APPENDIX L
OF
TEST REPORT T60643_F

USER MANUAL

FCC ID: TVN-MDR1109
Manufacturer: MAGELLAN TECHNOLOGY PTY LIMITED
Test Sample: MDR-1109 Desk Top Reader
Model: MDR-1109
Serial Number: 100132

Date: 19th July 2006

MAGELLAN TECHNOLOGY

HF RFID System

User Manual

MDR-1109

Desktop Reader-Writer

Document Number : 60-70-002-DOC
Last Changed : 21 July 2006

Content

📖 Please read before proceeding

Please read and understand this document before using the products. If you have any questions, comment or suggestions about the User Manual please contact Magellan Technology.

① Important Information

- **Installation Environment**

    For indoor use only unless otherwise specified.

    Install the products 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.

- **Installation**

    Magellan'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.

- **Maintenance**

    All Magellan'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 equipment.

    ! Removal of the equipment 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 equipment before cleaning. Do not use a solvent of any kind.

- **Electrical Safety**

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

- **Environmental**

    For disposal readers should be treated as industrial waste.

    This symbol on the product or on its packaging indicates that this product 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 product is disposed of 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 product, please contact your local city office, your household waste disposal service or the Magellan Technology regional sales office.

1. Introduction

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

This User Manual will provide you with information to rapidly adopt Magellan'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 the 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)

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate of receiving antenna

- Increase the separation between the equipment and receiver

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected

- Consult the dealer or an experienced radio/TV technician for help

! 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.

Intended use of the equipment is as a desktop Reader to read and write information to multiple or individual tags.

! 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.

Industry Canada Radio Frequency Interference Declaration of Conformity (Canada)

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

IC: 6596A-MDR1109

ICES\NMB-003

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

Magellan'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

Magellan'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 Magellan.

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

Magellan'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 purchases the Reader directly from Magellan, contact Magellan 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.

Magellan 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 Magellan Technology Pty Limited. This document is protected by copyrights and is intended solely for use in conjunctions with Magellan'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.
⚠	**Warning!** In order to avoid electric shock follow the instructions provided.
! CAUTION	Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury. Can cause property damage.
! WARNING	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
GUI	Graphical Use Interface
IT	ItemTag (chips, inlets and labels)
ItemTag tags (IT tags)	Magellan's labels and inlets for item tagging (separated items) that work with Magellan'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 Magellan Technology Pty Limited. PJM is a RFID communication technology developed and patented by Magellan Technology 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 Magellan's ItemTag tags
PJM StackTag®	Registered Trade Mark for Magellan's StackTag tags
P/N	Part Number
RAN	Return Authorisation Number
Reader/s	Magellan'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 the 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	- generic name for RFID inlet and label; - RFID inlet or label inserted into a housing (glass, polycarbonate, polyamid, epoxy, ABS, etc.)
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)	Magellan's labels and inlets for item tagging (stacked, touched or overlapping items) that work with Magellan's family of reader-writers

2. Product Overview

Intended use of Magellan's RFID Reader is to read and write information to individual Magellan ItemTags and multiple Magellan 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 Magellan if purchased directly from Magellan.

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:

- Reader-writer

- 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. 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 Magellan's equipment.

- Data communication cable

Magellan supplies one USB shielded cable (USB 2.0, 2 m long)

! USB cable should not be longer than 3m

! As shielded cables are generally required in order to comply with EMC emissions limits, the shielded cables recommended by Magellan Technology must be used. Unshielded cabled may be used where explicitly allowed in the Installation Requirements section of this User Manual.

Ethernet cable is not included with the supply.

Magellan recommends CAT5 Ethernet cable.

- Quick Start Guide

- CD-ROM

The CD-ROM should contain the following files:

AdbeRdrxx_enu_full.exe	Self-extracting installation kit for the Adobe Acrobat reader, which is required to read and print PDF files.
40-01-000-DOC *Programmer Guide.pdf*	PDF document describing how to program all of Magellan's Readers.
40-01-006-DOC *Reader Manager User Manual*	PDF document describing various tools and advanced options available in ReaderManager
46-70-012-DOC *User Manual.pdf*	PDF version of this document.
ReaderManager-Install.exe	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

Magellan'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.

