Advanced Card Systems Limited

Card and Reader Technologies

Peer to Peer Demo Manual

ACR122U NFC Reader

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1.0 Introduction

The ACR122U 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 and purchasing Cinema tickets by just placing the device near the poster. This application highlights the NFC capabilities of the ACR122U NFC Reader.
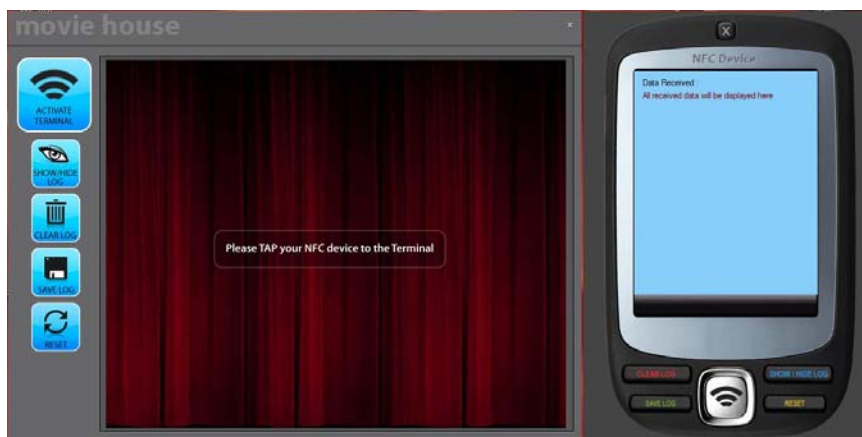

Figure 1 ACR122U Smart Poster Demo

Figure 2 ACR122U Cinema Entrance Demo

2.0 Overview

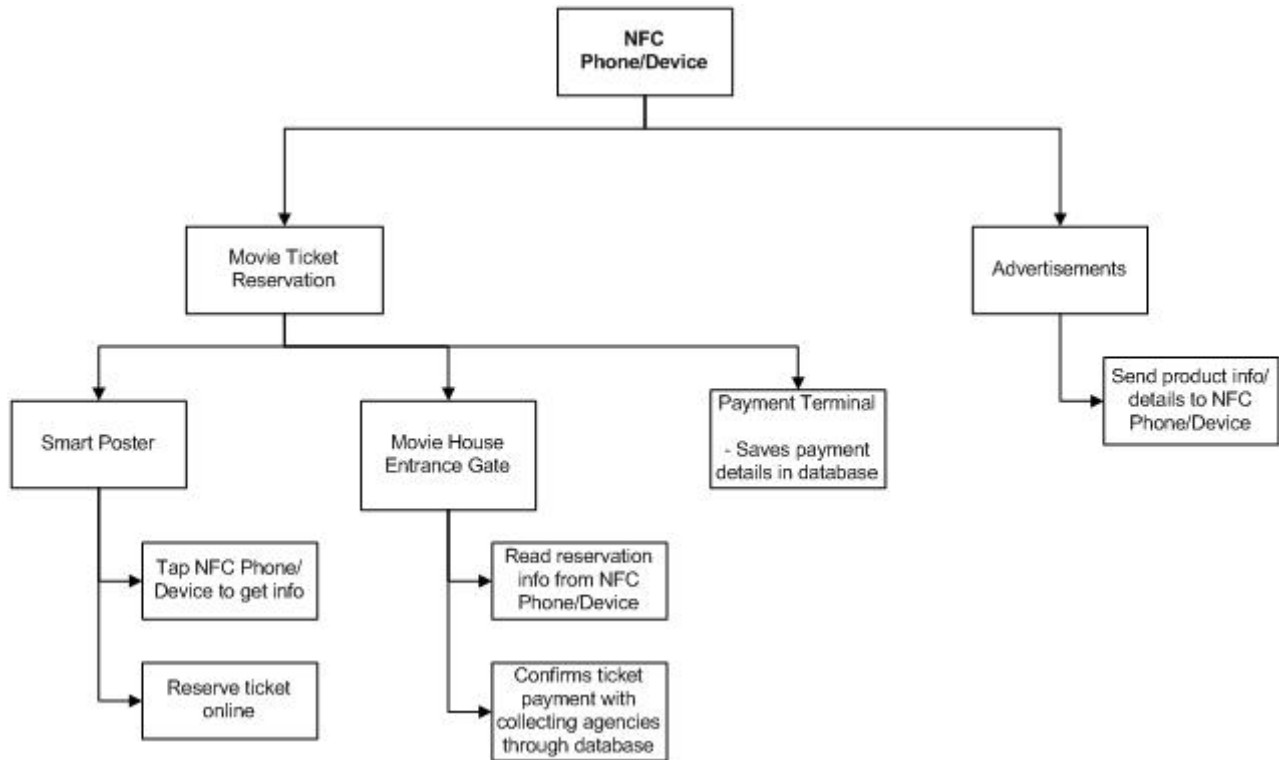The program flow of the Multi-Application Demo can be summarized by the figure below:

Figure 3 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 of the movie.

