



# User Manual

**MDR-1109**

**Desktop Reader-Writer**



**Document Number : 60-70-002-DOC Last  
Changed : 22 May 2014**

**Copyright © SATO VICINITY 2014  
Commercial in Confidence**

# Content

|  |           |
|--|-----------|
| <b>1. INTRODUCTION</b>   | <b>3</b>  |
| 1.1 REGULATION AND STANDARDS                                   | 3         |
| 1.2 WARRANTY   | 4         |
| 1.3 LIMITATION OF LIABILITY                                    | 4         |
| 1.4 CHANGES IN PRODUCT FAMILY, SPECIFICATIONS AND USER MANUALS | 5         |
| 1.5 COPYRIGHTS AND COPY PERMISSION                             | 5         |
| 1.6 MEANING OF ALERT SYMBOLS AND SIGNAL WORDS                  | 5         |
| 1.7 GLOSSARY OF TERMS AND ABBREVIATIONS                        | 6         |
| <b>2. PRODUCT OVERVIEW</b>                                     | <b>7</b>  |
| 2.1 MDR-1109   | 7         |
| <b>3. GETTING STARTED GUIDE</b>                                | <b>8</b>  |
| 3.1 UNPACKING AND INSPECTION                                   | 8         |
| 3.2 BEFORE YOU BEGIN   | 10        |
| 3.2.1 <i>Installation Environment</i>                          | 10        |
| 3.2.2 <i>Recommended System Requirements</i>                   | 10        |
| 3.2.3 <i>Working with Tags</i>                                 | 11        |
| 3.2.4 <i>Installation Requirements</i>                         | 11        |
| 3.2.5 <i>Tag-to-Reader Orientation</i>                         | 12        |
| 3.3 HARDWARE INSTALLATION                                      | 13        |
| 3.3.1 <i>Connecting a Reader to a Computer using USB</i>       | 14        |
| 3.3.2 <i>Connecting a Reader to a Computer using Ethernet</i>  | 15        |
| 3.3.3 <i>Connecting Multiple Readers to a local network</i>    | 15        |
| 3.4 READERMANAGER SOFTWARE INSTALLATION                        | 16        |
| 3.4.1 <i>Software Installation and Functionality Test</i>      | 16        |
| 3.4.2 <i>Connecting to a Reader</i>                            | 17        |
| 3.4.3 <i>Communication Test</i>                                | 20        |
| 3.4.4 <i>Changing the Reader's Network Setup</i>               | 21        |
| <b>4. REPORTING A PROBLEM</b>                                  | <b>24</b> |
| 4.1 TROUBLESHOOTING  | 25        |
| 4.2 SERVICE FORM   | 26        |
| <b>5. CONTACT US</b>   | <b>27</b> |
| <b>6. REVISION HISTORY</b>                                     | <b>28</b> |
| <b>7. APPENDIX</b>   | <b>29</b> |
| 7.1 SPECIFICATION  | 29        |

## Please read before proceeding

Please read and understand this document before using SATO VICINITY's Readers. If you have any questions, comment or suggestions about the User Manual please contact SATO VICINITY.

## Important Information

### Installation Environment

For indoor use only unless otherwise specified.

Install SATO VICINITY's Readers within the temperature and humidity range according to the product specification.

The environment must not contain corrosive, flammable or explosive agents or be subject to rapid changes in temperature, to direct vibration or shock.

### f Installation

SATO VICINITY's RFID reader-writers communicate with data carriers (RFID inlets, labels and tags) using the 13.56 MHz High Frequency (HF) band. Some industrial devices can generate unwanted noise which may degrade communication. Make sure that other equipment is properly installed, grounded and at a reasonable distance.

Wireless communication can be degraded by high-voltage and high-current lines and other sources of strong electric and magnetic fields. Installation in such locations should be avoided.


### f Maintenance

All SATO VICINITY's RFID readers-writers are low maintenance equipment. Except for externally accessible fuses there are no user-serviceable parts in any Reader. There is no requirement to remove the cover of the Reader.


|          |   |
|----------|---|
| <b>!</b> | Removal of the Reader cover by unauthorised personnel will void the product warranty. |
|----------|---|

Do not attempt to clean internally. Periodic cleaning of external case parts with a damp cloth is advisable. Turn off the Reader before cleaning. Do not use a solvent of any kind.

### f Electrical Safety

|   |   |
|---|---|
|  | In order to avoid electric shock do not remove the Reader cover or attempt to repair. The equipment must be maintained by authorised, qualified and service-trained personnel only. |
|---|---|

### f Environmental

|   |  |
|---|--|
|  | For disposal purposes Readers should be treated as industrial waste. |
|---|--|

This symbol on the Reader or on its packaging indicates that this Reader shall not be treated as household waste. Instead it shall be handed over to an appropriate collection point for the recycling of electrical and electronic equipment. By ensuring this Reader is disposed off correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. The recycling of materials will help to conserve natural resources. For more detailed information about recycling of this Reader, please contact your local city office, your household waste disposal service or the SATO VICINITY office.

# 1. Introduction

Thank you for your recent purchase of a SATO VICINITY RFID reader-writer.

This User Manual will provide you with information to rapidly adopt SATO VICINITY's PJM technology for your needs, to install the Reader hardware and ReaderManager software and get the Reader running.

Refer to the ReaderManager User Manual (40-01-006-DOC) for a description of the various tools and advanced options available in ReaderManager.

Programming is covered in the Programmer Guide (40-01-000-DOC).

## 1.1 Regulation and Standards

RFID equipment is subject to national and international regulations.

The FCC regards RFID equipment as low-power transmitting devices and, therefore, does not require users of RFID devices to obtain a license to operate them.

### FCC Radio Frequency Interference Statement (USA)

These devices comply with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) these devices may not cause harmful interference, and (2) these devices must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limit for a Class A digital device and intentional radiator, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. 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. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.



Any changes or modifications to the equipment that are not expressly approved by the party responsible for compliance could void the user's authority granted under FCC Rules to operate this equipment.

**FCC ID: TVN-MDR1109**

### CE Declaration of Conformity (European Union)

This equipment has been declared as compliant in accordance with R&TTE EU Council Directive 1999/5/EC and displays the CE mark accordingly. Products with CE marking comply with EMC Directive (89/336/EEC amended by 93/68/EEC) issued by the Commission of the European Community.

This apparatus complies with ETSI EN 301 489-1 RF common mode immunity requirements on Ethernet Port with shielded CAT5 Ethernet Cable.

