RFID SOFTWARE USER INTERFACE





Technical Information Manual

Revision n. 03

22/03/2011

Scope of Manual

The goal of this manual is to provide the basic information to work with the RFID Software User Interface.

Change Document Record

| Date | Revision | Changes | | | | |
|-------------|----------|---|--|--|--|--|
| 18 Feb 2006 | 01 | First release. | | | | |
| 14 Jan 2011 | 02 | Added Federal Communications Commission (FCC) Notice | | | | |
| 22 Mar 2011 | 03 | Added R1260U Reader in the declaration of Federal Communications Commission (FCC) note. | | | | |

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Federal Communications Commission (FCC) Notice (Preliminary)¹

This device was tested and found to comply with the limits set forth in Part 15 of the FCC Rules. Operation is subject to the following 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. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This device generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instruction manual, the product may cause harmful interference to radio communications. Operation of this product in a residential area is likely to cause harmful interference, in which case, the user is required to correct the interference at their own expense. The authority to operate this product is conditioned by the requirements that no modifications be made to the equipment unless the changes or modifications are expressly approved by CAEN RFID.

¹ This declaration only applies to FCC readers A828US, A829US, A528, R1230CB, R1260I, R1260U.

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General Information

The present manual describes how to operate with the software pack provided with CAEN RFID UHF readers and development kits.

- The CD includes the following tools:
- RFID Java Demo program
- RFID Visual C++ test program
- RFID .Net Sample
- Upgrade firmware and protocols (for A928EU/A948EU, A828EU/A829EU, A828US/A829US, A949EU/A946EU)
- Uninstall tool







Software User interface: Installation

Before you begin, be sure that:

- 1. the Reader is not connected to your computer;
- 2. the Reader supports your operating system (Windows 2000/XP);

To install the software:

Place the CD in the CD tray in your PC. Then the following menu will open:

| | CAENRFIC | | |
|------------------------|---|--|--|
| | (((CD Software Pack))) | | |
| Install CAEN RFID Demo | The CAEN RFID Demo Program is an user friendly interface for the module control. Suitable for Windows 98/2000/XP. | | |
| Programmer's Interface | You can use the CAEN RFID Software Library to build your own software application that use and control the Reader. Moreover, the CAEN RFID Demo Program's sources are provided as example for programmers. | | |
| User Guides | This section contains the technical manuals of CAEN RFID product and a collection of documents related to RFID Technology. | | |
| Related Documentation | The documents in this section guarantee that the CAEN RFID Reader A928 is compliant to the local norms in matter of electro-magnetic emissions. | | |
| Online Resources | Keep yourself updated with the latest technical information periodically visiting the CAEN RFID web site. | | |

Fig. 2.1: CAEN RFID CD Main Menu

| If the menu does not open, then | Double-click on "My Computer". |
|---------------------------------|-----------------------------------|
| | Double-click on the CD-ROM drive. |
| | Double click on "index.html". |

Double-click on the file name "Install CAEN RFID Demo" option. Setup will install the files in the folder listed under "Destination Folder". To install to this folder, click "Next". To install to a different folder, click "Browse" and select another folder.

The Setup program creates the following directories:

| Discology (file second | Physics and the second at the second s |
|------------------------------|---|
| Directory/file name | Directory files description |
| Java | RFID Demo Java Version (see § Getting Started pag.8) |
| CAENRFIDIib.dll ² | Include files |
| lib | CAENRFIDlib.lib (stub for Microsoft Visual C++ 6.0) |
| sources | demo program Microsoft Visual C++ 6.0 Source files |
| RFID_Demo.exe | demo program |
| RFIDUpgrade.exe | Upgrade firmware and protocols |

² CAENRFIDLib library is described in the relevant Technical Information Manual



| TestRFID.exe | RFID Test program | | |
|--------------------------------------|-------------------|--|--|
| Unins000 | Uninstall tool | | |
| Tab. 2.1. CAEN PEID DEMO directories | | | |

Tab. 2.1: CAEN RFID DEMO directories

Launching the Software User interface

The RFID Demo Java Version is started by launching the CAENRFIDJavaDemo.jar file in the CAEN_RFID_Development_kit_Java\CAENRFIDJavaDemo folder in the CD's "<u>Programmer's Interface</u>" directory.

