Advanced Card Systems Ltd.
Card & Reader Technologies

ACR1222S Serial NFC Reader

SDK User Manual

Version History

Date	By	Changes	Version
2009-10-14	Aileen Herrera	• Initial draft	1.0
2009-11-17	Allan Joseph Tiongson	• Added screenshots and more body text	1.1
2011-05-05	Marizon Javierto	• Updated page properties • Changed filename from "ACR1222S SDK User Manual v1.1" to "**ACR1222S_SDK_USR_Manual_v1.10.01**" • Updated document formatting • Updated 1.1 Typical Applications • Added Chapter 2.0: SDK Specifications • Updated screenshots in 2.3 • Changed '2.0: Installation' to '3.0 Installation' • Updated caption of Figure 1 to '**Connection Diagram of ACR1222S Serial NFC Reader**' • Updated 3.1: Sample Codes • Added Section 3.4: '**Installation of Adobe PDF Reader**' • Updated Figure 2-3 screenshots (Tools and Utilities) • Updated 4.3: User Manuals and Reference Materials • Deleted the last paragraph of 5.0: ACR1222S API • Proofread the document	1.10.01
2011-05-06	Marizon Javierto	• Changed the 3.1 Installation requirement from '.NET Framework 2.0' to '.NET Framework 3.5 SP1'	1.10.02
2011-05-06	Melissa Frances Balmes	• Changed product photo • Proofreading	1.10.03
2011-05-16	Marizon Javierto	• Changed SDK Installation procedure and screenshot in section 3.4. step no. 4	1.10.04
2011-05-17	Marizon Javierto	• Changed AutoRun screenshot for Adobe Reader Installation	1.10.05
2011-05-24	Melissa Frances Balmes	• Release Document: v2.00	2.00.00

Table of Contents

Figures

1.0. Introduction

ACR1222S 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.

ACR1222S 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 ACR1222S Serial NFC Reader SDK provides the user tools and utilities, sample codes and reference materials to make application development as easy as possible with ACR1222S. This manual contains the procedure on how to install the SDK and an overview of its contents.

1.1. Typical Applications

- e-Government
- e-Banking and e-Payment
- e-Healthcare
- Transportation
- Network Security
- Access Control
- Loyalty Program

This device complies with part 15 of the FCC Rules.Operation is subject to the following two conditions: This device may not cause harmful interference, and must accept any interference received, including interference that may cause undesired Operation. Changes or modifications not expressly approved by the party responsible for compliance could void the equipment.

2.0. SDK Specifications

2.1. SDK Contents and Features

- 1 ACR1222S Serial NFC Reader
- 5 Mifare 1K Cards
- 1 ACOS6-SAM Card
- SDK CD-ROM

2.2. SDK System Requirements

- IBM Compatible Personal Computer with minimum of 1 GHz Pentium Processor or higher
- Window XP, Windows Vista, Windows 7
- Minimum of 256 MB RAM
- Minimum of 600 MB Free Hard Disk Space
- CD-ROM Drive
- Serial RS232 port
- USB port

3.0. Installation

3.1. Requirements

If you have installed a previous version of the ACR1222S Serial NFC Reader SDK, uninstall this version first via **Add/Remove Programs** in Control Panel before installing this SDK version. Make sure that all folders have been deleted.

The Microsoft .NET Framework 3.5 is a pre-requisite to run the ACR1222S Tool. For Windows XP, Windows Vista, Windows 7 users, the Microsoft .NET Framework 3.5 Service Pack 1 can be downloaded from:

http://www.microsoft.com/downloads/en/details.aspx?FamilyID=ab99342f-5d1a-413d-8319-81da479ab0d7