## **! WARNING**

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

### **ACMA Declaration of Conformity (Australia)**

This product complies with the Australian Communications and Media Authority (ACMA) Radiocommunications regulations and carries the C-Tick mark accordingly.

 **N15661**

## **! WARNING**

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

### **ISO/IEC 18000 – 3 Mode 2 (Air Interface at 13.56 MHz) Compliance**

SATO VICINITY's Readers fully complies with the ISO/IEC 18000 Part 3 Mode 2 (Information technology – Radio frequency identification for item management. Part 3: Parameters for air interface communications at 13.56 MHz) published in August, 2004.

## **1.2 Warranty**

SATO VICINITY's warranty and liability with respect to products and/or services is for a period of 12 months from date of delivery and is limited to the rectification of faulty workmanship and/or non-compliance by SATO VICINITY.

Any liability with respect to components including purchased or free issued items and other materials used in the manufacture of products are covered by, and limited to, any warranty provided by the original manufacturer.

## **1.3 Limitation of Liability**

SATO VICINITY's warranty excludes products that have been improperly installed or maintained, modified or misused. Notification of claims must occur within the warranty period.

End-users should contact the company from whom they purchase the products for replacement, repair or refund.

If user purchases the Reader directly from SATO VICINITY, contact SATO VICINITY for a Return Authorization Number (RAN) before shipment.






## 1.4 Changes in Product Family, Specifications and User Manuals

This document is subject to change without notice in future editions. SATO VICINITY reserves the rights to change its product design, specifications and product range.

## 1.5 Copyrights and Copy Permission

This document shall not be copied, reproduced or transmitted in any form or by any means without written permission from SATO VICINITY Pty Ltd. This document is protected by copyrights and is intended solely for use in conjunctions with SATO VICINITY's products only.

## 1.6 Meaning of Alert Symbols and Signal Words

|   |  |
|---|--|
|    | Notes and Tips. Application Notes.   |
|    | This part of the Manual requires your attention.   |
|   | <p><b>Warning!</b><br/>In order to avoid electric shock follow the instructions provided.</p>  |
|  | Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury. Can cause property damage.   |
|  | Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death. Can cause significant property damage. |

## 1.7 Glossary of Terms and Abbreviations

|                         |  |
|-------------------------|--|
| D/C                     | Date Code (month/year)   |
| DSB                     | Digital Support Board  |
| HDF                     | High Density Fiberboard (for MARS only)  |
| HF                      | High Frequency   |
| IT                      | ItemTag (chips, inlets and labels)   |
| ItemTag tags (IT tags)  | SATO VICINITY's labels and inlets for item tagging(separated items) that work with SATO VICINITY's family of reader-writers  |
| LAN                     | Local Area Network   |
| LED                     | Light Emitting Diode   |
| MDF                     | Medium Density Fiberboard (for MARS only)  |
| MLC                     | Machine Level Control (System Configuration Control)   |
| MRD                     | Maximum Read-Write Distance  |
| OEM label               | Original Equipment Manufacture label is located on the back of the equipment. It includes the Model Number, P/N, D/C, S/N and MLC.   |
| PJM                     | Phase Jitter Modulation or PJM™ is a registered Trade Mark of SATO VICINITY Pty Ltd. PJM is a RFID communication technology developed and patented by SATO VICINITY Pty Ltd and complies with ISO/IEC 18000-3 Mode 2. PJM technology products include a range of RFID chips, inlets, tags and Readers. |
| PJM ItemTag®            | Registered Trade Mark for SATO VICINITY's ItemTag  |
| PJM StackTag®           | Registered Trade Mark for SATO VICINITY's StackTag tags  |
| P/N                     | Part Number  |
| RAN                     | Return Authorisation Number  |
| Reader/s                | SATO VICINITY's RFID reader-writer/s   |
| ReaderManager           | Graphical user application for Windows/Linux which provides a platform for testing, demonstrations and application development   |
| ReaderServer            | Embedded application that provides standard Application Programmer Interface to serve end-user applications. This application runs on the Reader.  |
| RFID                    | Radio Frequency IDentification   |
| RFID inlet              | A RFID device comprising a microchip and a printed antenna (copper/aluminium/conductive inks) on a flexible substrate (PET plastic film)   |
| RFID label              | RFID inlet with adhesive backing (sticky label)  |
| RFID tag                | <ul style="list-style-type: none"> <li>- generic name for RFID inlet and label;</li> <li>- RFID inlet or label inserted into a housing (glass, polycarbonate, polyamid, epoxy, ABS, etc.)</li> </ul>   |
| RFID reader-writer      | Device for reading and writing to RFID tags  |
| S/N                     | Serial Number  |
| ST                      | StackTag (chips, inlets and labels)  |
| StackTag tags (ST tags) | SATO VICINITY's labels and inlets for item tagging (stacked, touched or overlapping items) that work with SATO VICINITY's family of reader-writers   |

## 2. Product Overview

Intended use of SATOI Vicinity's RFID Reader is to read and write information to individual SATO VICINITY ItemTags and multiple SATO VICINITY StackTags.

The communication protocol used by the Reader is compliant with ISO/IEC 18000 - 3 Mode 2 (Air Interface at 13.56 MHz).

### 2.1 MDR-1109

Desktop reader-writer

Single-axis antenna

2 communication channels





## 3. Getting Started Guide

### 3.1 Unpacking and Inspection



When you receive your system, inspect it for any obvious damage that may have occurred during shipment. If there is damage, notify the shipping carrier and the supplier of the equipment or SATO VICINITY if purchased directly from SATO VICINITY.



Until you have checked the system, save the shipping carton and packaging materials in the event the unit has to be returned.

Included with the MDR-1109 should be the following components:

- *f* Reader-writer
- *f* Power adaptor

The Reader connection to the power source is realized via a low voltage power pack (12VDC output).



A power cable is not included with the supply. End-users should purchase a power cable suitable for the country of use.

#### **! CAUTION**

Only power cables and adaptors that are compliant with the regulations in the country of use may be connected to SATO VICINITY's equipment.

- *f* USB data communication cable (USB 2.0, screened cable, 2 m long)



USB cable should not be longer than 3m.



As shielded cables (USB and Ethernet) are generally required in order to comply with EMC emissions limits, only shielded communication cables should be used.



Ethernet cable is not included with the supply.

SATO VICINITY recommends CAT5 Ethernet cable.

