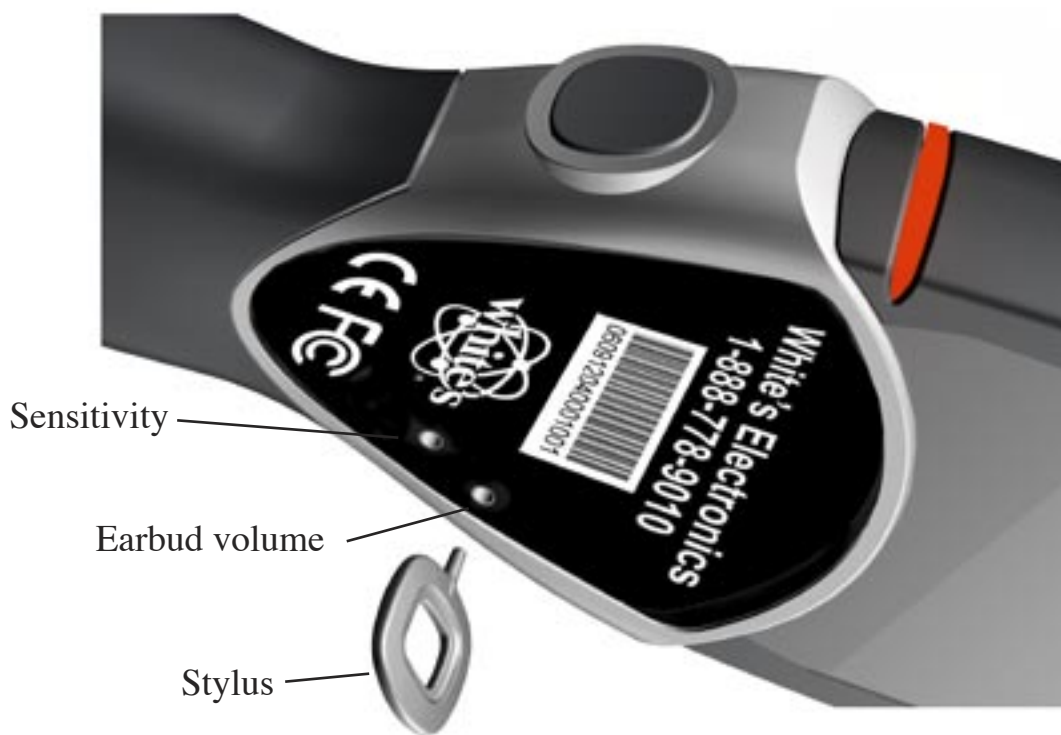
Press the elastomeric keypad to cycle through the volume levels, medium, high, low, etc. The unit will beep or vibrate and will flash the red visual indicator to announce the new volume level:

One beep / vibration / flash = low volume

Two beeps / vibrations / flashes = medium volume

Three beeps / vibrations / flashes = high volume

When the earbud is plugged into the scanner, the audio speaker is deactivated. When the unit is turned off or the battery is removed, the earbud volume level setting is retained in the memory.



* To be determined by administration policy and supervisor control.

Testing the scanner

- Turn on the scanner in the “On Audio” or “On Vibrate” mode.
- Pass the scanner over a metal test object to make sure that the LED, audio alarm or the vibrate alarm are working properly. If the battery is fresh or recently recharged (more than 7V), the LED next to the “ON/OFF” button will produce a green light (See Page 7). If the battery is discharged to less than 7V, the LED will produce a yellow light. It is recommended that you replace the battery if the light is yellow.

Batteries

One 9V battery is included with the detector. Use a 9V alkaline, 9V lithium-manganese dioxide, or externally charged 9V battery. If the battery is fresh or recently recharged (more than 7V), the LED next to the "ON/OFF" button will produce a green light. If the battery is discharged (less than 7V) the LED will flash a yellow light. It is recommended that you replace the battery if the light is yellow.

Battery life

Based upon measurements, battery life for a 600 mA-hour alkaline battery at room temperature:

On 216 hours 9 days
Off 2880 hours 120 days

Battery life is doubled with the 1200 mA-hour lithium-manganese dioxide batteries.