Since the ACR122U NFC Reader does not have a built-in memory, a contactless card will be used as a memory card where the data will be stored in. This application can use a MiFare 1K, MiFare 4K and a Topaz contactless card for the memory storage. (Note: For Topaz cards, the transactions done with the card might take up a longer time, as compared to the MiFare cards.)

3.0 Demo Application Requirements

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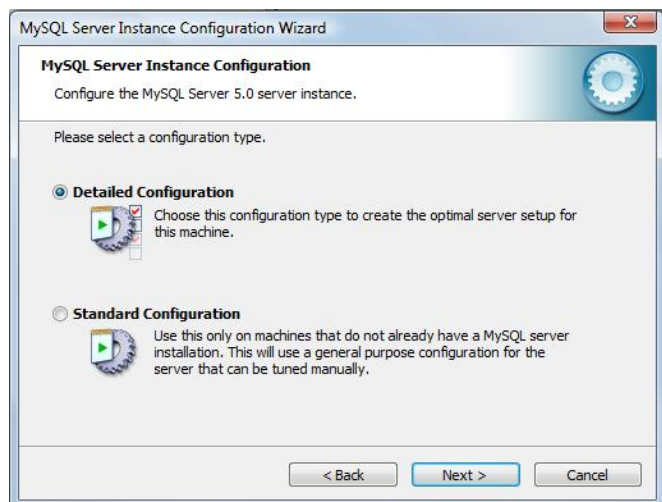
3.1 Database Set-up

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/
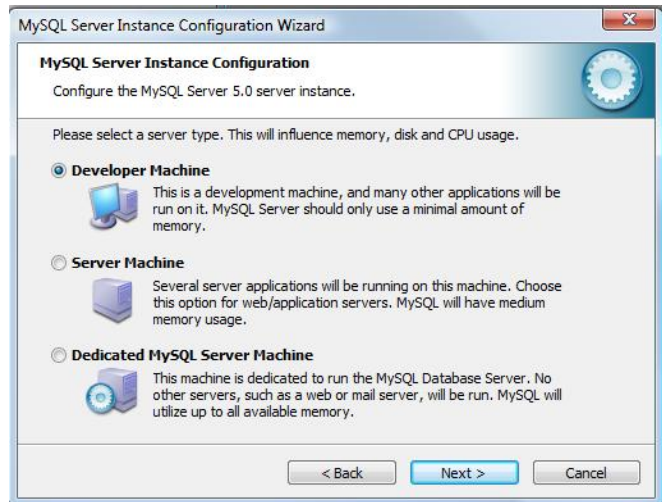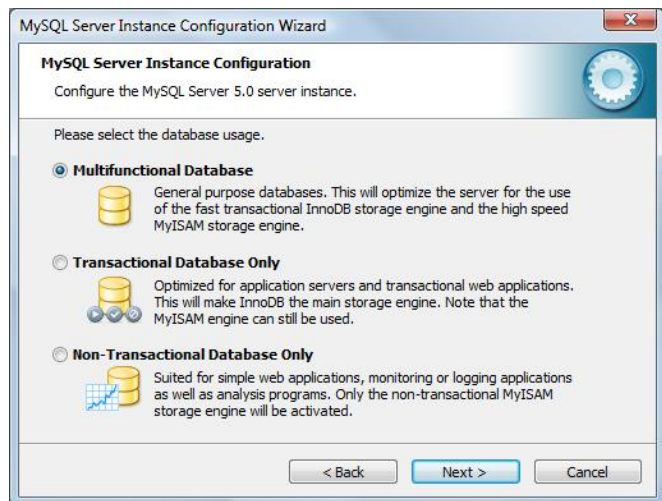
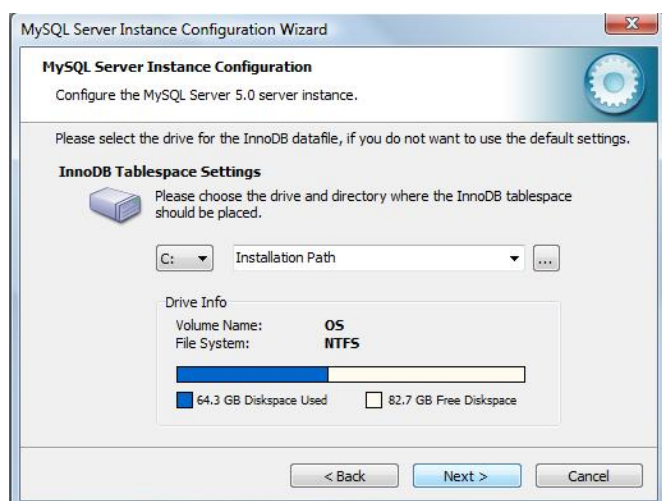2. Choose Detailed Configuration. Click on Next.