- Quick Start Guide

- CD-ROM

The CD-ROM should contain the following files:

|   |   |
|---|---|
| <i>AdbRdrxx_enu_full.exe</i>                                    | Self-extracting installation kit for the Adobe Acrobat reader, which is required to read and print PDF files. |
| <i>40-01-000-DOC<br/>Programmer Guide.pdf</i>                   | PDF document describing how to program all of SATO VICINITY's Readers.  |
| <i>40-01-006-DOC<br/>ReaderManager User Manual</i>              | PDF document describing various tools and advanced options available in ReaderManager                         |
| <i>60-70-002-DOC<br/>MDR-1109 User Manual.pdf</i>               | PDF version of this document.   |
| <i>45-00-001-SPC BT &amp; ST Chip<br/>Logical Specification</i> | Defines the functionality of IT and ST chips.   |
| <i>ReaderManager-Install.exe</i>                                | Self-extracting installation kit for the ReaderManager.   |

- Test tags (required for Hardware Functionality Test and Communication Test)

## 3.2 Before You Begin


### 3.2.1 Installation Environment

SATO VICINITY's Readers are designed to operate in indoor environments where temperature and humidity are controlled unless other conditions are specified for customised Readers.

For standard Readers the temperature range is from +10°C to +45°C. The humidity range is from 10% to 80% (non-condensing humidity).


Install the Readers within the temperature and humidity ranges according to the product specification.


The environment must not contain corrosive, flammable or explosive agents and conductive dust or be subject to rapid changes in temperature, direct vibration or shock.

|   |   |
|---|---|
|  | Do not operate this Reader in an environment which contains flammable or explosives gases or fumes. |
|---|---|

SATO VICINITY's RFID reader-writers communicate with data carriers (RFID inlets, labels and tags) using the 13.56 MHz High Frequency (HF) band. Some industrial devices can generate unwanted noise which may degrade communication. Make sure that other equipment is properly installed, grounded and are at a reasonable distance.

Wireless communication can be degraded by high-voltage and high-current lines and other sources of strong electric and magnetic fields. Installation in such locations should be avoided.

|   |  |
|---|--|
|  | In order to avoid electric shock do not remove the Reader cover or attempt to repair. SATO VICINITY's reader-writers are to be maintained by authorised, qualified and service-trained personnel only. |
|---|--|

|   |   |
|---|---|
|  | Removal of the Reader cover by unauthorised personnel will void the product warranty. |
|---|---|

### 3.2.2 Recommended System Requirements

Recommended minimum host computer requirements:

|                   |                   |
|-------------------|-------------------|
| Operating System: | Windows XP        |
| Memory:           | 128MB RAM         |
| Hard Drive:       | 20 GB             |
| CPU:              | Intel Celeron 500 |
| Interface:        | USB or Ethernet   |

### 3.2.3 Working with Tags



- Do not stack ItemTags on top of each other. Only StackTags can be stacked, overlapped or touch each other.
- Single-axis Readers are tag orientation sensitive. Refer to Tag-to-Reader/Tag-to-Antenna section of this document.
- Reading and writing speeds depend on reader-tag communication speeds and channel numbers (communication protocol), amount of information to be read and/or written and number of tags presented at a time. The additional number of tags and information to be read and especially written slow down read-write communication. Please consult SATO VICINITY or your support organisation regarding these issues for your specific application.
- Be aware that tags and Readers can be incompatible with each other. Bigger tags can work with all types of Readers. Smaller tags require higher field strengths to communicate with a Reader and as a result they do not communicate with some Readers or have to be closer to a Reader antenna. Refer to the Reader-Tag Compatibility section of this document.

### 3.2.4 Installation Requirements

MDR-1109 is a stand-alone peripheral desktop device that does not require special installation or tuning of an internal antenna.

Power supply requirements:

|                               |                          |
|-------------------------------|--------------------------|
| Mains input:                  | 110 - 240 VAC @ 50/60 Hz |
| Low voltage input (MDR-1109): | 12 VDC @ 350 mA          |

### 3.2.5 Tag-to-Reader Orientation

Tags should always be presented face on to the Reader surface. They may still work at some angle depending upon the distance between the tag and the Reader.

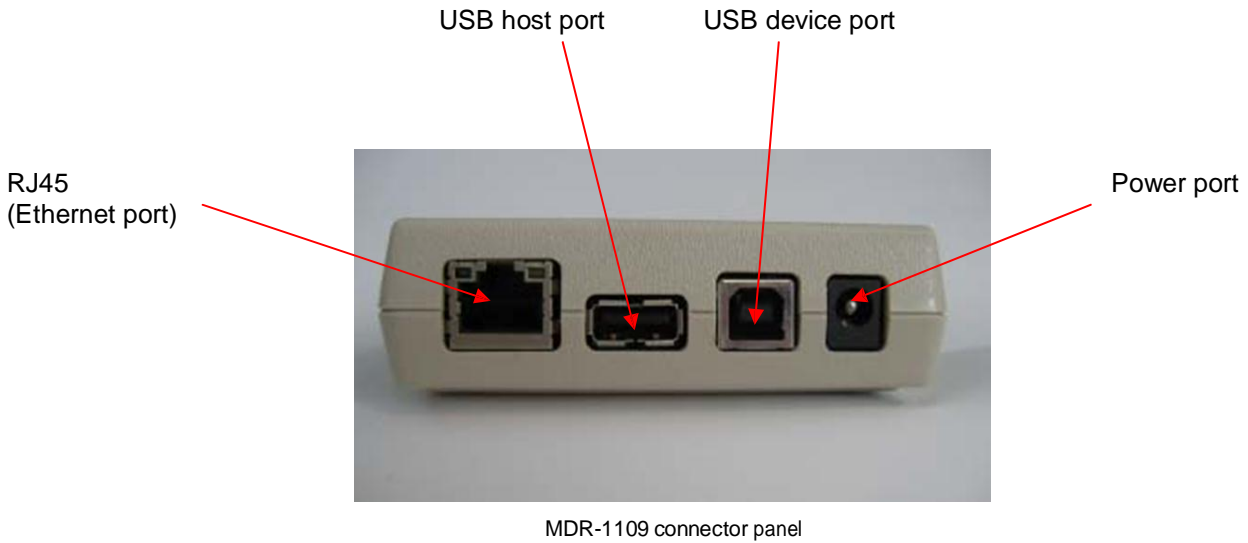


Correct orientation



Incorrect orientation (90° angle).