3.2. Connection Diagram
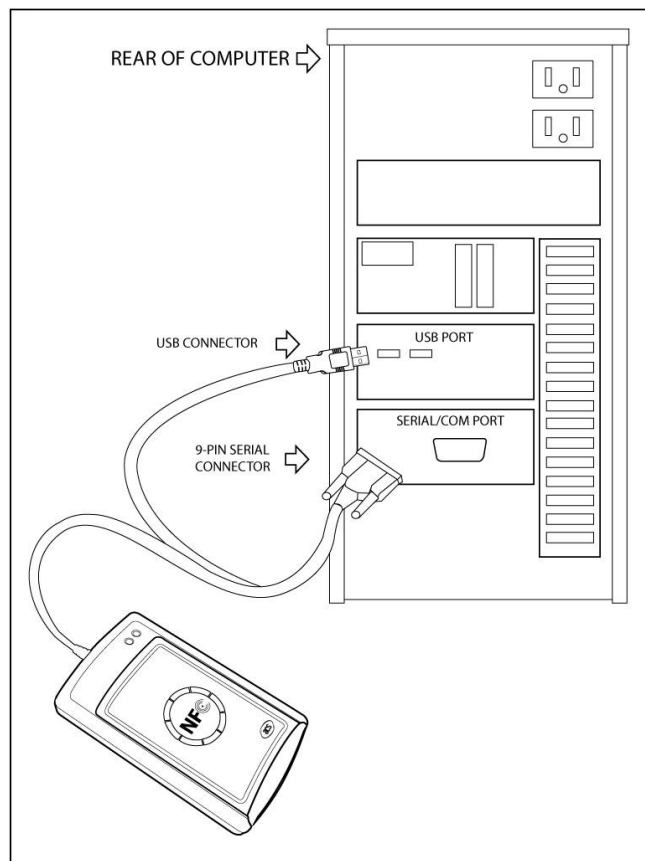
Connect the device as shown below:

Figure 1: Connection Diagram of ACR1222S Serial NFC Reader

ACR1222S uses the generic COM driver, which is already installed in Windows and Linux operating systems; hence driver installation is not necessary.
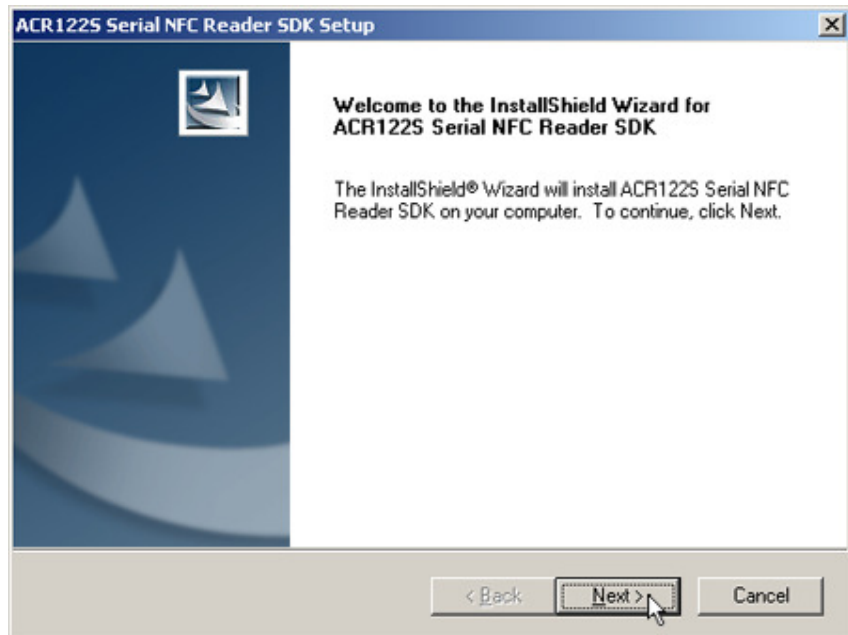
3.3. Installation of SDK Components