3. Choose Developer Machine. Click on Next.

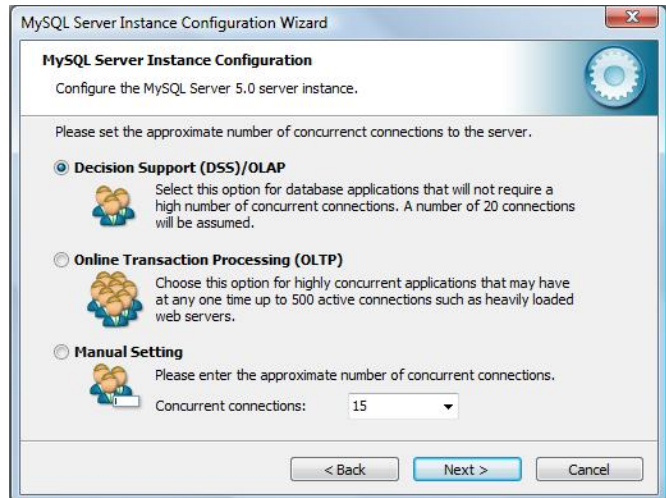4. Choose Multi-Functional Database. Click on Next.

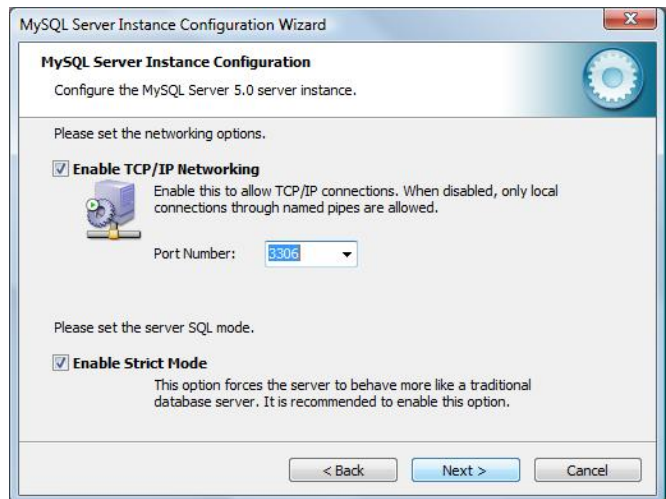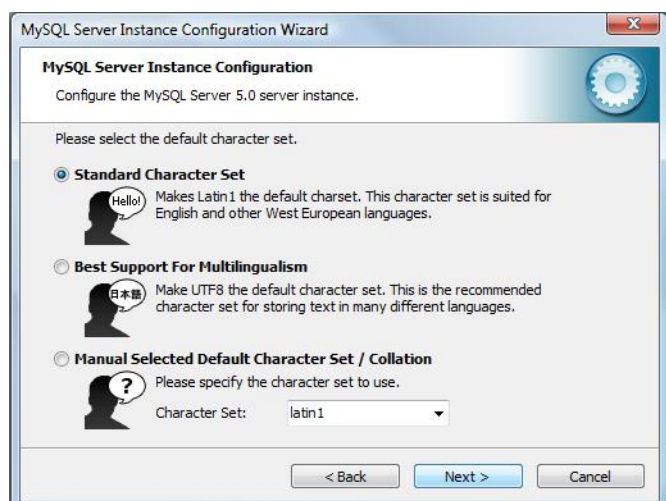5. Specify the Installation Path. Click on Next.

