

# Installation and Operating Manual

## Metor 900M

P/N 101023281 – Rev. 0.5

***Rapiscan***<sup>®</sup>  
***s y s t e m s***

An OSI Systems Company

## Foreword

Thank You for choosing a Metor product. This manual is intended for the installation and normal daily use of the equipment. In addition to these instructions, local laws and regulations, and requirements by authorities shall be observed.

The user should read this manual and understand its contents before the installation or use of the equipment.

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## Content of this Manual

We have made an effort to ensure that the information in this manual is accurate as of the date of publication. However, the product that you have purchased may contain options, upgrades or modifications not covered by this manual.

If you have any questions about the content of this manual or the product that you have purchased, please contact Rapiscan Systems Customer Service.

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## Revision History

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0.3	2020-01-24	Updates to user interface chapter.
0.4	2020-03-10	Added FCC statement.
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## 1 IMPORTANT INSTRUCTIONS

Read through this chapter carefully before operating the equipment. Keep this manual so that it is always readily available to the user.

The instructions in this manual shall be followed in all situations, when installing, using, or servicing the equipment. Rapiscan Systems cannot be held responsible for any personal or material damage caused by use contradicting the instructions given in this manual.

All safety regulations must be observed. A dangerous or unsafe manner of operation may be a health risk.

Installation may only be carried out by qualified person.

Before installing, operating or servicing the equipment, make sure that it poses no risk of personal or material damage.

Be aware that although the walk-through metal detector unit is heavy it may fall down if a heavy force collides with it. To eliminate the risk of overbalancing the WTMD must be attached (anchored) on the floor.

Do not operate the equipment unless you are fully trained to do so. The operator must know the use, service, and safety instructions of the equipment, and local safety regulations.

Service of Rapiscan products shall be performed only by a Rapiscan Systems qualified service provider or authorized contractor qualified service provider. Make sure that there are no unauthorized persons in the working area when servicing and repairing the equipment.

It is forbidden to operate the equipment when ill, or under the influence of alcohol or drugs.

The equipment may not be connected to mains supply until all other connections necessary for the installation are completed.

The equipment shall always be connected to an earthed socket outlet.

The equipment shall be disconnected from mains supply before servicing, cleaning, or moving it.

Original Metor spare parts should be exclusively used.

Use a damp cloth for cleaning the equipment. Do not use any chemicals or liquid detergents.

The end user is responsible for the final calibration of the equipment for the intended application. It is also the end user's responsibility to regularly verify calibration to the desired sensitivity level by using a suitable test object or objects.

If there is any reason to suspect that the security level of the equipment may have deteriorated due to incorrect operation or external damage, the equipment should be removed from operation and an authorized service provider should be called in.

## 1.1 Types of Alert Messages

### **WARNING**

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

### **CAUTION**

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury and/or equipment damage or generally unsafe practices.

### **NOTICE**

Indicates an important notice to the reader, that does not necessarily involve the possibility of personal injury or equipment damage.

All warnings, cautions, notices and instructions presented in this manual should be read and followed by all personnel who will use or maintain this equipment.

Failure to follow all such warnings, cautions, notices and instructions may result in damage to the equipment and/or injury or death to personnel. Such failure may also nullify any warranties provide by the manufacturer.

## 1.2 Symbols used on Unit and in Manual



### **General Warning Sign**

This sign is used to alert the user to potential hazards. All safety messages that follow this sign shall be obeyed to avoid possible harm.



### **Recycling Symbol**

This symbol means that according to local laws and regulations this product should not be disposed of in the household waste but sent for recycling.



### **CE Symbol**

CE marking on a product is a manufacturer's declaration that the product complies with the essential requirements of the relevant European health, safety and environmental protection legislation.



### **Symbol for Alternating Current (AC)**

## 2 INTRODUCTION

### 2.1 Intended Use

Metor 900M is a walk-through metal detector (WTMD) designed to detect metal objects people are carrying with them. The product is used primarily for weapons detection. Typical applications are:

- Airports and seaports: passenger screening
- Public and private buildings: visitor screening
- Conferences, sporting/special events, stadiums, concerts: access control
- Power plants and factories: employee and visitor screening
- Hotels, restaurants, casinos, discotheques, night clubs: visitor screening

The manufacturer disclaims all liability if the equipment is used for purposes incompatible with the above descriptions.

Metor 900M is suitable for both outdoor and indoor use.

#### **NOTICE**

**In outside use at warm climates unit should be protected from direct sunshine to prevent surfaces from heating over specified temperature range.**



## 2.2 Product Safety

Metor 900M has been tested against and complies with applicable magnetic field standards concerning human exposure and pacemaker safety.

Metor 900M conforms to the applicable international standards for electrical safety and electromagnetic compatibility.

### **WARNING**

Following warning is required by NIJ Standard-0601.02, Walk-Through Metal Detectors for Use in Concealed Weapon and Contraband Detection, paragraph 2.9.1. item f:

**“This Device May Affect Personal Medical Electronic Devices.”**

### **FCC ID: 2AVRB-METOR-900M**

This device complies with Part 15 of the FCC rules.

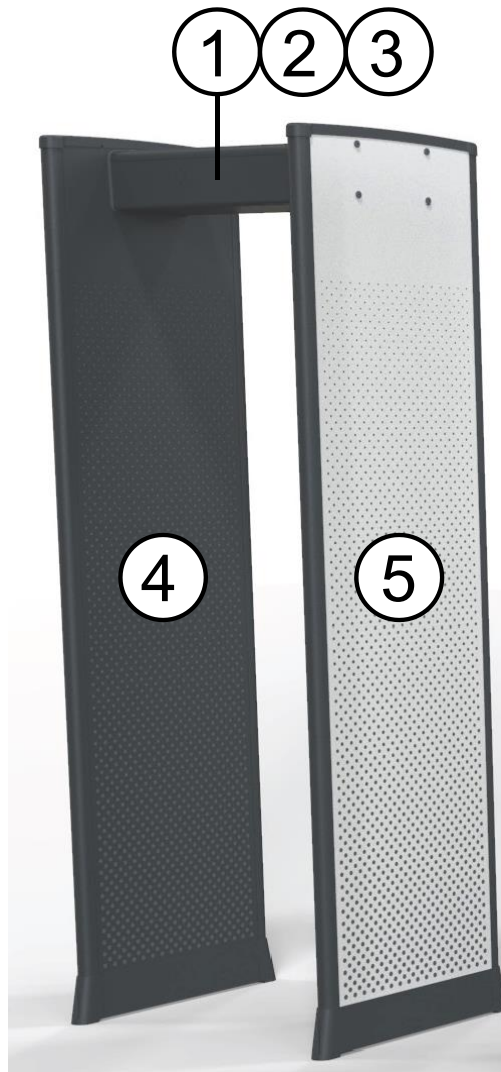
Operations is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

### **WARNING**

**Changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.**

## 2.3 Main Components



1. Cross piece including display and keypad (MCES5322-30)
2. Electronics set, inside cross piece, (MELS5317)
3. AC/DC power supply set, inside cross piece (MPSS5321)
4. Transmitter panel set, i.e. TX panel, (MTXS5326)
5. Receiver panel set, i.e. RX panel, (MRXS5325)

## 2.4 Battery Backup Set

A battery backup accessory MBBS5332, Rapiscan part number 101010726, is available for emergency power in case of power outage.