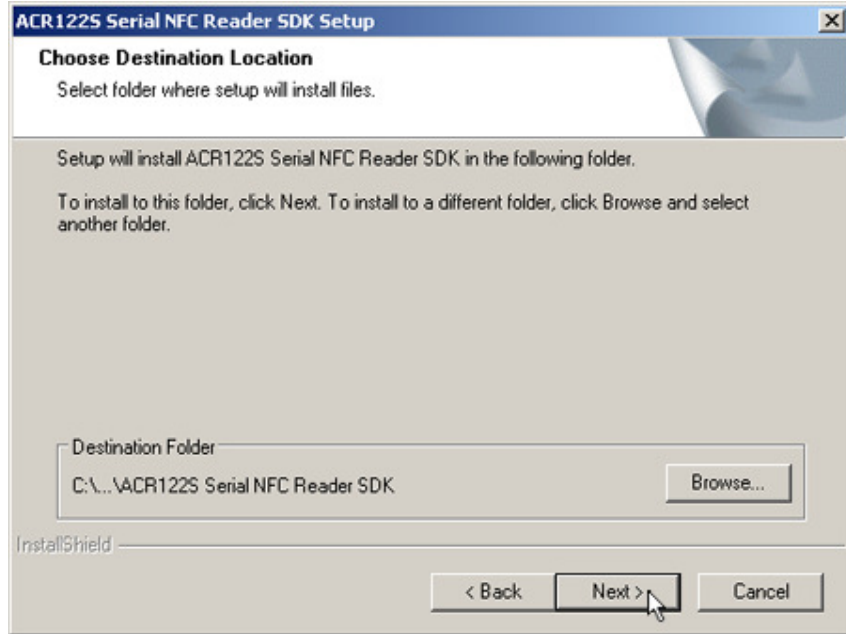1. Click on **Install SDK Components** button from the ACR1222S SDK Installer GUI.

2. ACR1222S SDK Setup Wizard will be displayed.

   Click **Next** to continue.

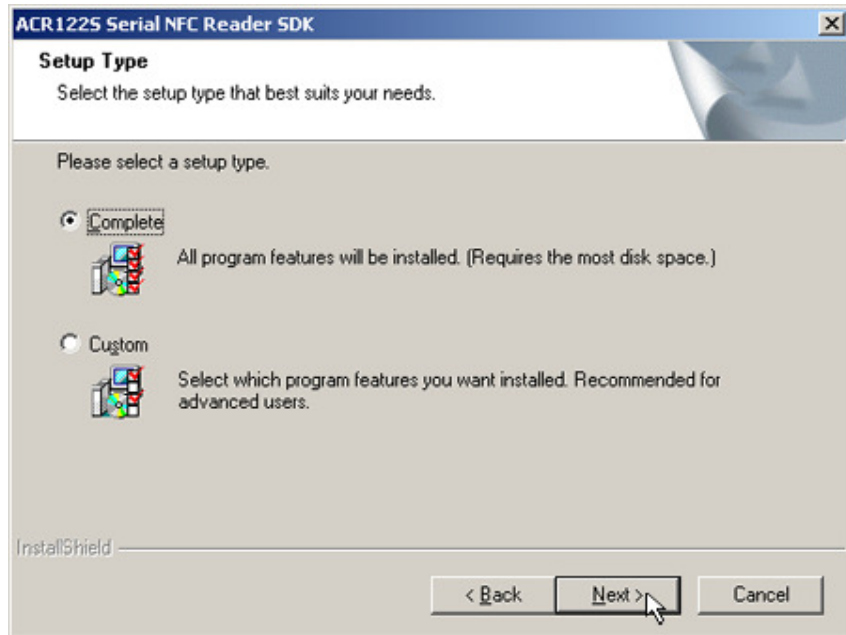# Advanced Card Systems Ltd.
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3. Choose the location where you want to install the ACR1222S SDK.