The present program is developed for demonstrative purposes, the Java classes are available in the "Programmer's Interface" directory of the CD.

Before launching the RFID Demo Java Version, it is necessary to install the Java 2 Platform Standard Edition 5.0, available at: <u>http://java.sun.com/j2se/1.5.0/download.jsp</u>

| 🍰 CAEN RFID Demo java version | |
|---|---------------|
| File Configuration Features About | |
| Open Connection Close Connection Exit THE AF | |
| Settings Acquisition | Tags Detected |
| Antenna dBi 8 | |
| Polarity Linear 🔾 Circular 🖲 📃 🔤 | |
| Cable dB 1.5 Syn | chronous |
| Set Power Asyn | tehronous |
| Data Exchange Status Bit | |
| RFID Reader Not Connected !!! | |

Fig. 2.2: CAEN RFID Demo start window

Connection configuration

Once you have connected the CAEN UHF RFID Reader to your PC, turn it ON, then:

Click on

File > Open connection

The following pop-up window will open:

| | 14 C |
|---------------|--------------|
| Connection by | TCP/IP 💌 |
| | |
| CP/IP Address | 192.9.200.85 |

Fig. 2.3: Connection port configuration

Choose the connection type; if you are using TCP-IP enter the IP address (default address: 192.168.0.125), if you are using RS232, type the connected port (COM1, COM2...) then click on <Connect>. If you wish to use RS232 or USB, please make sure that the Java Platform you are running supports such ports.



Reader protocol configuration

Optionally, it is possible to change the used protocol (ISO18000-6B or EPC C1G1/C1G2);

Click on

configuration > change reader's protocol

A pop-up window will allow to chose between ISO18000-6B (which supports also Philips UCODE EPC 1.19) and EPC C1G1.

If the protocol is changed, a reader reboot will be performed; then it is necessary to shut and re-start the CAEN RFID Demo program.

Network configuration

Optionally, it is possible to update the reader's network settings;

Click on

configuration > network setup

The following pop-up window will open (the figure shows the default configuration):

| IP Address 192.168.0.125 | | | | | |
|--------------------------|-----------|-----------|--|--|--|
| Netmask | 255.255.2 | 255.255.0 | | | |
| Gateway | 192.168.0 | 1.1 | | | |
| Sel | | Cancel | | | |

Fig. 2.4: Reader Network configuration

Input output management

This function allows to handle the reader general purpose inputs/outputs;

Click on

configuration > I/O Management

By checking the Output boxes, the relevant signal will be driven high. The Input status is also monitored: red = active, green = idle.

| 🍰 I/O Management 🛛 🛛 🔀 | | | | | | | |
|------------------------|----------|---|-------|---|---|--|--|
| | Input | | | | | | |
| | | 1 | 2 | 3 | 4 | | |
| | Output | | | | | | |
| Apply | | | Close | | | | |
| R | RFID: OK | | | | | | |

Fig. 2.5: Reader Network configuration



Logical source selection

Click on

configuration > configure logical source

The following pop-up window will open:



Fig. 2.6: Logical source selection and test

The antenna(s) status is checked:

BAD (antenna not connected) = RED

POOR (antenna with faulty operation) = YELLOW

GOOD (antenna ok) = GREEN

Then choose the antenna(s) you wish to use.

Finally it is necessary to set the thresholds:

Observed:

READCYCLE MODE (see § Detecting test tags with the RF field pag.12): the number of subsequent times a tag must appear in an acquisition before it shifts from "glimpsed" to "observed".

TIME MODE (see § Detecting test tags with the RF field pag.12): the number of milliseconds a tag must appear in an acquisition before it shifts from "glimpsed" to "observed".

Lost:

READCYCLE MODE: the number of subsequent times an observed tag must disappear from an acquisition before it shifts from "observed"" to "lost".

TIME MODE: the number of milliseconds an observed tag must disappear from an acquisition before it shifts from "observed"" to "lost".

Read Cycle: the number of times an acquisition must be timed out and then restarted **Confirm settings by clicking on <Configure>. Thresholds are meaningful only with Asynchronous Acquisition** (see § Detecting test tags with the RF field pag.12).

Detecting test tags with the RF field

Now the Reader is ready for detecting tags; click on either:

<Synchronous Acquisition> <Asynchronous Acquisition>

With Synchronous Acquisition, a "one shot" readout is performed.