The battery backup guarantees uninterrupted operation in case of a temporary power outage. The unit is installed inside the cross piece.

For more information on battery backup refer to its manual.

## 2.5 Technical Data

### Power

- Voltage, nominal ..... 100 – 240 VAC
- Voltage, absolute limits ..... 90 – 264 VAC
- Frequency..... 47 – 63 Hz
- Power consumption, typical..... 30 W
- Power consumption, maximum ..... 65 W, with battery backup charging
- Power consumption, at standby..... 6 W

### Recommended operating conditions

- Environment ..... both outdoor and indoor use
- Ambient temperature..... -20 °C – +60 °C / -4 °F – +140 °F  
-15 °C – +45 °C / +5 °F – +113 °F,  
when battery backup is in use
- Storage temperature ..... -40 °C – +70 °C / -40 °F – +158 °F
- Relative humidity..... 0 – 100 %
- Elevation..... max. 3000 m / 9840 ft
- Ingress protection rating..... IP65
- Pollution degree..... 2

### Dimensions and weight

- Height ..... 224 cm / 88 in
- Internal height ..... 206 cm / 81 in
- Width (standard) ..... 87 cm / 34 in
- Width (with extension set) ..... 92 cm / 36 in
- Internal width (standard)..... 76 cm / 30 in
- Internal width (with extension set) ..... 82 cm / 32 in
- Depth..... 65 cm / 26 in
- Weight ..... 60 kg / 133 lbs

### 3 INSTALLATION

When planning the installation of a WTMD there are a few important things that should be considered. The optimum operation of the WTMD as well as maximum traffic flow at the security checkpoint can be ensured only when these factors have been taken into account.

#### 3.1 Checkpoint Layout

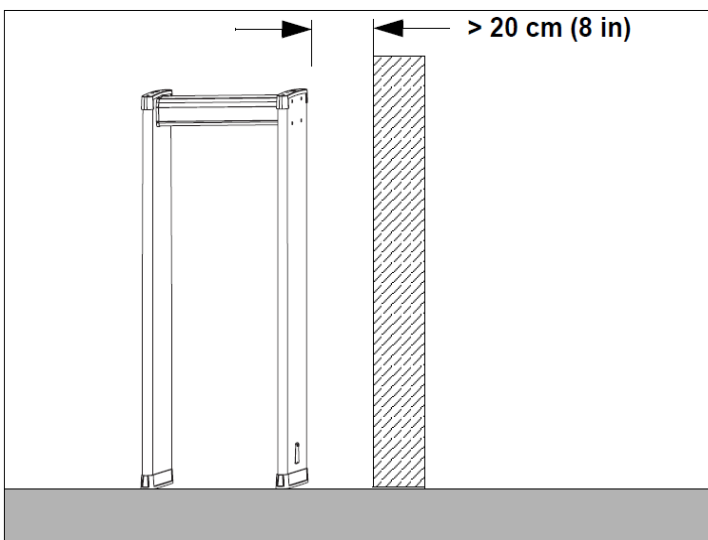
The layout of a security checkpoint should be planned carefully before installing the equipment in order to maximize the traffic flow. In addition to the considerations regarding mechanical and electrical interferences at the installation site, operative security checking should be organized properly. The functionality of a checkpoint is very much affected by the following:

- Queuing to enter the WTMD should be arranged so that only the person screened is in the immediate vicinity of the WTMD.
- The secondary screening of persons causing alarms should not stop the screening with the WTMD.
- The checking of hand luggage should be arranged so that it does not cause extraneous alarms.

#### 3.2 Minimizing External Interference

It is important to minimize the effect of different sources of interference that may have an influence on the operation of the WTMD. The following recommendations should be considered when selecting the installation site.

##### Static Metal



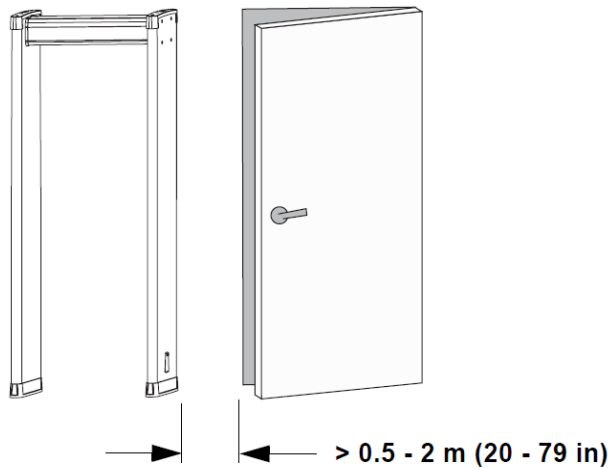
##### Static metal

Large static or stationary metal objects should be at least 20 cm (8 in) away from the WTMD. The effect on sensitivity is small but may make the WTMD more prone to the effects of vibration.

##### Floor vibration

The floor should be even and solidly supported to prevent vibration. Especially when there are vibrating metal constructions beneath the floor, people walking through the WTMD can cause unnecessary alarms.

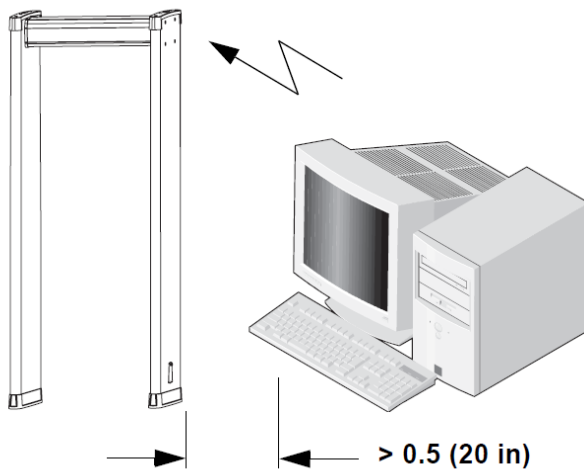
**Moving Metal**



**Moving metal objects**

Large moving metal objects outside the WTMD should be kept at least 0.5 - 2 m (20 - 79 in) away from the WTMD to avoid false alarms. The required distance between the moving metal and the WTMD varies depending on the size of the metal object and the sensitivity setting of the WTMD.

