Advanced Card Systems Limited

Card and Reader Technologies

Multi-Application Demo Manual

ACR122U NFC Reader

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1.0 Introduction

The ACR122 NFC Reader can be used in a wide range of applications and this demonstration program simulates a Smart Poster/ NFC Device setting. The application shows that conventional functions such as gathering information from a Smart Poster on the go and purchasing Cinema tickets with just tapping into the poster. This application highlights the NFC capabilities of the ACR122 NFC Reader.
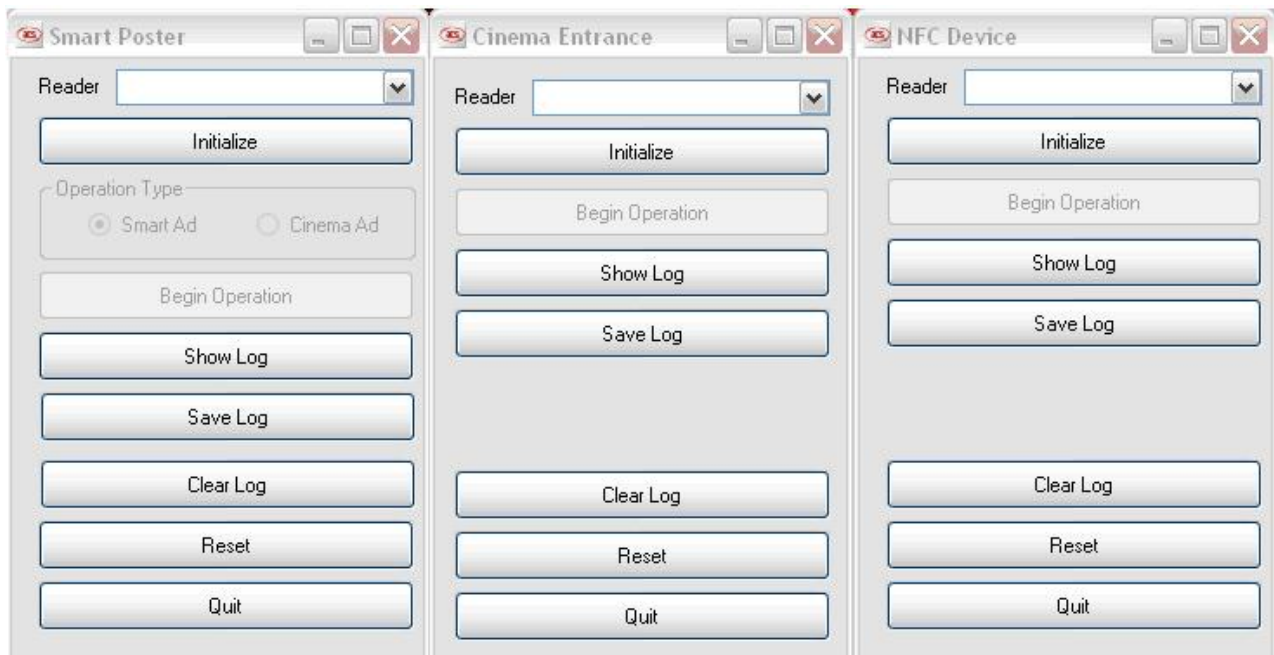

Figure 1. ACR122 Multi-Application Demo

2.0 Overview

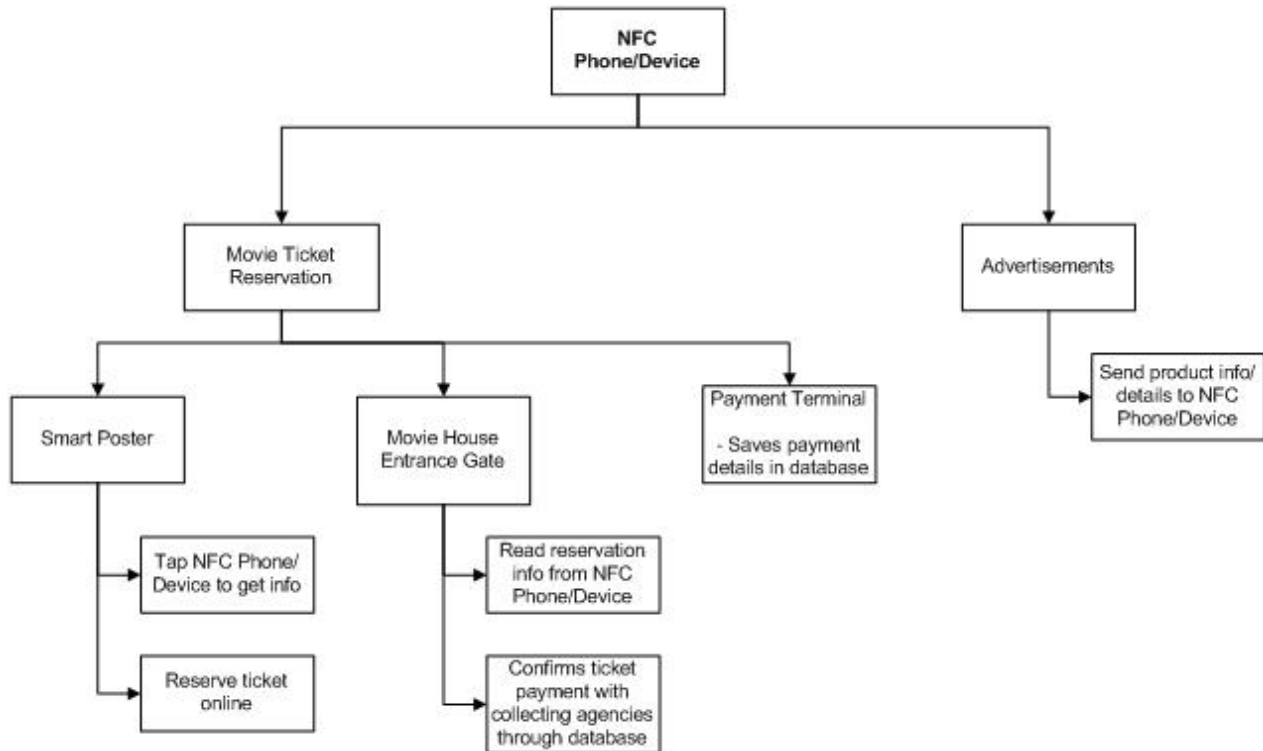The program flow of the Multi-Application Demo can be summarized by the figure below:

Figure 2. Application Flow Chart

This demonstration program is divided into two main parts, the Advertisement module, where the Smart Poster will send information about a certain product to the NFC device and the Movie Ticketing module where the Smart Poster will send information about a certain movie to the NFC device and will ask the user if he wants to buy a ticket to the movie online.

Since the ACR122 NFC Reader doesn't have a built-in memory, a contactless card will be used as a memory card where the data will be stored in. This application will use a MiFare 4K contactless card for the memory storage.

3.0 Demo Application Requirements

Once the SDK Components have been successfully installed, you need the following to properly run the Demonstration Application.
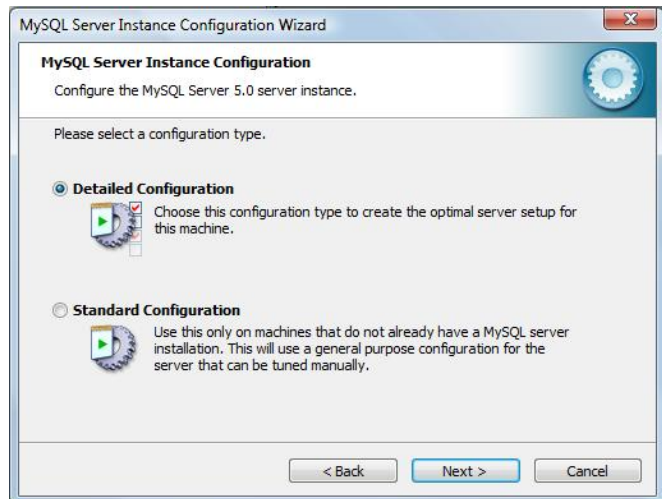
3.1 Database Set-up

1. Install the MySQL Server. Click on Next.

Note: You can download the MySql Server Installer as well as the Installation guide from http://www.mysql.com/ or you can extract mysql-5.0.45-win32.zip file from the ACR122 SDK installer folder and run Setup.exe.
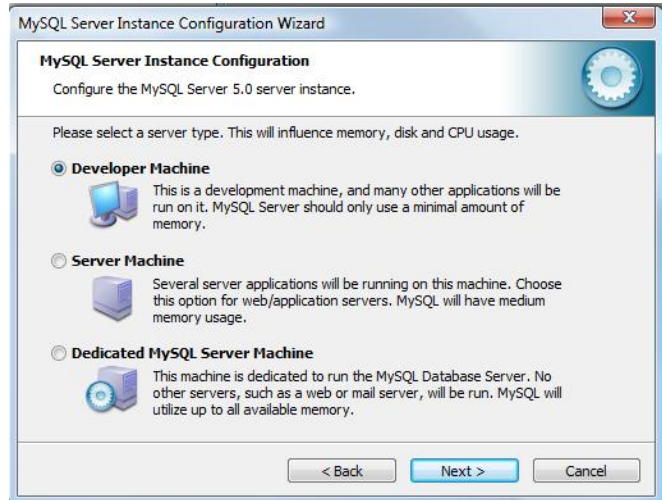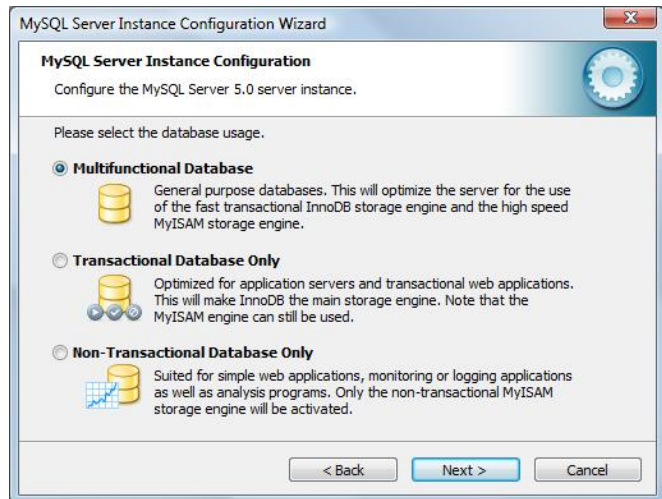
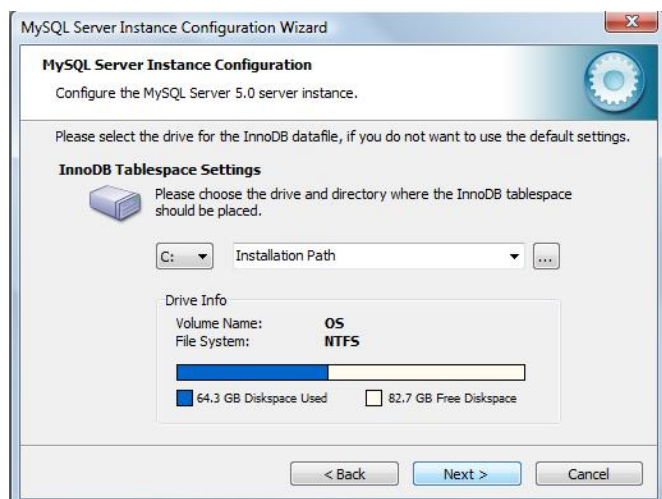2. Choose Detailed Configuration. Click on Next.