Asynchronous Acquisition allows to perform either Timed Acquisition or a I/O Timed-out acquisition.

In the first place it is necessary to set the "Event mode" by clicking on: Configuration>Configure Event Mode The following window opens:



| Change Event Mode | | | |
|-------------------|--------|---------------------------|---|
| Even | t Mode | READCYCLE MODE | - |
| | 1 | READCYCLE MODE | |
| | Apply | TIME MODE NOEVENT MODE | |
| RFID: | ок | X | |

Fig. 2.7: Event mode configuration

If READCYCLE MODE is selected, the logical source thresholds are expressed in cycles, whose duration is equal to the Delay time set when Asynchronous Acquisition is launched.

If TIME MODE is selected, the logical source thresholds are expressed in milliseconds; it must be noticed that the thresholds might not be multiple of the delay time, so a tag can change its status after a non-integer number of cycles.

If NOEVENT MODE is selected, the tags are continuously scanned, the threshold values are meaningless (the tag is considered either inside or outside the reader's field and no Glimpsed/Observed status is notified)

After changing Event Mode it is necessary to restart both the Reader and the RFID Demo Java Version. The following message will be shown:

| 🖆 Message Box 🛛 👂 | × |
|--|---|
| The Reader's Event Generation Mode will be changed on next reboot Please Disconnect before restart Reader! | |

Fig. 2.8: Change Event mode message

| Choose a Trigger type: | Timer | |
|---------------------------|-------------|--|
| | Timer | |
| Delay time (millisecond): | I/O Input 0 | |
| | I/O Input 1 | |
| Notification on: | I/O Input 2 | |
| Local H | I/O Input 3 | |
| | | |

Fig. 2.9: Asynchronous Acquisition configuration

If you wish to make a Timed Acquisition in READCYCLE MODE:

- choose "Timer" as trigger type in the drop down menu of the Asynchronous Configuration which is started as Asynchronous Acquisition is selected.
- set the timer period in "Delay time" field
- set the notification on Local or Remote host: in the latter case you have to enter the host IP address
- "Start" acquisition

The notification takes place on the RFID Server window, which is shown either on the Local host or on the Remote one:





Fig. 2.10: RFID Server

If you wish to make a **I/O Timed-out Acquisition** in READCYCLE MODE:

- choose the General Purpose Input you wish to use as trigger type in the drop down menu of the Asynchronous Configuration.
- set the time out delay in "Delay time" field
- set the notification on Local or Remote host: in the second case you have to enter the host IP address
- "Start" acquisition

The notification takes place on the RFID ServerConfiguration; after the first acquisition the Reader waits for one "Delay time" period, then checks the status of the used input: if it is high, then the second acquisition takes place, otherwise it is timed out; at this point the Reader waits for another Delay time, then checks the status of the used input again.

If you wish to make a Timed Acquisition in TIME MODE:

- choose "Timer" as trigger type in the drop down menu of the Asynchronous Configuration which is started as Asynchronous Acquisition is selected.
- set the timer period in "Delay time" field
- set the notification on Local or Remote host: in the latter case you have to enter the host IP address
- "Start" acquisition

The notification takes place on the RFID Server window, which is shown either on the Local host or on the Remote one. The status does not depend on the number of performed cycles, but ONLY on the threshold values (see § Logical source selection pag.12); the "Delay time" must be smaller than the thresholds.

If you wish to make an acquisition in NOEVENT MODE, simply :

- set the timer period in "Delay time" field
- set the notification on Local or Remote host: in the latter case you have to enter the host IP address
- "Start" acquisition

The notification takes place on the RFID Server window, which is shown either on the Local host or on the Remote one, no status is notified.

Readout of one tag's memory

Now the ISO18000-6B detected tags are ready for read/write operations. In case of Timed, Continuous or I/O Acquisition it is necessary to stop scanning, by clicking on the stop acquisition button. Now click on one of the tags' Unique ID's; then go to:

Features

>ISO18000-6B >Read/Write Tag Memory

The following window is shown:



| ag ID EOO | 42BCD2C0100 | 00 |
|-------------|------------------|------------|
| lemory valu | ue from location | n 30 to 60 |
| CAEN RFID | Tag | |
| ogical Sour | ce: Source_(|) |
| Undate | Restore | Close |

Fig. 2.11: Tags memory

By writing in the Value field, it is possible to update the tag memory; changes are saved via the <Update> button, while <Restore> allows to recover the former value.