**Electromagnetic Interference**



**Radiated EM interferences**

The distance between electromagnetic interference sources and the WTMD should be maximized. Recommended minimum distance is 0.5 m (20 in). However, the exact distance has to be determined for each case separately, i.e. by moving the WTMD and the interference source in respect to each other until the optimal position is found. Interference may be generated for example by electrical control panels, radio and computer equipment, video monitors, powerful electric motors and transformers, AC power lines, thyristor control circuits, flickering fluorescent lighting, and arc welding equipment.

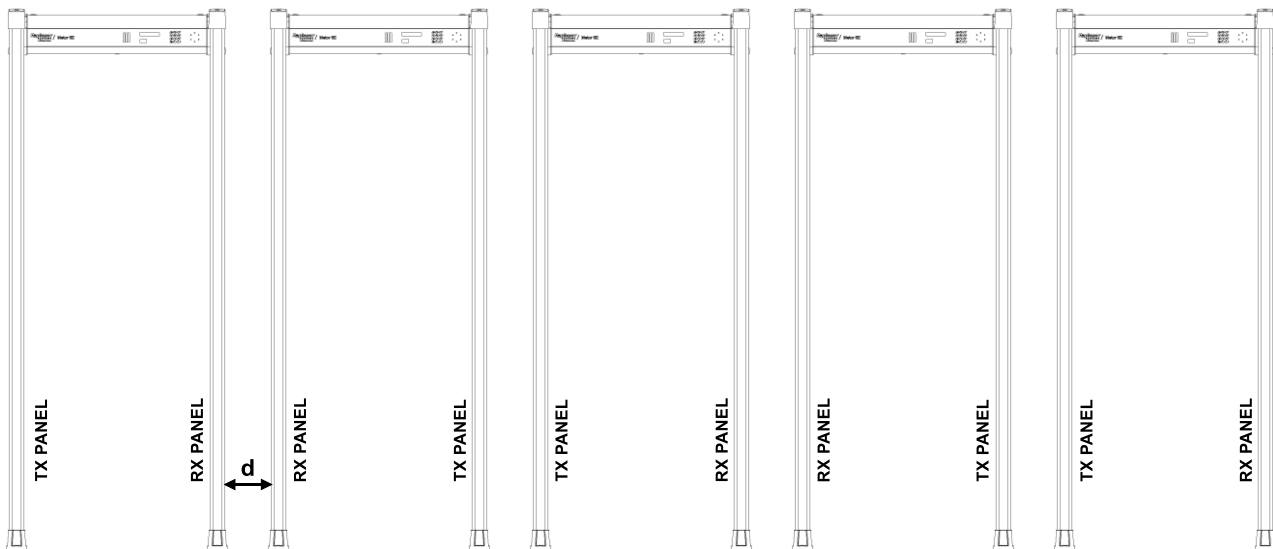
**Conducted EM interferences**

Plug the power cord to a line not sharing any heavy loads, like large electric motors. They can cause major power or voltage surges in the line.

The magnitude of interference may vary depending on the selected operating frequency of the unit. If the source of interference can not be removed or its distances to the unit changed select an operating frequency which minimizes the interference. However, if the frequency spectrum of the interference is broad changing operating frequency of the unit may not help.

### 3.3 Side-by-Side Operation

Side-by-side operation means that two or more Walk Through Metal Detectors operate close to each other. When operated side-by-side, WTMDs may interfere with each other to some extent. The level of interference depends on the distance between the units, their operating frequencies and selected detection sensitivity.



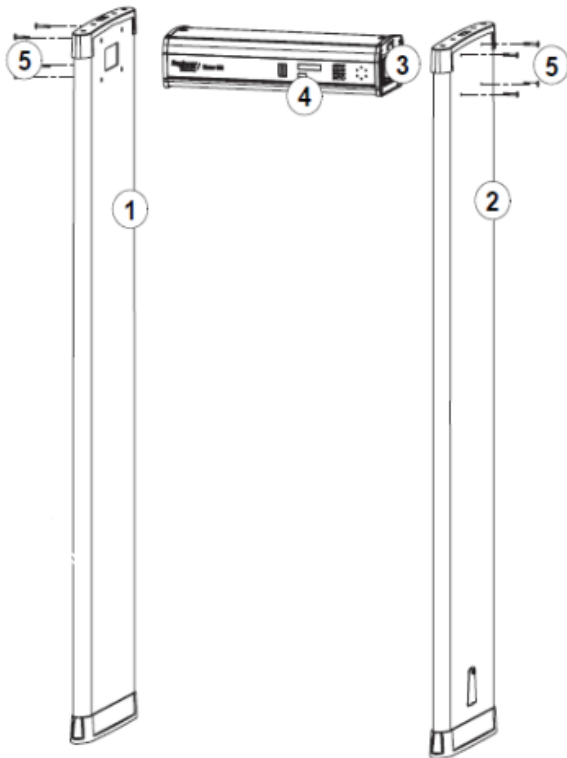
When using two or more Metor 900M units near to each other assemble the units so that RX panels or TX panels of adjacent units are next to each other as illustrated in the figure above. With just two units it is recommended to have RX panels of adjacent units next to each other.

The recommended minimum gap (marked as *d* in the figure) between the units is 5 cm (2 in). However, actual usable minimum gap between the units depends on installation site, the number of units, and selected detection sensitivities.

When operating two or several units close to each other their operating frequencies need to be different. Metor 900M has ten different operating frequencies to enable operation of multiple units close to each other. All the operating frequencies are suitable for side-by-side use.

When selecting operating frequencies for several units turn on the units one at the time. Turn on first the outmost unit and select a suitable frequency for it. Then turn on the next unit and select a suitable frequency for it. Do not turn off the first unit. Do the same for all the units one at the time. If you have more than ten units or some frequencies are not suitable select the frequency of the first unit.

### 3.4 Mechanical Assembly



The items needed in mechanical assembly are packed in the box containing the cross piece.

For checking the distance of the coil panels there is a pasteboard gauge in the cross piece box.

Ref	Part	Pcs
1.....	TX panel.....	1
2.....	RX panel .....	1
3.....	Cross piece .....	1
5.....	Mounting screws.....	8
	Anti-skid pads.....	4
	Allen key.....	1

The following parts illustrated in picture are integrated into coil cross piece, but they must be considered in assembly:

