Functional Description / User manual

Pocket reader scanner PR100

PR100

User manual

Ref.	(PR100 readers)
Date:	2008-03-13
Rev.	1_01
Status:	Released

Contents:

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Revision Index

Revision	Date	Author	Change Record
1_00	2007-03-03	Soemsak	New document
1_01	2008-03-13	Soemsak	- Added (4) FCC Statement

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1. Introduction

This document specifies how to use the PR100 RFID reader, the reader user interface and the communication protocol with some modifications.

2. Preparing

In this chapter specifies what tools and environments that you need for working with the PR100 RFID reader and also how to install driver and support software.

2.1 Environments

- a PC (recommended >= Pentium 4, 1.00Ghz, 512MB Ram, 1GB hard drive space, a USB port)
- Window XP SP2
- Microsoft Dot Net Framework 2.0
- Microsoft Excel 2000 or newer version

2.2 Tools (In Support CD)

- PR100 Download Software version1.0.0.0 – uses for downloading data from the memory of the PR100 RFID reader
- EZTerminal.exe – uses for monitoring sent data from the PR100 RFID reader and debugging
- FlashSTA .exe – uses for updating a new firmware to the PR100 RFID reader

2.3 Installing PC drivers

The PR100 RFID reader uses virtual RS232 port to communicate with a PC via USB port. The instruction below will show you how to install the driver.

- Insert Support CD to a PC
- Go to “x:\Driver”
- Follow the instruction in “x:\Driver\Windows_XP_Installation_Guide.doc”

2.4 Installing Microsoft Dot Net Framework 2.0

PR100 Download Software version1.0.0.0 runs under Microsoft Dot Net Framework 2.0 environment. Therefore, use needs to install the framework before attempting to use PR100 Download Software version1.0.0.0. . The instruction below will show you how to install the framework.

- Insert Support CD to a PC
- Double click on “x:\Microsoft Dot Net Framework 2.0\dotnetfx.exe”
- Follow the installing instruction.

3. Getting Start

This chapter will show you how to use the PR100 RFID reader.

3.1 Turn ON and OFF

User can turn ON and OFF the PR100 RFID reader by pressing the “POWER” button

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Picture 3.1.1 Layout of the keyboard

And also user can turn ON the PR100 RFID reader by pressing the “Trigger” button on the reader.

Picture 3.1.2 the “Trigger” button

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***For saving power, the reader will turn OFF itself after 10 minutes if no pressed keys or no commands sent via virtual RS232 port. After the reader turn ON, it will go to the “ISO-6B READ ID(H)” mode

3.2 Reading IDs

The PR100 RFID reader supports 2 standard types of the RFID transponders/tags, ISO18000/6B and ISO18000/6C (EPC Class1 Gen2). User can change reading tag type by pressing the “TAG TYPE” button.

Picture 3.2.1 the position of the “TAG TYPE” button

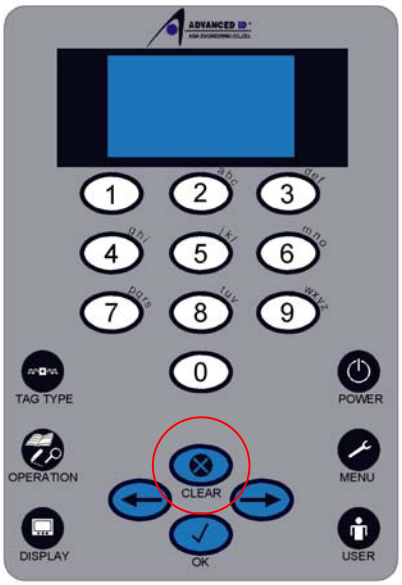
Once, user press on the “TAG TYPE” button, the reading mode will change by the sequence below.

ISO-6B READ ID(H) -> EPC-G2 READ ID(H)

Note: *(H) means the reader will show IDs in Heximal number (0 – F)

The counter number will increase according to the number of read tags.
Note: the maximum tag number that the reader can count is 50 unique tags.

If user wants to clear the tag counter and the data on the display, just press the “CLEAR” button.