3. Choose Developer Machine. Click on Next.

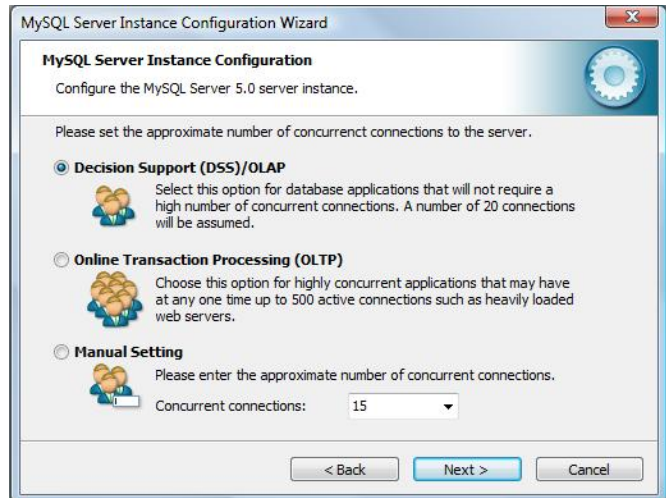4. Choose Multi-Functional Database. Click on Next.

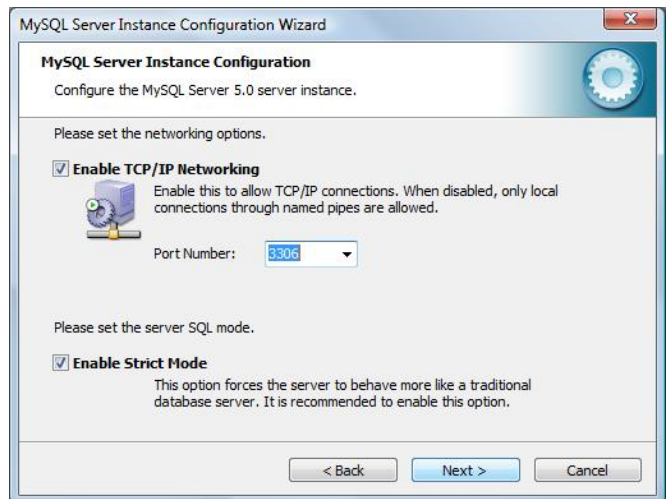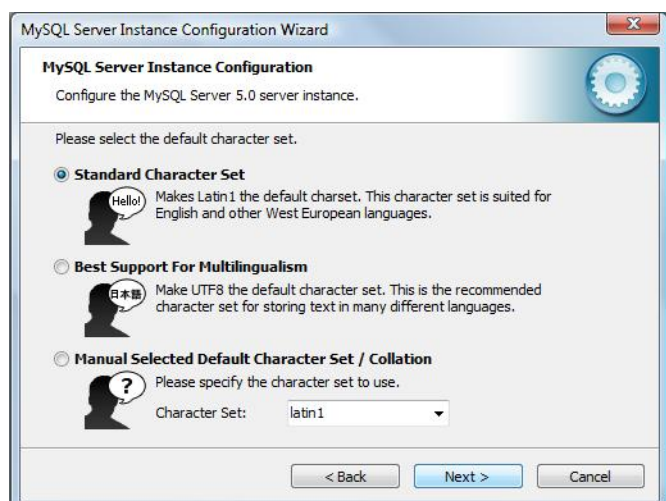5. Specify the Installation Path. Click on Next.

6. Choose Decision Support. Click on Next.

7. Leave the default Port Number which is 3306. Click on Next.

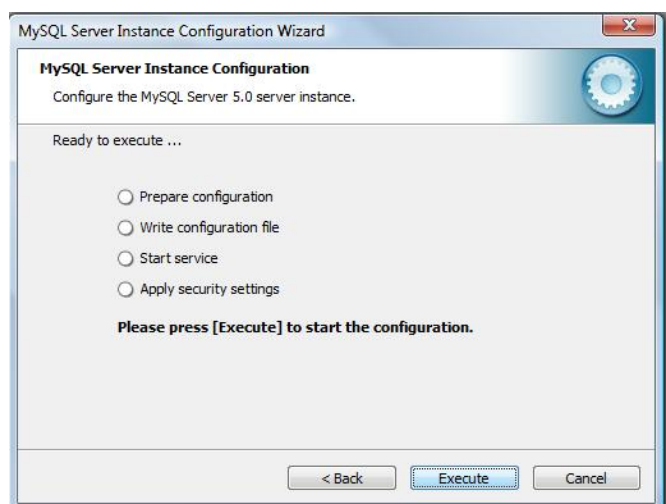8. Check which Character Set Support you would like. Click on Next.

9. Click on Install as Windows Service. Click on Next.

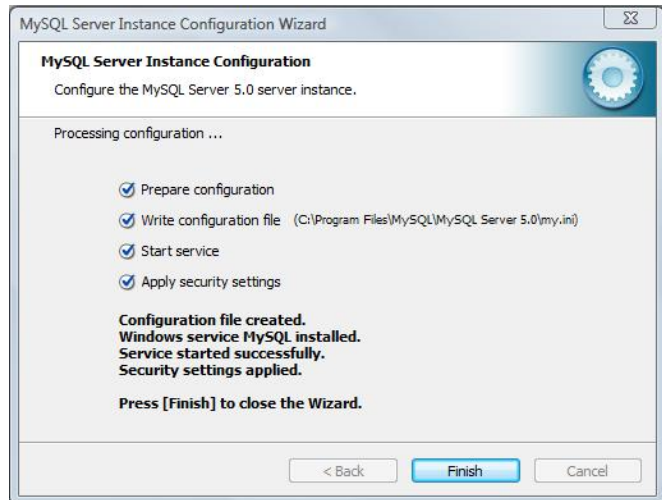10. Input a password. You will use the password in creating the database. Click on Next.

