Overview

The USB CCID smart card application is a simple demonstration program based on the KSDK and EMV library. It is enumerated as a smart card reader.

System Requirement

Hardware requirements

- Mini/micro USB cable

- USB A to micro AB cable

- Hardware (Tower module/base board, and so on) for a specific device.
  Tower System module and TWR-POSTCARD (REV B).

- Personal Computer(PC)

Software requirements

- The path for the project files for lite version example is:
  <SDK_Install>/boards/<board>/usb_examples/usb_device_ccid_smart_card_lite/<rtos>/<toolchain>.
  For non-lite version example, the path is:
  <SDK_Install>/boards/<board>/usb_examples/usb_device_ccid_smart_card/<rtos>/<toolchain>.

  Note

    The <rtos> is Bare Metal or FreeRTOS OS.

- To get the PC Test tool "Snooper", go to www.microissuer.com/download_en.html, download, and install it.
  See the `Snooper.Spec-002-how to snoopery` and `Snooper.Spec-003-apdu script for taoism`.

  Note

    The USB CCID smart card example is only tested using Microsoft Windows® 7 Enterprise X64. The "Smart Card Service" in services.msc must be started.

Getting Started

Hardware Settings

- Remove resister R215 and the Jumper settings:
  J25 1-2 3-5, remove all jumpers from J22 of tower board, and the jumpers of TWR-POSTCARD are J6(4-6), J7(4-6), J8(4-6), J9(empty), J10(empty), J11(1-2), J12(1-3;4-6).

  Note

    Set the hardware jumpers (Tower system/base module) to default settings.

Prepare the example

1. Download the program to the target board.

2. Connect the target board to the external power source (the example is self-powered).

3. Power off the target board. Then, power on again.

4. Connect a USB cable between the PC and the USB device port of the board.

Note

    For detailed instructions, see the appropriate board User's Guide.

Run the example

1. Plug in the device, which is running the CCID smart card application, into the PC. A smart card reader device "Microsoft Usbccid Smartcard Reader (WUDF)" in "Smart card readers" shows up as enumerated in the Device Manager.
   For more information about the smart card readers driver, see `"Microsoft Class Drivers for USB CCID Smart Cards"`.
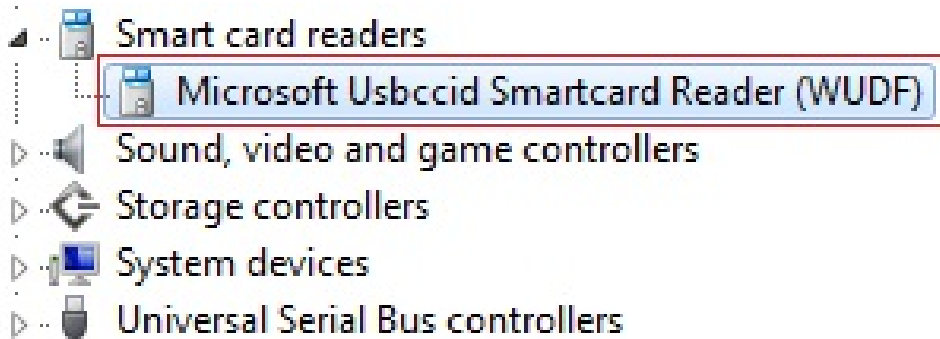
Figure 1: The device is attached

2. Insert a smart card. The device notifies the host that the slot has changed. The host sends the CCID command "POWER ON" to enable the card and then gets the Answer to Reset (ATR) from the device. If the smart card is an EMV card, the device responds with the ATR data. Otherwise, the device rejects the card with a message "This card is not an EMV card", and responds with an error code "The card is not supported". If the card is valid (the ATR is valid), the host tries to recognize the card by sending the APDU level command. If the card is recognized, the host installs the diver for this card. Otherwise, the host can't install the driver. Users need to provide the specified driver for this card or use a generic smart card driver for the host.
   For the specified driver for the smart card, see `"Smart Card Minidrivers"`.
   If the device is not recognized by the host, follow these steps:

   • When a smart card is inserted and the host doesn't recognize it, the smart card driver is not installed.