Picture 3.2.3 the position of the “CLEAR” button

When the PR100 RFID Reader reads tag’s ID, the reader will store the information of the tag into the flash memory and user can download the information by using the program “PR100 Download Software version1.0.0.0” (this document will explain it in the next chapter). The contents of the information are as below:

Name	Description
Record number	The address in flash memory that the tag was stored.
Date	Date when the tag was read.
Time	Time when the tag was read.
Tag type	Type of the tag(ISO18000/6B or ISO18000/6C)
Action	The action mode(READ or WRITE or FIDE)
Display	The read field of data(ID, DATA, TID, RESERV)
ID	ID of the tag
Start address	If user is in “READ DATA” or “WRITE DATA” mode, this field will identify which address of the tag is the start address for reading/writing.
Data length	If user is in “READ DATA” or “WRITE DATA mode, this field will identify how long of the

	data that user read/write from the start address to the end of data. Note: the maximum is 32bytes
Data	If user is in “READ DATA” or “WRITE DATA mode, this field will identify the data in the tag.

3.3 Writing data/ID

The PR100 RFID allows user to write data/ID into RFID tags. However, **user needs to know first which RFID tag type that they are using (ISO18000/6B or ISO18000/6C)**.

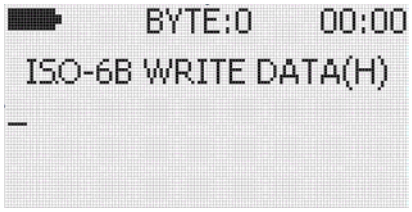
For writing data into tags ISO18000/6B type, user has to go to “ISO-6B WRITE DATA(H)” or “ISO-6B WRITE DATA(A)*” by pressing the “TAG TYPE” button to select “ISO-6B” type and then press the “OPERATION” button.

Note: *(A) means the reader will show data in ASCII characters (0-9, A – Z).

Picture 3.3.1 the position of the “OPERATION” button

Once user presses the “OPERATION” button, the operation will change to sequence below:

“ISO-6B READ ID(H)” -> “ISO-6B WRITE DATA(H)” -> “ISO-6B READ DATA(H)”

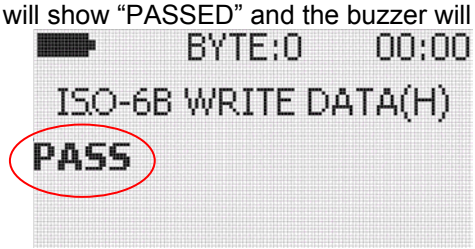


Picture 3.3.2 "ISO-6B WRITE DATA(H)" mode

User can type in 1 – 32 bytes data from the keyboard on the PR100 RFID reader.

Trip: if user wants to type in A,B,C in heximal, just repeat pressing the "2" button. If user wants to type in D,E,F in heximal, just repeat pressing the "3" button.

Note: user must enter the heximal data correctly. For example, the reader does not allow writing the heximal data which has wrong data length such as 0102030 (3 and half bytes), the reader will show error "WRONG LENGTH" on the display when user attempts to write it.
When user finishes typing in the data, point the reader to an ISO18000/6B tag ,press and hold the "Trigger" button to write the data into the tag until the display shows "PASS". When it finishes writing the display will show "PASSED" and the buzzer will beep.



Picture 3.3.3 writing success

If user wants to write data in ASCII mode, just press the "DISPLAY" button.

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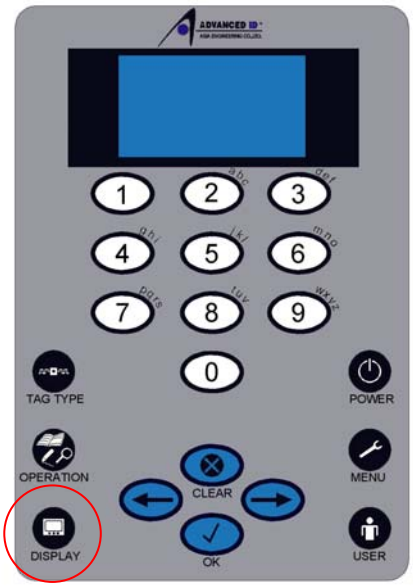

Picture 3.3.4 the position of the “DISPLAY” button

Once user presses the “DISPLAY” button, the operation will change to sequence below:

“ISO-6B READ ID(H)” -> “ISO-6B READ DATA(H)” -> “ISO-6B READ DATA(A)”
Or
“ISO-6B WRITE DATA(H)” -> “ISO-6B WRITE DATA(A)”

When user is in “ISO-6B WRITE DATA(A)” mode, the PR100 RFID reader will allow typing in ASCII Characters (0 – 9, A – Z).