11. Click on Execute to continue the installation.
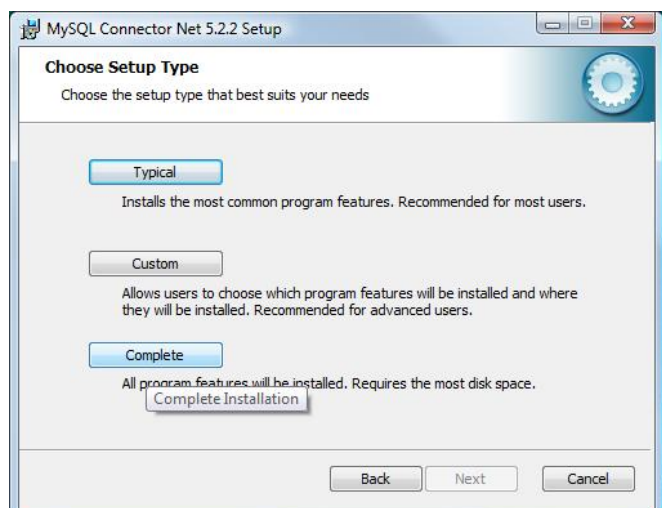
12. Click on Finish.

3.2 Install MySQL .NET Connector

1. You can download this from http://dev.mysql.com/downloads/connector/net/1.0.htmlor you can use the one from the installer folder.
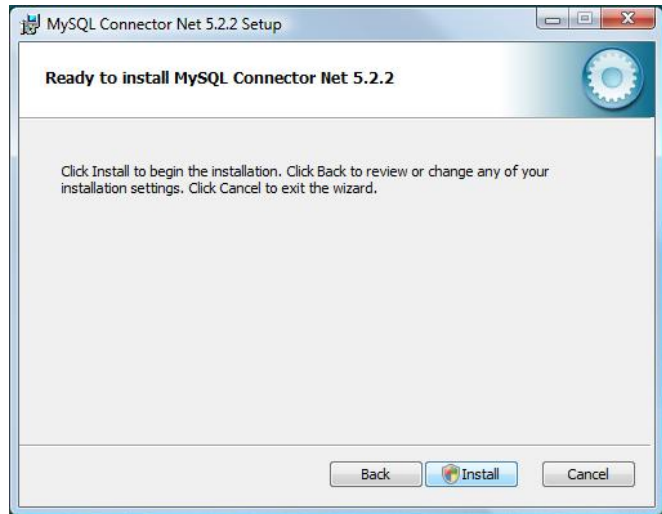
Click on Next.
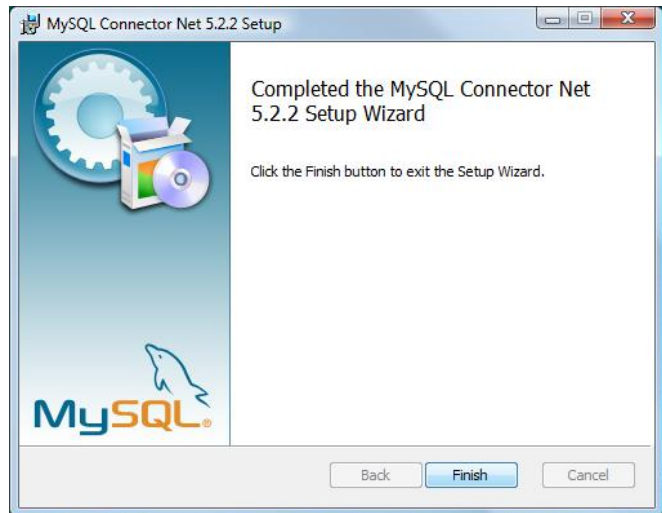

2. Choose Complete Install.

3. Click on Install to continue with the installation.

4. Click on Finish.

3.3 Creating a user in the Database

1. Run the MySQL Server from the Start Menu to create a database. Input the Root Password.

   Path: Start -> Programs -> MySQL -> MySQL Server 5.0 -> MySQL Command Line Client

Run the MySql Script,
ACR122DemoApp_DB.sql, which can be found from the installation folder
e.g. C:\Program Files\Advanced Card Systems Ltd\ACR122U Demo Application\

From MySql shell command key in:
source [InstallationFolder]\ACR122DemoApp_DB.sql

2. type: GRANT ALL PRIVILEGES ON *.* TO '<user>'@'localhost'

   e.g. GRANT ALL PRIVILEGES ON *.* TO 'user1'@'localhost'

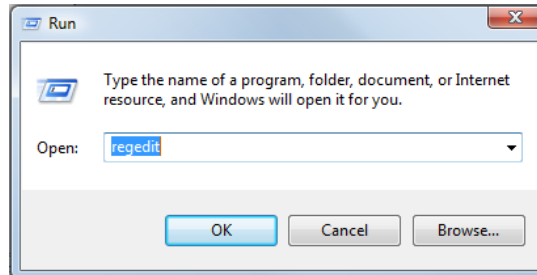3. Afterwards, type: IDENTIFIED BY '<passwd>' WITH GRANT OPTION;

e.g. IDENTIFIED BY 'pass1' WITH GRANT OPTION;