Ref	Part	Pcs
4.....	Display and keypad .....	1

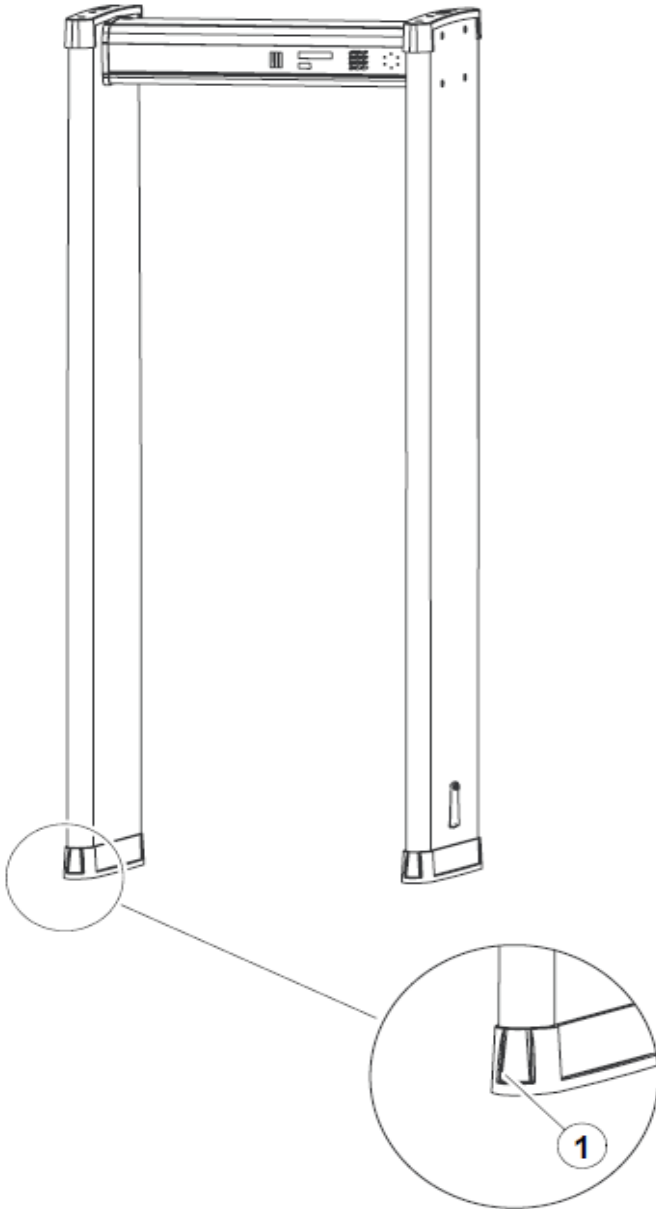
- First define the sides of the coil panels if you have side-by-side operation.
- Both panels have zone display on both edges. Zone displays are also used for traffic light function.
- Lay the coil panels on the floor.
- Install the cross piece with display and keypad towards the exit side.
- Take cable assembly (and AC jumper cable) out of the coil panel and put it into the cross piece.
- Place the cross piece to the holes in the coil panel and fasten using the mounting screws.
- Repeat with the other panel.
- Pull AC jumper cable out of boot and connect mains power cord to it. Connectors can be inserted back into the boot to prevent accidental disconnection and for protection against weather.
- Do the final tightening of the screws after lifting the unit to ensure that the panels are parallel.



**CAUTION**

While assembled three persons are recommended for safe lifting and lowering of the equipment.

### 3.5 Floor Fixing



- Lift the unit up to a vertical position in its final mounting location.
- Check that the panels are parallel both in walking direction and sidewise. Use the pasteboard gauge provided to ensure that distance between panels is the same at top and at bottom.
- Tighten the mounting screws.
- Use the mounting holes (1) in the panel boots to fix the unit to the floor with screws.
- If drilling holes to the floor is not preferred you can use the flat areas under the boots to attach the unit to the floor with double sided tape or suitable adhesive.
- Do not fix the unit before you have checked that there is no excess interference at intended position.

#### **CAUTION**



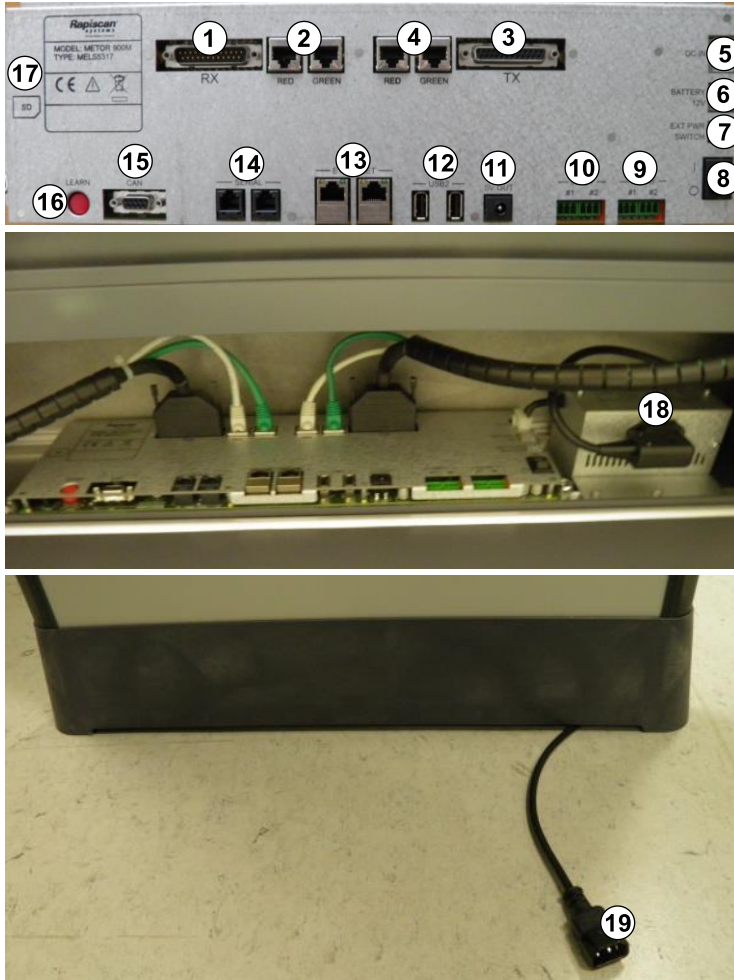
To eliminate the risk of overbalancing the equipment must be fastened to the floor.

The equipment must be disassembled before carrying by a single person or suitable carrying equipment must be used. Care must be taken not to overbalance the equipment when screws are removed from the floor.



### 3.6 Electrical Connections

- Open cross piece hatch to access connections to the electronics.
- Mains power cord can be connected either to AC jumper cable in TX panel or, if mains connection is on ceiling, it can be taken into the cross piece using lead-ins on upper inner edge of the panels and connected directly to power supply.



**Connections:**

1. RX panel coil connector
2. RX panel zone display connectors  
Note color coding of connections
3. TX panel coil connector
4. TX panel zone display connectors  
Note color coding of connections
5. DC power input connector  
Connected at factory
6. Connector for Battery Back-p
7. Connector for optional external power switch
9. Digital outputs
10. Digital inputs
11. 5 V OUT (0.5 A max.)
12. USB ports  
Use Metor USB to Ethernet adapter for connection to MetorNet
13. Ethernet ports (service only)
14. Serial (RS-232) ports (service only)
15. CAN bus port (service only)
17. SD memory card slot
18. AC input connector
19. AC jumper cable connector for mains cord

**Switches:**

8. Power switch
16. LEARN button

- Do not force connections to avoid damaging the contacts.
- Panel coil connectors are polarized to avoid misconnections.
- Observe color coding when connecting zone display cables.