Figure 2: The device can't be recognized

   • Install a user-provided smart card driver or an OS-provided generic smart card driver.
     Right click on the smart card in the Device Manager-> Select "Properties"->Select "Update Driver" in Driver table-> Select "Browse my computer for driver software"->Select "Let me pick from a list of devices drivers on my computer"->Select "Smart cards".
     For a specified driver, select "Have Disk..." and select the specified driver in the disk.
     For a generic driver, select "Identity Device (Microsoft Generic Profile)". When the driver is installed, the smart card works.
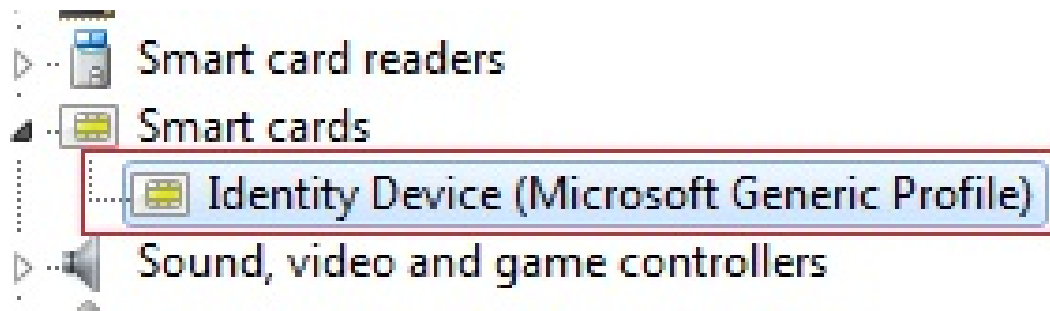
Figure 3: The driver of the device is installed

3. Open the test tool "Snooper.exe" and select the USB CCID smart card device "FREESCALE SEMICONDUCTOR INC. MCU CCID DEMO 0".
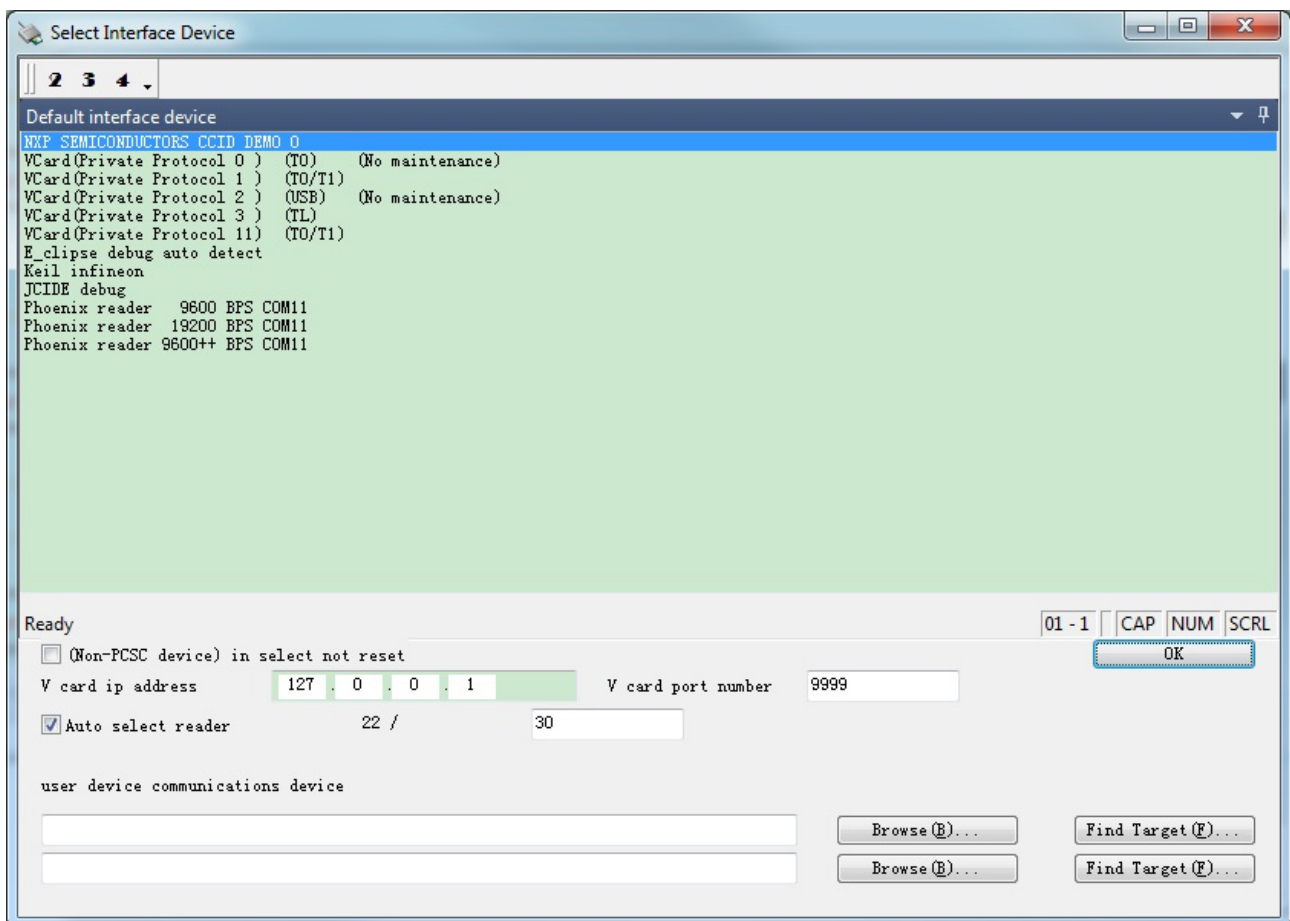