4. Repeat steps 2 and 3 to add more users in the database. Click on close to exit the MySQL Application
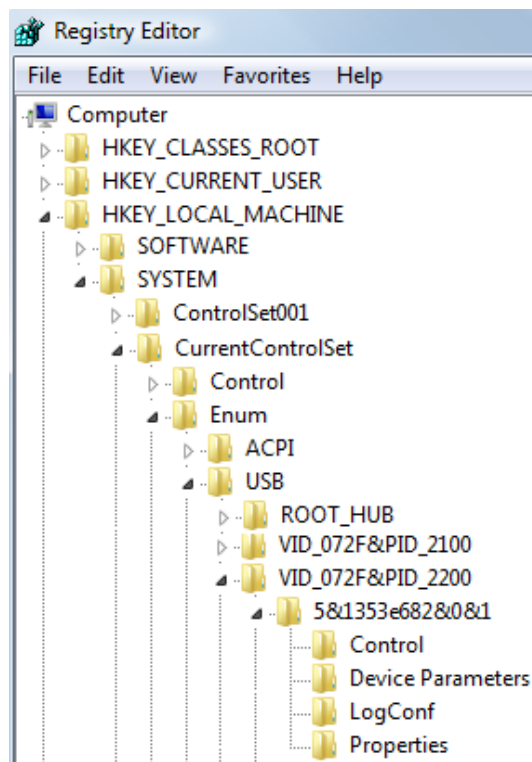
3.4 Enable PCSC Escape Command

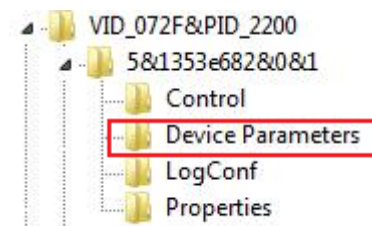1. Execute the "RegEdit" in the "Run Command Menu" of Windows

2. Add a DWORD "EscapeCommandEnable" under HKLM\SYSTEM\CCS\Enum\USB\Vid_072F&Pid_90CC\Device Parameters

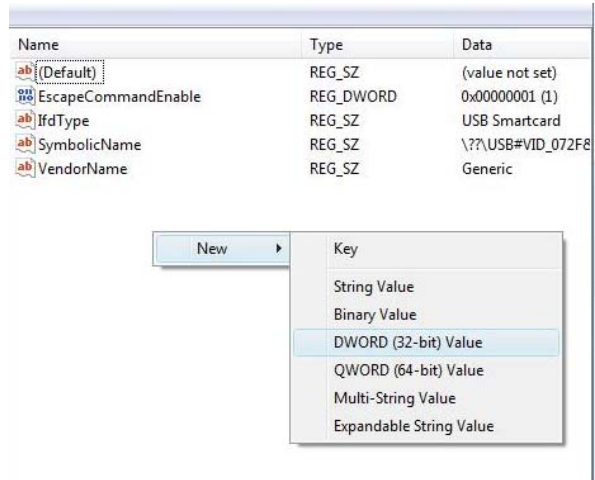For Vista, the path is: Computer\HKEY_LOCAL_MACHINE\SYSTEMS\CurrentControlSet\Enum\USB

3. Look for: VID_072F&PID_2200 Then expand the node. This will list the USB port where you have plugged the two readers. Choose one port. Look under Device parameters
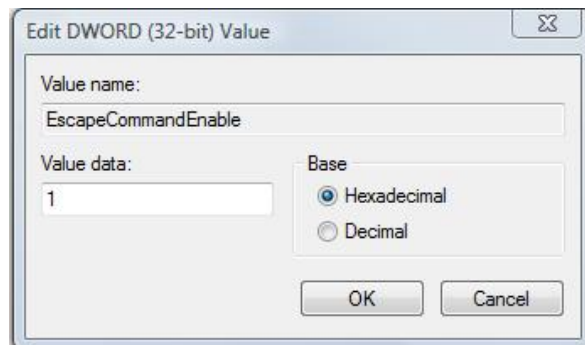
4. Create a DWORD entry (32-bit) with the name:
EscapeCommandEnable

5. To Modify the value of the EscapeCommandEnable double click on the entry and input 1 in the Value data with the base set in Hexadecimal.

6. Repeat Steps 3-5 for the other USB ports.

4.0 Multi-Application Components
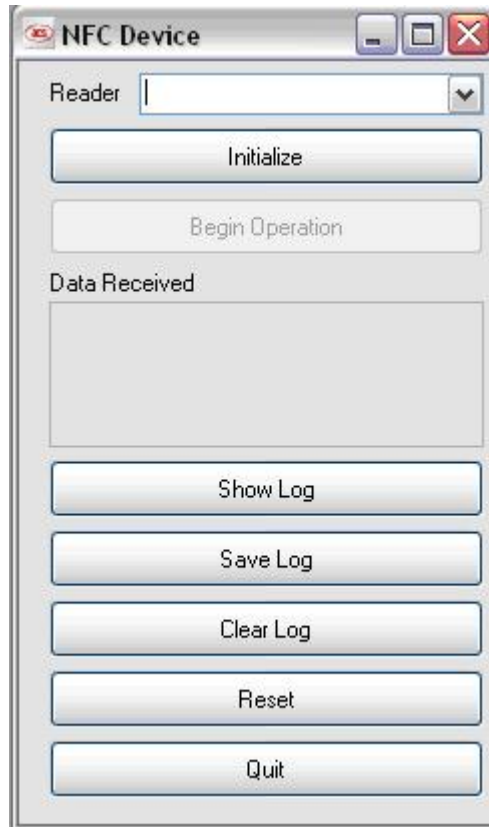
4.1 NFC Device Application

Figure 3. NFC Device Program

Initialize – initializes the program and connects to a reader

Begin Operation – begins the operation of the program. This program can detect if it is communicating with the Smart   Poster or the Cinema Gate application