3.4 Reading other field of ISO18000/6C(EPC Class1 Gen2)

The PR100 RFID reader allows user to read 4 fields in ISO18000/6C(EPC Class1 Gen2) tags. The fields are as below:

- Reserve – the data such as “ACCESS CODE”, “KILL CODE”(read/write or read only).
- EPC – EPC(ID) number of a tag (read/write/lock).
- TID – tag’s manufacture number and/or serial number. This field is written from a factory (read only).
- USER DATA – reserves for user data (read/write/lock).

When user want to read EPC(ID),DATA(H),DATA(A),TID or Reserve in ISO18000/6B(EPC Class1 Gen2) tags, just press the “TAG TYPE” button to select “EPC-G2” mode and then press the “DISPLAY” button. The sequence after pressing the “DISPLAY” button is as below:

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"EPC-G2 READ ID(H)" -> "EPC-G2 READ EPC" -> "EPC-G2 READ DATA(H)"
-> "EPC-G2 READ ID(A)" -> "EPC-G2 READ TID(H)" ->"EPC-G2 READ RESV(H)"

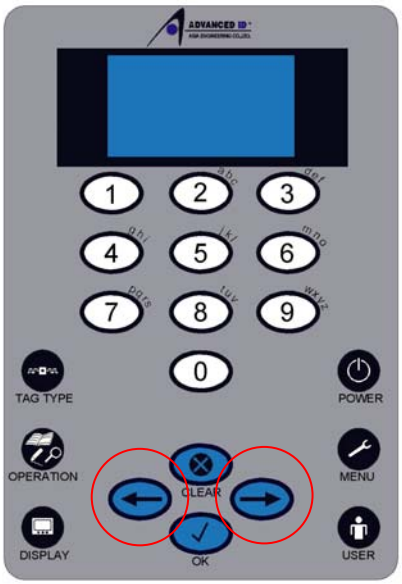
The PR100 RFID reader allows user to write EPC(ID) and DATA into ISO18000/6B(EPC Class1 Gen2) tags. When user want to write EPC(ID) or DATA, just press the "TAG TYPE" button to select "EPC-G2" mode and then press "OPERATION" to select "WRITE ID(H)" mode and then press the "DISPLAY" button.

3.5 Menu

User can change the data length, start address for reading/writing ISO18000/6B and start address for reading/writing ISO18000/6C by pressing the "MENU" button. If user repeats pressing the "MENU" button, the reader will go to the sequence below:

"SET DATALENGHT" -> "SET START ADDRESS FOR ISO-6B" -> '"SET START ADDRESS FOR EPC-G2"

To change the values, just press the "LEFT" or "RIGHT" button.
To go back to reading/writing mode press "OK" or "CLEAR"



Picture 3.6.1 the position of the "LEFT" and "RIGHT" button.

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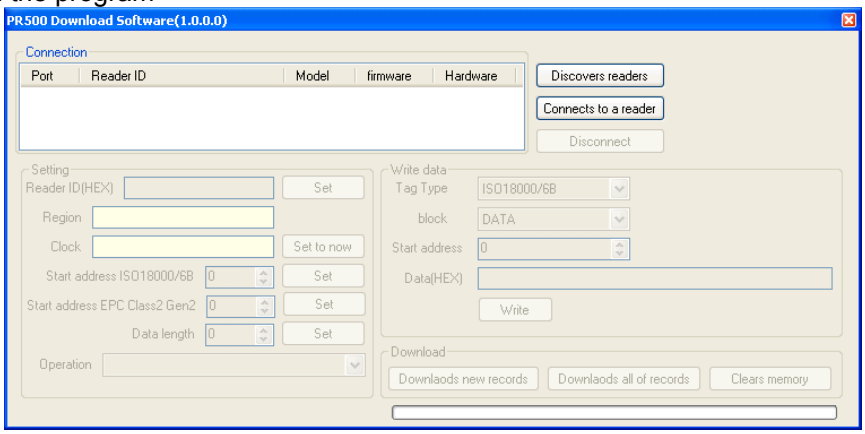
3.6 Downloading data from flash memory