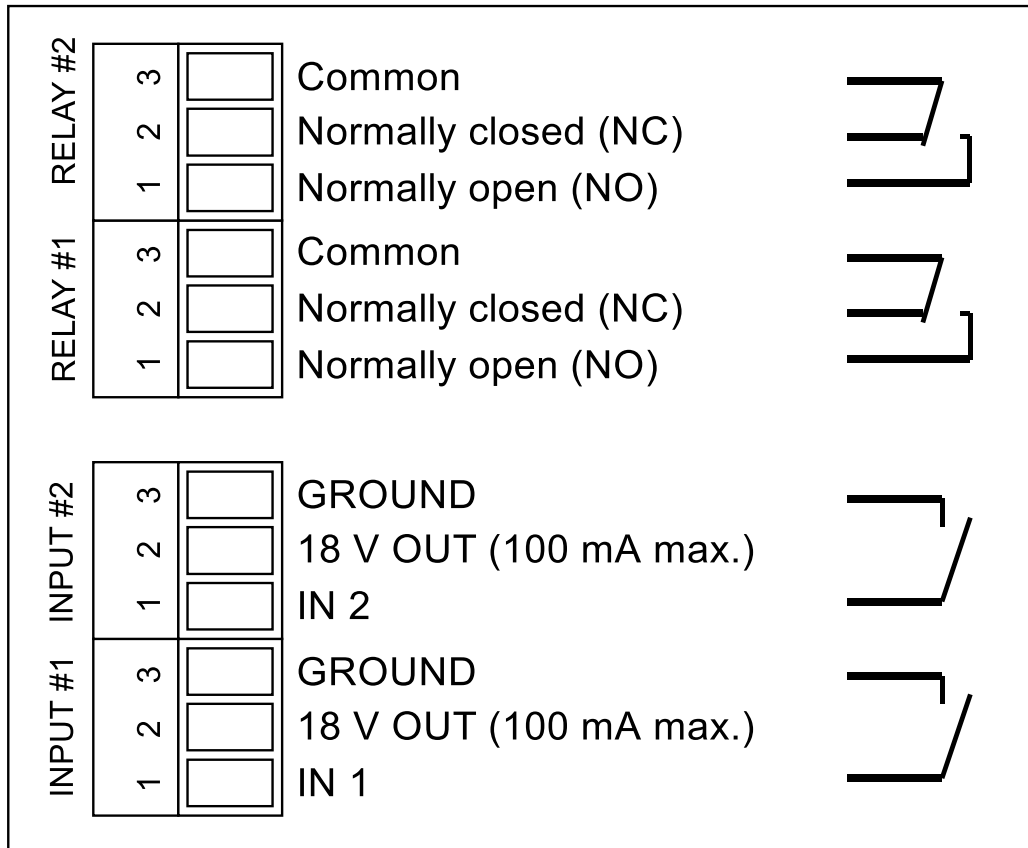
**WARNING**

Mains power cord shall be located to be easily accessible for disconnection.

### 3.7 Connections for Digital I/O

The Metor 900M has two configurable digital inputs and two configurable digital outputs.

The digital inputs have a pull-up resistor to 3.3 V. Maximum input voltage is 5 VDC. Recommended connection is a switch that connects input (pin 3) to ground (pin 1).



Maximum load for each relay output is 24 V and 1 A.

#### **WARNING**



Line voltage or any circuit connected to line voltage may not be connected to any of the connectors in the electronics, including the relay outputs. External isolation circuitry (double/reinforced insulation) must be used if a circuit connected to line voltage must be controlled.

## 4 STARTUP AND SHUTDOWN

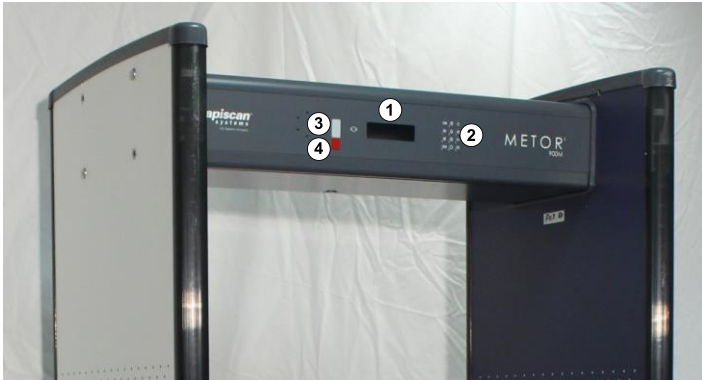


- Metor 900M is turned on and off from the power switch on the main electronics inside the cross piece.
- To access the switch open the cross piece hatch with the key provided.
- The unit can be switched to standby without the need to open the cross piece hatch by enabling the standby feature from the user interface. Standby state is turned on and off from keypad on the cross piece. During standby all displays and lights are off and metal detection is disabled with magnetic field generation turned off.
- After switching on Metor 900M runs a self-test sequence before normal operation starts.

### NOTICE

**In permanent outdoor installations it is recommended to use standby feature to turn power off instead of using on/off switch. Standby power keeps temperature inside cross piece above ambient and thus prevents possible moisture condensation inside the cross piece due to thermal cycling effects.**

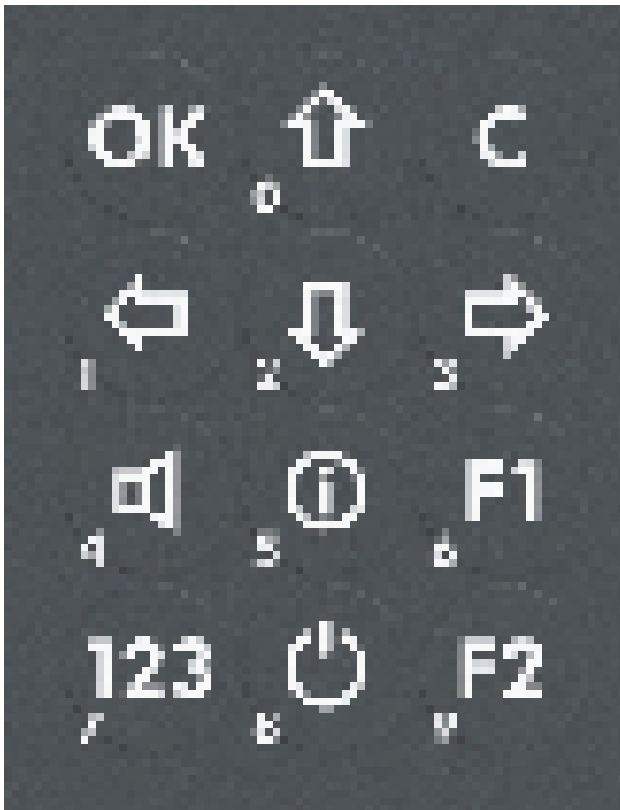
## 5 DISPLAYS AND KEYPAD



- All functions of Meteor 900M are controlled using the keypad and the graphical display on the cross piece.
- During normal operation the status of the unit is shown on status LED display and the graphical display.