   The default location is **x:\Program Files\Advanced Card Systems Ltd\ACR1222S Serial NFC Reader SDK**, with **x** as the drive letter of the local Windows drive.
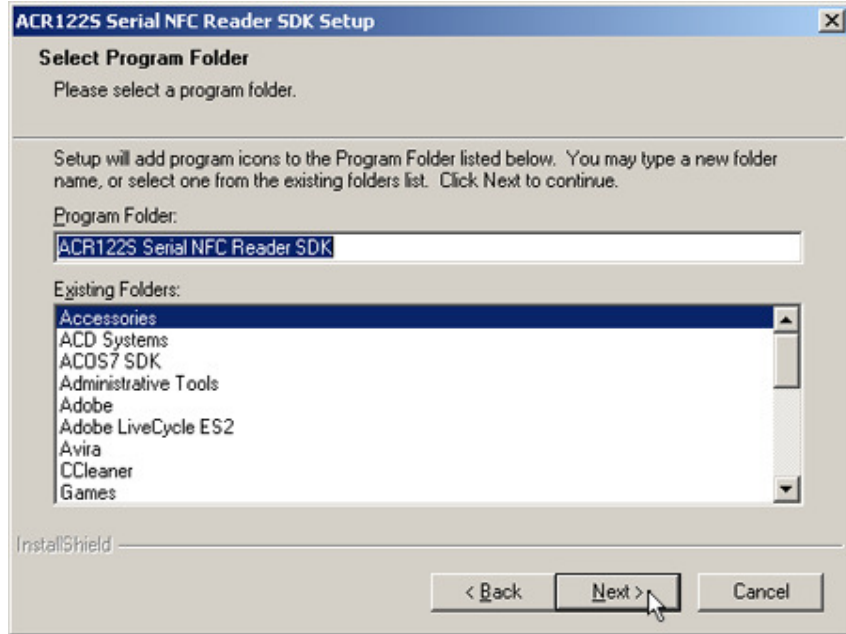
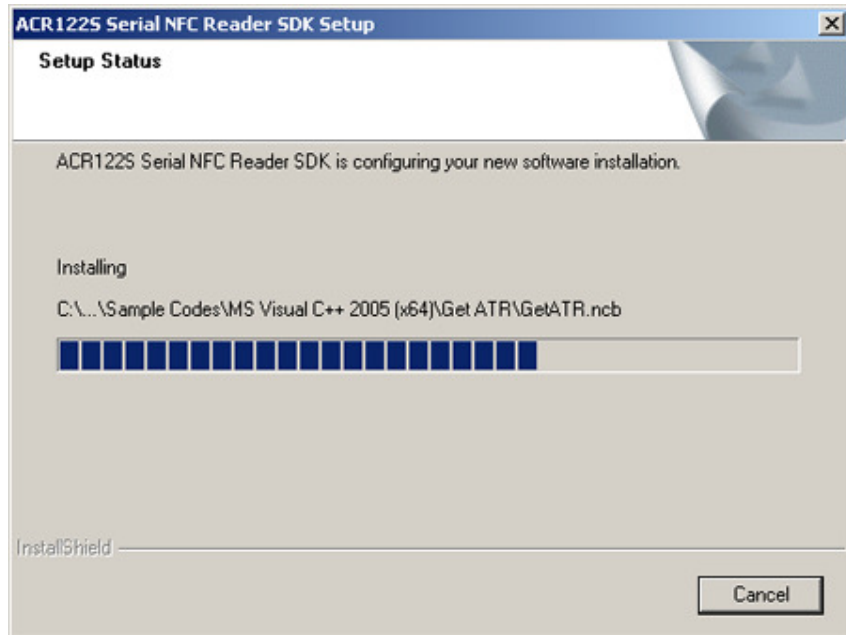4. Choose **Complete** and click **Next**.

   Note: Advanced users may choose **Custom** to install preferred components.