Show Log – shows the logs of the application

Save Log – saves the log to NFCDeviceLogs.txt which is saved to where the application is located

Clear Log – clears the log

Reset – resets the application

Quit – exit the application
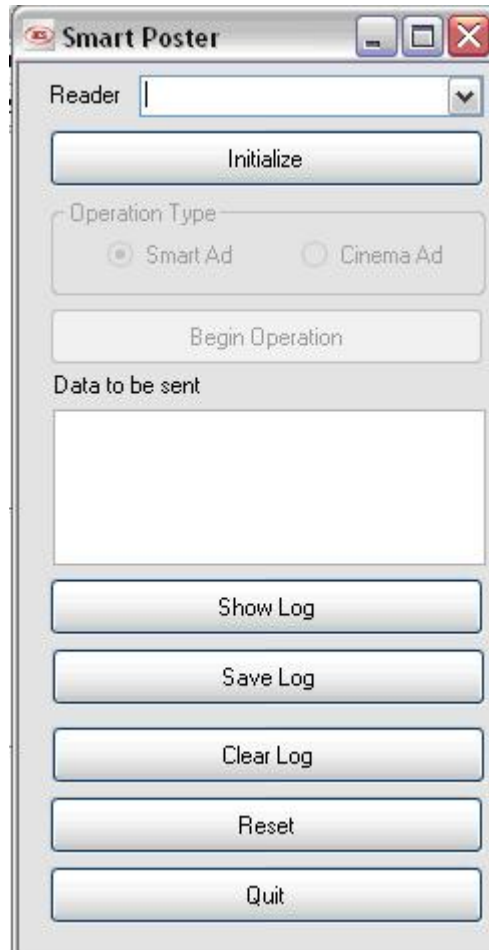
4.2 Smart Poster Application

Figure 4. Smart Poster Program

Initialize – initializes the program and connects to a reader

Begin Operation – begins the operation of the program. You can choose how the program will behave it can act as a smart poster that only sends advertisements or it can act as a cinema ad that will allow you to purchase tickets for the movie

Data to be sent – Input data here to be sent to the NFC Device

Show Log – shows the logs of the application

Save Log – saves the log to SmartPosterLogs.txt which is saved to where the application is located

Clear Log – clears the log

Reset – resets the application

Quit – exit the application

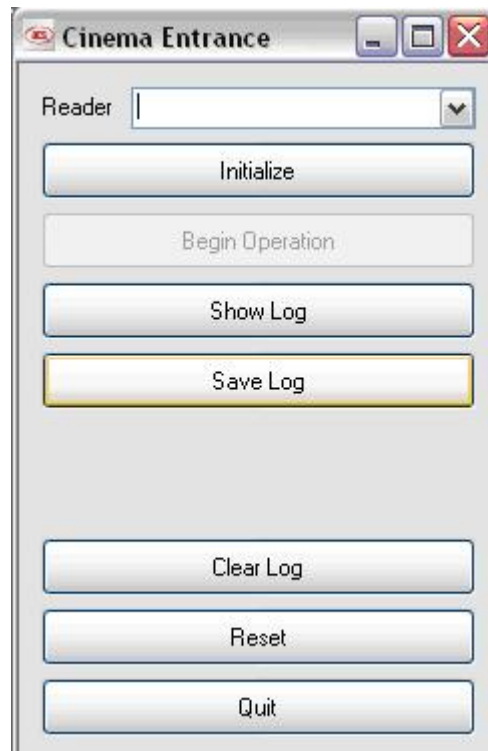### 4.3 Cinema Entrance Application

Figure 5. Cinema Entrance Program

Initialize – initializes the program and connects to a reader

Begin Operation – begins the operation of the program. This program will check the receipt numbers of the tickets that you purchase in the MiFare card

Show Log – shows the logs of the application

Save Log – saves the log to CinemaEntranceLogs.txt which is saved to where the application is located

Clear Log – clears the log

Reset – resets the application

Quit – exit the application

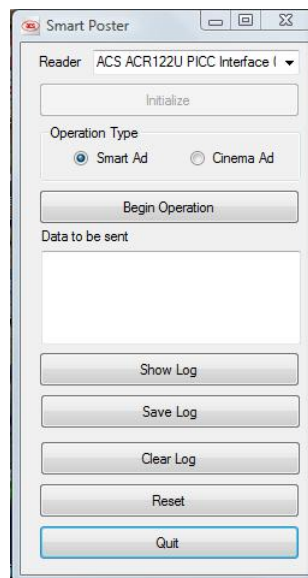## 5.0 Using the Demo Application

Run all the included sub-Applications namely Cinema Entrance, Smart Poster, and the NFC Device applications. Make sure that two ACR122 Readers are connected to your system and you have successfully completed all the requirements for the Demo Application. (See 3.0 Demo Application Requirements)

5.1 Smart Poster Application

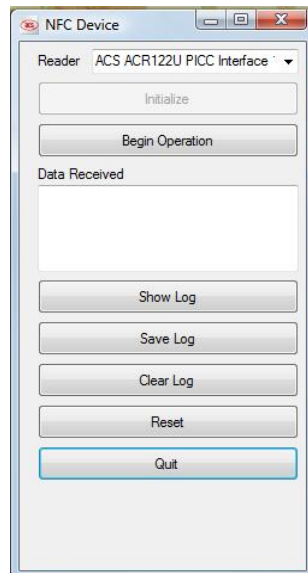1. The three sub-applications, Smart Poster, NFC Device and Cinema Entrance should be running.