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

Magellan'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. Magellan'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 Magellan 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

MDR-1109 connector panel

USB host port

USB device port

RJ45
(Ethernet port)

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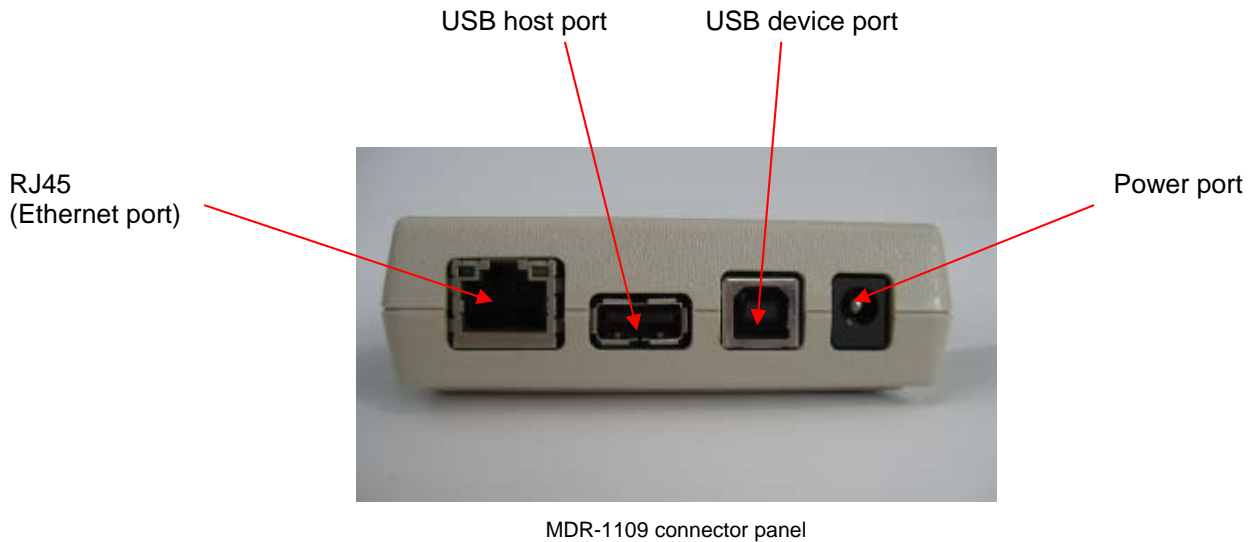
Step 1. Connect a low voltage power pack to the unit.

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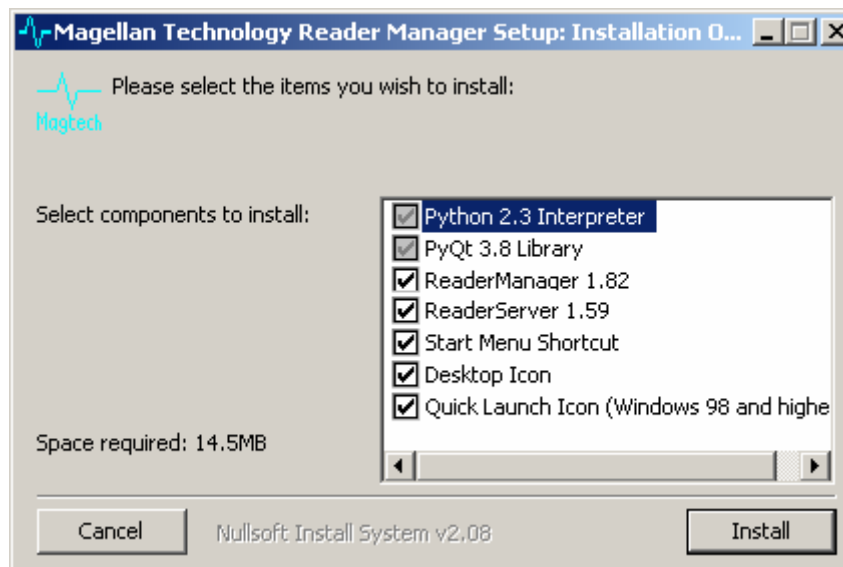
Step 3. Ensure all the items are ticked, and then click the Install button.

