MacDonald Humfrey (Automation) Ltd

Mach-SmartLane®

Automated Tray Return System

HF RFID Handheld Scanner User Manual

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Chapter 1 Introduction to the HF RFID Handheld Scanner

Overview

Thank you for using the HF RFID Handheld Scanner from MacDonald Humfrey (Automation) Ltd.

This device uses HF (**H**igh **F**requency) radio waves to read pre-programmed RFID (**R**adio **F**requency **ID**entification) tags, which are mounted on the trays that form part of the Mach-SmartLane automated tray X-ray and return system.

This product has been designed to be used solely in conjunction with the Mach-Secure range of products from MacDonald Humfrey (Automation) Ltd.. It is not designed for use by the general public or for domestic applications.

Safety information

General safety notes

The HF RFID Handheld Scanner is designed and manufactured with state-of-the-art technology and conforms to recognised safety regulations. The user must, nevertheless, understand that there are dangers associated with its use and its intended purpose. All users of the device must therefore read and understand the following safety information carefully and keep it in mind. If in doubt, seek clarification before using the Scanner.

About these instructions

- Read and understand all safety and operating instructions before installing or operating the HF RFID Handheld Scanner. Heed all warnings. Follow all warnings as per the operating instructions.
- Keep these instructions, and store them in a place that can be accessed at any time by all persons involved in installing, operating, and troubleshooting the device.
- These instructions are intended for personnel who are trained in the operation of the Mach-SmartLane automated tray X-ray and return system that is manufactured by MacDonald Humfrey (Automation) Ltd.

Equipment handling

- The HF RFID Handheld Scanner is **not** intended for use by the "general population" in an uncontrolled environment. Installation, operation and error handling of the device must only be carried out by suitably qualified experienced responsible personnel.
- The HF RFID Handheld Scanner must only be installed and operated in accordance with the manufacturer's instructions. It must only be installed or operated in good and undamaged condition with reference to this manual. It is essential that the Scanner is visually checked prior to use for damage. Do not use the Scanner if it is damaged.

- Only use attachments, accessories and connecting cables recommended and supplied by MacDonald Humfrey (Automation) Ltd.
- The device is designed to connect to a standard computer USB port 5VDC 0.5Amp of the type described in these instructions only. Never connect the device to any other kind of power supply as this may result in fire, electric shock, or other hazards and will invalidate any warranty given.
- To disconnect the device use the connector; never pull on the cable itself. Keep the connector evenly aligned to avoid bending any connector pins. When you connect a cable, ensure that the connector pins are positioned correctly.
- Never over-bend the device cable or expose it to mechanical loads or sharp edges.
- Do not use around flammable gas. All electrical equipment can generate sparks that can ignite flammable gas.
- Keep the equipment dry, and only use it indoors. The system has not been made weatherproof. Do not use with wet hands.
- Keep cables tidy. When you are not using the RFID Handheld Scanner, hang it in its storage rack to keep it out of the way to reduce the risk of the unit and its cable from getting dropped, knocked or damaged.
- The HF RFID Handheld Scanner has no user-serviceable parts. It must be returned to the manufacturer only for servicing and repair. Unauthorised repair, substitution or replacement part may result in fire, electric shock, or other hazards and will invalidate any warranty given.

Medical considerations

- The HF RFID Handheld Scanner transmits and receives High Frequency (HF) radio waves at 13.56MHz to power and read passive RFID tags. **Never** put the HF RFID Scanner close to or touching parts of the human body while transmitting. In

addition to the heating effect that HF radio waves can have on human tissue, the radio emissions from the Scanner can adversely affect medical devices such as pacemakers and other electronic medical implants. Studies have shown that close proximity exposure (22.5 centimetres / 9 inches or less) can cause an adverse reaction in pacemakers. Persons with medical implants which are susceptible to Electro-Magnetic Interference should seek medical advice prior to using the Scanner.

- People with hearing aids should be aware that radio signals transmitted by the Scanner might cause a very unpleasant buzzing noise in their hearing aids if in close proximity to the Scanner.

Applicable standards and approvals

- RoSH
- Reach Compliant
- Din 16901 T130
- CE

CE mark for Class A ITE Following European standards

BS EN 55024:2010+A1:2015. Information technology equipment. Immunity characteristics. Limits and methods of measurement.

BS EN 55032:2015. Electromagnetic compatibility of multimedia equipment. Emission Requirements.