In order to lock one particular address in the tag memory, go to:

Features >ISO18000-6B >Lock

The following window is shown; <Lock> allows to lock one particular address, <Cancel> to quit. Locked addresses cannot be changed anymore.

| ISO18000-6B Lo | ock TAG's Mem 🗙 |
|--|---------------------------|
| TAG ID 0130110 | :0FF9F6205 |
| Address to lock | (08DF) |
| (data written in TAG' address 1F to 1E.) | 's memory are stored from |
| Lock | Cancel |

Fig. 2.12: Tag readout

The configuration of the ISO18000-6B compliant tags is the following:

| Byte | Content | Status | Description |
|---------|-----------------|----------|------------------------------|
| 0,1 | E0, 04 hex | locked | Unique serial number |
| 2÷7 | xx hex | locked | Unique serial number |
| 8÷10 | 00 hex | unlocked | User memory |
| 11 | 02 hex | unlocked | User memory |
| 12÷17 | FF hex | unlocked | User memory |
| 18÷219 | 00 hex | unlocked | User memory |
| 220÷223 | 57 5F 4F 4B hex | unlocked | "w_ok" in ASCII, user memory |

The CAEN RFID Demo program allows to write only bits [2; 17].

EPC protocol tags operations

If EPC tags are detcted, then go to:

Features >EPC

>Program ID

For (over)writing the tags ID, setting the password, and locking them:



| 👙 EPC C1G1 ProgramID 🛛 🛛 🚺 | | | | |
|----------------------------|------|--------|--|--|
| Tag ID Passw | ord | Lock 📃 | | |
| | Burn | Cancel | | |
| RFID: OK | | | | |

Fig. 2.13: Tag programming

Go to:

Features >EPC

>Kill

For killing the tag (the password is required). Once killed the tag does not respond to (any) reader anymore.

| 👙 EPC C1G1 Kill | Tag 🛛 🔀 |
|-----------------|---------------|
| ID: 21A87C68F9C | 2BB2E3087D336 |
| Password: |] |
| Kill | Cancel |
| RFID: OK | |

Fig. 2.14: Tag killing

The configuration of the EPC Class 1 Gen 1 compliant tags is the following:

| Byte | Туре | Status | Description |
|------------|--------|----------|-----------------------|
| 00, 01 hex | System | locked | Tag header |
| 02 hex | System | unlocked | EPC portion |
| 03÷07 hex | System | unlocked | EPC portion |
| 08÷0F hex | System | unused | |
| 10÷17 hex | System | unlocked | EPC portion |
| 18÷37 hex | User | unlocked | User memory (256 bit) |
| 38÷FF hex | RFU | | |



Temperature monitoring with the semipassive tag

The semipassive tag Mod. A927 includes a temperature sensor; so it is possible to view the temperature parameter as a function of time. This is possible by clicking on the termometer icon.



Fig. 2.15: Temperature monitoring/1

A pop-up window with the temperature trace will be then shown:

| r ag iv | 2223242526270000 |
|---------|---------------------|
| | Current Temperature |
| Close | 10 019 |

Status:

Green = tag inside reader's field Red = tag outside reader's field

Creating the Log file

Click on

configuration > Enable logging

Then start the "Continuous acquisition".

When the acquisition is stopped, it will be possible to save the log text file, containing information on the detected tags, for example:

 Tue Apr 19 11:01:19.011
 e004840306010000
 Glimpsed

 Tue Apr 19 11:01:19.101
 e004840306010000
 Glimpsed

 Tue Apr 19 11:01:19.201
 e004840306010000
 Glimpsed

N.B.: creating the Log file is possible only with "Continuous acquisition".

RF Field test

It is possible to test the RF field emissions in the following way: Click on configuration > select test & read point Then select the read point to be tested (0..3). Go to the main menu, then set the desired power and choose "single acquisition". Click on configuration > experimental > RF ON It is now possible to test the RF field emission on the selected read point. In order to test another read point it is necessary to repeat the procedure from the start.



Quit CAEN RFID Demo program

For quitting the CAEN RFID Demo program click on File > exit

Then turn off the reader and disconnect the antenna cable, the power cord and the link cable.