Rechargeable 9V batteries can be used, but battery life per charging is typically much shorter than the life of 9V alkaline batteries, and depends upon battery type and the battery recharging system.

Do **NOT** use the earbud jack as a recharging port! Use of the earbud jack as a recharging port may damage the Matrix 100 or the battery charger, and will void the warranty.

Battery temperature ratings

Alkaline batteries are rated by the manufacturer:

Energizer -18°C to 55°C (0°F to 130°F)
Panasonic -20°C to 54°C (-4°F to 130°F)

Lithium-manganese dioxide batteries are rated by the manufacturer:

Duracell -20°C to 60°C (-4°F to 140°F)
Energizer -40°C to 60°C (-40°F to 140°F)
Ultralife -20°C to 60°C (-4°F to 140°F)

Manufacturer's ratings are based upon operating loads quite different from the Matrix 100 so you may see different results..

High temperature batteries:

For information about special batteries that will operate at temperatures as low as -40°C contact White's Electronics, Inc.

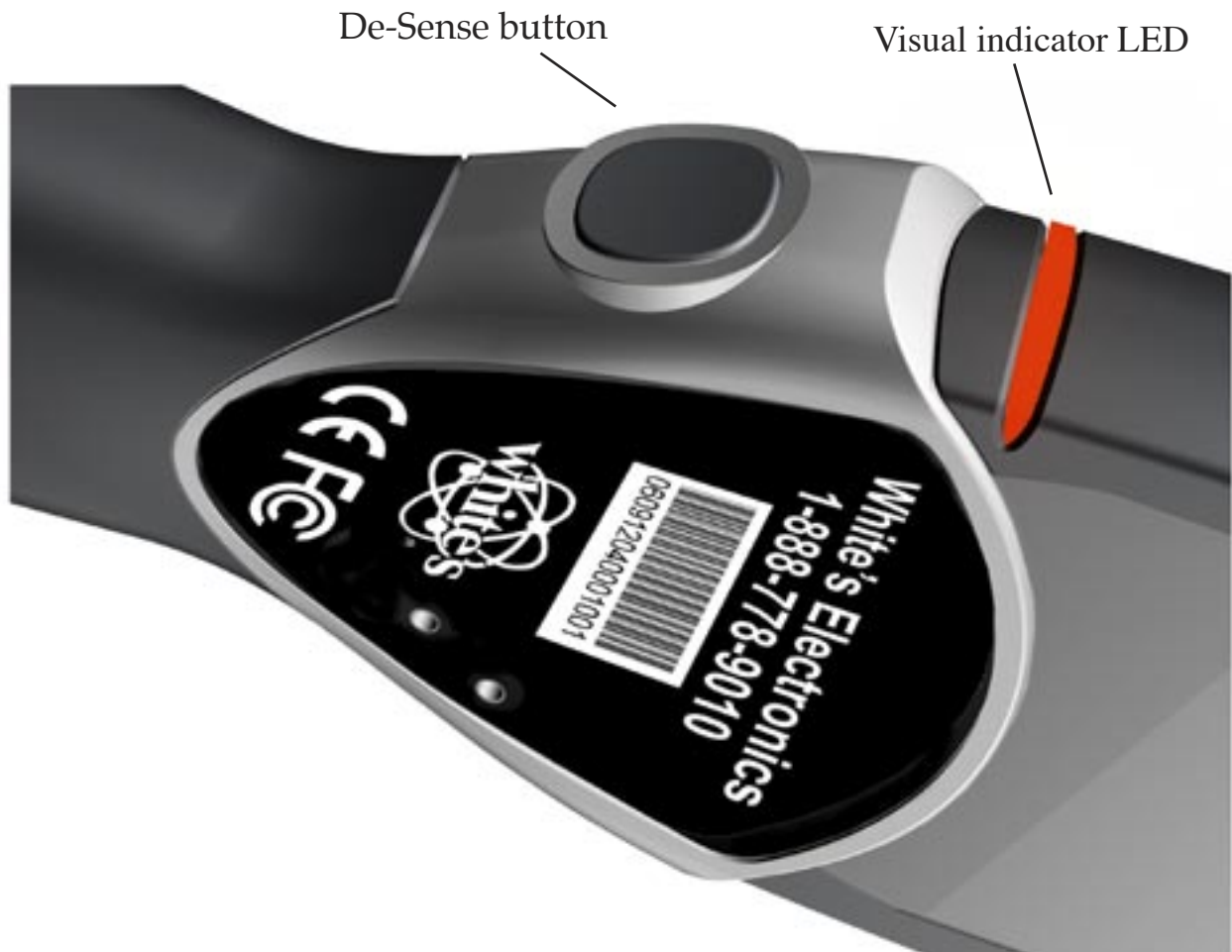
Battery Installation

- Gently slide the battery door open.
- Slide a 9 volt battery into the battery cavity.
- Close the battery door.



De-Sense button

On the top edge of the scanner, there is a large rubber “De-Sense” button. When depressed, this button will reduce the detectors sensitivity by approximately 50%. This is particularly useful when scanning near rebar reinforced floors. The “De-Sense” is only activated as long as the button is depressed. While the De-Sense button is pressed the “ON/OFF” light (see page 3) will illuminate continuously. If the battery is good the light will be green. If the battery is bad the light will be yellow.



Earbud jack

The earbud jack accepts a 3mm or 1/8" "Mono" connector.



Earbud jack rubber plug

Helps protect against dirt and moisture.



Lanyard

A lanyard is provided with the unit. The small nylon loop can be threaded through the lanyard hole and looped back through itself to secure the unit. The lanyard is tested to withhold approximately 25 pounds of force, before breaking.



Scanning a person

- **Warning: Follow the approved policy & procedure for scanning a person. This policy & procedure should be approved by the administrator and/or supervisor of the person using the scanner.**
- It is recommended that the person using the scanner “NOT” touch the person being scanned with the detector.
- The detector is not a weapon.
- Treat the detector with care. Do not abuse.

National Institute of Justice guidelines for use of handheld detectors in schools.