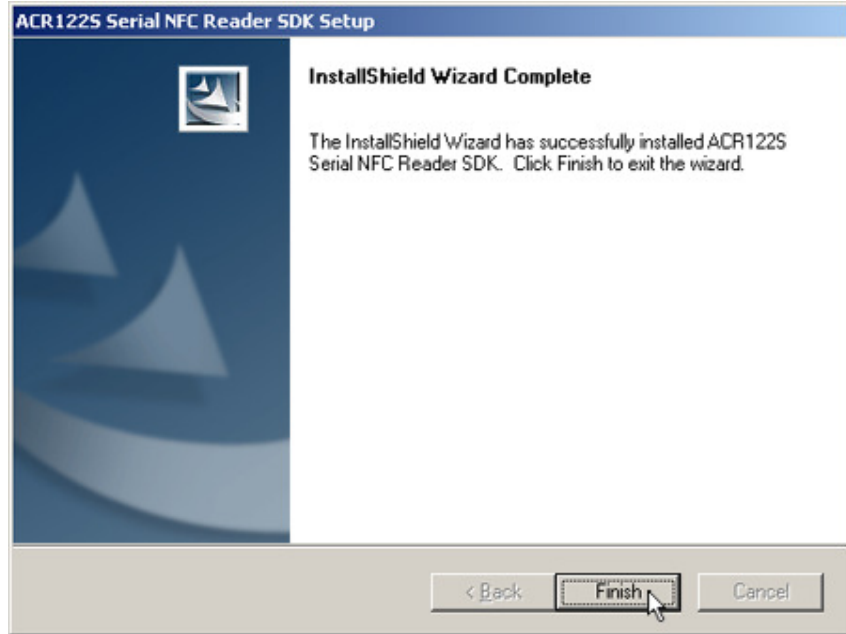5. Select a program folder where icons will be placed and then click **Next**.

6. Wait for the installation process to be completed.

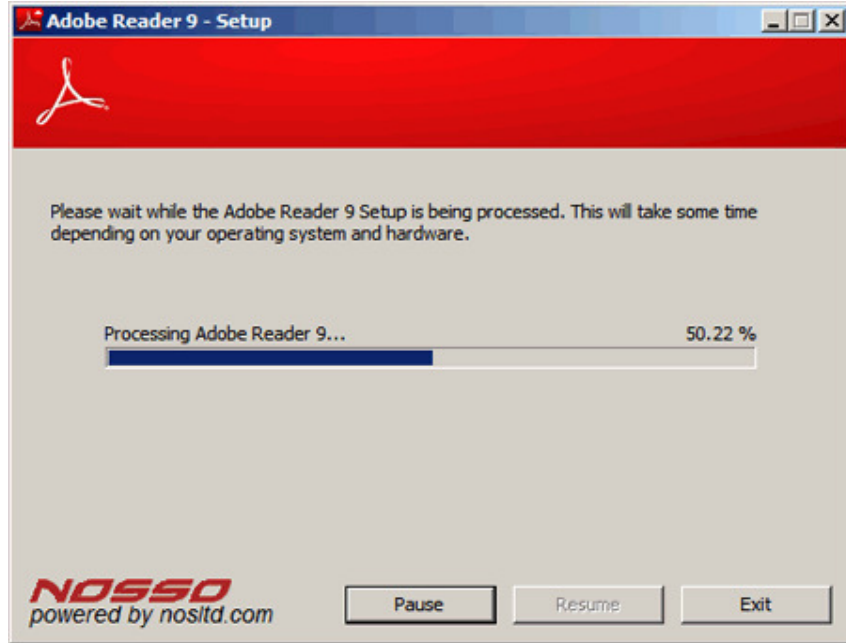7. Click **Finish** to close the Setup Wizard window.

3.4. Installation of Adobe PDF Reader

1. Click the **Install Adobe PDF Reader** button from the ACR1222S SDK Installer GUI.
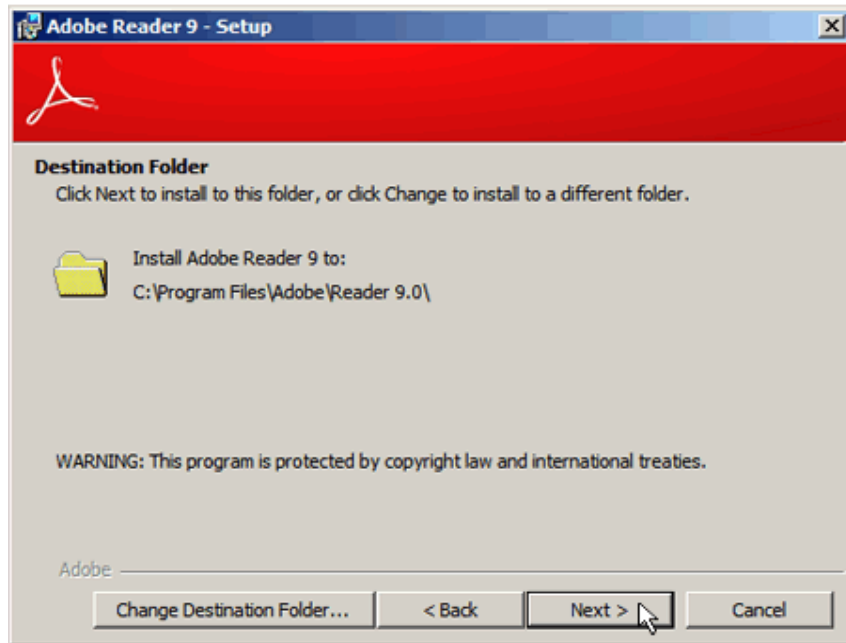
2. Wait while the installation is being processed.