ISO18000-6B protocol tags operations

The ISO18000-6B detected tags are ready for read/write operations. It is necessary to stop scanning, by clicking on the stop acquisition button. Now click on one of the tags' Unique ID's; then go to:

Features

>ISO18000-6B

>Read/Write Tag Memory

The following window is shown:

| 🖆 Update Tag Value | × |
|-------------------------------------|---|
| Tag ID E004ABBC2C010000 | |
| Memory value from location 30 to 60 | |
| test_tag_new |] |
| Logical Source: Source_0 | |
| Update Restore Close |] |
| RFID: Tag Readed !!! | |

Fig. 2.17: ISO18000-6B Tags memory

By writing in the Value field, it is possible to update the tag memory; changes are saved via the <Update> button, while <Restore> allows to recover the former value.

In order to lock one particular address in the tag memory, go to:

Features >ISO18000-6B >Lock

The following window is shown; <Lock> allows to lock one particular address, <Cancel> to quit. Locked addresses cannot be changed anymore.

| 🖆 Lock Tag's Memory 🛛 🔀 | | | |
|--------------------------|-------|--|--|
| Tag ID E004ABBC2C010 | 0000 | | |
| Logical Source: Source_0 | | | |
| Address to lock (dec) | | | |
| Lock Tag | Close | | |
| RFID: OK | | | |

Fig. 2.18: ISO18000-6B Tag readout

The configuration of the ISO18000-6B compliant tags is the following:

| Byte | Content | Status | Description |
|-------|------------|----------|----------------------|
| 0,1 | E0, 04 hex | locked | Unique serial number |
| 2÷7 | xx hex | locked | Unique serial number |
| 8÷10 | 00 hex | unlocked | User memory |
| 11 | 02 hex | unlocked | User memory |
| 12÷17 | FF hex | unlocked | User memory |



| 18÷219 | 00 hex | unlocked | User memory |
|---------|-----------------|----------|------------------------------|
| 220÷223 | 57 5F 4F 4B hex | unlocked | "w_ok" in ASCII, user memory |

The CAEN RFID Demo program allows to write only bits [2; 17].

EPC1.19 protocol tags operations

If EPC1.19 tags are detected, then go to:

Features >EPC1.19

> Read/Write Tag Memory

For (over)writing the tags ID and Memory:



Fig. 2.19: EPC1.19 Tag programming

In order to lock one particular address in the tag memory, go to Go to:

Features

>EPC1.19 >Lock

The following window is shown; <Lock> allows to lock one particular address, <Cancel> to quit. Locked addresses cannot be changed anymore.

| 👙 Lock Tag's Memory 🛛 🔀 |
|---|
| Tag ID EF0402000134B9E1000000000000000000 |
| Logical Source: Source_0 |
| Address to lock (dec) |
| Look Tag Close |
| RFID: OK |
| Fig. 2.20: EPC1.19 Tag locking |

EPC 1.19 Tag Data memory mapping (96 bit)

| - | 12 Byte |
|--------|---------|
| | |
| Header | Numbers |
| Bit 96 | Bit 1 |





| 1 Byte | 6 Byte | 5 Byte |
|---------------|---------------|--------------|
| | | |
| Portion A | Portion B | Portion C |
| Bit 96 Bit 89 | Bit 88 Bit 41 | Bit 40 Bit 1 |

Fig. 2.22: Separation of 96 bit data structure for UCODE EPC 1.19

| Byte | 00 _{hex} | 01 _{hex} | 02 _{hex} | 03 _{hex} | 04 _{hex} | 05 _{hex} | 06 _{hex} | 07 _{hex} | |
|-------------------|-------------------|-------------------|-------------------|-------------------|--------------------|-------------------|--------------------------|-------------------|--|
| memory content | EF_{hex} | 04 _{hex} | Portion A | | | | | | |
| | | | | | | | | | |
| Byte | 10 _{hex} | 11 _{hex} | 12 _{hex} | 13 _{hex} | 14 _{hex} | 15 _{hex} | 16 _{hex} | 17 _{hex} | |
| memory content | content Portion B | | | | Partition value | Filter value | | | |
| | | | | | | | 0000 Oppp _{bin} | 0000 Offf bin | |

ppp ... containing a copy of the 3 Bit Partition value for selection possibility if a partition exists, otherwise ppp shall be 000 bin

fff ... containing a copy of the 3 Bit Filter value for selection possibility if a filter exists, otherwise fff shall be 000 th