Figure 4: Select the smart card reader

The tool connects to slot 0 of the device.

Figure 5: The slot 0 of the smart card reader is selected

4. Select the "Common Script Tool (regular edition) 00".

Figure 6: Select the Common Script Tool

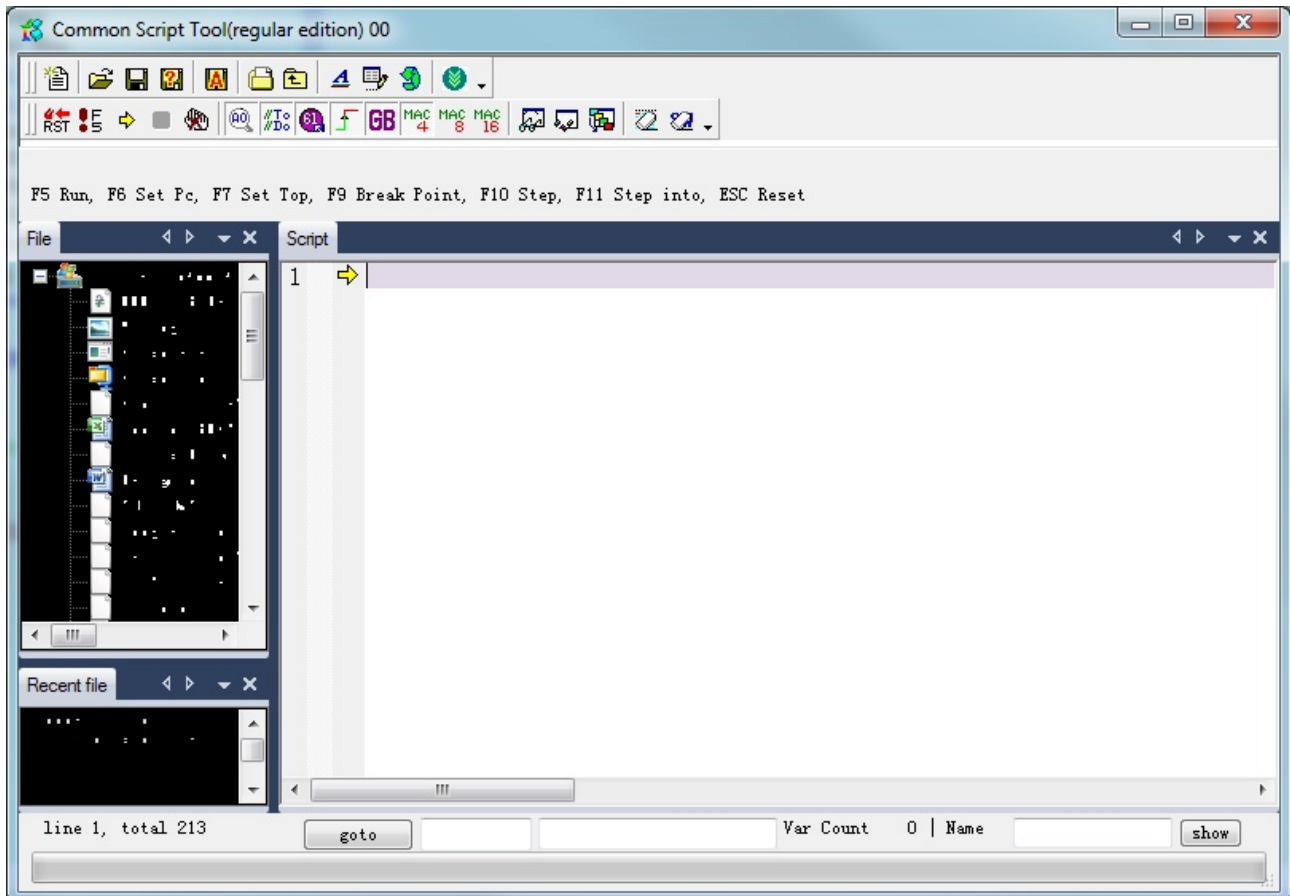The form of the "Common Script Tool (regular edition) 00" is shown.