   Click **Pause** to temporarily stop the installation or **Exit** to stop the installation.
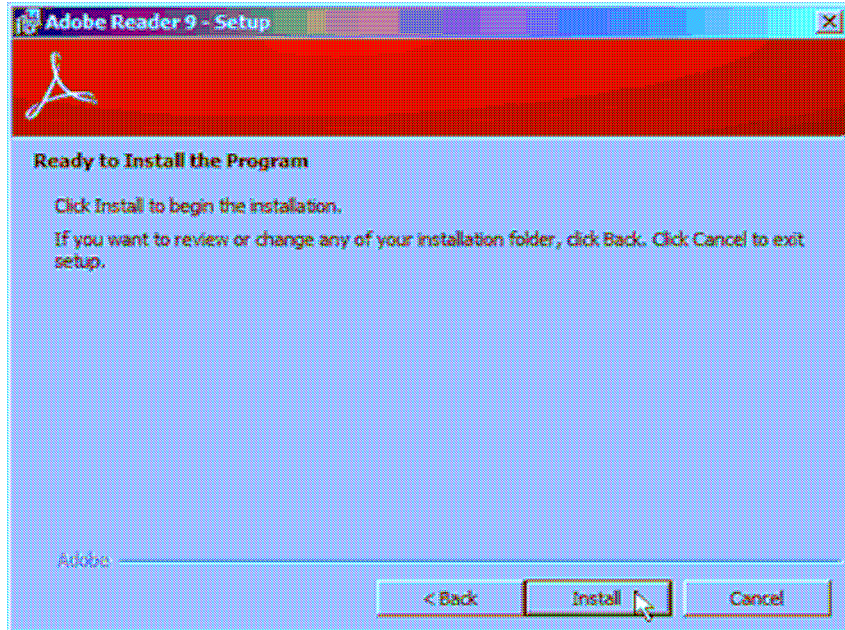
3. Choose the destination folder where you want Adobe Reader to be installed. Click **Change Destination Folder** to choose a preferred location.

   Otherwise, click **Next** to install the Adobe Reader on the default folder location.

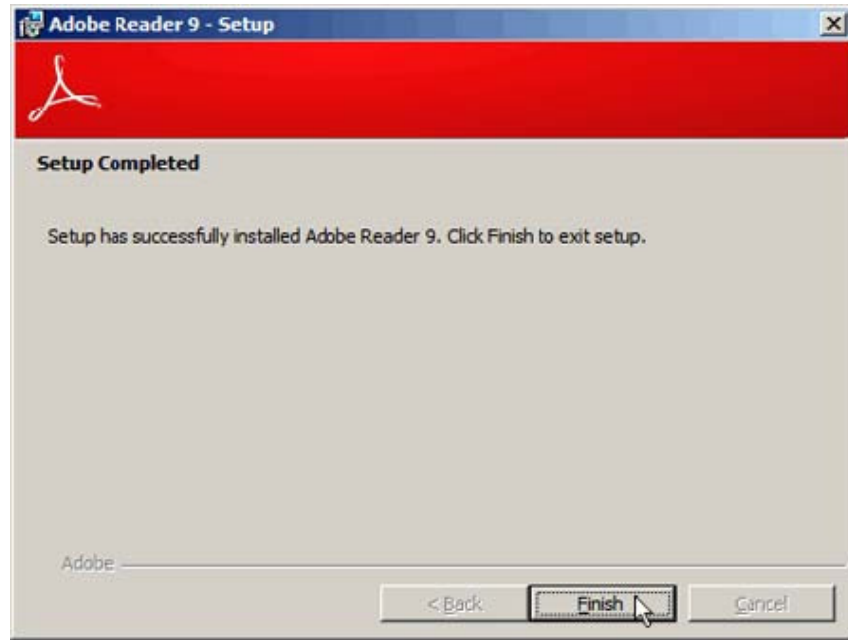4. Once ready, click **Install** to begin the installation.