Fig. 2.23: Mapping of 96 bit data structure into UCODE EPC 1.19 memory

EPC 1.19 Tag Data memory mapping (64 bit)

| | 8 Byte |
|--------|---------|
| | |
| Header | Numbers |
| Bit 64 | Bit 1 |

Fig. 2.24: General structure of 64 bit EPC number



Fig. 2.25: Separation of 64 bit data structure for UCODE EPC 1.19

| Byte | 00 _{hex} | 01 _{hex} | 02 _{hex} | 03 _{hex} | 04 _{hex} | 05 _{hex} | 06 _{hex} | 07 _{hex} |
|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| memory content | EF_{hex} | 04 _{hex} | Portion A | | | Portion C | | |

| Byte | 10 _{hex} | 11 _{hex} | 12 _{hex} | 13 _{hex} | 14 _{hex} | 15 _{hex} | 16 _{hex} | 17 _{hex} |
|---------|-------------------|-------------------|-------------------|-------------------|--------------------------|--------------------------|--------------------------|-------------------|
| memory | Denti | Portion B | | | 0000 0000 | 0000 0000 _{bin} | 0000 0000 _{bin} | Filter |
| content | Porti | | | bin bin | 0000 0000 _{bin} | | | value |
| | | | | | | | | 0000 0fff |

fff ... containing a copy of the 3 Bit Filter value for selection possibility if a filter exists, otherwise fff shall be 000 th

Fig. 2.26: Mapping of 64 bit data structure into UCODE EPC 1.19 memory



| 3 | Firmware Upgrade |
|---|------------------|
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Firmware upgrade via serial port

In order to upgrade the Reader firmware, connect the it with the PC Host via RS232, then open the following directory:

| CAEN RFID Development Kit | |
|--|---------|
| File Modifica Visualizza Preferiti Strumenti ? | 1 |
| 🔇 Indietro 🔹 🕥 - 🎓 🔎 Cerca 🌔 Cartelle | • |
| Indirizzo 🗁 C:\Programmi\CAEN RFID Development Kit | 🖌 🔁 Vai |
| Java | |
| 🛅 lib | |
| Sources | |
| S CAENRFIDLIB.dll | |
| RFID_Demo.exe | |
| RFIDUpgrade.exe | |
| 🗐 unins000.dat | |
| Junins000.exe | |
| | |

Fig. 3.1: CAEN RFID DEMO directories

Now launch RFIDUpgrade.exe:

|) <mark>00</mark> CAEN RFI | DUpgrade | 2.0 | | | | × |
|----------------------------|----------|---------|---------|----------|---|--------|
| Image file: | | | | | _ | Browse |
| RS232 port: | COM1 | - | Upgrade | Firmware | F | |
| | | | | Firmware | | |
| | | Upgrade | | Cancer | | |

Fig. 3.2: CAEN RFIDUpgrade/1

Select "Firmware" in the Upgrade Menu and the connected port, then Browse the image file to be uploaded (for example: image-2.0b.bin):

| Image file: | C:\Program | ni\CAEN RI | FID\image-2.0 |)b.bin | | Browse |
|-------------|------------|------------|---------------|----------|---|--------|
| RS232 port: | COM1 | • | Upgrade | Firmware | • | |

Fig. 3.3: Selecting the image file

Now click on <Upgrade>; it will take 10 minutes for uploading the updated firmware and rebooting the Reader; when the Reader is ready the ISO/EPC and the Active leds will light up: **do not turn off** the Reader before the Active led lights on and then off!