ETSI - EN 302 291-2 ELECTROMAGNETIC COMPATIBILITY AND RADIO SPECTRUM MATTERS (ERM); SHORT RANGE DEVICES (SRD); CLOSE RANGE INDUCTIVE DATA COMMUNICATION EQUIPMENT OPERATING AT 13,56 MHZ; PART 2: HARMONIZED EN UNDER ARTICLE 3.2 OF THE R&TTE DIRECTIVE

FCC Compliance Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

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

FCC WARNING

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in business, industrial, and commercial environments.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications and other electronic equipment.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause nuisance interference to analogue or digital device reception, this can be determined by turning the device off and on. Close proximity of such devices to the Scanner is not recommended. The user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the devices in relation to each other.
- Increase the separation between the equipment.
- Contact MacDonald Humfrey (Automation) Ltd. for technical assistance.

Caution

To comply with the limits for an FCC Class A device, always use the shielded signal cord supplied with this unit.

The Federal Communications Commission warns that changes or modifications of the device not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Canadian DoC Notice for Class A Computing Devices

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the Radio Interference Regulation of the Canadian Department of Communications.

“Le présent appareil numérique nèmet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la class A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada."

Radio Frequency Interference Statement

Warning

This is a Class A product for non-residential operation. This product may cause radio interference in which case the user may be required to take adequate measures.

Chapter 2 Connecting the HF RFID Handheld Scanner

The HF RFID Handheld Scanner simply plugs into any USB port on the host Windows PC.

> Note
>
> The HF RFID Handheld Scanner is only supported for USB 2.0 and above.

Connecting the Scanner to a generic Windows PC

To connect the Scanner to a standard laptop so you can test its general operation:

- **Without pressing the trigger on the Scanner**, plug the Scanner into the laptop's USB port. You can do this with or without the PC switched on.

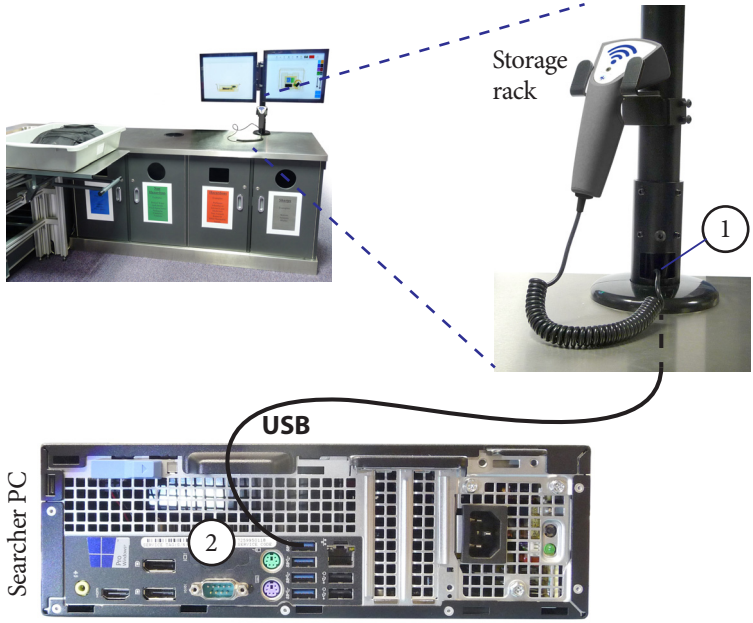
Windows automatically recognises the Scanner and installs the drivers for it.

For information on the Scanner's power-up sequence, see *Scanner power-up information* on page 9.

To use the Scanner, see Chapter 3.

Connecting the Scanner to a Searcher PC on a Mach-SmartLane

1. Feed the RFID Handheld Scanner cable down through the monitor mounting pole on the Searcher station.
2. **Without pressing the trigger on the Scanner**, plug the Scanner cable into the uppermost USB port on the back of the Searcher PC, inside the Searcher station cabinet. You can do this with or without the PC switched on.



Details of the additional connections on the Searcher PC are beyond the scope of this manual.

For information on the Scanner's power-up sequence, see *Scanner power-up information*, next.

To use the Scanner once it is powered up, see Chapter 3.