6. Choose Decision Support. Click on Next.

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

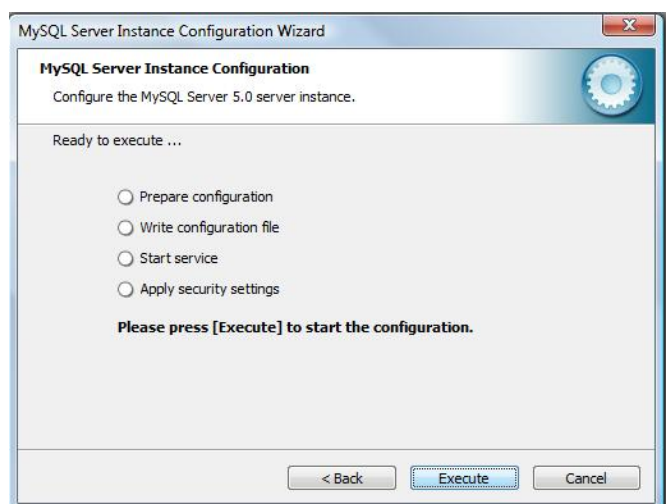8. Check which Character Set Support you would like. Click on Next.

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.
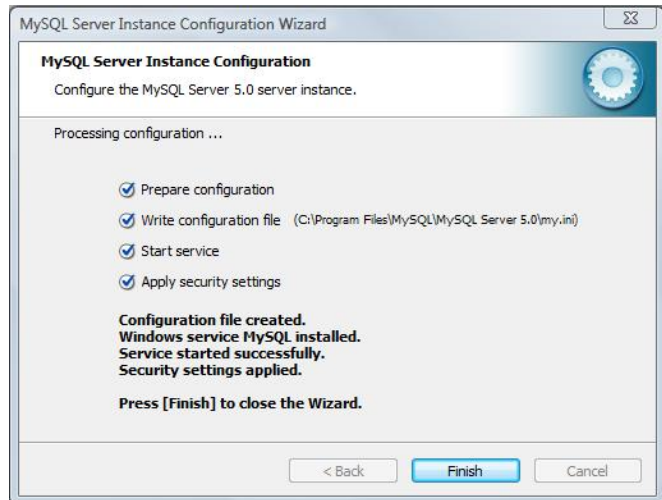

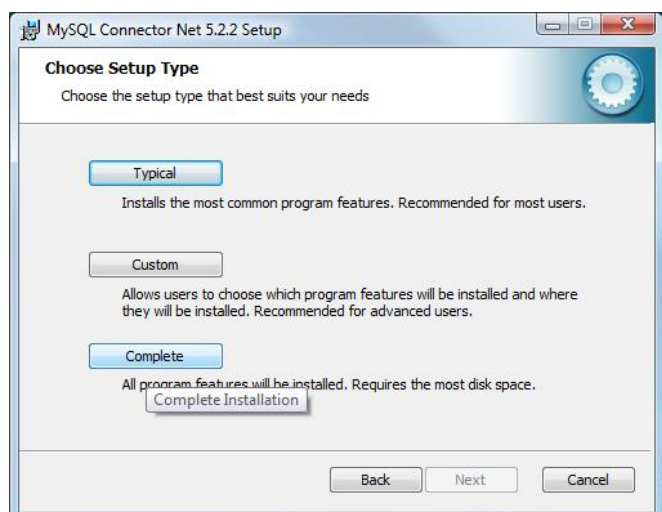11. Click on Execute to continue the installation.

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.html
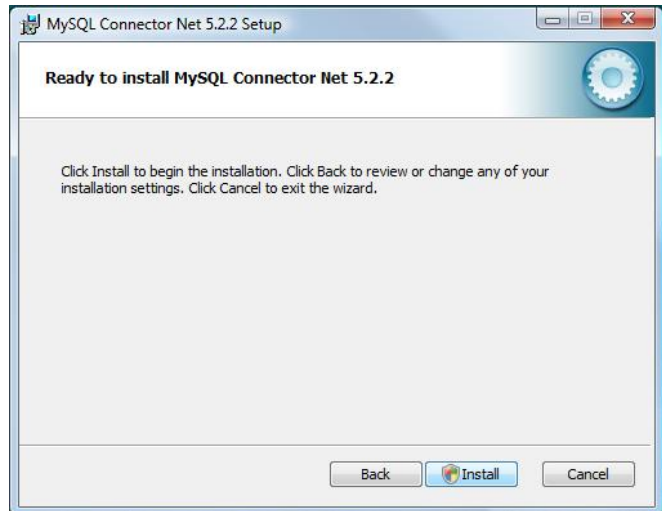
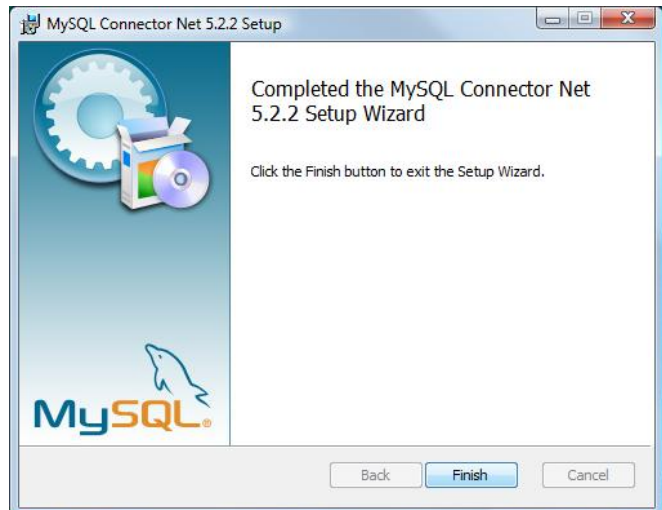Click on Next.

