Advanced Card Systems Ltd.
Card & Reader Technologies

ACR122S Serial NFC Reader

SDK User Manual

Table of Contents

Figures

1.0. Introduction

ACR122S is the serial interface (RS232) reader in the ACR122 Series, which is a family of PC-linked NFC contactless smart card readers/writers. Developed based on the 13.56 MHz RFID technology and the ISO/IEC 18092 NFC standard, it supports ISO 14443 Type A and B, Mifare, FeliCa and NFC contactless technologies.

This serial NFC reader is equipped with a buzzer and two LEDs as well for rich user interaction. It also supports anti-collision and selective card polling, allowing smooth operation even when multiple cards are presented. Moreover, it is equipped with a built-in SAM slot to secure the overall contactless operation.

ACR122S is ideal for different contactless applications, such as personal identity verification, home banking, network log-on and online micropayment transactions. It is available in module form as well, facilitating integration into POS terminals, kiosks, ticketing and vending machines.

The ACR122S Serial NFC Reader SDK provides the user tools and utilities, sample codes and reference materials to make application development as easy as possible with ACR122S. This manual contains the procedure on how to install the SDK and an overview of its contents.

1.1. Typical Applications

- Automatic Fare Collection
- Vending machines
- NFC Mobile Tag
- Public Transportation Terminals
- Customer Loyalty
- Network access control
- Physical Access Control
- Micropayment
- E-Banking
- Contactless Public Phones
- Time and Attendance

2.0. Installation Guide

2.1. Requirements

If you have installed a previous version of the ACR122S Serial NFC Reader SDK, then you must uninstall this version first via **Add/Remove Programs** in Control Panel before installing this SDK version. Make sure that all folders have been deleted.

For non-Vista users, .NET Framework installation is needed for you to use the ACR122S Tool. This can downloaded via:
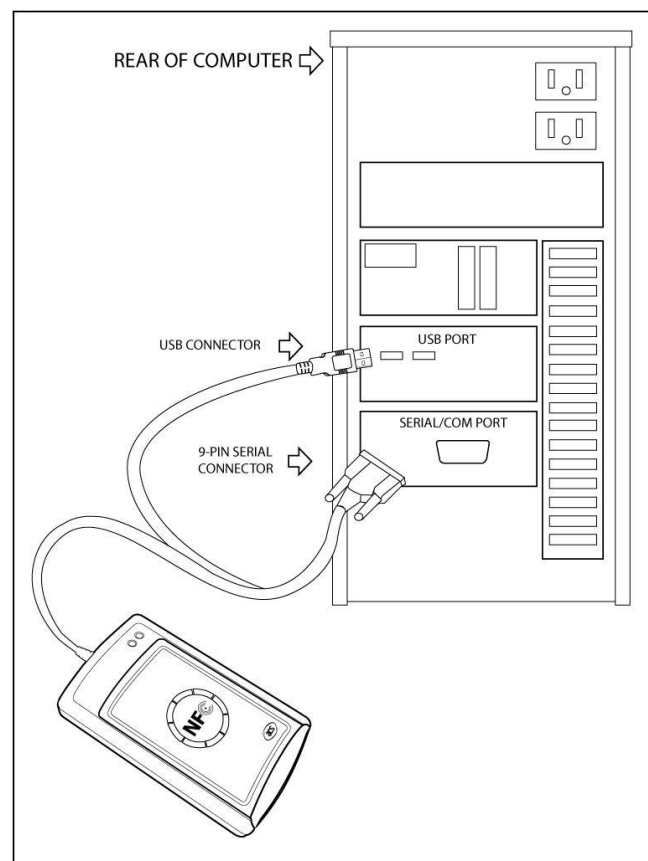
Microsoft .NET Framework Version 2.0 (x86)

http://www.microsoft.com/downloads/details.aspx?FamilyID=0856EACB-4362-4B0D-8EDD-AAB15C5E04F5&displaylang=en