While it is not difficult to learn to use a handheld metal detector correctly, school administrators should not underestimate the value of annual training for their operators, as well as training for staff who may be called upon to serve as backup or supplemental operators. However, on-the-job practice is important in allowing the school to achieve the type of throughput that will be required in order to process students quickly.

Every school will want to tailor its own set of operator procedures to take into consideration its students’ and community needs. Some generic procedures:

- The detector should be passed over the scannee’s body at a distance of no more than 3 to 4 inches. Avoid touching the body or clothing with the detector. However, for some baggier clothing, such as pants or jackets, it may be necessary to hold the detector against or more into the fabric while scanning in order to stay within 3 to 4 inches of all body surfaces.
- Most handheld metal detectors should be set at their highest sensitivity; an exception to this is if there is significant interference from metal reinforcing

in a floor or other nearby material that could cause constant alarms unless the detector's sensitivity is turned down.

- The body scan should be performed each time in the same pattern so that the operator always knows what parts of the body still need scanning. A sample routine, illustrated in exhibit 3.10, follows:

1. Ask the scannee to place all carried items, plus any caps or headgear on a table (procedures for manual search of baggage are not covered in this text). The scannee should stand with his or her feet about 18 inches apart, facing away from the table and about 2 feet in front of it. Footprints outlined on the floor or drawn on a mat can greatly help position the scannee properly. Ask the scannee to hold his or her arms out to the sides, parallel to the floor.

2. Quickly run the handheld detector across some piece of conductive material on your own body, such as a belt buckle. The ensuing squeal of the detector will assure you that the scanner is still operating properly.

3. Start at the top of one shoulder of the scannee. With the paddle of the detector held horizontally and parallel to the front of the body, sweep down one side of the front of the torso, down the leg to the ankle, then move to the other ankle and sweep back up the front of this opposite leg and torso, ending with the opposite shoulder. (If a particular detector's detection paddle is less than half the width of the average body, or if a particular body is wider than twice the width of the detection paddle, the pattern will have to be modified to achieve adequate coverage).