Scanner power-up information

The Scanner is powered from the USB port's 5VDC supply. During the Scanner power-up sequence (either when you power up the PC to which the Scanner is attached, or when you plug the Scanner into a live PC) the LED on the Scanner flashes an amber colour. After power-up, the Scanner displays a steady green light to indicate that it is in Idle mode, ready for use:

Powering up:
Flashing Amber LED

Idle/Ready mode:
Steady Green LED

Note

Do not press or hold the trigger button on the Scanner while it is powering up, as this will put the Scanner into "Continuous Read" mode which is only used for service and maintenance procedures. You can tell if the Scanner is in Continuous Read mode if you hold the Scanner up to an RFID tag and the Scanner reads the tag before you have pushed the trigger button. If you put the Scanner into this mode by accident, unplug and re-plug the Scanner without touching the trigger button on the Scanner, or reboot the PC without touching the trigger button on the Scanner.

If the Scanner goes into Continuous Read mode even if you are not touching the trigger button during power-up, it is possible that the trigger button is stuck. Make sure the trigger button movement is not hindered by dirt or debris around the button. If you still have problems, contact MacDonald Humfrey (Automation) Ltd. to have the Scanner replaced.

To use the Scanner once it is powered up, see Chapter 3.

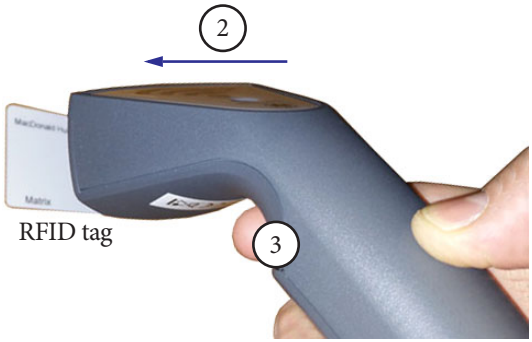
Chapter 3 Using the HF RFID Handheld Scanner

General usage

1. Make sure the HF RFID Handheld Scanner is plugged into the host Windows PC and displaying a **Green** Ready light (see Chapter 2.)

Ready

2. Hold the Scanner head up to the RFID tag to be read. The Scanner head must be within 4 cm (1.75 inches) of the tag to get a reliable reading.



3. Press and hold the Scanner trigger button.

This initiates the read sequence and the Scanner indicates the status as one of the following:

- **GOOD TAG READ** is indicated by a steady **Amber** LED and a single long duration beep. The LED then goes off until the trigger is released.

Beeeeeep

- **NO READ / NO TAG** is indicated by a flashing **Red** LED and a series of short duration beeps. The LED then goes off until the trigger is released.

Beep Beep Beep Beep

- **Post Read Cycle** - When you release the trigger button after either of the above results, the Scanner displays a steady **Green** LED light again, indicating it is in Idle mode and ready for the next scan.

Ready again

The actions of the PC that are then invoked by a good or bad read are determined by the software that you are using that makes use of the Scanner. A more detailed example is given in the next section.

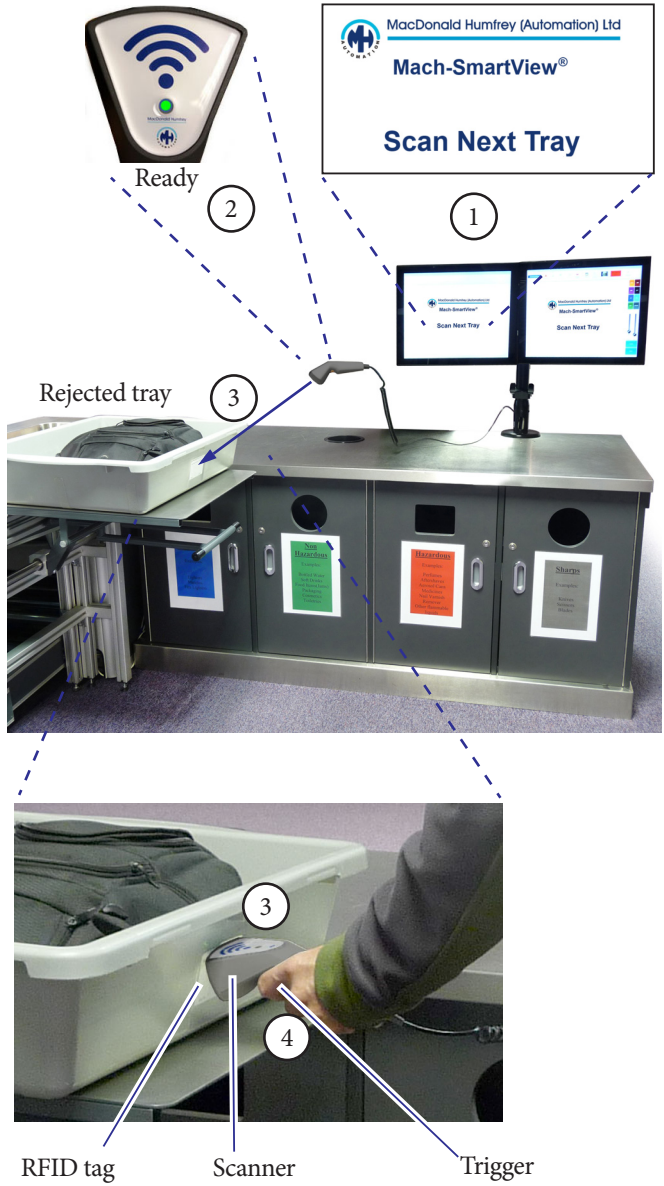
Using the Scanner on a SmartLane Searcher station