Cross piece has:

1. Graphical display
2. Keypad
3. Status LED window
4. IR window for communication with remote control.



Keypad features are:

- **<OK>** This button is used to accept the functions selected and the changes made to settings, as well as to navigate the menus.
- **<◀>, <▲>, <▼>, <▶>** The arrow keys are used for navigation of menus and to change the settings.
- **<C>** This button is used to return to a higher menu level or to cancel the current function without changing the settings. This button can also operate as a standby switch.
- **<Speaker>** This button is used to adjust the volume (no access code required).
- **<i>** This button can be pressed to receive instructions.
- **<F1>** and **<F2>** User programmable buttons.
- **<123>** This button is used to access the unit's settings for editing or to directly enter numeric values. You can enter a value by pressing the corresponding number key(s).
- **<Standby>** This button turns unit to standby and back on.

## 6 USER INTERFACE

### 6.1 Access to User Interface

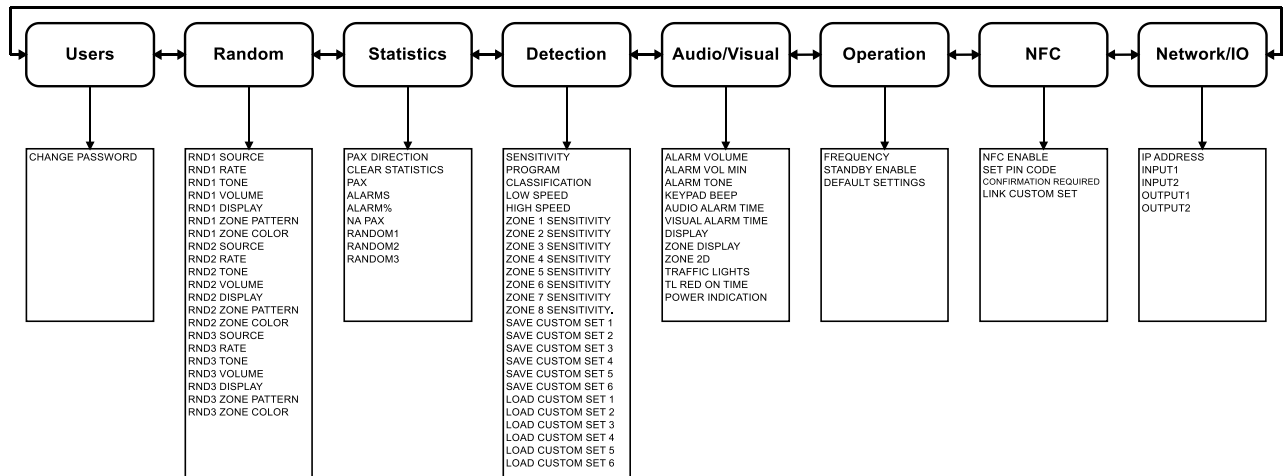
To adjust unit's parameters or to use functions a user needs to enter the user interface:

- Press **<OK>** key.
- Select either SUPERUSER or USER using arrow keys and confirm selection with **<OK>** key. SUPERUSER has access to all user interface items while USER can only view and clear passenger and alarm counters.
- Enter password followed by **<OK>**. Default password for SUPERUSER is 1, 2, 3, and for USER 7, 8, 9.

With **<speaker>** key one can directly adjust alarm volume without entering user interface. Note that minimum adjustable volume is limited by a separate parameter only accessible in user interface.

### 6.2 User Interface Structure

Complete user interface structure accessible to SUPERUSER is shown below. User interface has two levels with menu icons on upper level and menu item lists on lower level. Left and right arrows are used to move between menu icons. Press **<OK>** key to access menu items of a highlighted icon. Up and down arrows are used to move through item list and **<OK>** key to select highlighted item.



### 6.3 Users Menu



Item	Possible values	Default setting	Description
CHANGE PASSWORD	-	-	Change SUPERUSER or USER password.

### 6.4 Random Menu



Metor 900M has three random alarm generators. The generators can be individually configured and can be simultaneously in operation. All generators have same parameters.

Item	Possible values	Default setting	Description
RND1 SOURCE	NO ALARM ALARM	NO ALARM	Selects whether random alarms are generated for non-alarming or for alarming passengers. Alarming passenger means a passenger that carries metal items causing an alarm when passing through the unit. In case a random alarm is generated for an alarming passenger normal alarm is not activated.
RND1 RATE	0 - 100	0	Random alarm rate target value in percentages. When value is 0 no random alarms are generated.
RND1 TONE	1 - 5	2	The audible alarm tone used for a random alarm. Same selection of tones is available as for normal alarms.
RND1 VOLUME	0 - 9	5	The audible alarm volume used for a random alarm. Same selection of volumes is available as for normal alarms. When value is 0 alarm is muted. Random volume cannot be less than value set by ALARM VOL MIN parameter.
RND1 DISPLAY	TEXT SIGNAL	TEXT	TEXT: display shows text "random 1 alarm" when a random alarm is generated. SIGNAL: display shows same information during random alarms as during normal alarms.

Item	Possible values	Default setting	Description
RND1 ZONE PATTERN	0 – 4	1	Selection of zone display pattern during random alarms. 0: no zone display. 1: segments in the middle are lighted. 2: every second segment is lighted. 3: every third segment is lighted. 4: every fourth segment is lighted. Note that if zone displays are disabled in Audio/Visual menu no random zone pattern are shown.
RND1 ZONE COLOR	RED GREEN BLUE CYAN YELLOW MAGENTA	RED	Selection of zone display color during random alarms.

### 6.5 Statistics Menu



Item	Possible values	Default setting	Description
PAX DIRECTION	1, 2	1	Selection of direction of passenger flow. Defines also ENTRY and EXIT sides of the unit. 1: TX panel is on left side when passing through the unit from ENTRY side to EXIT side. 2: TX panel is on right side.
CLEAR STATISTICS	-	-	Resets all counters to zero.
PAX	-	-	Displays the number of passes through the unit.
ALARMS	-	-	Displays the number of alarms caused by metal items.
ALARM%	-	-	Display the alarm rate percentage (ALARMS/PAX%).
NA PAX	-	-	Displays the number of passes where no alarm was caused by metal items.
RANDOM1	-	-	Displays the number of random alarms generated by random alarm generator 1.
RANDOM2	-	-	Displays the number of random alarms generated by random alarm generator 2.
RANDOM3	-	-	Displays the number of random alarms generated by random alarm generator 3.

**NOTICE**

Maximum value of counters is 4 294 967 295. Should a counter ever reach its maximum value it will stay at the maximum value. Use the function "CLEAR STATISTICS" to reset counters.