### 3.3 Hardware Installation



#### Step 1. Connect a low voltage power pack to the unit.

The connection to the power source is realized via a low voltage power pack.



The power cable is not supplied with the Reader and recommended to be purchased in the country of use.



MDR-1109 with plugged-in low voltage power cable

#### Step 2. Plug the power supply into AC power mains. LEDs will come on.

When power is applied to an MDR-1109 Reader the LEDs on the unit should operate as follows:

- the red LED and green LED will immediately come on; both LEDs will go off in about 1 minute



MDR-1109 with red and green LEDs

- the **red LED** will come on again in 1-3 seconds indicating that the unit is in an operational mode; the **green LED** will be off
- once the unit is in an operational mode the **red LED** will remain lit



- Both LEDs are controlled by the MDR-1109 software
- This setting can be changed to LEDs being controlled by ReaderManager software depending on the user application. Refer to Programmer Guide (40-01-000-DOC).

**Step 3. Test the Reader with the supplied test tags. The green LED will flash every time a tag is successfully read.**

### 3.3.1 Connecting a Reader to a Computer using USB

Connect the MDR-1109 Reader to a host computer using the USB data communication cable by plugging the USB cable into the MDR-1109 USB device port and the host computer USB port.



When the USB connection is used only a screened USB cable should be used.



MDR-1109 with the USB communication cable and power cable

### 3.3.2 Connecting a Reader to a Computer using Ethernet

Connect the MDR-1109 Reader to a host computer using a cross over Ethernet cable. Plug the Ethernet communication cable into the MDR-1109 RJ45 socket (Ethernet port) and the network interface port on the PC.



MDR-1109 with the Ethernet communication cable and power cable

### 3.3.3 Connecting Multiple Readers to a local network

Multiple Readers can be connected to a local network using an Ethernet hub/switch. Plug the Ethernet communication cable into the MDR's RJ45 socket (Ethernet port) and Ethernet Hub.



## 3.4 ReaderManager Software Installation

ReaderManager application software allows tag data to be viewed and programmed.

The ReaderManager can only connect to one reader at a time. The *Connections* menu allows the user to connect to other readers by disconnecting from the currently connected reader and then establishing a connection to a new reader.

It is possible to run many ReaderManagers on the same computer at the same time. Simply double click on the ReaderManager icon to open up multiple instances of ReaderManager.

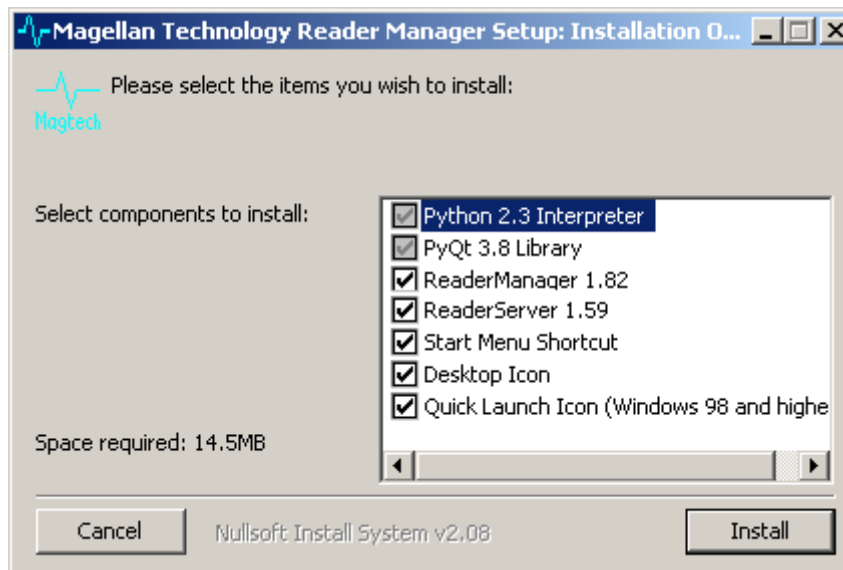
Refer to the ReaderManager User Manual (40-01-006-DOC) for a description of the various tools and advanced options available in ReaderManager.

### 3.4.1 Software Installation and Functionality Test

**Step 1. Insert the CD supplied with the reader into the CD-ROM.**

**Step 2. Open Windows Explorer, double click on *ReaderManager-Install*.**

The Install dialog is shown below.

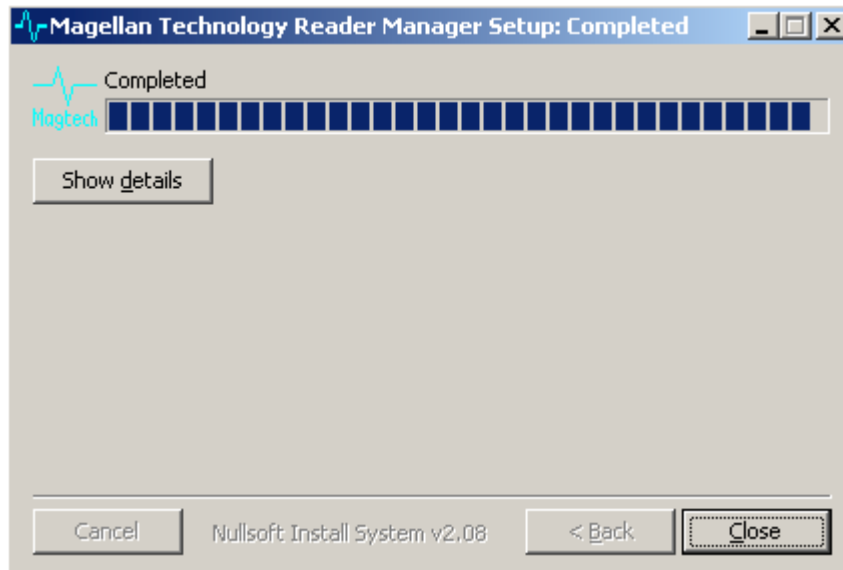


**Step 3. Ensure all the items are ticked, and then click the Install button.**

If Python is not installed on your computer, the installation program will prompt you if you would like to install Python. Click the Yes button and accept all the default options during installation.

When the ReaderManager and all the required libraries are installed the dialog box shown below will be displayed. Ensure the dialog box shows *Completed* and no problems are reported.

**Step 4. Click the *Close* button to continue.**



If ReaderManager is already installed, double click *ReaderManager-Upgrade*. Follow steps 3 to 4 above.

If Python and PyQt are already installed, the installation program will not re-install them. To force the installation program in re-install these libraries, click the relevant check boxes.