Detailed instructions for using the HF RFID Handheld Scanner in combination with SmartSearcher software running on the Mach-SmartLane Searcher station PC are given in the separate *SmartSearcher User Manual*. A brief summary is given below.

The picture shows a typical situation that requires use of the HF RFID Handheld Scanner at the Mach-SmartLane Searcher station. Each tray on the SmartLane has a unique RFID tag which identifies the tray and its contents. The SmartLane has its own built-in HF RFID Scanners, and when the SmartLane photographs and X-rays a tray, the images produced are associated with the tray's RFID tag number. The tray shown in the picture has been X-rayed and photographed on the SmartLane, the X-ray images have been inspected by a Remote Analyst working elsewhere on the SmartViewMatrix network while the tray was in the SmartLane holding area, the Analyst has spotted one or more potential threats in the X-ray images and rejected the tray, and the SmartLane has re-routed the tray to the Searcher station to be hand-searched by you, the Searcher.

To assist your hand-search of the tray contents, you use the HF RFID Handheld Scanner to scan the tray's RFID tag, and the Searcher station PC then displays the photograph, X-ray images, and threat markers for that tray on the Searcher station monitors.

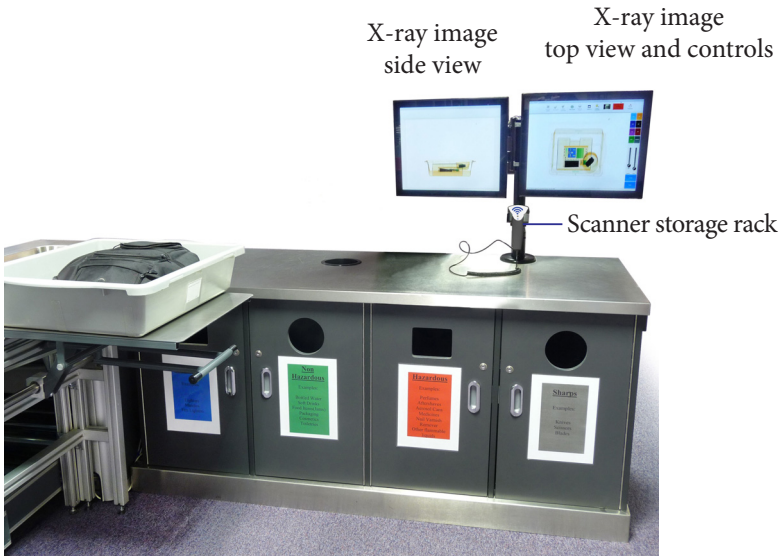
1. Make sure the SmartSearcher application on the Searcher PC shows **Scan Next Tray**, which indicates that the software is ready to receive the next set of X-ray images.
2. Make sure the HF RFID Handheld Scanner is plugged into the host Windows PC and displaying a **Green** Ready light.
3. Hold the HF RFID Handheld Scanner up to the RFID tag on the tray. The Scanner head must be within 4 cm (1.75 inches) of the tag to get a reliable reading.
4. Press the trigger button on the Scanner.


MacDonald Humfrey (Automation) Ltd
Mach-SmartView®
Scan Next Tray
Ready
2
1
Rejected tray
3
3
4
RFID tag
Scanner
Trigger

If the read is successful then the Scanner makes a single audible beep and the LED on the Scanner shows a steady **Amber** light.