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.
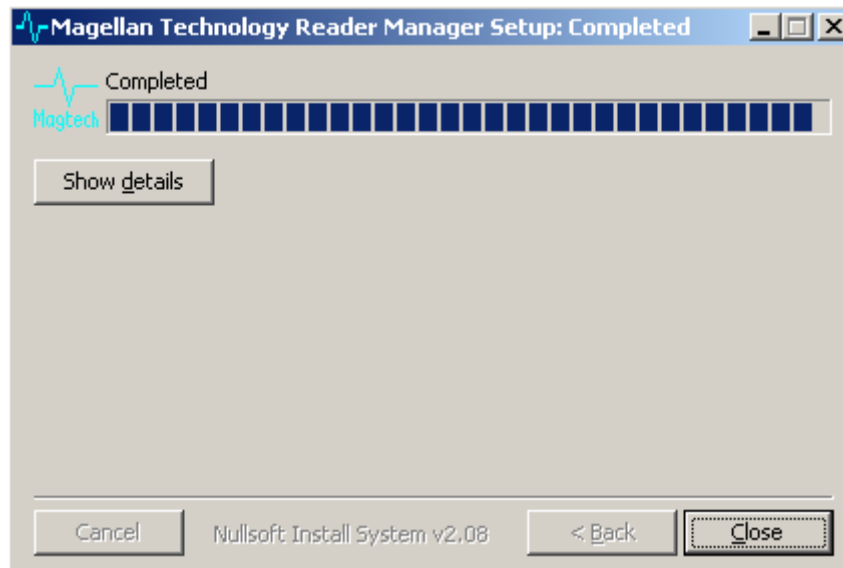
> If ReaderManager is already installed, double click *ReaderManager-Upgrade*. Follow steps 3 to 4 above.
>
> If Python and PyQt are already installed, the installation program will not re-install them. To force the installation program in re-install these libraries, click the relevant check boxes.

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).

- 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.

- Subsequently when a customer starts using the Reader the new name will appear on the list of Readers in the Connection menu.

- 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.

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:

1. In *Found New Hardware Wizard* tick *Yes, this time only* to search for software and press *Next*.
2. In *What do you want wizard to do?* tick *Install the software automatically* and press *Next*.
3. Wait while the wizard installs the software: *Linux USB Ethernet/RNDIS Gadget*. Ignore other message and press *Continue anyway*.
4. Press *Finish*.
5. Open the *Connection* menu to see a list of Readers and the new Reader identified by Model Name-Serial Number on the list.
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.

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.

Automatically detected Reader list

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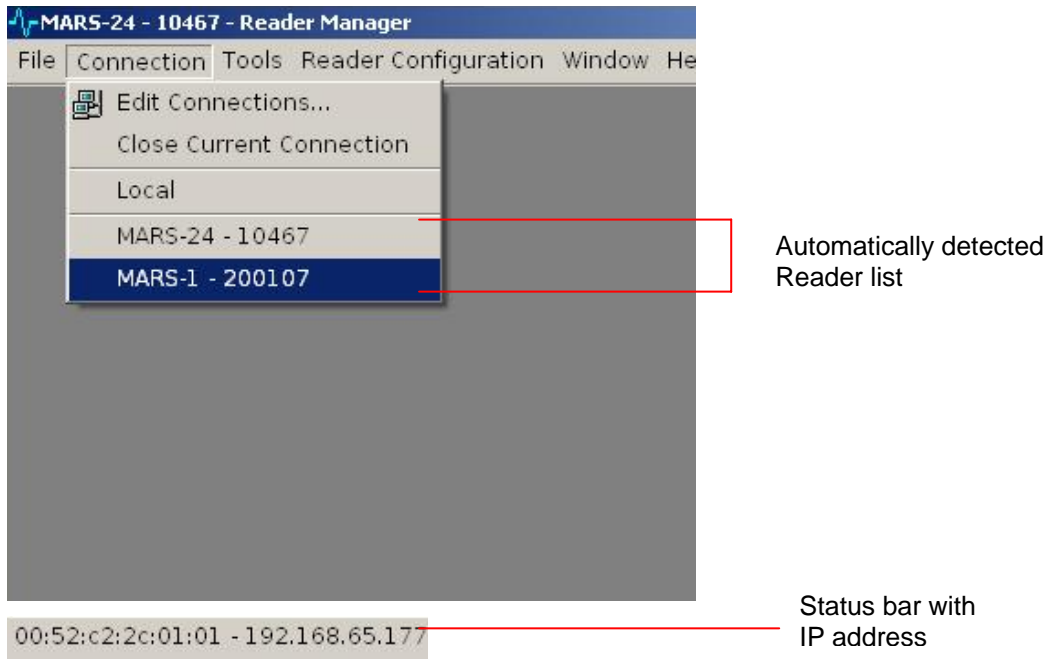
Step 3. To connect to a Reader, from the *Connection* menu select the Reader you would like to connect to, then click the left mouse button.