Microsoft .NET Framework Version 2.0 (x64)

http://www.microsoft.com/downloads/details.aspx?familyid=B44A0000-ACF8-4FA1-AFFB-40E78D788B00&displaylang=en

2.2. Connecting the Device to the PC

Connect the device as shown below:

Figure 1:   Connection Diagram

ACR122S uses the generic COM driver, which is already installed in Windows and Linux OSes, hence driver installation is not necessary.
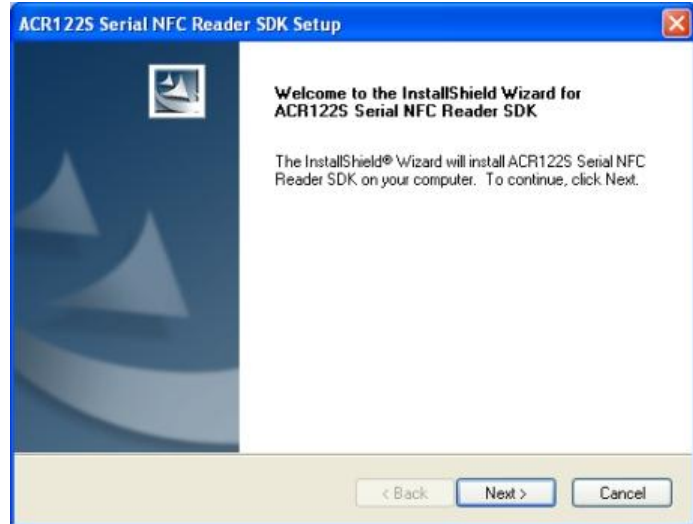
2.3. Installation of SDK Components

1. You can click on the "**Getting Started**" option to check the procedure on how to install the ACR122S SDK components.

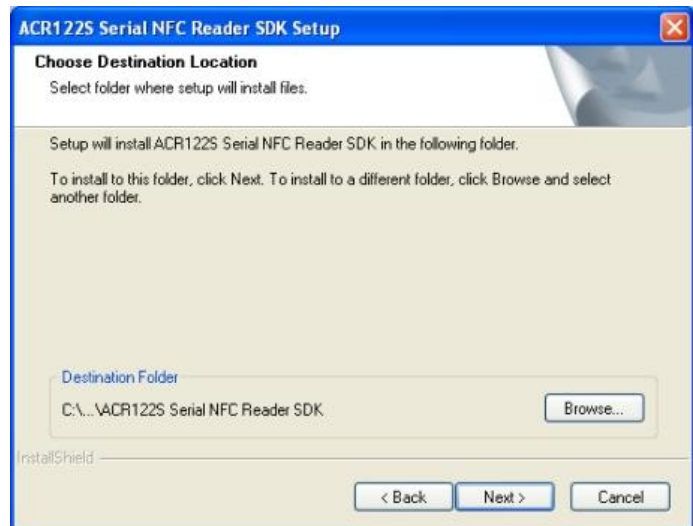2. Click on "**Install SDK Components**".
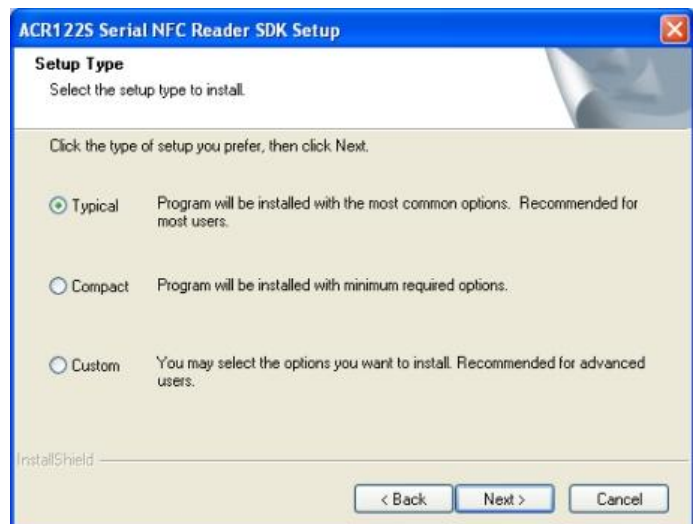
3. Click on "**Next**".