Beeeeeep

The SmartSearcher software then compares the ID of the tray against the list of rejected trays on the SmartViewMatrix network. When it finds a match, the Searcher station displays the X-ray images previously taken for that tray, along with any threat markers that the Analyst added to the images.

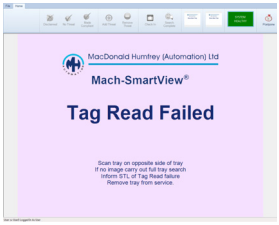


You can then process the threats in the tray. See the separate *SmartSearcher User Manual* for details.

RFID tag read failure

If the Scanner cannot read the RFID tag, this is indicated by a flashing **Red** LED on the Scanner and a series of short duration beeps. The LED then goes off until the trigger is released. The SmartSearcher software on the Screener PC informs you that the tag read failed.

Beep Beep Beep Beep



Do the following:

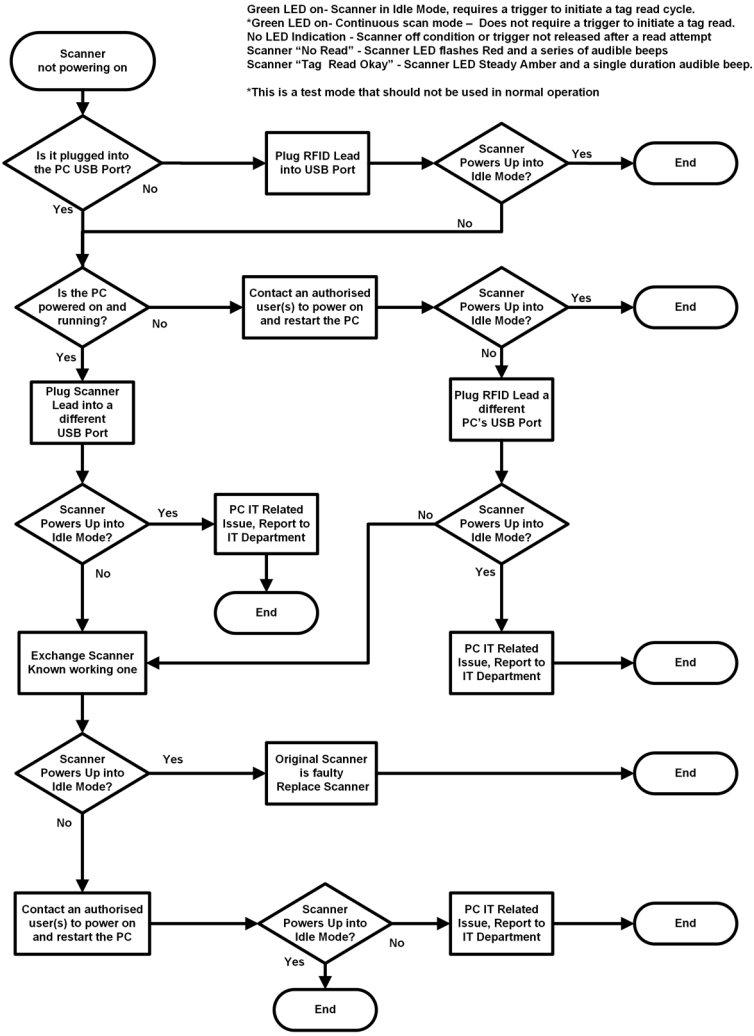
- Try scanning the tag again, making sure that you hold the Scanner close enough to the tag when pressing the trigger button on the Scanner.
- Try scanning the tag on the opposite side of the tray. If this works then process the tray as normal, then inform your Security Team Leader that one of the tags on the tray may be faulty and remove the tray from service until its tags can be checked and/or replaced.

If repeated attempts to read the tags fail then inform your Security Team Leader and follow local standard operating procedures for a failed tag read. These might include carrying out a full hand search on the tray without the aid of X-ray images, or transferring the tray contents into a different tray and putting the new tray and its luggage through the X-ray machine again. Remove the faulty tray from service until its tags can be checked and/or replaced.