4. Sweep the detector paddle over the outside top of the arm from the top of the shoulder to the bottom of the wrist, then up the inside of the arm to the armpit. Sweep down that side of the body to the ankle, then up the inside of that leg and down the inside of the opposite leg, then back up the other leg from the ankle to the underarm. Repeat the sweep of the inside and outside of this arm. Note that it would be particularly important to avoid touching the paddle up against the scannee's body when scanning up and down between the legs.

5. Ask the scannee to turn around. (Arms can be put down now). The pattern used to scan the front of the body should now be repeated over the back of the body.

6. Ask the scannee to grab the edge of the table for support, then to lift one foot up in back of him- or herself. Scan across the bottom of the shoe. Repeat for the other foot. The operator should expect to hear a short squeal from the detector when scanning the bottom of shoes or boots with steel shanks or steel toes. Both shoes should cause equivalent squeals.

7. For the head area, start at the top of the forehead and scan around the top of the head down to the back of the neck.

- Given that the type of handheld detector being used is the kind that provides different volumes of feedback, i.e., a soft squeal versus a much louder squeal, the operator will be able to distinguish between the detection of a smaller innocuous item or material, such as a zipper, and the detection of a larger, more suspicious item. It is important to be attuned to these different volumes to recognize when further investigation is required for a particular scannee.

- When the detector identifies a suspicious item and there is no visible source for the alarm (clothing is shielding the source object), ask the person to show you what they have in that area. For example, for an alarm along the arm or wrist, have the scannee pull up his or her shirt sleeve. Using your detector, duplicate the squeal you heard before, but now over the visible item.

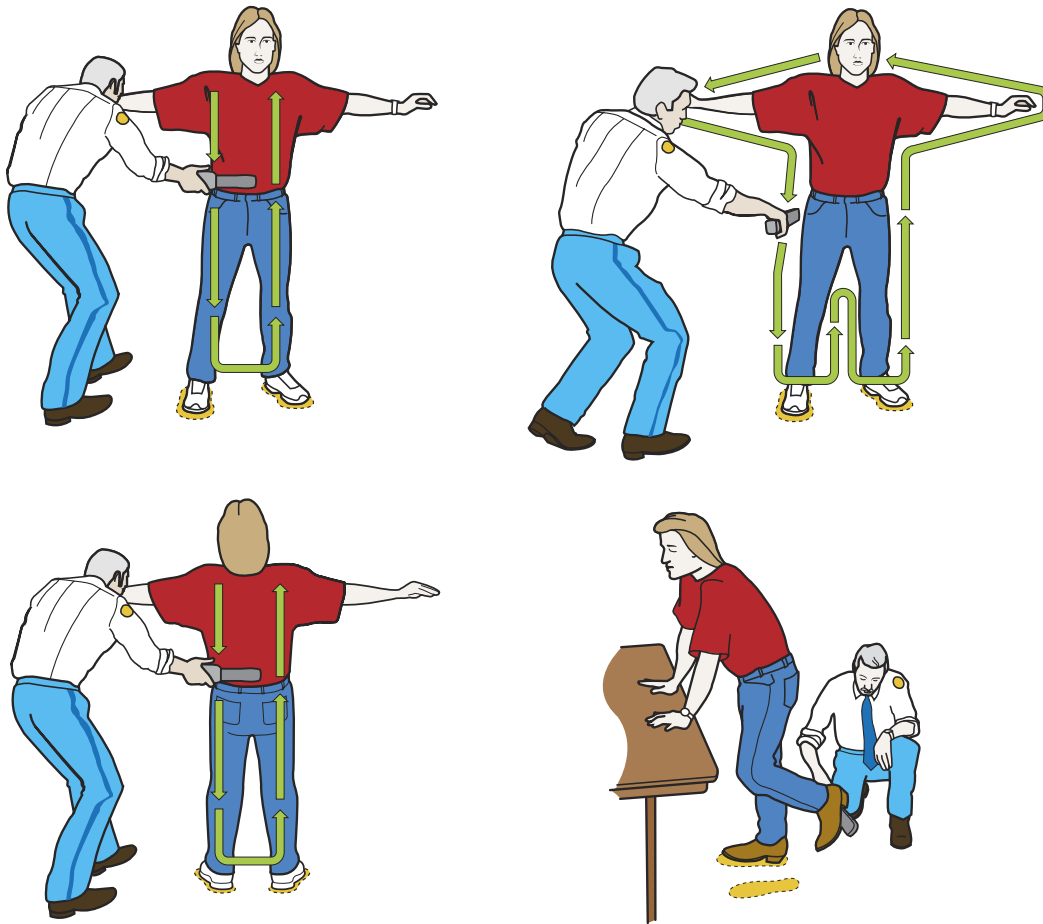
- Do not let the scannee influence you as to what is actually causing an alarm (exhibit 3.11). For instance, if the detector denotes the presence of a suspicious item under a shirt sleeve, do not fail to completely investigate the source of the alarm even though the scannee assures you that it is just his or her watch.