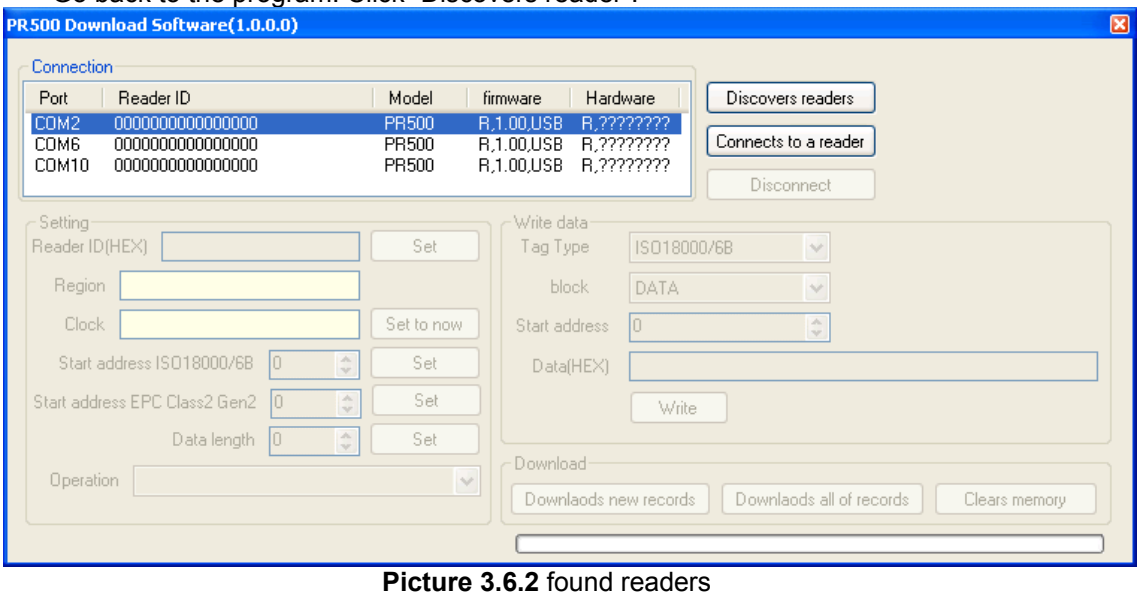
After user was reading RFID tags, they will be able to download the data out of the flash memory by using program “PR100 Download Software version1.0.0.0”. the instruction below will show you how to download data.

- Insert Support CD
- Makes sure you have already install Microsoft Dot Net Framework 2.0. if not, please go to chapter 2.
- Go to “x:\PR100 Download Software.exe” in the CD.
- Open the program