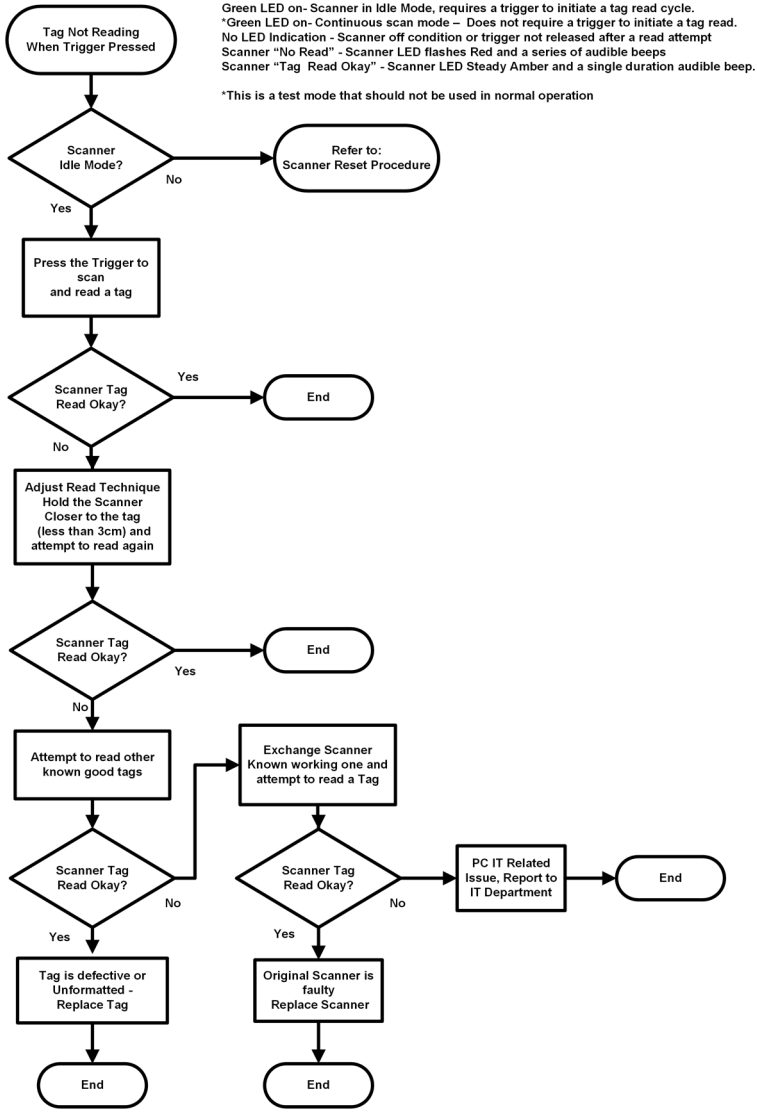
When the Scanner is not in use, hang it in its storage rack on the pole to keep it out of the way so the cable doesn't get caught or damaged.

Chapter 4 Troubleshooting

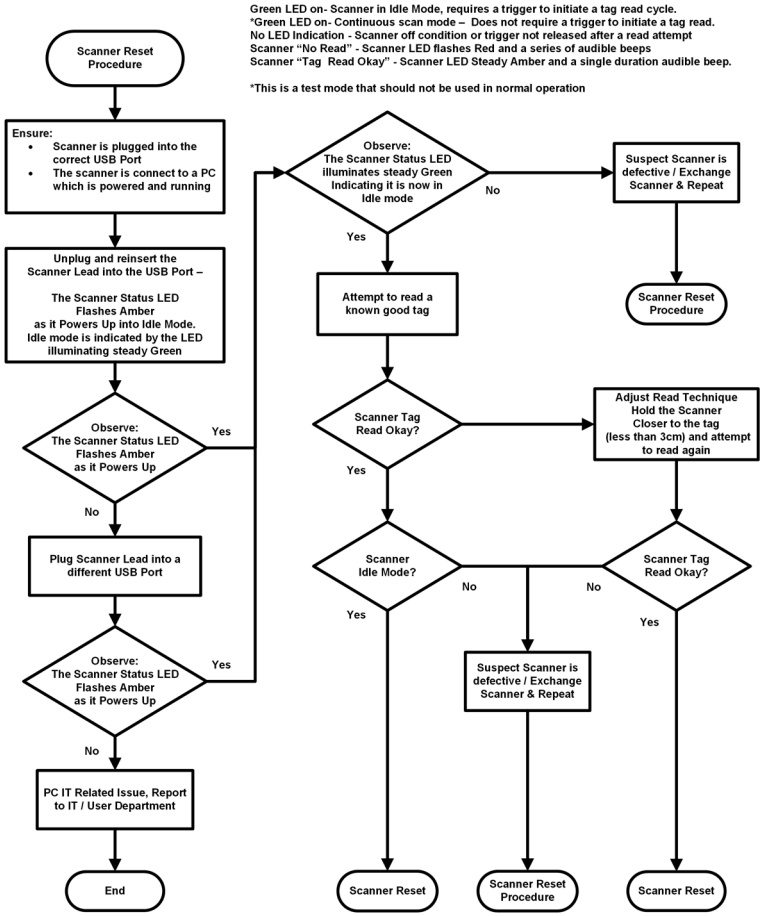
Scanner not powering on — no LED indication