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.*

Check some default settings in Tools>System>Reader Settings:

- Tag Type. Default is IFX_STACK. If you use ItemTags the default should be changed to IFX_ITEM.

- The Powering Field box should be ticked.

- Tag Reply Mode:

For 8 channel Readers, the default is:
CommandReplyChannelHopping7_8muted
CommandReplyChannel Hopping Unmuted

For 2 channel Readers, the default is:
CommandReplyChannelHoppin3_4muted
CommandReplyChannelHoppingUnmuted
FixedReplyChannel(G)

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.

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.

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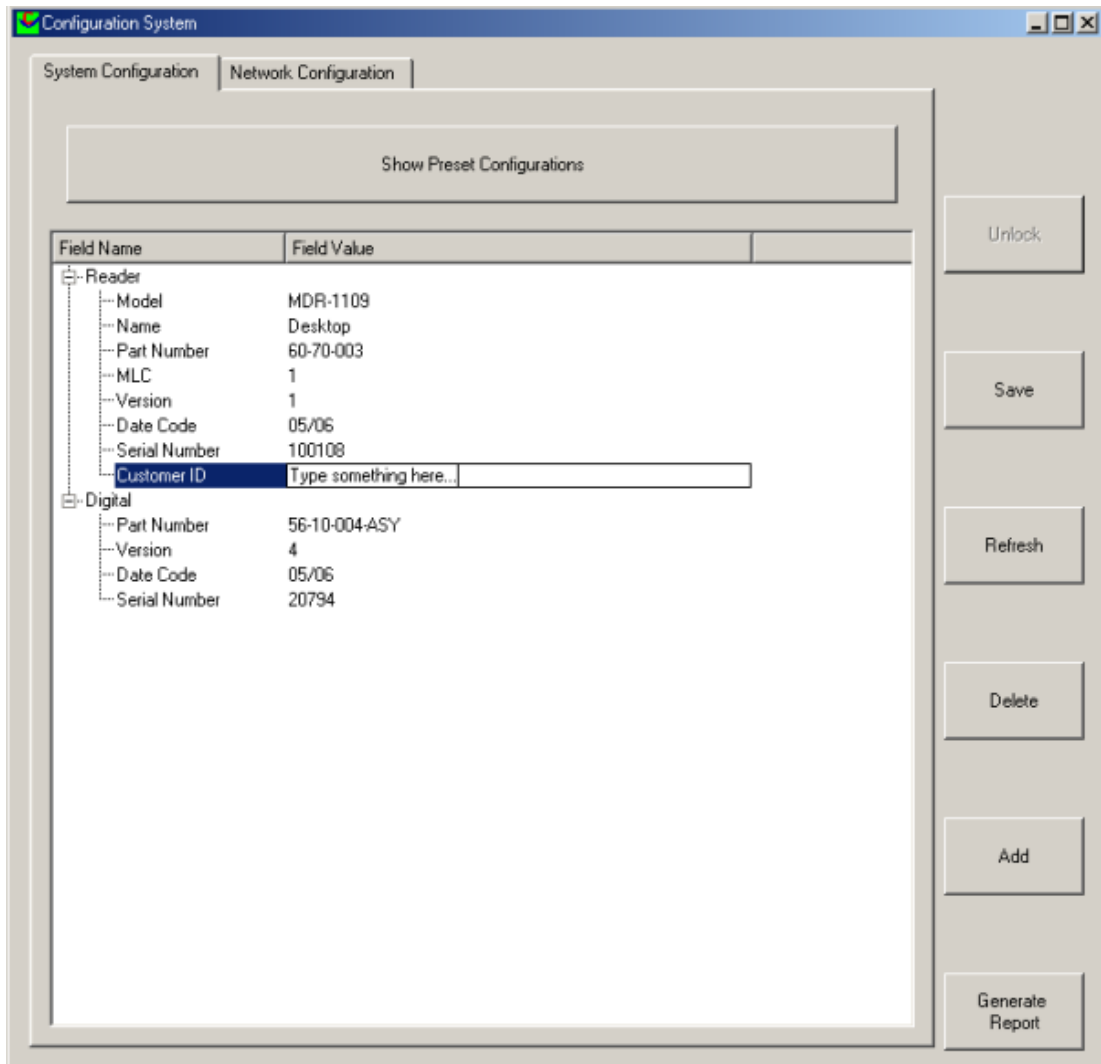
Click the column on the right of *Customer ID* and enter the name you would like the Reader to be identified as. This is the name that will appear on the *Connection* menu.