The image file can be found in the Upgrade_img_file directory of the "Driver, Demo software and Technical manuals" CD ROM (included in the RFID Development Kit); it can also be downloaded at: http://www.caen.it/rfid/english/download.php



Firmware upgrade via TCP/IP

The Firmware upgrade via TCP/IP works only with the CAENRFID Demo Java Version. First you need a TFTP Server & Client application, if you have not one installed, you can download (from <u>http://www.klever.net/</u>), install and run the pumpkin.exe freeware application:



Fig. 3.4: PumpKIN Menu Window

Select [Options] and browse the folder where the image file resides with the following selections, then press [OK]

| C:\Documents and Settings\user\Desktop\ C:\Documents and Settings\user\Desktop\ ✓ Allow access to subdirectories Read Request Behavior | erver Netwo | rk Sounds | th) | |
|---|---|--|--------------|------------------------|
| Allow access to subdirectories Read Request Behavior Give all files Prompt before giving file Deny all requests | C:\Docume | nts and Settings\user | Desktop\ | |
| Read Request Behavior Confirmati Give all files Confirmati Prompt before giving file Confirmation C Deny all requests Write Request Behavior Confirmation C Deny all requests Confirmation Confirmation C Take all files Confirmation Confirmation C Always prompt before accepting file Confirmation Confirmation | Allow ac | cess to subdirectories | | |
| Write Request Behavior C Take all files C Prompt if file exists C Always prompt before accepting file C Dopu all acquirate | Read Require Give all Prom C D | est Behavior iles pt before giving file eny all requests | | Confirmatio timeout |
| Deny all requests | Write Reque C Take all C Prom C Al | ist Behavior files pt if file exists ways prompt before ad Deny all requests | cepting file | |

Fig. 3.5: PumpKIN Options Window

Connect to the Reader by using CAEN RFID Demo Java version and select Configuration>Firmware Upgrade

enter the TFTP server address and browse the image file to be loaded into the Reader, then press [OK]:

| 👙 Firmware Upgr | ade 🛛 🗙 |
|-------------------|---------|
| TFTP Server Addre | ISS |
| Upgrade File Name | |
| | Browse |
| Ok | Close |
| RFID: OK | |

Fig. 3.6: Firmware upgrade browser

The following information message will then be shown:

CAENRFID

| Messag | ge 🔀 |
|--------|---|
| i | The firmware upgrading procedure stop all reader's function. If a valid TFTP server is found and the filename is correct the reader will download it and upgrading itself, during this period the reader's error led will flash and then all leds will be lit for about 3 minutes then the reader will restart with new firmware. If an error occurs only EPC/ISO and Error leds will be lit then a manual restart is needed. |
| | ОК |

Fig. 3.7: Firmware upgrade message

Press ok and this confirmation message will be returned:

| Firmwa | re Upgrade | | | × |
|---------------|-------------------|-------------|------------------|-----------------|
| ? | Are you sure y | rou want to | upgrade the read | der's firmware? |
| | | Yes | No | |
| Fig. 3.8: Con | firmation message | | | |

Press YES then Download image via TFTP; the Firmware Upgrade is then completed.



| 4 | RFID Test Program |
|---|--------------------------|
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This is a simple VisualC++ test program: go to the main directory CAEN RFID DEMO KIT, then launch the TestRFID.exe executable file; the following Menu will be launched:

| 🔎 RFI | DTest | | |
|-----------|---------|---------------|--|
| File Se | ettings | About | |
| 1 | | | |
| Star | rt Test | Acq/Sec | |
| Sou TA | nd 🔽 | Tags/Sec | |
| |) | Efficency | |
| CAEN R | FIDTest | Disconnected. | |

Fig. 4.1: RFID Test main menu

Connection configuration

Once you have connected the CAEN UHF RFID Reader to your PC, turn it ON, then:

Click on

File > Connect

The following pop-up window will open:

| Connection by | TCP/IP | |
|----------------|--------------|--|
| TCP/IP Address | 192.9.200.85 | |
| | | |

Fig. 4.2: Connection port configuration

Choose the connection type; if you are using TCP-IP enter the IP address (default: 192.168.0.125), if you are using RS232, type the connected port (COM1, COM2...) then click on <Connect>.