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,
ACR122UDemoApp_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]\ACR122UDemoApp_DB.sql

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

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

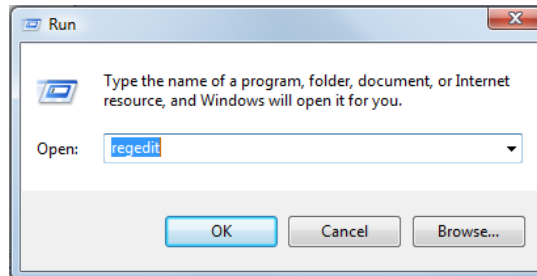3. Afterwards, type: IDENTIFIED BY '<passwd>' WITH GRANT OPTION;
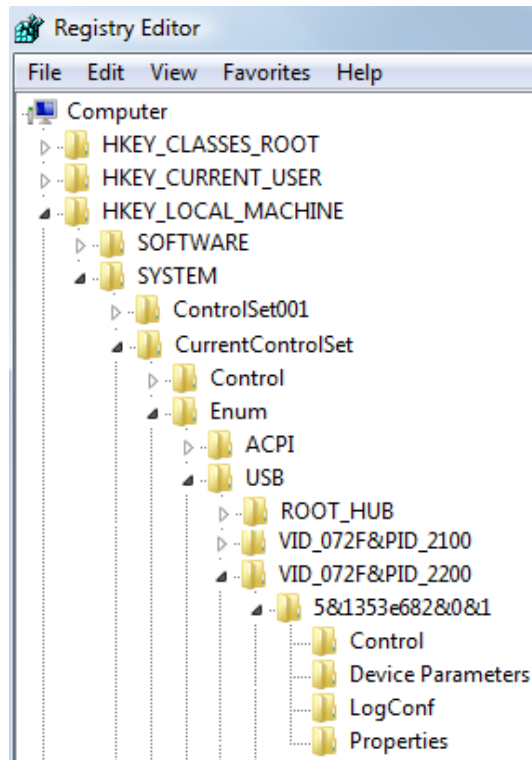
e.g. IDENTIFIED BY 'pass1' WITH GRANT OPTION;

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

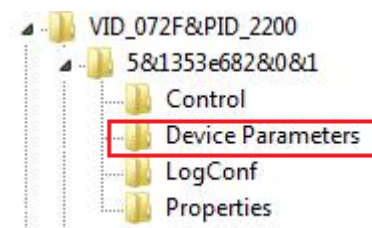## 3.4 Enable PCSC Escape Command

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

2. Add a DWORD "EscapeCommandEnable" under HKey_Local_Machine\SYSTEM\Current ControlSet\Enum\USB\Vid_072F&Pid_2 200\Device Parameters
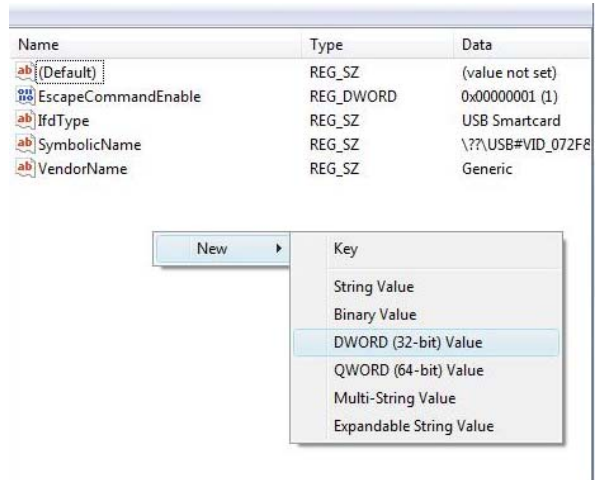