**Step 5. To start ReaderManager, double click the *ReaderManager* icon or select *ReaderManager* from the *Programs Start* menu.**



**Step 6. Functionality test. From menu, select *Help>About ReaderManager* to see the version of the ReaderManager software and its status.**


### 3.4.2 Connecting to a Reader

A Reader provides Ethernet and USB device interfaces to allow for client connection. The USB interface uses TCP/IP networking over USB as the protocol. This allows you to connect to a reader as if it was a normal network. So all the usual services, such as telnet and FTP are available.


**Step 1. Ensure a reader is turned on and a communication cable is plugged in.**

ReaderManager will automatically detect all readers on the local network.

When a Reader is connected for the first time to a network using an Ethernet cable or a host computer using a USB cable, the Reader is identified by its Model Name-Serial Number (recommended to keep).

|   |   |
|---|---|
|  | <ul style="list-style-type: none"> <li>▪ Customers can replace or add additional information to the Model Name-Serial Number such as a physical location or customer ID number. Refer to section 3.5.4 Changing the Reader's Network Setup of this User Manual.</li> <li>▪ Subsequently when a customer starts using the Reader the new name will appear on the list of Readers in the Connection menu.</li> <li>▪ Tip: If you want to use the new name immediately, simply unplug the power connector and plug in again to view the new name on the Connection menu list.</li> </ul> |
|---|---|

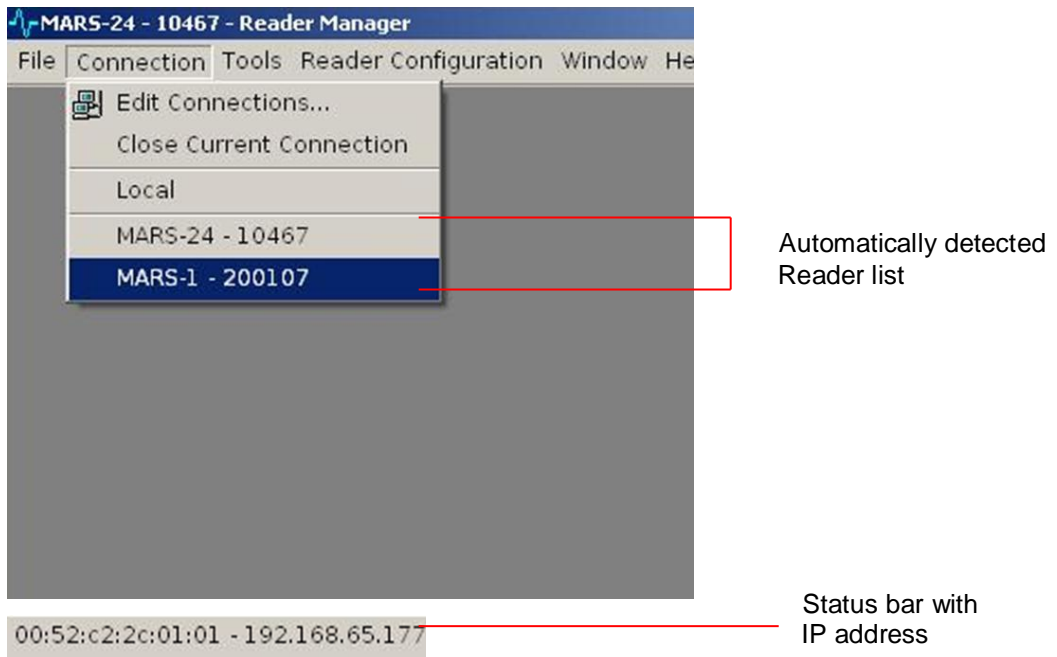
When a Reader is connected to a host computer for the first time using a USB cable, there are a few more steps to go through before ReaderManager is able to identify a new Reader:

|   |   |
|---|---|
|  | <ol style="list-style-type: none"> <li>1. In <i>Found New Hardware Wizard</i> tick <i>Yes, this time only</i> to search for software and press <i>Next</i>.</li> <li>2. In <i>What do you want wizard to do?</i> tick <i>Install the software automatically</i> and press <i>Next</i>.</li> <li>3. Wait while the wizard installs the software: <i>Linux USB Ethernet/RNDIS Gadget</i>. Ignore other message and press <i>Continue anyway</i>.</li> <li>4. Press <i>Finish</i>.</li> <li>5. Open the <i>Connection</i> menu to see a list of Readers and the new Reader identified by Model Name-Serial Number on the list.</li> <li>6. If you can not find the new Reader on the list simply unplug the USB cable and plug it again into the Reader USB device port. This time you should be able to see the Reader's Model Name-Serial Number.</li> </ol> |
|---|---|

**Step 2. Click the *Connection* menu item to view Readers found on the local network.**

ReaderManager will use network broadcasts to look for active readers via USB and Ethernet. If you click on the *Connection* menu, you can see readers defined in there automatically.

A list of Readers will be displayed as shown below. The IP address and MAC address will be shown on the status bar as you move the mouse over each Reader entry.



**Step 3. To connect to a Reader, from the *Connection* menu select the Reader you would like to connect to, then click the left mouse button.**


The status bar will change from a red to a green background to indicate that the ReaderManager was able to connect to a Reader. The tag type and IP address are also shown on the status bar.



To setup static connections to readers refer to the ReaderManager User Manual (40-01-006-DOC).

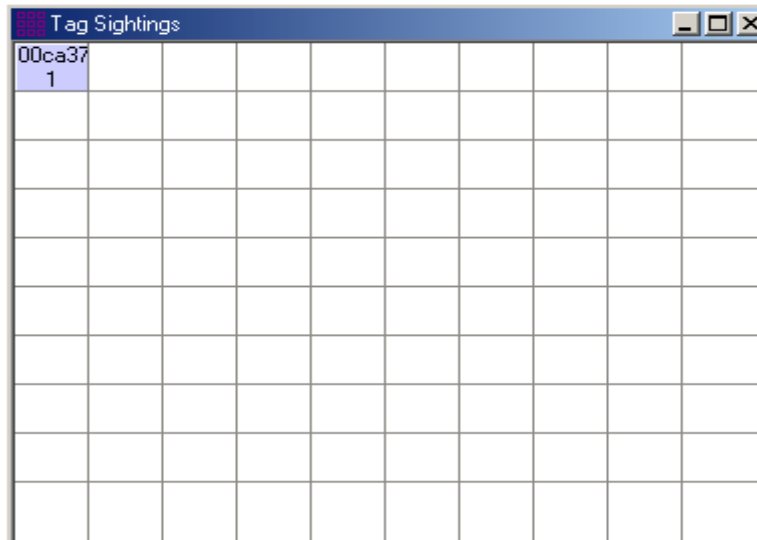
### 3.4.3 Communication Test

From the *Tools* menu, select *System* then *Grid of tags sight count*.