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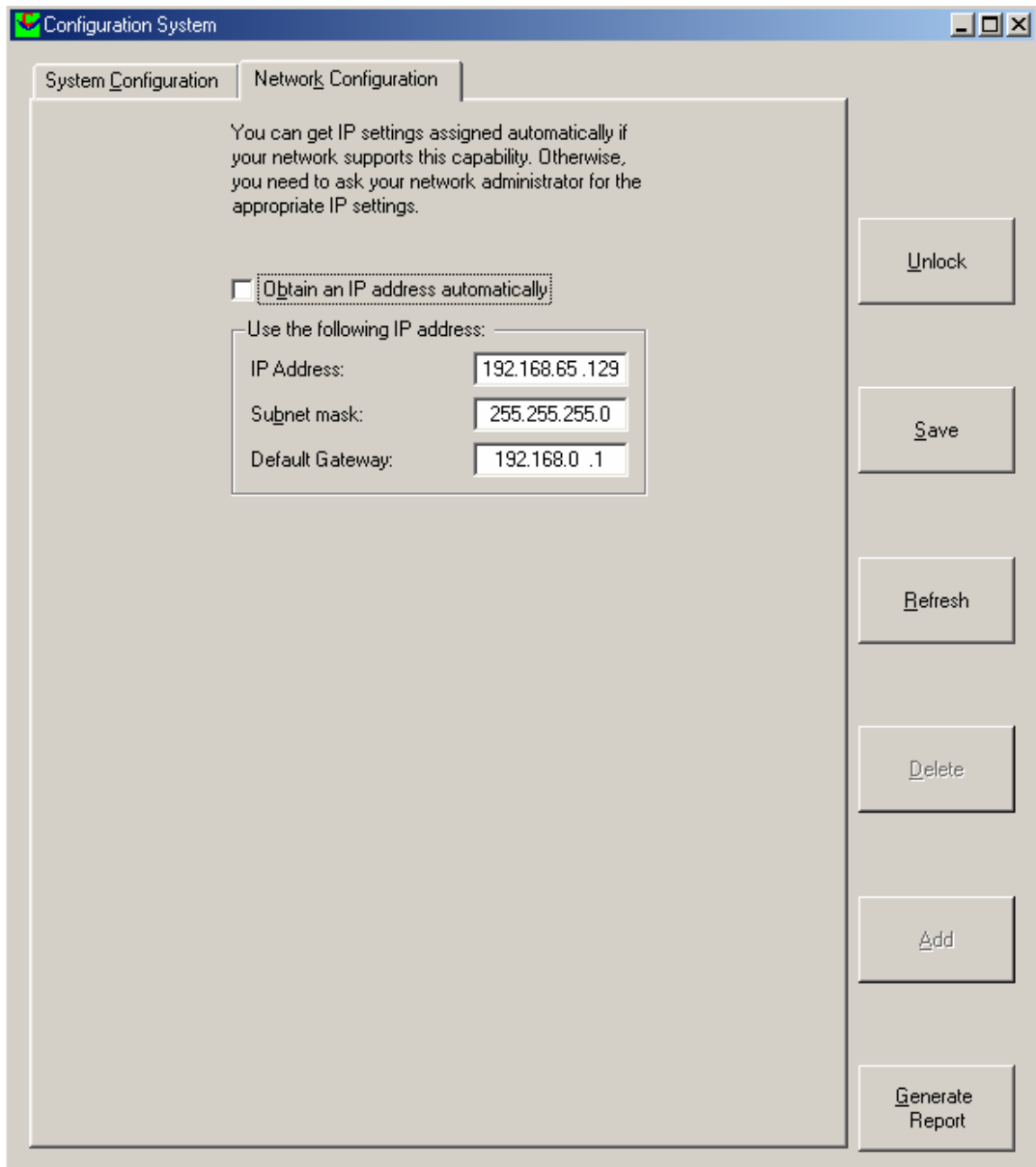
If the Reader is to be assigned an IP address from a DHCP server click the *Obtain an IP address automatically* check box.