3. Look for: VID_072F&PID_2200 Then expand the node. This will list the USB port where you have plugged the two readers. Choose one port. Look under Device parameters
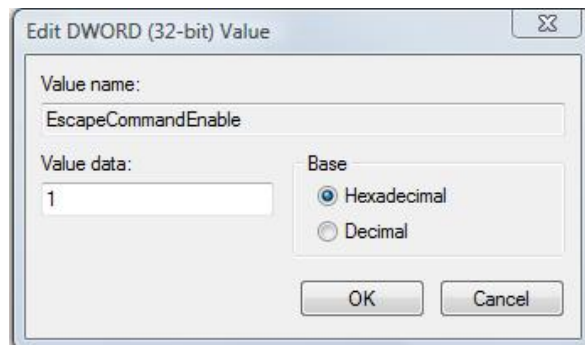
4. Create a DWORD entry (32-bit) with the name:
EscapeCommandEnable

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

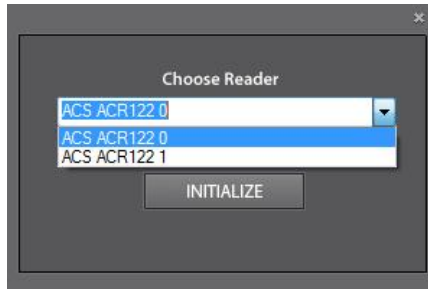All three components have the Initialize Option which initializes the program and connects it to a specific reader.

Figure 4 Initialization

4.1 NFC Device Application

The figure below shows the GUI of the NFC Device application.

Figure 5 NFC Device

Different Commands and Options in the Application:

 Starts the operation of the program

 This option shows and hides the logs of the application

 Clears the log

 Saves the log to NFCDeviceLogs.txt which is saved to where the application is located.
Resets the application for a new operation.

4.2 Smart Poster Application

The figure below shows the GUI of the Smart Poster Application
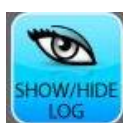

Figure 6 Smart Poster

Different Commands and Options in the Application:

This option begins the operation of the program. The program behavior is determined by the radio button selected for the program. It can act as a Smart Ad program, wherein it allows the program to send advertisements to the NFC device, or it can act as a Cinema Ad program that allows the user to purchase tickets for a movie. The radio button options are located on the topmost part of the application.

The data to be sent to the NFC reader can be placed here (for Smart Ad application only).

This option shows and hides the logs of the application

SAVE LOG	This option will save the log to SmartPosterLogs.txt which is saved to where the application is located
CLEAR LOG	This option clears the log.
RESET	Clicking this option restarts the application for a new operation.
☒	The exit button is found at the topmost right side of the GUI. This option closes the application.

4.3 Cinema Entrance Application

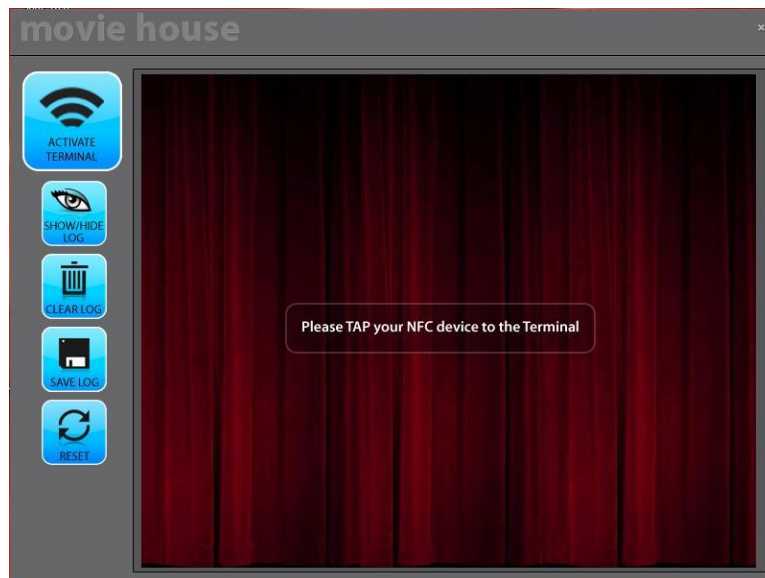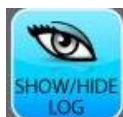The figure below shows the GUI of the Cinema Entrance Application

Figure 5. Cinema Entrance Program

Different Commands and Options in the Application

ACTIVATE TERMINAL	Clicking this will begin the operation of the program. This program will check the receipt numbers of the tickets that has been purchased with contactless card. (MiFare 1K, MiFare 4k, or Topaz cards can be used).
SHOW/HIDE LOG	This option shows and hides the logs of the application

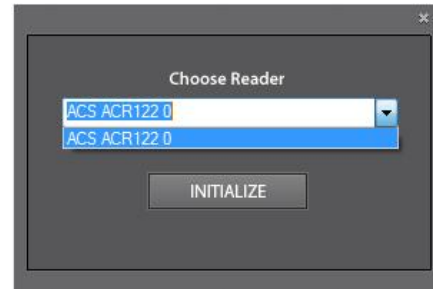|	
	This option will save the log to CinemaEntranceLogs.txt which is saved to where the application is located
	This option clears the log.
	Clicking this option restarts the application for a new operation.
	The exit button is found at the topmost right side of the GUI. This option closes the application.