Figure 7: The form of the Common Script Tool

5. Create a new blank script table and copy the test script to the table.

```
clear

reset

auto_response on
prompt on

? "Test start"

g_pse                    =              "1PAY.SYS.DDF01"

? "Select PSE"
00 a4 04 00 ($g_pse)
if sw != 9000
    pause
endif
set resp

? "Read PSE"
00 b2 01 0c 00
```

```
if sw != 9000
    pause
endif


set resp
g_output_aid = gettlv( $resp, 70 61 4f )

? "Select AID"
00 a4 04 00 ( $g_output_aid )
if sw != 9000
    pause
endif

? "Test end"
```

6. Press "F7" to set script to top.

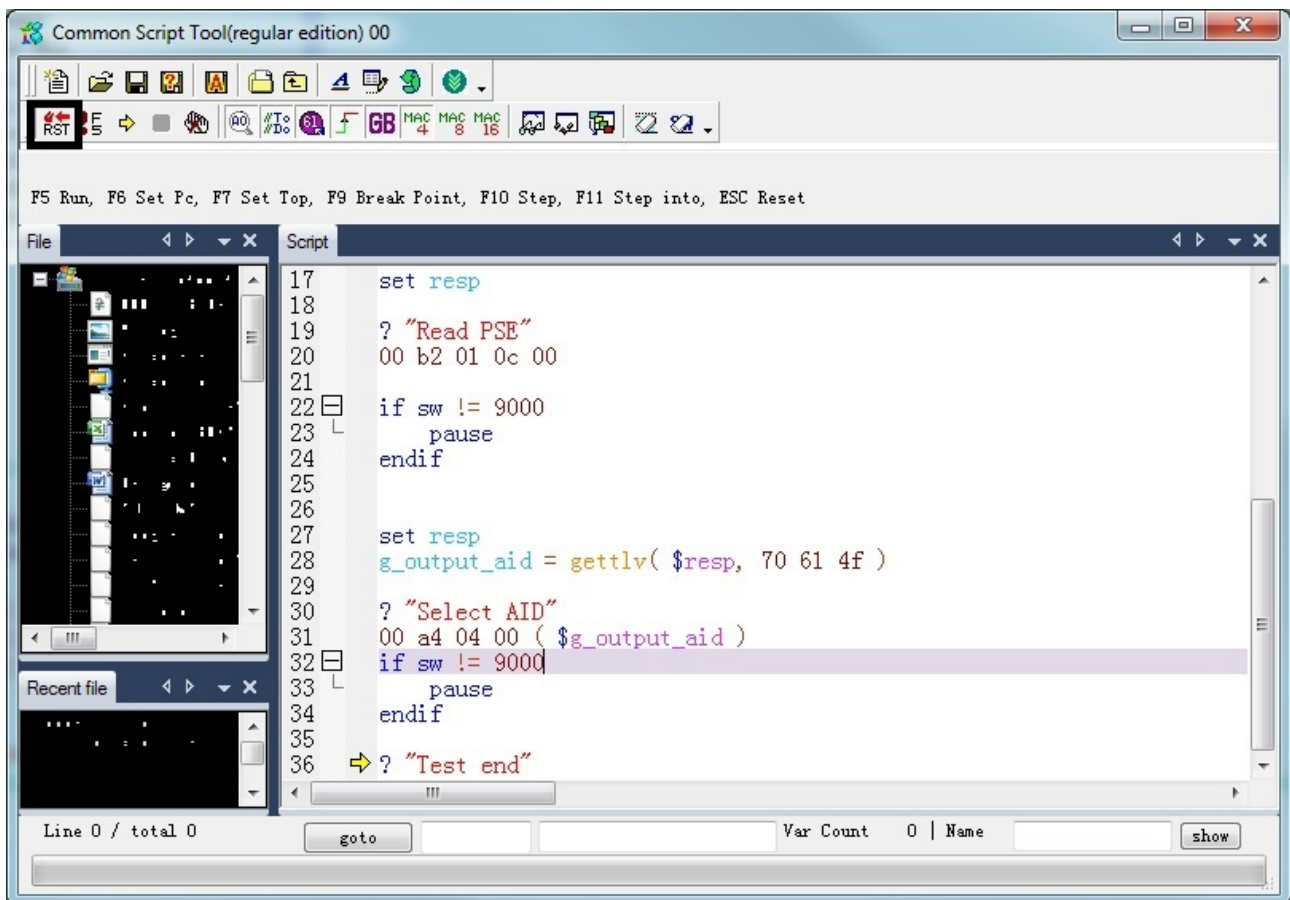7. Click "RST" to reset the smart card.