4. You can choose the destination where you want to save the SDK or you can leave it as is for it to save on its default location.

x:\Program Files\Advanced Card Systems Ltd\ACR122S Serial NFC Reader SDK where x is the drive letter of your local Windows Drive.
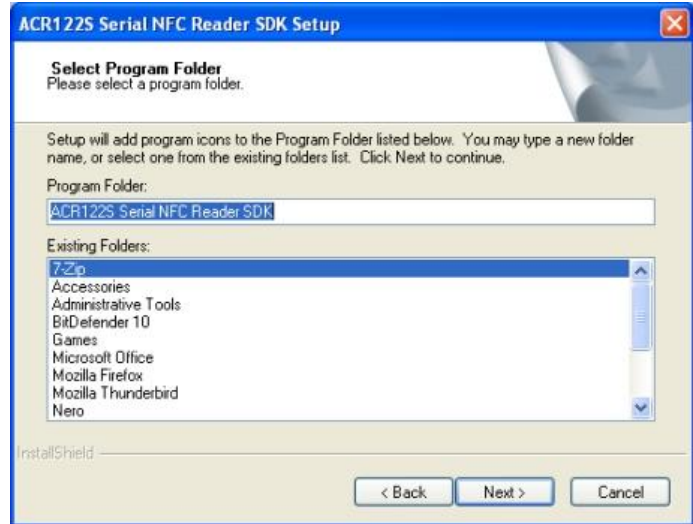
Click on "**Next**".

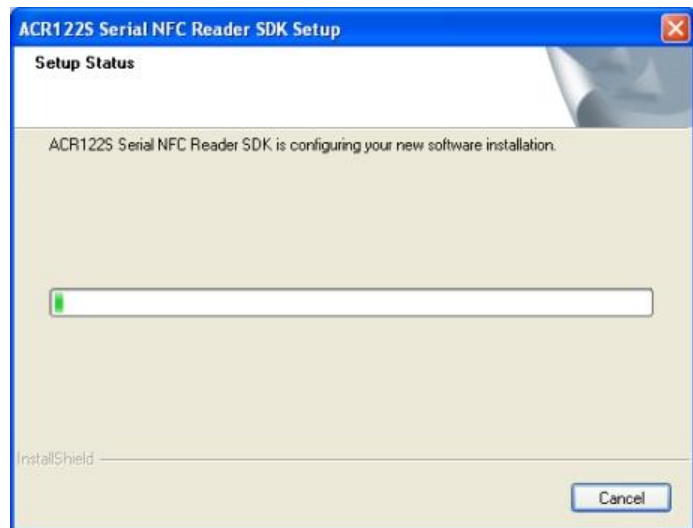5. Choose **Typical Install**. Click on "**Next**".

6. You can change the folder name or leave the default name as is.
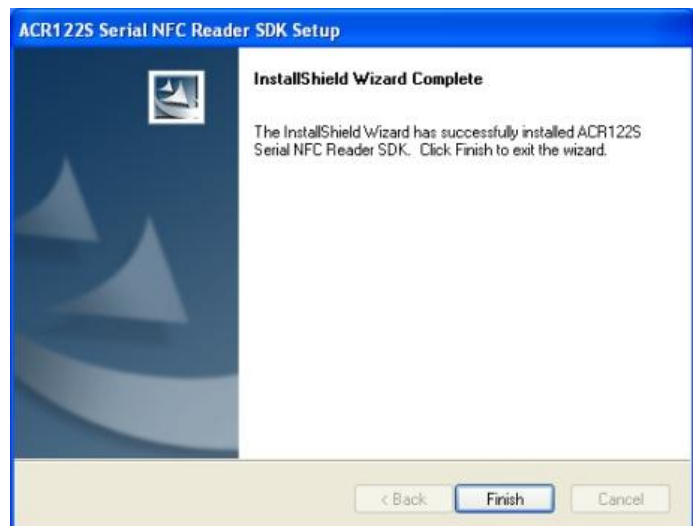
Click on "**Next**".