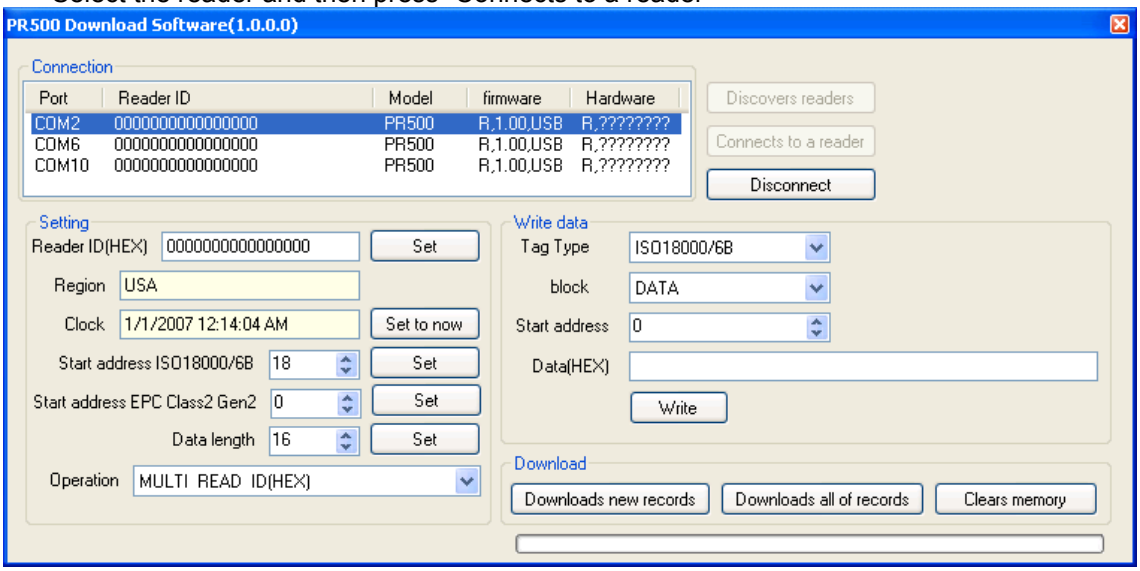
Picture 3.6.1 layout of the program

- Connect the PR100 RFID reader to the PC using the USB cable.
- Turn ON the reader.
- Go back to the program. Click “Discovers reader”.

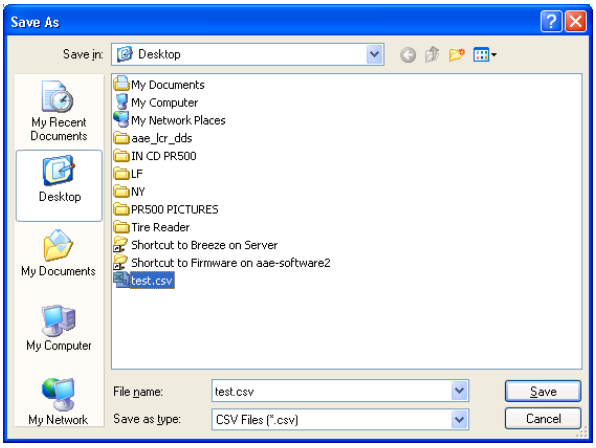


Picture 3.6.2 found readers

- The program will list the readers and show in the list box.
- Select the reader and then press “Connects to a reader”



- User can download data by pressing “Downloads new records” or “Downloads all of records”. “Downloads new records” will continue downloading data from the last time but for “Downloads all of records” will download all of data that was stored in the memory. After you press “Download”, Save As dialog will show as below.



- Select the path for saving the data. Click “Save”
- User can select 2 extensions. First is .CSV(opened by MS-Excel) and second is .TXT(opened by Notepad).

4. FCC Statement

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 instructions, 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 of the following measures:
Reorient or relocate the 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.
To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example - use only shielded interface cables when connecting to computer or peripheral devices).

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

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

FCC Radiation Exposure Statement:
(if mobile device (generally 20 cm distance) is applicable, MPE calculation)
“This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter”.

(if portable device is applicable (SAR))
“This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. SAR has been evaluated with a laptop as host and the maximum SAR value reported is 0.76 W/kg. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter”.

(also important for LAN is the following statement; may be included in manual or separate letter))
“This equipment marketed in USA is restricted by firmware to only operate on 2.4 GHz channel 1-11”.

For **Canada** the following text has to be included in the user manual: (See RSS-210 clause 5.11)

Operation is subject to the following two conditions:
1) this device may not cause interference and
2) this device must accept any interference, including interference that may cause undesired operation of the device

If the antenna is detachable the following sentences according to RSS-210 clause 5.5/5.11 need to be included:

“This device has been designed to operate with an antenna having a maximum gain of .. dB. Antenna having a higher gain is strictly prohibited per regulations of Industry Canada. The required antenna impedance is 50 ohms”.

“To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the EIRP is not more than required for successful communication”.

For LAN type equipment, the following text needs also to be present in the user manual:

“To prevent radio interference to the licensed service, this device is intended to be operated indoors and away from windows to provide maximum shielding.
(Equipment (or its transmit antenna) that is installed outdoors is subject to licensing).

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