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 Magellan 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:

- What kind of tags are you using and how many are you putting inside the Reader at one time?

- Have this Reader and the tags you are using worked at any time in the past?

- Have you tried connecting to the Reader with a different PC?

- Have you successfully installed the ReaderManager application?

- 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.

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.

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

If you purchased the Reader directly from Magellan, contact Magellan for a Return Authorization Number (RAN) before shipment.

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 Magellan if you purchased directly from Magellan 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 *Powering Field* is off	Ensure the powering field is on. Go to *Tools>System>Reader Setting.* Tick the *Powering Field* 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 *Connected*	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 *Connected,* 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 *Tools> System* menu as a communication tool.
Can not find and connect to the Reader as the Reader is not shown on the *Connection* menu list	The Reader was not in operational mode when you connected a communication cable and/or open the *Connection* menu	Unplug and plug in the communication cable. Open the *Connection* 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 *Connection* menu. Find the Reader you want to connect to on the list.

4.2 Service Form

<table>
<tr><td rowspan="1">CONTACT</td><td>Company _____
Address _____
Country _____
Sales Order _____
PO Number _____
Purchase Date _____</td><td>Return Authorisation Number (RAN) _____
Date _____
Technical Contact _____
Telephone _____
Fax _____
Email _____</td></tr>
<tr><td>PRODUCT</td><td colspan="2">From OEM label on the back of the equipment:
Model _____
P/N _____
D/C _____
S/N _____
MLC _____
      (first number in order after black dots)
Describe any hardware modifications made to the unit and modification date:
_____
_____
_____
_____
_____
_____</td></tr>
<tr><td>REASON FOR RETURN</td><td colspan="2">Describe problems (see 3.2 Reporting a Problem):
_____
_____</td></tr>
<tr><td>RETURN TO*</td><td>If purchased from Magellan:

Magellan Technology Pty Limited

65 Johnston St.
Annandale
NSW 2038
Australia</td><td>Tel.: +61 2 9562 9800
Fax: +61 2 9518 7620
Email: info@magtech.com.au
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</table>

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

5. Contact Us

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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)

7. Appendix

7.1 Specification

MDR-1109 Desktop Reader-Writer	
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) 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

7.2 Reader-Tag Compatibility and Maximum Read-Write Distance

Maximum Read-Write Distance* (MRD), mm		READER-WRITERS					
		MPR- 5050	MARS and round external antenna (60 mm radius)	MSTRP-5050	MDOCR-2505	MDR-1109	MTR-1310
S T A C K T A G S	Rectangular, 76 x 45 mm, 5 turns	315	235	✔	✔	60	✔
	Rectangular, 76 x 45 mm, 2.5 turns	160	170	✔	✔	30	✔
	Rectangular, 56 x 26 mm	280	220	✔	✔	55	✔
	Round, 35 mm diameter	145	170	✔	✔	40	✔
	Round, 25 mm diameter		115			15	✔
	Round, 20 mm diameter		100			10	
	Rectangular, 28 x 16 mm		120			15	✔
	Rectangular, 20 x 15 mm		95			10	
I T E M T A G S	Rectangular, 76 x 45 mm, 5 turns	540	315	✔		110	✔
	Rectangular, 20 x 15 mm		135		✔	25	✔

* - Measured for a single tag
✔ - Tags operate inside an internal volume or shrouded area