**6.6 Detection Menu**

Item	Possible values	Default setting	Description
SENSITIVITY	1 - 200	100	Selection of overall detection sensitivity. The larger the sensitivity value the smaller a metal item causes an alarm.
PROGRAM	see following table		Selection of detection program. The unit has various detection for selection of suitable detection performance for different types of items and to optimize discrimination.
CLASSIFICATION	OFF METAL ITEM ITEM+METAL	OFF	Functionality for identifying either metal type or item class.
LOW SPEED	1, 2	2	Selection of low speed range. 1: for very slowly moving items. 2: for items carried through by people.
HIGH SPEED	1, 2, 3	2	Selection of high speed range. 1: for high external interference environments. 2: for items carried through by people. 3: for very quickly moving items. Note that interference attenuation diminishes with higher value.
ZONE 1 - 8 SENSITIVITY	-100 – +100	0	Selection of zone sensitivities. Parameters adjust relative sensitivity of confined vertical zones. Note that effective areas of adjacent zones can overlap.
SAVE CUSTOM SET 1 - 6	-	-	Saves the current values of parameters excluding PAX DIRECTION and FREQUENCY to selected non-volatile memory location. Six sets can be stored.
LOAD CUSTOM SET 1 - 6	-	-	Reverts to using the parameter values stored earlier. New values are applied immediately.



<b>Metor 900M DETECTION PROGRAMS</b>	
<b>Name</b>	<b>Description</b>
<b>CRITICAL INFRASTRUCTURE</b>	
CI1	
CI2	
CI3	
CI4	
<b>AVIATION</b>	
EU1	ECAC level 1
EU2	ECAC level 2
<b>MASS TRANSIT</b>	
MT1	
MT2	
<b>HIGH FOOTFALL</b>	
HF1	
HF2	
HF3	
HF4	
<b>LAW ENFORCEMENT</b>	
LE1	
LE2	
NIJ LARGE	NIJ Standard-0601.02 large object size
NIJ MEDIUM	NIJ Standard-0601.02 medium object size
<b>LOSS PREVENTION</b>	
ALL METALS	Balanced detection for all metal types
MAGNETIC1	Selective to magnetic metals, selectivity increases with number
MAGNETIC2	Selective to magnetic metals, selectivity increases with number
MAGNETIC3	Selective to magnetic metals, selectivity increases with number
MAGNETIC4	Selective to magnetic metals, selectivity increases with number
NON-MAGNETIC1	Selective to non-magnetic metals, selectivity increases with number
NON-MAGNETIC2	Selective to non-magnetic metals, selectivity increases with number
NON-MAGNETIC3	Selective to non-magnetic metals, selectivity increases with number
NON-MAGNETIC4	Selective to non-magnetic metals, selectivity increases with number
NON-FERROUS1	Selective to non-ferrous metals, selectivity increases with number
NON-FERROUS2	Selective to non-ferrous metals, selectivity increases with number
NON-FERROUS3	Selective to non-ferrous metals, selectivity increases with number
NON-FERROUS4	Selective to non-ferrous metals, selectivity increases with number
ALL METALS HS	Balanced detection for all metal types, increased sensitivity

## 6.7 Audio/Visual Menu



Item	Possible values	Default setting	Description
ALARM VOLUME	0 - 9	5	Selection of audible alarm volume. When value is 0 alarm is muted. Volume cannot be less than value set by ALARM VOL MIN parameter. Note that volume can also be adjusted directly using <speaker> key without entering user interface.
ALARM VOL MIN	0 - 9	2	The minimum value to which audible alarm volume can be adjusted.
ALARM TONE	1 - 5	2	Selection of audible alarm tone.
KEYPAD BEEP	YES/NO	YES	Selection whether a beep is made when a keypad button is pressed.
AUDIO ALARM TIME	0.4 – 6.0 s	2.0 s	Selection of the time audible alarm is on.
VISUAL ALARM TIME	0.4 – 6.0 s	2.0 s	Selection of the time visual alarm is on. Note that VISUAL ALARM TIME cannot be shorter than AUDIO ALARM TIME.
DISPLAY	SIGNAL COUNTERS PARAMS BLANK	SIGNAL	Selection of what is shown on display. SIGNAL: signal size is shown. COUNTERS: passenger and alarm counter values are shown. PARAMS: sensitivity value and detection program are shown. BLANK: display is blank.
ZONE DISPLAY	EXIT ENTRY BOTH OFF	EXIT	Selection of the side(s) on which zone displays are operational. ENTRY and EXIT sides are defined by PAX DIRECTION parameter.
ZONE 2D	YES/NO	YES	YES: zone displays show in addition to vertical information and the side of the alarming items. If alarming item is passing through the center of the unit both zone displays are lit. NO: zone displays on both panels show the same information of the height(s) of alarming (items).
TRAFFIC LIGHTS	ENTRY EXIT BOTH OFF	ENTRY	Selection of the side(s) on which traffic lights are operational. ENTRY and EXIT sides are defined by PAX DIRECTION parameter.

Item	Possible values	Default setting	Description
TL RED ON TIME	0.0 – 6.0 s	0.0 s	Selection of the time traffic lights stay red after passenger exits the unit. In case of an alarm traffic lights stay red as long as there is an alarm indication.
POWER INDICATION	EXIT ENTRY BOTH OFF	EXIT	Selection of the side(s) on which power indication is shown. Power indication is green lights on top segment of zone displays.



**CAUTION**

When using the maximum setting the audible alarm volume is exceeding 90 dBa at distances less than 1 m.

**6.8 Operation Menu**



Item	Possible values	Default setting	Description
FREQUENCY	1 - 10	1	Selection of operating frequency set of the unit. With units operating close to each other select different frequency to each unit. Also in case of the installation site having external interferences affecting the unit a frequency set other than default may need to be selected.
STANDBY ENABLE	YES/NO	YES	Selection whether <standby> button on keypad is enabled or not. When enabled pressing the button switches the unit to standby and back to normal operation. During standby detection and all indicators and turned off.
DEFAULT SETTINGS	-	-	Resets all parameters to default values.

## 6.9 NFC Menu



Metor 900M is equipped with NFC capability. You can use Rapiscan supplied NFC cards to quickly change unit's parameter values. NFC read area is indicated by NFC symbol on the cross piece between status LED window and display.

Item	Possible values	Default setting	Description
NFC ENABLE	YES/NO	NO	Selection of whether NFC functionality is enabled or not.
SET PIN CODE	-	-	For setting an optional 4 digit pin code to a NFC card. If set pin code needs to be entered before card can be used.
CONFIRMATION REQUIRED	YES/NO	NO	If set to YES confirmation is requested before NFC card operation is done.
LINK CUSTOM SET	-	-	Selection of a custom parameter set to be linked to a NFC card. After the link is made NFC card can be used to load selected custom set parameters without a need to enter user interface.