7. Wait for setup to be completed.

8. Once completed, click on "**Finish**".

9. If you have not installed **Adobe Acrobat** in your workstation, click on this option. You need this to view the manuals and other reference materials.

9. Click "**Browse CD**" to navigate through files and folders.

10. Click on this option to exit the application.

3.0. SDK Components

3.1. Sample Codes

Sample codes written in different programming languages are provided

- Java
- Delphi 7
- Visual Basic 6
- Visual C++ 6
- Visual C++ 2005 (x64)
- Visual C # 2005
- Visual Basic .Net 2005

The sample codes show the different capabilities of the ACR122S and showcases how to control the ACR122S peripherals and how to communicate with a contactless tag and SAM.

3.2. Tools and Utilities

3.2.1. ACR122S Tool

The ACR122S Tool is an application utility tool that enables the user to perform reader and card-related commands. This tool supports a variety of cards and can properly detect ISO 14443 and ISO 18092 cards.
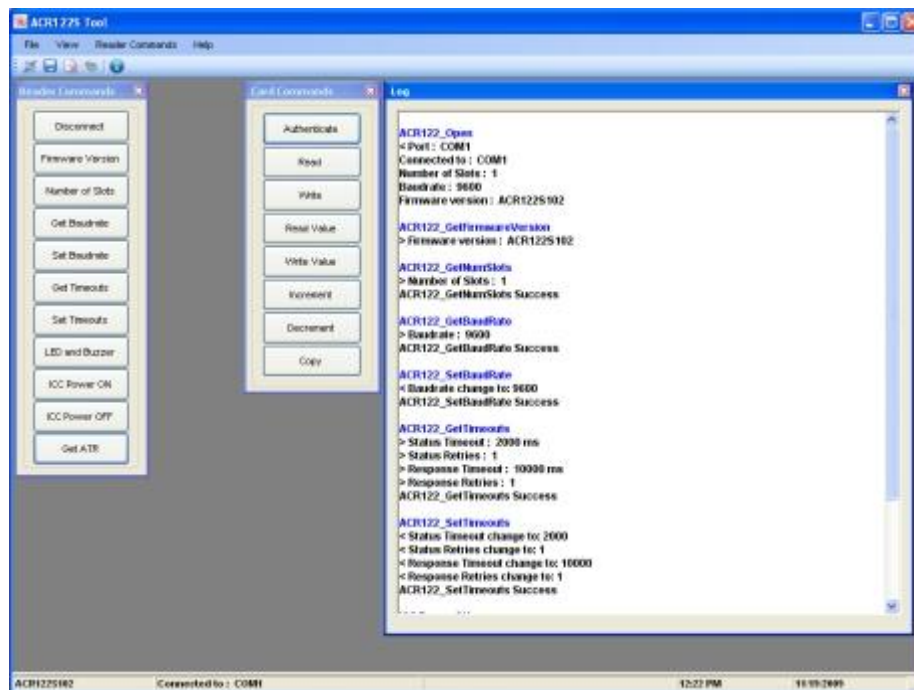
Figure 2: ACR122S Tool