|   |   |
|---|---|
|  | <p>Check some default settings in Tools&gt;System&gt;Reader Settings:</p> <ul style="list-style-type: none"> <li>▪ Tag Type. Default is IFX_STACK. If you use ItemTags the default should be changed to IFX_ITEM.</li> <li>▪ The Powering Field box should be ticked.</li> <li>▪ Tag Reply Mode:<br/>           For 8 channel Readers, the default is:<br/>           CommandReplyChannelHopping7_8muted<br/>           CommandReplyChannel Hopping Unmuted<br/><br/>           For 2 channel Readers, the default is:<br/>           CommandReplyChannelHoppin3_4muted<br/>           CommandReplyChannelHoppingUnmuted<br/>           FixedReplyChannel(G)</li> </ul> <p>Refer to ReaderManager User Manual (40-01-006-DOC) and Programmer Guide (40-01-000-DOC) for a description of the various tools and advanced options available.</p> |
|---|---|

Using one of the test tags supplied with the Reader, place the tag on the Reader antenna.

The first square in the grid should turn from white to blue and display the tag's ID number and the number of times the tag was sighted (should be one). An example of this is shown below.

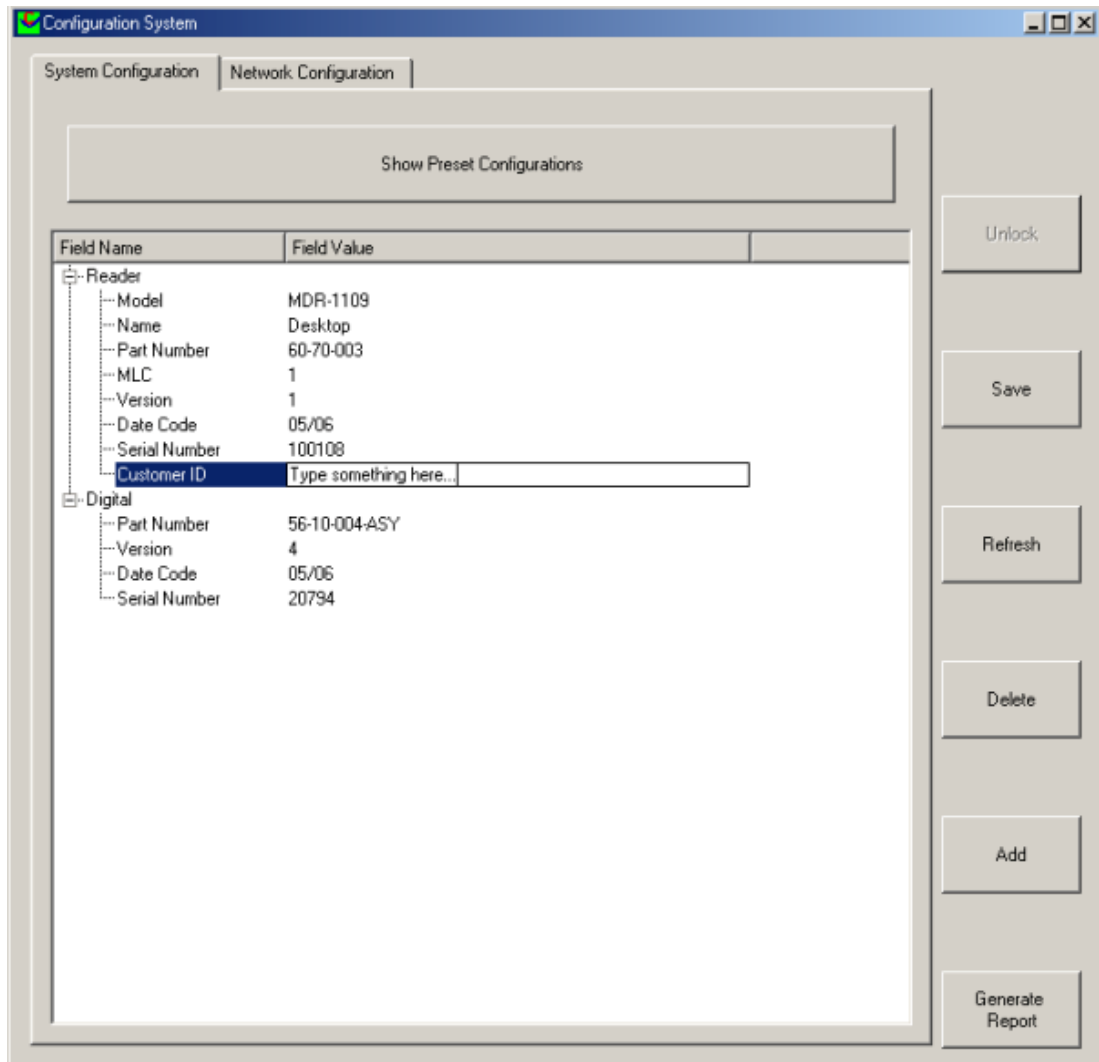


| Tag Sightings |  |  |  |  |  |  |  |  |  |
|---------------|--|--|--|--|--|--|--|--|--|
| 00ca37        |  |  |  |  |  |  |  |  |  |
| 1             |  |  |  |  |  |  |  |  |  |
|               |  |  |  |  |  |  |  |  |  |
|               |  |  |  |  |  |  |  |  |  |
|               |  |  |  |  |  |  |  |  |  |
|               |  |  |  |  |  |  |  |  |  |
|               |  |  |  |  |  |  |  |  |  |
|               |  |  |  |  |  |  |  |  |  |
|               |  |  |  |  |  |  |  |  |  |
|               |  |  |  |  |  |  |  |  |  |

### 3.4.4 Changing the Reader's Network Setup

Ensure the Reader is connected as described above.