## 6.10 Network/IO Menu



Item	Possible values	Default setting	Description
IP ADDRESS	-	-	Shows unit's IP address when unit is connected to network.
INPUT1	OFF Manual alarm Alarm inhibit	OFF	Configuration of digital input1. OFF: input is disabled. MANUAL ALARM: when input is closed a metal detection alarm is made. ALARM INHIBIT: when input is closed alarms are disabled.

Item	Possible values	Default setting	Description
INPUT2	OFF Manual alarm Alarm inhibit	OFF	Configuration of digital input2. Same values as for input1. If both inputs are configured for same operation a logical OR is made between them. In case of two conflicting simultaneous inputs priority is following: 1. MANUAL ALARM 2. ALARM INHIBIT
OUTPUT1	OFF ALARM PAX	OFF	Configuration of relay output1. OFF: output is disabled. ALARM: output is closed for the duration of alarm. PAX: output is closed momentarily when PAX counter is increased.
OUTPUT2	OFF ALARM PAX	OFF	Configuration of relay output2. Same values as for output2. Both outputs can be configured to same operation.

**NOTICE**

For connections of digital I/O refer to chapter 3.7.

## 7 MAINTENANCE

### 7.1 Periodic Maintenance

The Metor 900M is virtually maintenance-free. However, the operation should be checked regularly, preferably daily, to ensure that the security is not compromised.

For additional information on maintenance please refer to the Maintenance Manual.

### 7.2 Replacing Input Fuse

Inside the electronics (MELS5317) there is a 5.0AT fuse F9 protecting the electronics. Fuse type is Littlefuse Nanofuse 0454005.MR, part number 58105674.



#### **WARNING**

Replace fuse only with equivalent type to avoid risk of fire.

### 7.3 Replacing MELS Battery

Inside the electronics (MELS5317) there is a CR2032 type 3 V lithium battery that powers the real time clock while power is off. When battery is empty, the clock resets to January 1, 2010. Empty battery can also corrupt counter statistics. Typical battery life is over ten years.



#### **WARNING**

Replace battery only with equivalent type to avoid risk of fire.

## 8 TROUBLESHOOTING

### 8.1 Fault Conditions

Fault	Possible cause	Recommended actions
Random alarming	External interference	Change operating frequency. Relocate the unit. Reduce sensitivity.
High interference level	Selected frequency not suitable for the environment	Change operating frequency.
	Interference source close to the unit	Remove interference source or relocate the unit.
	Large moving metal close to the unit	Increase distance between the unit and the metal.
	Floor vibrating when people walk through the unit	Improve support of the floor or relocate the unit.
No power to electronics	Power cable loose	Check power cable connections.
	Power supply faulty	Call service.
Unit does not start	Mains not connected	Check power connections.
	Power switch is off	Turn power switch on.
	Electronics faulty	Call service.
Zone displays not working	Zone displays not enabled	Check from user interface that zone displays are enabled and correct direction is selected.
	Zone display cables misconnected	Check cable connections.
	Zone displays faulty	Call service.
Passenger counting does not work	Zone display cables misconnected	Check cable connections.
	IR transmitters or receivers faulty	Call service.

## 9 DISPOSAL OF EQUIPMENT

When the equipment is taken out of use, it should be disposed of by observing the following environmental aspects:

- The steel and aluminum of the equipment structures, the copper of the cables, and the precious metals in the electronics should be recycled as raw materials and used for production of new metal products.
- Materials that can be incinerated include fiberboard and plastics, excluding PVC.
- The packaging material of the product is of 100 % recyclable materials.
- Parts made of PVC, electric components, and other hazardous waste shall be disposed of according to the local laws and regulations.



## APPENDIX A: Definition of Terms

Some special terms used in this manual are explained below.

**WTMD** - Walk Through Metal Detector

**Sensitivity** - Parameter for defining the size of the metal items that will generate an alarm. When sensitivity is increased smaller metal items will be detected.

**Discrimination** - The WTMD's ability to differentiate harmless items from weapons. The alarm rate of a WTMD at a security check point indicates the discrimination ability of the equipment. Discrimination is affected by several factors e.g. sensitivity level, passenger profile, season (cold or warm) etc.

**Unwanted alarm** - (=nuisance alarm). Alarm caused by harmless metal items that people carry with them through the WTMD.

**False alarm** - Alarm caused by some other reason than metal objects (e.g. electrical interferences). Alarms caused by metal objects (wanted or unwanted) are not false in the case of a metal detector.

**Alarm rate** - The amount of alarms due to metal items as a percentage of the total number of people passing through the WTMD. The alarm rate is affected by the discrimination ability of the WTMD. If discrimination is poor i.e. there are a lot of alarms due to harmless items the alarm rate is higher. **Note! Alarms caused by electrical interferences or reasons other than items taken through the WTMD, are not included in the alarm rate.**

**Throughput rate** - The maximum number of people in a given time that can pass through without affecting the detection performance of the WTMD. Represents the WTMD's ability to return to stand-by condition after a person has walked through. In practice, the maximum throughput rate is only theoretical and can usually not be reached because it is limited by the checking procedure and maximum walking speed of people.

**Object speed response** - The ability of a WTMD to maintain the sensitivity level unchanged when people pass through at different speeds.

**Calibration** - Procedure to set the parameter values of the WTMD for reaching the optimal performance according to the requirements of the application.

**Side-by-side use** - Two or more WTMDs are operated so closely-spaced that their electromagnetic fields affect each other's operation. The effect of the adjacent WTMD can be minimized by using different operating frequencies.

**Operating frequency** - The frequency of the electromagnetic field generated by a WTMD. Usually WTMDs have several different operating frequencies. When calibrating a WTMD at the installation site the operating frequency with lowest interference level is chosen. Several operating frequencies enable also side-by-side use of multiple WTMD without synchronization cables.

**Detection uniformity** - The ability of a WTMD to maintain uniform sensitivity throughout the whole detection area regardless of the shape and orientation of the metal item. Detection uniformity directly affects the discrimination capability of a WTMD. The sensitivity of a WTMD is usually set according to the weakest position of the detection area. In case of poor detection uniformity this may lead to unnecessary high sensitivity in other parts of the passage, considerably degrading discrimination. When the detection uniformity of a WTMD is tested it should always be done with real objects e.g. a weapon, or their simulators. Cylinders or spheres as test items can give wrong indications on the true detection uniformity of a WTMD.

**Interference immunity** - The operation of a WTMD can be affected by electrical or mechanical interferences. Electrical interferences are caused by other electrical equipment which are usually located near the installation site. Electrical interferences can be conducted through the mains power line or radiated. Mechanical interferences are caused by e.g. moving metal items near the WTMD or vibrating behind wall or underneath floor constructions. Good interference immunity can only be achieved through effective hardware and software filtering as well as specialized coil design.

**Critical test object** - The most difficult object to be detected from a group of test objects. Requires the highest sensitivity for detection.

## APPENDIX B: Contact Information

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