5. Wait for the installation process to be completed.

6. Click **Finish** to exit
setup.

4.0. SDK Components

4.1. Sample Codes

The sample codes features the different capabilities of the ACR1222S, each shows how to control the ACR1222S peripherals and how to communicate with a contactless tag and SAM.

Sample codes are written in the following languages:

- Java
- MS Visual Basic (x32)
- MS Visual Basic .NET (x32)
- MS Visual Basic .NET (x64)
- MS Visual C# (x32)
- MS Visual C# (x64)
- MS Visual C++ (x32)
- MS Visual C++ (x64)
- Delphi

4.2. Tools and Utilities

4.2.1. ACR1222S Tool

The ACR1222S Tool is an application utility tool that allows 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.
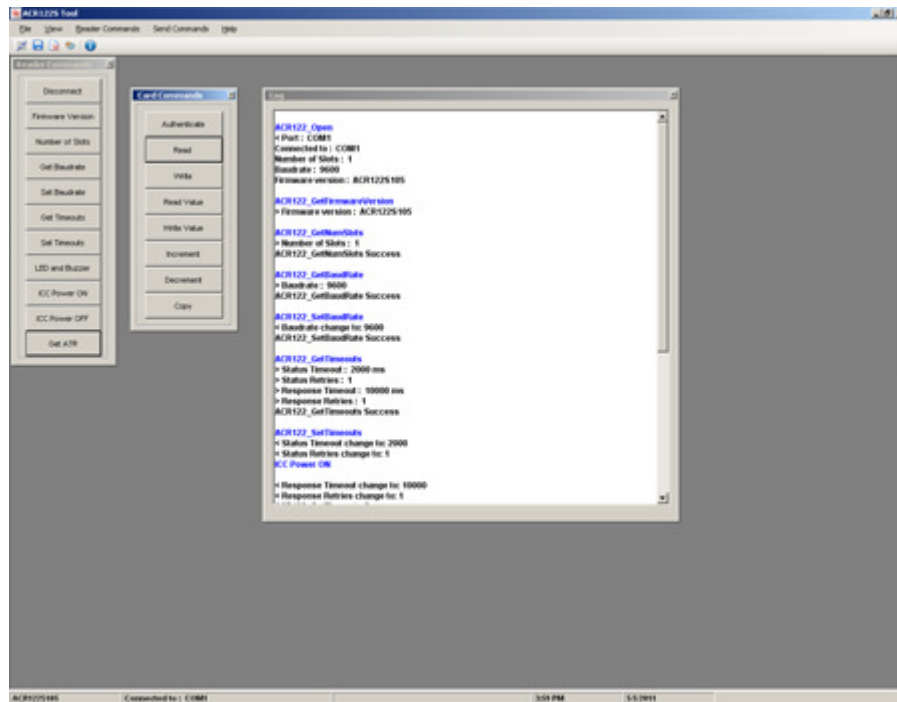