3.2.2. ACS Easy Key

The ACS Easy Key is a utility program for changing Mifare security settings. Please refer to the MiFare Card Reference Manual to efficiently utilize the ACS Easy Key.
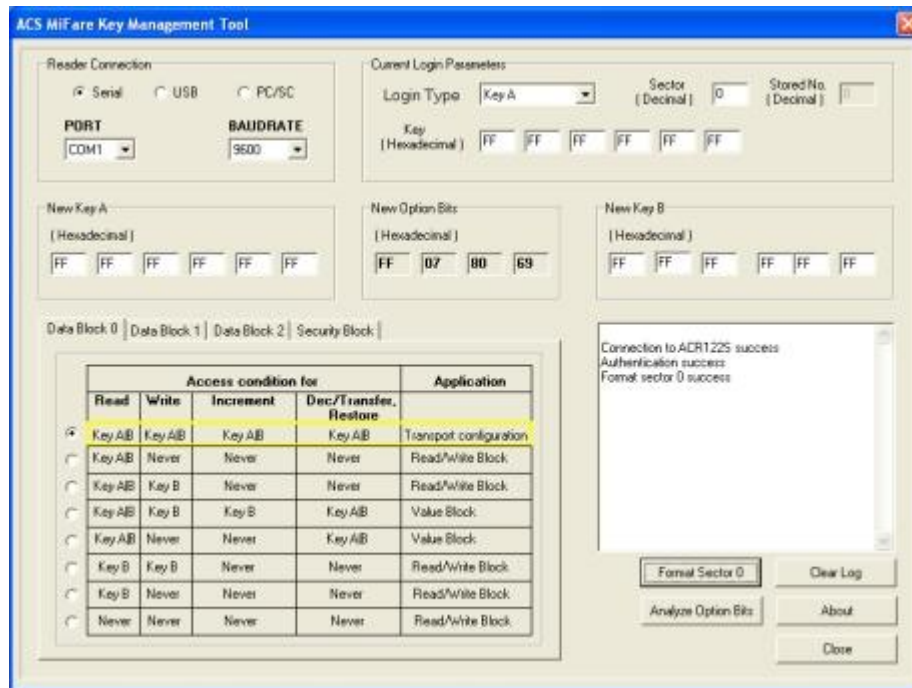
Figure 3: ACS Easy Key

3.2.3. ACS QuickView

The ACS QuickView is a utility program that checks if the user has properly installed the ACR122S device. For a detailed explanation on how to use the tool, you may check the Help Menu in the program.

Figure 4: ACS QuickView

3.3. User Manuals and Reference Materials

- ACR122S API
- ACR122S Communication Protocol
- ACR122S SDK User Manual
- ACR122S Technical Specifications
- Mifare 1K Reference Manual
- Mifare 4K Reference Manual
- Mifare Ultralight Reference Manual
- Topaz Reference Manual
- ACOS6-SAM Reference Manual

4.0. ACR122S API

An interface software to program the ACR122S is on-hand to facilitate application development. It is supplied in the form of 32-bit and 64-bit DLL (Dynamic Link Library) which can be programmed using popular development tools like Java, Delphi, Visual Basic, Visual C++, Visual C# and Visual Basic .Net.

The DLL is a set of high-level functions provided for the application software to use. It supplies a consistent API (Application Programming Interface) for the application to operate on the ACR122S and the corresponding presented card. The DLL communicates with the ACR122S via the communication port facilities provided by the operating system.

The ACR122S API defines a common way of accessing the ACR122S. Application programs can invoke the ACR122S through the interface functions and perform operations on the presented card.

Please note that for any ACR122S DLL-based application to work with the ACR122S reader, the DLL should be present in the System32 folder and/or application directory. The ACR122S SDK installer automatically places the DLL into your System32 folder. You can also find the DLL files from **C:\Program Files\Advanced Card Systems Ltd\ACR122S Serial NFC Reader SDK\Sample Codes\Library Modules** after you have installed the SDK.

The ACR122S API library documentation (see **ACR122S API** .chm file under User Manuals and Reference Materials folder) covers the APIs provided by the ACR122S API library.