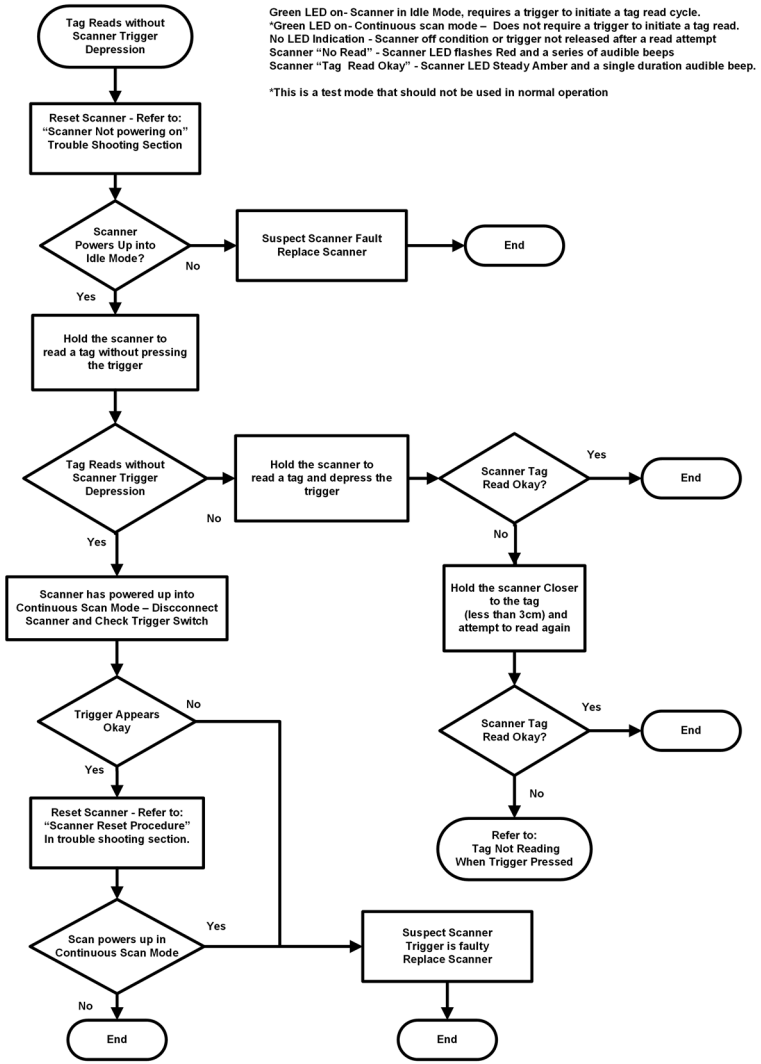
RFID tag read failure



Scanner reset procedure



Scanner reads without pressing the trigger button

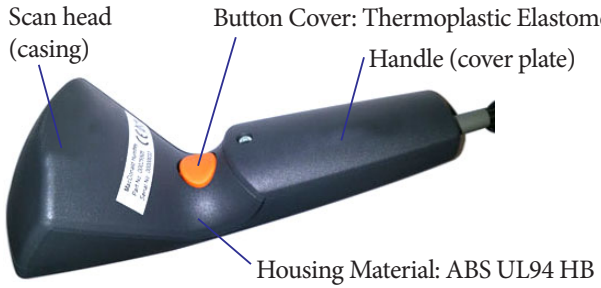


Chapter 5 Specifications

Technical specifications

- Frequency: 13.56 MHz
- Tag Type: ISO15693
- Read Range: 0-80mm
- Supply Voltage: 5Vdc
- Current: 30/65mA Rest / Read
- Operating Systems: Microsoft Windows 7 & 10, 32 & 64 Bit
- Interface: HID POS
- Connection type: USB Type A
- Operation: Single button press
- Air read: Button Press / Button Release (No Data).
- Feedback: Two Audio announcements – 'Data' or 'No Data'
- LED Indication: Start up, Power, Data and No Data
- Compatible Host: Any MS Windows 7 or 10 PC with USB 2.0 (or above) connector.