Initialize Smart Poster Application first.

Note that USB Port 0 will be the default USB port for the Device that will be used for the Smart Poster Application.

2. Place the other reader on top of the device that will be used as the "Smart Poster". The device on top will be used as the "NFC Device". Since there is no built-in memory for the ACR122, place a Mifare 4K card on top of the NFC Device.
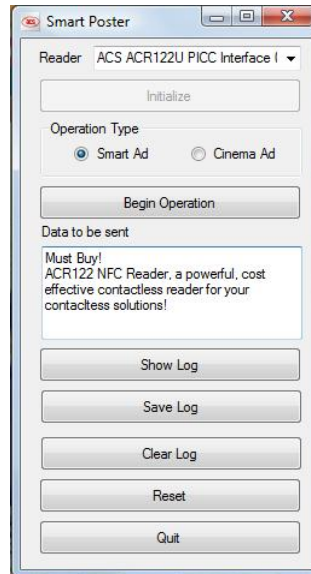
Initialize the NFC Device Application.

3. Choose Smart Ad as the Operation Type in the Smart Poster Application.
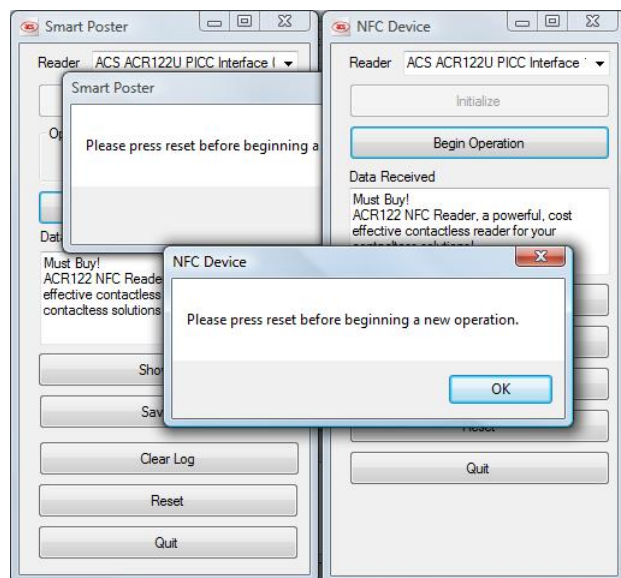
Input data in the Smart Poster text box for it to be sent to the NFC Device application.
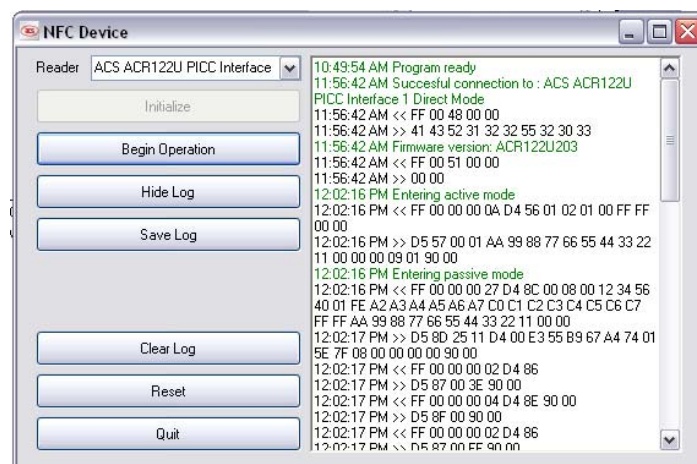

4. Click Begin Operation on the Smart Poster. Afterwards, click on Begin Operation on the NFC Device Application.

A Pop Up Message for both Smart Poster and NFC Device will be shown to remind that you need to click on Reset before beginning a new Operation.
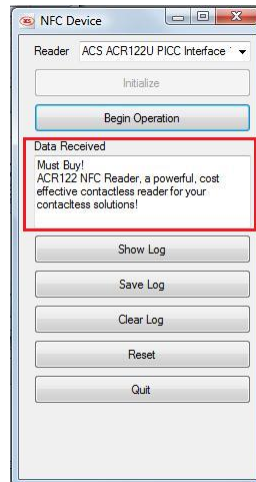
Click on OK.