- If the person you are about to scan caused an alarm when walking through a portal metal detector, and your job is to try to locate the source of that alarm on his or her body, do not stop the complete scanning process just because you come across one alarm-causing item. Continue the scan even though you find one or more items in the process.

- The lower abdominal area is particularly difficult to scan because this area is private in nature and because of the metal items usually found in this area: belt buckles, metal buttons or snaps, and metal zippers. When doing the initial front body scan, if an alarm occurs in this area, there are two possible ways to further investigate:

- a. Ask the scannee to undo any belt he or she might have on and have him or her pull the belt ends away from the middle of the body. Now scan the zipper area; the feedback volume from your handheld metal detector should tell you if it is now only sensing a zipper and/or a metal snap, or if a more suspicious item is present and further investigation is needed.

- b. A second approach that some schools use is that, if the lower abdominal area is causing an alarm on the handheld detector, ask the scannee to bend the front of his or her front waistband forward, to ascertain that no weapon is hidden behind it. Facilities need to be available for situations where further investigation can be accomplished privately, but only in the presence of two or more school employees who are the same gender as the scannee.



This is an example of procedures for using a handheld metal detector that has at least a 10-inch zone of direction.

(The preceding guidelines and illustrations were produced by the National Institute of Justice in their report titled *The Appropriate and Effective Use of Security Technologies in U.S. Schools*. National Institute of Justice, U.S. Department of Justice: Washington, DC (September 1999) Available online at: <http://www.ojp.usdoj.gov/nij/pubs-sum/178265.htm>)

There have been no conclusive studies showing that the magnetic fields generated by handheld metal detectors will or will not affect personal medical electronic devices (PMEDs), such as pacemakers, cardiac defibrillators, infusion pumps, spinal cord stimulators, etc. Therefore, caution should be used when operating handheld metal detectors near people with the PMEDs.

Three year warranty

White's Electronics manufacturers warranty covers all parts and labor for three years from the original purchase date.

White's Warranty

The Matrix 100 is warranted by White's Electronics, Inc., under normal use, against manufacturing defects from the date of purchase. Equipment returned to the authorized repair center or the factory during the 36 months from the date of purchase will be inspected and evaluated under the performance specifications. White's Electronics will repair or replace, at no charge to the owner, all parts determined to be faulty. Items not covered by this warranty are: batteries; failures caused by abuse, tampering with the internal electronics; battery acid; repairs made by an unauthorized party, contaminants; use in adverse conditions.

Returns must be prepaid and shipped to:

Whites Electronics, Inc.

Security Division

Repair Department

1011 Pleasant Valley Road

Sweet Home, OR 97386

1-541-367-6121

Specifications

- Alarm: Visual indicator LED with audio or vibrate.
- Battery Consumption = 4.8 mA
- Dimensions: length = 16" / 41 cm
width = 2 3/4" / 7 cm
thickness = 1.17" / 3 cm
- Operating frequency is 125 kHz.
- Weight: 9.5 oz. / 269 grams without battery
11.1oz. / 316 grams with battery