5.0 Using the Demo Application

To start the Demo application, two ACR122U Readers are needed. Also, the requirements for the Demo Application (MySql Setup, Regedit Setup) must be done first and is working properly for the programs to run efficiently. (See 3.0 Demo Application Requirements)

5.1 Smart Poster Application

1. Plug in the first ACR122U in your computer. Run the Smart Poster Application.Exe then choose the reader that will be used for the Smart Poster. Click on Initialize button.
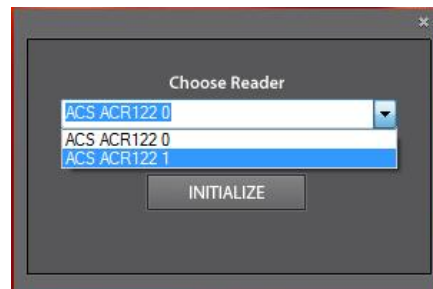
2. You will then be directed to the screen shown on the right.

3. Plug in the second ACR122 in your computer.

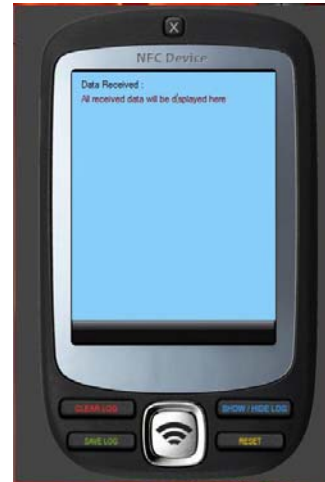Run the NFC Device.Exe then choose the second reader. Click on Initialize button.

4. Put a MiFare card on top of the reader. This will serve as the memory of the NFC device since there is no built-in memory for the ACR122U.
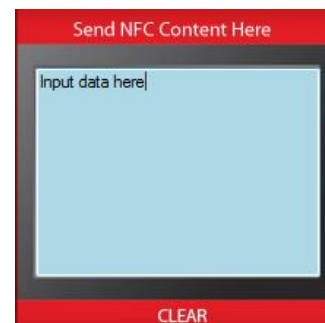
Note: MiFare or Topaz cards may be utilized in this demonstration but Topaz cards when used will have a slower processing time.
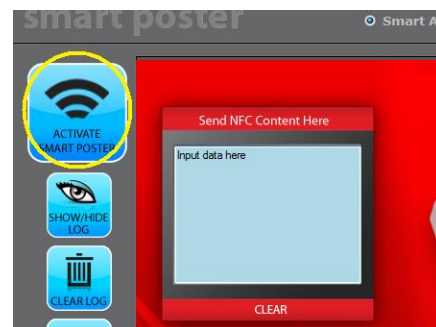

5. Choose Smart Ad as the Operation Type in the Smart Poster Application.

6. Input the data to be sent in the Smart Poster text box. Data is needed to be placed here for the application to initialize and work with the NFC device application.
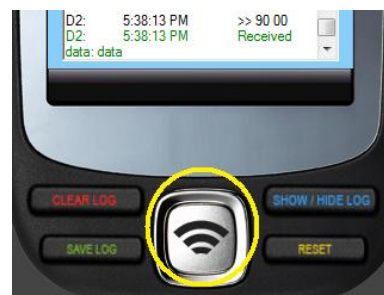

7. Click Activate Smart Poster button on the Smart Poster program.

8. Quickly place the NFC Device (with the Contactless card) on top of the Smart Poster Device then, click on Activate button on the NFC Device Application.

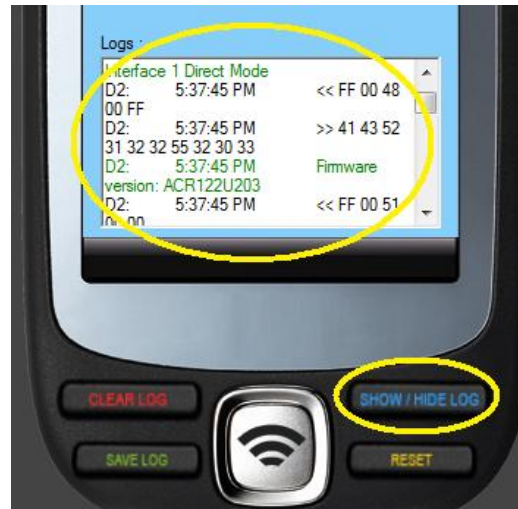Note: You need to click on Reset before beginning a new operation.