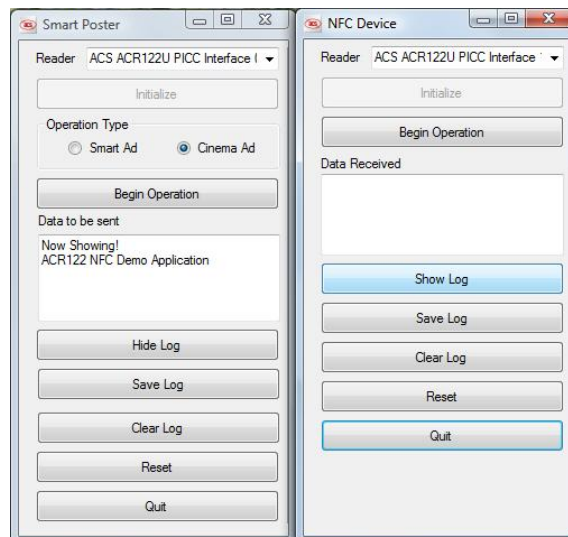

5. Click on Show Log to view the logs.

6. The received data will be displayed in the text box.

7. Click on Reset for both Smart Poster and NFC Device to begin another transaction.

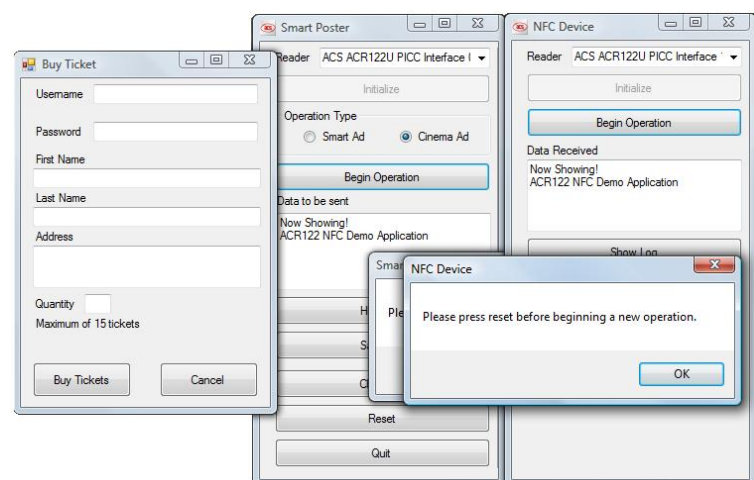Choose Cinema Ad as the next operation for the Smart Poster Application.

Input the data to be sent to the NFC device.

8. Click on Begin Transaction on the Smart Poster application. Afterwards, click on Begin Operation on the NFC Device Application.

A Pop Up Message for both Smart Poster and NFC Device will be shown to remind that you need to click on Reset before beginning a new Operation.

Click on OK.

9. Input the username and password. Fill up the remaining details needed.

Click on Buy Tickets.

10. A pop-up window will appear confirming the transaction and informing the buyer of the receipt number.

Click on OK.

Note: The number of pop-up window will correspond to the number of tickets you have bought. Each ticket will have its own receipt number.
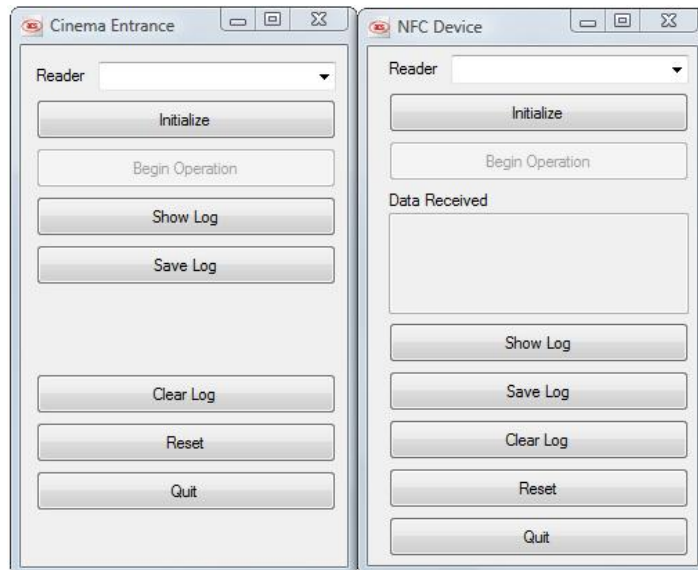
11. Click on the reset button to perform another transaction.
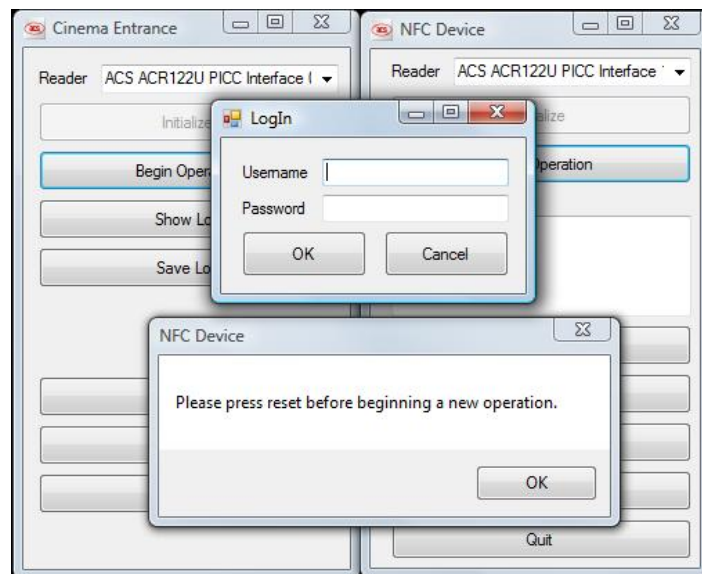
5.2 Cinema Entrance Application

1. Initialize both Cinema Entrance and NFC Device programs

2. Click Begin Operation on the Cinema Entrance Application. Afterwards, click on Begin Operation on the NFC Device Application.

A Pop Up Message for both Smart Poster and NFC Device will be shown to remind that you need to click on Reset before beginning a new Operation.

Click on OK.

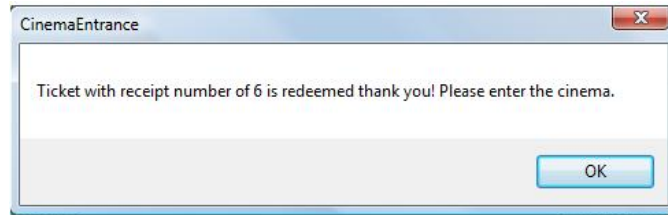3. Note also that a login window appeared. Enter the username and password.

Note: Since in the database, all access is granted, all the users can actually log in and access this. This will be further improved in the next release.

4. A popup window will appear if the tickets that you have purchased are redeemed or invalid.

CinemaEntrance

Ticket with receipt number of 6 is redeemed thank you! Please enter the cinema.

OK

Note: You can click on Show Logs to check the history of commands sent and received by the reader.

5. Click on Reset to start another transaction.