Figure 2: ACR1222S Tool

4.2.2. 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.
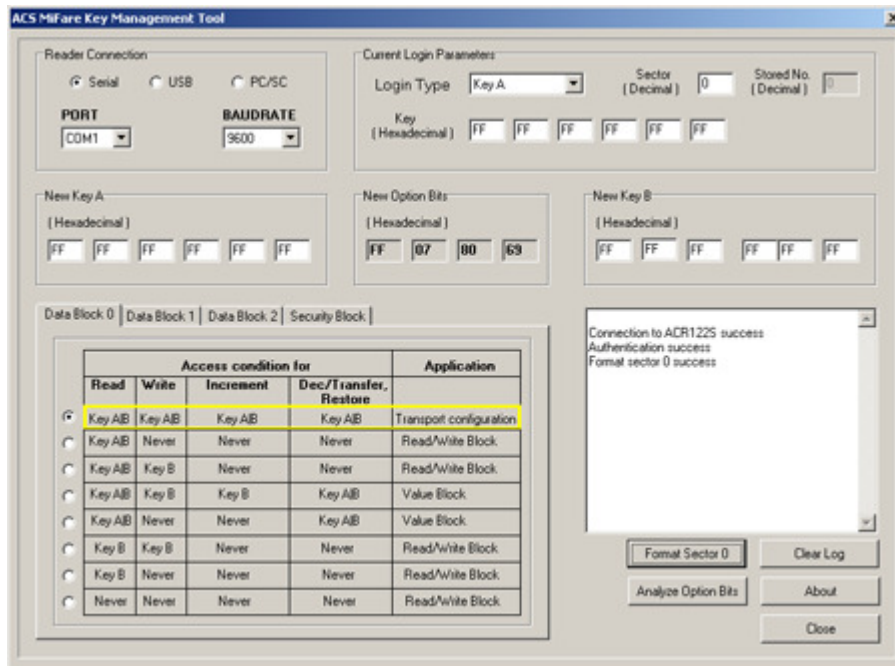

Figure 3: ACS Easy Key

4.2.3. ACS QuickView

The ACS QuickView is a utility program that checks if the user has properly installed the ACR1222S device. For a detailed explanation on how to use the tool, check the Help menu in the program.
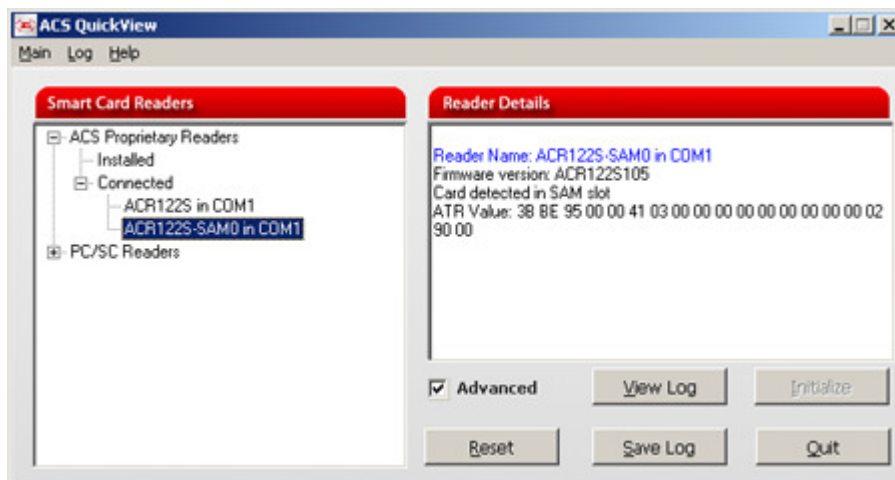

Figure 4: ACS QuickView

4.3. User Manuals and Reference Materials

- ACR1222S API
- ACR1222S Communication Protocol
- ACR1222S SDK User Manual
- ACR1222S Technical Specifications
- Mifare 1K Reference Manual
- Mifare 4K Reference Manual
- Mifare Ultralight Reference Manual
- ACOS6-SAM Reference Manual

5.0. ACR1222S API

An interface software to program the ACR1222S 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 ACR1222S and the corresponding presented card. The DLL communicates with the ACR1222S via the communication port facilities provided by the operating system.

The ACR1222S API defines a common way of accessing the ACR1222S. Application programs can invoke the ACR1222S through the interface functions and perform operations on the presented card.

Please note that for any ACR1222S DLL-based application to work with the ACR1222S reader, the DLL should be present in the System32 folder and/or application directory. The ACR1222S 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\ACR1222S Serial NFC Reader SDK\Sample Codes\Library Modules** after you have installed the SDK.