Settings

Antenna selection

Click on

settings > set source

then flag the antenna(s) you wish to use

|) 0 0 R | FIDTest | | |
|----------------|--|------------------------------|--|
| File | Settings About | | |
| 1 | Set Source Set Protocol Set Power Set Network | Ant0 Ant1 Ant2 Ant3 | |
| and a second | - Part | a | |
| S | itart Test Acionation | q/Sec qs/Sec | |
| | TAGS Effi | icency | |

Fig. 4.3: Source selection

Protocol selection

Click on

settings > set source

then flag the protocol you wish to use

|) <mark>00</mark> 3 R | FIDTest | | | | | |
|-----------------------|----------------------|----------------|---|-----|-------|-----|
| File | Settings | About | | | | |
| | Set So Set Pr | ource 🕨 | ✓ ISO 18000_68 | | North | |
| 1 | Set Po Set Ne | iwer stwork | EPC C1Gen1 EPC C1Gen2 MultiProtocol | | - Ce | 200 |
| 9 | itart Test | Perf | ormances q/Sec | | | |
| S | ound IT TAGS 0 | Ta Eff | gs/Sec cency | | | |
| TestF | RFID is cor | nnected to | A928 Reader at 192.168.0.1 | 25! | | |

Fig. 4.4: Setting the protocol



Power settings

Click on

settings > set source

then type the power settings you wish to use

| Set Power | |
|----------------|-----|
| Power Settings | |
| Antenna dBi | 8.0 |
| Cable dB | 1.5 |
| Set Power | 504 |

Fig. 4.5: Power settings fields

Reader network configuration

Optionally, it is possible to update the reader's network settings;

click on

settings > set network

The following pop-up window will open (the figure shows the default configuration):

| Reader Network Configu 🔀 | | | | | | |
|------------------------------------|--------|--|--|--|--|--|
| Set Reader Network's configuration | | | | | | |
| IP Address | | | | | | |
| Netmask | | | | | | |
| Gateway | | | | | | |
| Set | Cancel | | | | | |

Fig. 4.6: Network configuration

Start Test

Now click on « Start Test »: the name of the tags in the reader's field will be shown. Click on «Stop test» in order to stop acquisition.



Fig. 4.7: Tags detection



Quit CAEN RFID Test program

For quitting the CAEN RFID Test program click on

File > exit

Then turn off the reader and disconnect the antenna cable, the power cord and the link cable.





This is a simple RFID .Net Sample program. First of all, go to:

http://www.microsoft.com/downloads/

then download and install on your PC the DotNet Framework 1.1

Then go to the main directory CAEN RFID DEMO KIT, then launch the CAENRFIDCsDemo.exe executable file; the following Menu will be launched:

| 🖶 CAEN RFID C# Libra | ry demo application | |
|-------------------------|---------------------|--|
| Connection type: | | |
| RS232 🔽 | | |
| Address: | | |
| Tag type: | | |
| ISO USER 📃 | | |
| Address: Length: 4 4 | | |
| Connect | | |
| Inventory | | |
| Read | | |
| Write | | |
| Asynch | | |
| Disconnect | | |

Fig. 5.1: RFID Test main menu

Connection configuration

Once you have connected the CAEN UHF RFID Reader to your PC, turn it ON, then:

Choose the connection type; if you are using TCP-IP enter the IP address (default: 192.168.0.125), if you are using RS232, type the connected port (COM1, COM2...) then click on <Connect>. The following pop-up window will open:



Fig. 5.2: Connection confirmation



Start inventory

Select the tag type you want to read, then click on « Inventory »: the name of the tags in the reader's field will be shown. Click on «Disconnect» in order to stop acquisition.

| 🔜 CAEN RFID C# Libra | ary demo application | |
|----------------------------|--|--|
| Connection type: TCP/IP | E0-04-DC-FB-2C-01-00-00 E0-04-8C-BF-2C-01-00-00 | |
| 192.168.0.125 | | |
| ISO USER Address: Length: | | |
| 4 4 | | |
| Inventory | | |
| Read | | |
| Write | | |
| Asynch | | |
| Disconnect | | |

Fig. 5.3: Tags detection

Read tags memory

Select the tag type you want to read, then click on «Read»: the memory content of the tags in the reader's field will be shown.

| 🔜 CAEN RFID C# Libra | ry demo application | |
|----------------------|-------------------------|--|
| Connection type: | E0-04-DC-FB-2C-01-00-00 | |
| TCP/IP | E0-04-6C-BF-2C-01-00-00 | |
| Address: | | |
| 192.168.0.125 | | |
| Tag type: | | |
| ISO USER 📃 | | |
| Address: Length: | | |
| 4 4 | | |
| Connect | | |
| | | |
| | | |
| Read | | |
| Write | | |
| | | |
| Acurch | | |
| Asynch | | |
| Disconnect | | |
| | 2C-01-00-00 | |

Fig. 5.4: Tags memory readout