Environmental information



- IP rating: IP41
- Weight: 250g
- Cable length: 3m Spiral Nominal

- Operating Temperature: –20 to +60 °C (–4 to +140 °F)
- Storage Temperature: –40 to +80 °C (–40 to +176 °F)
- Dimensions: 180 × 86 × 45mm + Cable

Disposal

When the HF RFID Handheld Scanner reaches the end of its working life it should be recycled or disposed of responsibly, in accordance with local regulations for the disposal of electronic equipment.

Purchasing Data

- HF RFID Handheld Scanner Part Number: MHA 00025505
- Pack Size / MOQ: 1 piece per pack
- Country of manufacture: UK
- HST Code 8471.90.00.00

Warranty and Servicing

This product is warranted against defects in materials and workmanship for a period of 12 months from the time of purchase subject to proper use including fair wear and tear.

There are no user-serviceable parts in the HF RFID Handheld Scanner. In the event of malfunction the device must be returned to MacDonald Humfrey (Automation) Ltd. for repair and servicing.

Cleaning

To clean the HF RFID Handheld Scanner, shut down the Searcher station PC and then wipe the HF RFID Handheld Scanner with a damp cloth. Do not use any liquids or abrasive cleaners.

Return information

Before returning the HF RFID Handheld Scanner to MacDonald Humfrey (Automation) Ltd., please contact us for advice. Many perceived problems can turn out to be a configuration or usage issue that can be solved over the telephone. If you need to return the HF RFID Handheld

Scanner to MacDonald Humfrey (Automation) Ltd., use the address at the front of this manual, and refer to Chapter 7.

Chapter 6 Glossary

Hertz

The SI unit of frequency, equal to one cycle per second.

HF

High Frequency - (in radio) a frequency of 3–30 **MHz**.

IP rating

Ingress **P**rotection rating, or **I**nternational **P**rotection rating. The IP rating of a device is a two digit code. The first digit is a measure of resistance to penetration by solid objects accessing hazardous parts; the second digit is a measure of resistance to penetration by water. The IP rating of 41 for the HF RFID Handheld Scanner indicates that it is protected against penetration by solid objects over 1mm diameter, and protected against vertically falling drops of water and condensation.

MHz

Megahertz. A unit of frequency equal to one million **Hertz**.

RF

Radio Frequency - a frequency or band of electromagnetic frequencies in the range 104 to 1011 or 1012 Hz, suitable for use in telecommunications.

RFID

RFID (radio frequency identification) is a technology that incorporates the use of electromagnetic or electrostatic coupling in the radio frequency (RF) portion of the electromagnetic spectrum to uniquely identify an object, animal, or person.

USB

Universal **S**erial **B**us. A commonly used interface that enables communication between electronic devices over a cable. It is often used to connect a host controller such as a personal Computer (PC) to peripheral devices such as digital cameras, mice, keyboards, printers, scanners, smartphones, and of course the HF RFID Handheld Scanner.

Chapter 7 Return Material Authorization (RMA) Service Request Form

If you need to return the product to MacDonald Humfrey (Automation) Ltd.:

1. Obtain a Return Material Authorization number from MacDonald Humfrey (Automation) Ltd.
2. Photocopy the RMA Service Request Form on the next few pages.
3. Fill in the RMA Service Request Form. Make sure you include the following:
    - Your own address and contact details (telephone number, email address).
    - A description of the situation in which you are using the Scanner, for example SmartLane details and lane number, and Searcher station details.
    - A description of the problem, with respect to both hardware and software symptoms where applicable.
4. Return the form with the product to MacDonald Humfrey (Automation) Ltd.

Notes

MacDonald Humfrey (Automation) Ltd

RMA Service request form

RMA No.....

When requesting RMA service please complete this form, once complete this needs to be shipped with the parts requiring service.

To provide the best service please email or Fax this completed from to the Luton office address below (or your local service provider), we will issue an RMA number which will help track the repair process, please send a completed copy of this form with the parts to the Luton address below.

Your Company: Contact person:

Purchase date: Email, Fax, Phone:

Return Shipping Address

Serial No.: Model / Part No.:

Problem:

Remarks:

Attachments (photos, screen shots):

SPECIALISTS IN SYSTEMS INTEGRATION

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