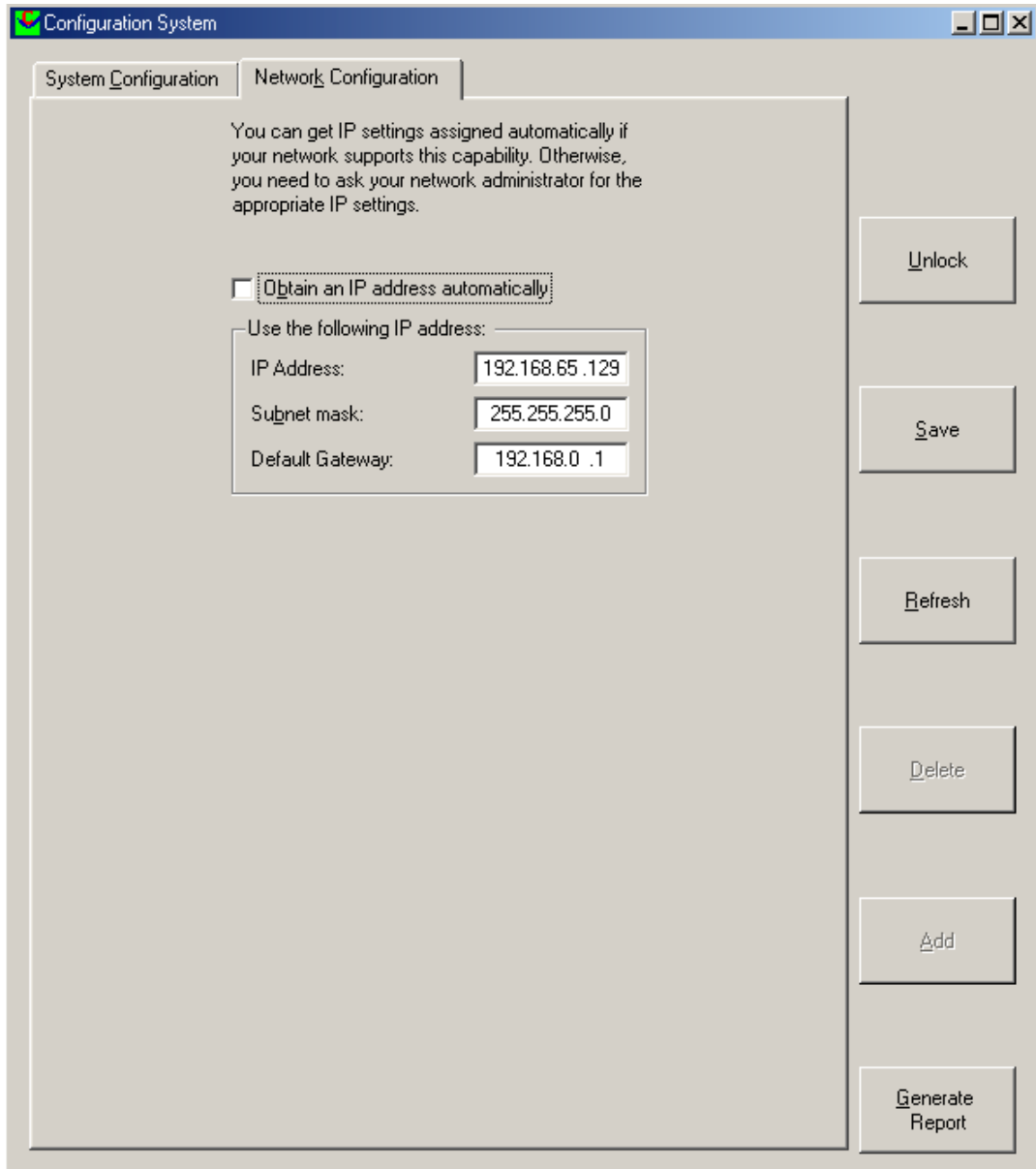
From the *Tools* menu, select *System* then *Configuration System*. The window shown below will be displayed.



Click the column on the right of *Customer ID* and enter the name you would like the Reader to be identified as. This is the name that will appear on the *Connection* menu.

Click the *Save* button on the right to save your changes to the reader, or click the *Refresh* button to restore the previously saved name.

To change the Reader's network settings, click the *Network Configuration* tab.



If the Reader is to be assigned an IP address from a DHCP server click the *Obtain an IP address automatically* check box.

To assign a static IP address, uncheck the check box and enter the IP address in the *IP address* text box. The box will turn red if the IP address is not valid. Care should be taken not to duplicate IP addresses on your network. If you are unsure what IP address to use consult your systems administrator.

Enter the network *Subnet mask* and *Default gateway* addresses in the text boxes provided.

Click the *Save* button to save these changes to the Reader, or click the *Refresh* button to restore the last saved values.

Restart the Reader for these changes to take effect.



Here is a general guide to the way reader network address assignment works:

- The Ethernet interface is either served an IP address via DHCP or is assigned a static IP address by the user. If the reader is set to use a DHCP assigned address and no DHCP server is available it will automatically use a link local address of 169.254.0.0/16.
- The reader must be powered up with the Ethernet connected to get a DHCP assigned IP address.




These are the networking rules:

- USB will always choose a subnet different to Ethernet.
- Both interfaces will try to obtain the 169.254.0.0 range, but Ethernet has priority.
- 172.16.0.0/16 is USB's fallover subnet if Ethernet has already taken it by either: DHCP, fixed, or link-local IP acquisition.



## 4. Reporting a Problem


If you are having a problem with a SATO VICINITY Reader, you will need to send a report to your support organisation. To make the diagnosis quicker and easier, please supply your problem report on a Service Form along with the following information:

|   |   |
|---|---|
|  | <ul style="list-style-type: none"><li>▪ What kind of tags are you using and how many are you putting inside the Reader at one time?</li><li>▪ Have this Reader and the tags you are using worked at any time in the past?</li><li>▪ Have you tried connecting to the Reader with a different PC?</li><li>▪ Have you successfully installed the ReaderManager application?</li><li>▪ In the ReaderManager, select the Help/About ReaderManager menu item and record on the Service Form what version numbers are shown in the window that appears.</li></ul> |
|---|---|

The required information about Model Number, S/N, P/N and D/C is located on OEM label on the back of the equipment.

### Warranty Repairs

Before shipping any Reader a Return Authorisation Number (RAN) must be obtained.

|   |   |
|---|---|
|  | <p>End-users should contact the company from whom they purchased the Reader for repair, replacement or refund.</p> <p>If you purchased the Reader directly from SATO VICINITY, contact SATO VICINITY for a Return Authorization Number (RAN) before shipment.</p> |
|---|---|

The copy of the Service Form with RAN must be enclosed in the original or equivalent packing with the RAN number clearly marked on the outside of the box.