Figure 8: Reset the card

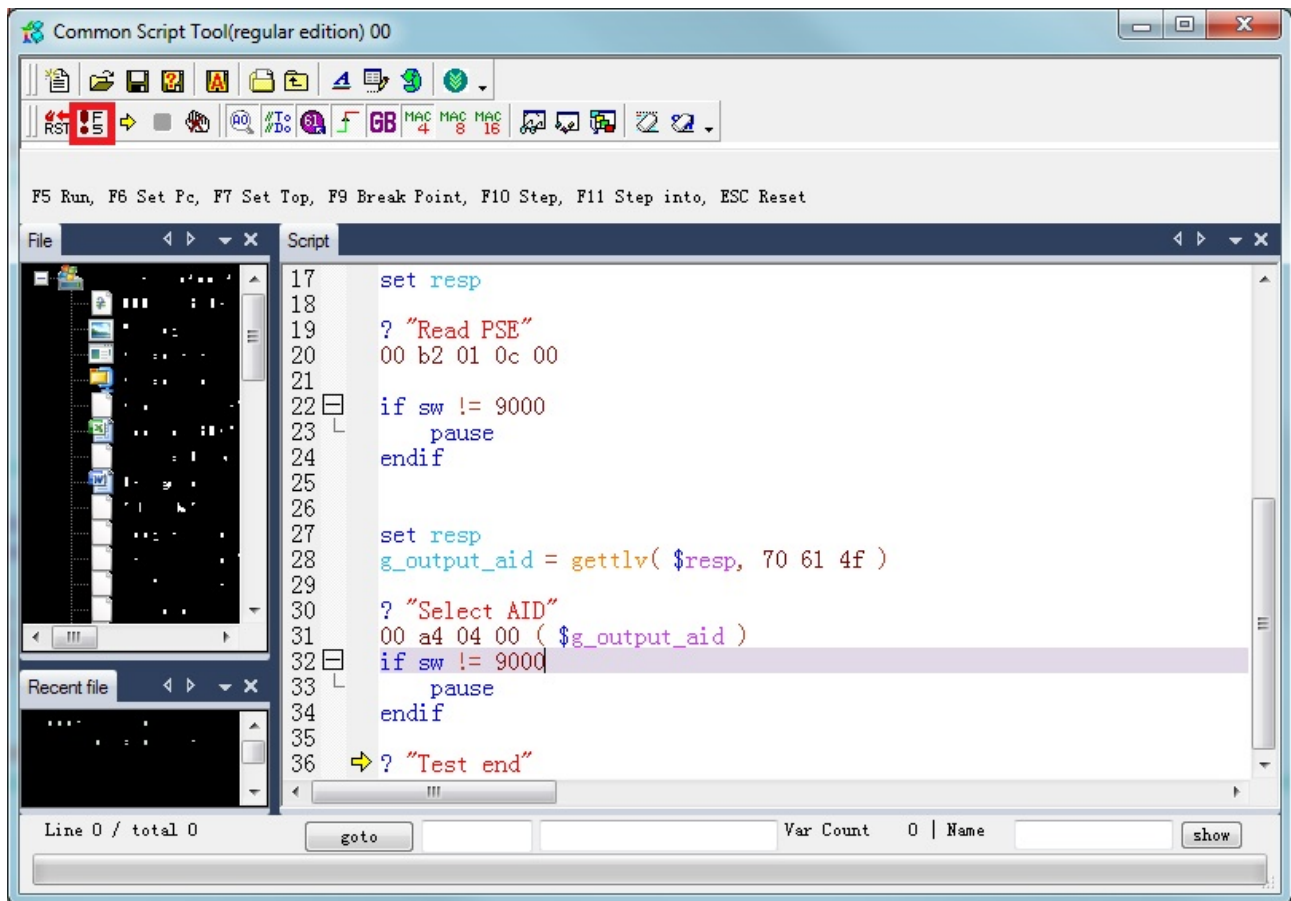8. Click "Run" to start the test.

Figure 9: Run the test script

Note

This example is tested using the PBOC specification compatibility card. The card must be compatible with ISO/IEC 7816-4.