Specifications list

Requirement	NIJ Specification 0602.03	Matrix 100		
		Sensitivity Level		
Sensitivity (measured from surface of detector to surface of object)		Low	High	Medium
Large object size class (zinc gun)				
Scan speed 0.5 to 2.0 m/s	8 cm	11.6 cm	8.6 cm	5.7 cm
Scan speed 0.1 m/s	5 cm	11.6 cm	8.6 cm	5.7 cm
Medium object size class (steel knife)				
Scan speed 0.5 to 2.0 m/s	6 cm	11.5 cm	9.4 cm	6.3 cm
Scan speed 0.1 m/s	5 cm	11.5 cm	9.4 cm	6.3 cm
Medium object size class (aluminum knife)				
Scan speed 0.5 to 2.0 m/s	6 cm	7.0 cm	5.3 cm	3.5 cm
Scan speed 0.1 m/s	5 cm	7.0 cm	5.3 cm	3.5 cm
Small object size class (steel handcuff key)				
Scan speed 0.1 to 2.0 m/s	3.5 cm	7.3 cm	5.6 cm	3.1 cm
Very small object size class (brass pen refill)				
Scan speed 0.1 to 2.0 m/s	1.5 cm	6.7 cm	5.0 cm	3.0 cm
Extremely small object size class (18-gauge stainless hypodermic needle)				
Scan distance and speed undefined		1.2 cm	0.2 cm	NA
Large metal panel interference	No alarm at 50 cm	43 cm	33 cm	21 cm
Scan area is cylindrical 28 cm long. Diameter is 2x the sensitivity distance for the object class plus 2 cm.				
Scan speed				
All object size classes	0.1 to 2.0 m/s	0.05 to 3.0 m/s		
Scan range				
Large object size class				
Scan speed 0.5 to 2.0 m/s	+/- 8 cm	+/- 10 cm 0.05 to 3.0 m/s		
Scan speed 0.1 m/s	+/- 5 cm			
Medium object size class				
Scan speed 0.5 to 2.0 m/s	+/- 7 cm	+/- 10 cm 0.05 to 3.0 m/s		
Scan speed 0.1 m/s	+/- 5 cm			
Small object size class				
Scan speed 0.1 to 2.0 m/s	+/- 5 cm	+/- 10 cm 0.05 to 3.0 m/s		
Very small object size class				
Scan speed 0.1 to 2.0 m/s	+/- 2 cm	+/- 10 cm 0.05 to 3.0 m/s		
Operating temperature (NIJ indoor/outdoor)	-37°C to +65°C -35°F to +149°F	-40°C to +85°C -40°F to +185°F		
Relative humidity	95% 20°C to 60°	C95% 20°C to 60°C		
Audible alarm volume	75 dB at 80 cm	85 dB at 80 cm		
Battery	One 9V	One 9V		
Battery life	16 hours 19°C to 23°C	9V Alkaline 215 hours 9V lithium 430 hours		
Body interference	No alarm when touching hand	Yes		
Electromagnetic emission	CISPR 22, Class B	Yes		
Weight	Less than 500 g	316 g (11 oz) with battery		
Operating frequency		125 KHz		
Peak magnitude of generated magnetic field at surface of detector		0.2 gauss		

Accessories

Batteries/Chargers

Lithium-manganese dioxide battery -20 degree C to +60 degrees C
9V rechargeable battery

4 station charger

10 station charger

Earbud

Earbud jack plug

Holster

Lanyard

Stylus

Matrix Security Academy, Store, Support

We're excited that you chose to purchase a "Matrix 100" handheld metal detector. Please read the "Instruction Manual" for step-by-step instructions. You may also download the manual from our security division web site at www.whiteselectronics.com. We welcome you to shop the White's Electronics Security Division online store. Soon you can attend the free on-line "Matrix 100" security workshop and address your questions to our security experts. Finally, you can register to attend our free quarterly White's Electronics "Security Academy". Thanks again.

Security on-line store

Ballistic nylon briefcase

Batteries

Battery chargers

Caps

DVD

Earbud

Earbud Jack Plug

Holster

Lanyard

Shirts

Stylus

Sweatshirts

Warm up suits

Maintenance

Perform daily inspection to insure that the unit is operating correctly. Check that the battery is "fresh" or charged and the unit is clean.



METAL DETECTORS SECURITY DIVISION

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Made in the USA