9. Click on Show Log to view the logs.

10. The received data will be displayed in the text box of the NFC device application.

11. Remove the NFC Device. Click on Reset for both Smart Poster and NFC Device to begin another transaction.

12. Choose Cinema Ad as the next operation for the Smart Poster Application.
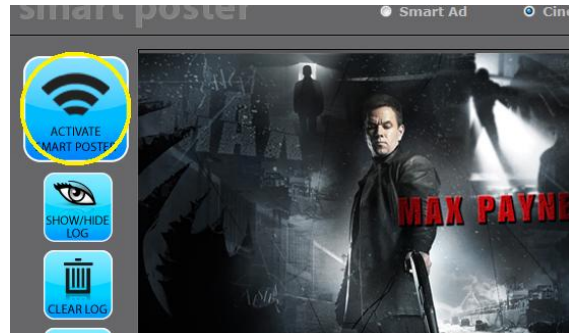
13. Click Activate Smart Poster button
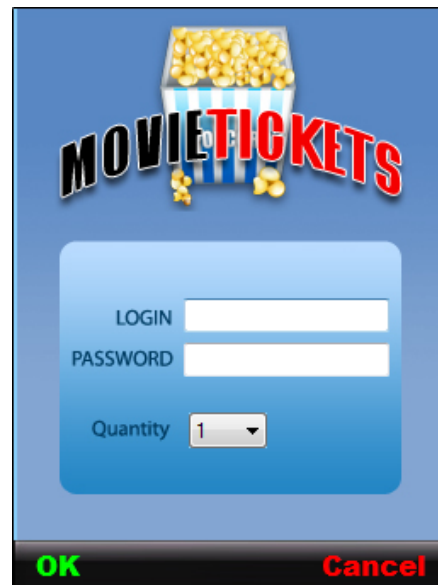on the Smart Poster program.

14. Quickly place the NFC Device
(with the Contactless card) on top of
the Smart Poster Device then, click

on Activate button on the NFC
Device Application.

Note: You need to click on Reset
before beginning a new operation.

15. Input the username and password
(use the corresponding username and
password used in the MySql
program). Fill up the remaining details
needed.

Click the OK button once finished.

16. A new screen will appear confirming the transaction with the buyer.

17. Remove the NFC device then click on the reset button to perform another transaction.

5.2 Cinema Entrance Application

1. Initialize both Cinema Entrance and NFC Device programs. You can use the slot for the Smart Poster used earlier.

NFC Device is initialized using the same USB slot earlier and make sure that the Mifare card used earlier is placed on top of the NFC Device.
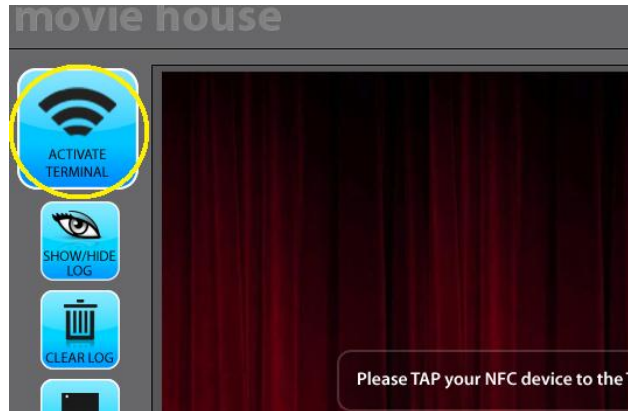
2. Click Activate Terminal button
on the Smart Poster program.

3. Quickly place the NFC Device
(with the Contactless card) on top of
the Smart Poster Device then, click
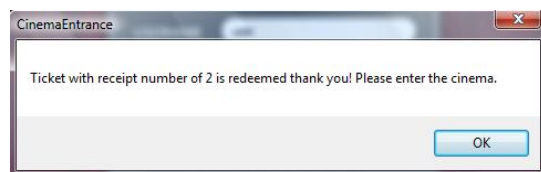on Activate button on the NFC
Device Application.

Note: You need to click on Reset
before beginning a new operation.

4. Note also that a login window will
appear. Enter the username and
password.

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

The screen in the Cinema Entrance
application will change,
acknowledging the transaction of
the tickets.

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

6. Click on Reset to start another transaction.