### Non-Warranty Repairs

If a Reader needs repairing after one year warranty period expires, your support organization or SATO VICINITY if you purchased directly from SATO VICINITY will first provide an estimate of repair charges. Then upon receiving approval from you the Reader can be sent for repair. Refer to above Warranty Repairs information for return procedures.

## 4.1 Troubleshooting

| Problem  | Reason   | Solution   |
|--|--|--|
| Red LED light is off   | Power cable not connected  | Ensure the power cable is connected correctly to both the mains power and to the Reader.   |
|  | Power cable faulty   | Replace the cable.   |
|  | Power adaptor faulty   | Replace the power adaptor.   |
|  | Reader faulty  | Send a service report on a Service Form.   |
| Absence of the flashing green LED light during tag reading   | Incorrectly orientated tag/tags  | Ensure tag/tags are oriented correctly for the Reader (see Tag-to-Reader/Tag-to-Antenna Orientation).  |
|  | Faulty tag/tags  | Replace tag/tags. Do not use tags with a black dot or black square marking (faulty tags).  |
|  | The <i>Powering Field</i> is off   | Ensure the powering field is on. Go to <i>Tools&gt;System&gt;Reader Setting</i> . Tick the <i>Powering Field</i> box.  |
|  | Reader faulty  | Send a service report on a Service Form.   |
| Green LED was sighted but tag did not appear on the computer screen                                  | USB or Ethernet connection is not functioning  | Ensure cable is connected correctly. Cycle the power on the Reader. Shut down and restart the host computer and ReaderManager.   |
|  | The reader is not <i>Connected</i>   | Ensure the Reader is turned on and a communication cable is plugged in. The status bar in bottom right corner of the ReaderManager window has to show an indication <i>Connected</i> , the tag type and the IP address.  |
|  | The tag type is incompatible with the Reader   | Use appropriate tag type according to the chart in section Reader-Tag Compatibility.   |
|  | A communication tool has not been chosen   | Choose Grid or Table from <i>Tools&gt;System</i> menu as a communication tool.   |
| Can not find and connect to the Reader as the Reader is not shown on the <i>Connection</i> menu list | The Reader was not in operational mode when you connected a communication cable and/or open the <i>Connection</i> menu | Unplug and plug in the communication cable. Open the <i>Connection</i> menu. Find the Reader you want to connect to on the list.   |
|  |  | Plug in the power and communication cables. Wait for about 1 minute after you apply the power to the Reader. The red or blue LED/LEDs must to be permanently lit and the green LED off. Open the <i>Connection</i> menu. Find the Reader you want to connect to on the list. |

## 4.2 Service Form

Always return a copy of this form along with the product

|                   |   |   |
|-------------------|---|---|
| CONTACT           | Company _____<br>Address _____<br>Country _____<br>Sales Order _____<br>PO Number _____<br>Purchase Date _____  | Return Authorisation Number (RAN) _____<br>Date _____<br>Technical Contact _____<br>Telephone _____<br>Fax _____<br>Email _____   |
| PRODUCT           | From OEM label on the back of the equipment:<br>Model _____<br>P/N _____<br>D/C _____<br>S/N _____<br>MLC _____<br>(first number in order after black dots)<br>Describe any hardware modifications made to the unit and modification date:<br>_____<br>_____<br>_____<br>_____<br>_____ |   |
| REASON FOR RETURN | Describe problems (see 3.2 Reporting a Problem):<br>_____<br>_____<br>_____<br>_____<br>_____<br>_____<br>_____<br>_____<br>_____<br>_____<br>_____<br>_____<br>_____<br>_____  |   |
| RETURN TO*        | If purchased from SATO VICINITY:<br><b>SATO VICINITY Pty Limited</b><br>Mailbox:<br>PO Box 408, Camperdown, NSW 1450  | Tel.: +61 2 9562 9800<br>Fax: +61 2 9518 7620<br>Email: <a href="mailto:contact@satovicinity.com">contact@satovicinity.com</a><br>Website: <a href="http://www.satovicinity.com">www.satovicinity.com</a> |

\* End-users should contact the company from whom they purchased the Reader

## 5. Contact Us



**SATO VICINITY PTY. LTD.**

8 Guihen Street, Annandale, NSW 2038, Australia

TEL.: +61 2 9562 9800

FAX: +61 2 9518 7620

EMAIL: [contact@satovicinity.com](mailto:contact@satovicinity.com)

WEBSITE: [www.satovicinity.com](http://www.satovicinity.com)

## 6. Revision History

| Version | Date    | Person | Reason  |
|---------|---------|--------|---|
| Ver.1   | 05.2006 | OK     | Initial User's Guide (40-01-005-DOC) has been split into separate User Manuals for each reader. New user-friendly document layout/design, new logo, new sections added (Alert Symbols, Glossary, Product Overview, Service Form, Specification, Revision History) |
| Ver. 2  | 05.2014 |        | Rebranding of document for SATO VICINITY (after acquisition of Magellan Technology). This includes new logo and replacing 'Magellan' with 'SATO VICINITY'.  |

# 7. Appendix

## 7.1 Specification

| <b>MDR-1109 Desktop Reader-Writer</b>         |  |
|---|--|
| Read and write operations                     |  |
| No manual calibration needed                  |  |
| No user-serviceable parts                     |  |
| ISO/IEC Compliance                            | 18000-3 Mode 2   |
| Operating Frequency                           | 13.56 MHz  |
| Number of Axes                                | 1  |
| Number of Reply Channels                      | 2  |
| Command Data Rate                             | 424 kbit/s   |
| Reply Data Rate                               | 106 kbit/s per channel   |
| Operation Range                               | 0 – 110 mm PJM ItemTag® (76x45 mm, 5 turns)<br>0 – 60 mm PJM StackTag® (76x45 mm, 5 turns) |
| Tag Type                                      | PJM StackTag® and PJM ItemTag®   |
| External Dimensions (L x W x H)               | 146 x 91 x 30 mm   |
| Net Weight                                    | 0.41 kg  |
| Low Voltage Input                             | 12 VDC @ 350 mA  |
| Operation environment                         | Indoor use   |
| Temperature range                             | +10°C to +45°C   |
| Humidity                                      | 10% to 80% (non-condensing)  |
| Recommended Minimum Host Computer Requirement | Windows XP/ 500 MHz CPU/ 128MB RAM   |
| Host Interface                                | USB and Ethernet   |