

Hamster Pro Duo CL™

PCSC User Guide

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1. General Description

Hamster Pro Duo CL™ is a combination fingerprint reader and contactless smart card reader that supports the USB (Universal Serial Bus) 1.1 and 2.0 interface, utilizes the Plug & Play architecture, and is hot swappable. The Hamster Pro Duo CLC is RoHS compliant and is compatible with the Hamster Pro 20™ fingerprint reader (model HU20) with regard to fingerprint functionality. The smart card reader in the device is 100% compatible with the ACS ACR1251U USB smart card reader.

The PCSC application is designed to continuously test the functionality of both the contact (SAM) card reader and the contactless (MIFARE) card reader in the Hamster PRO DUO.



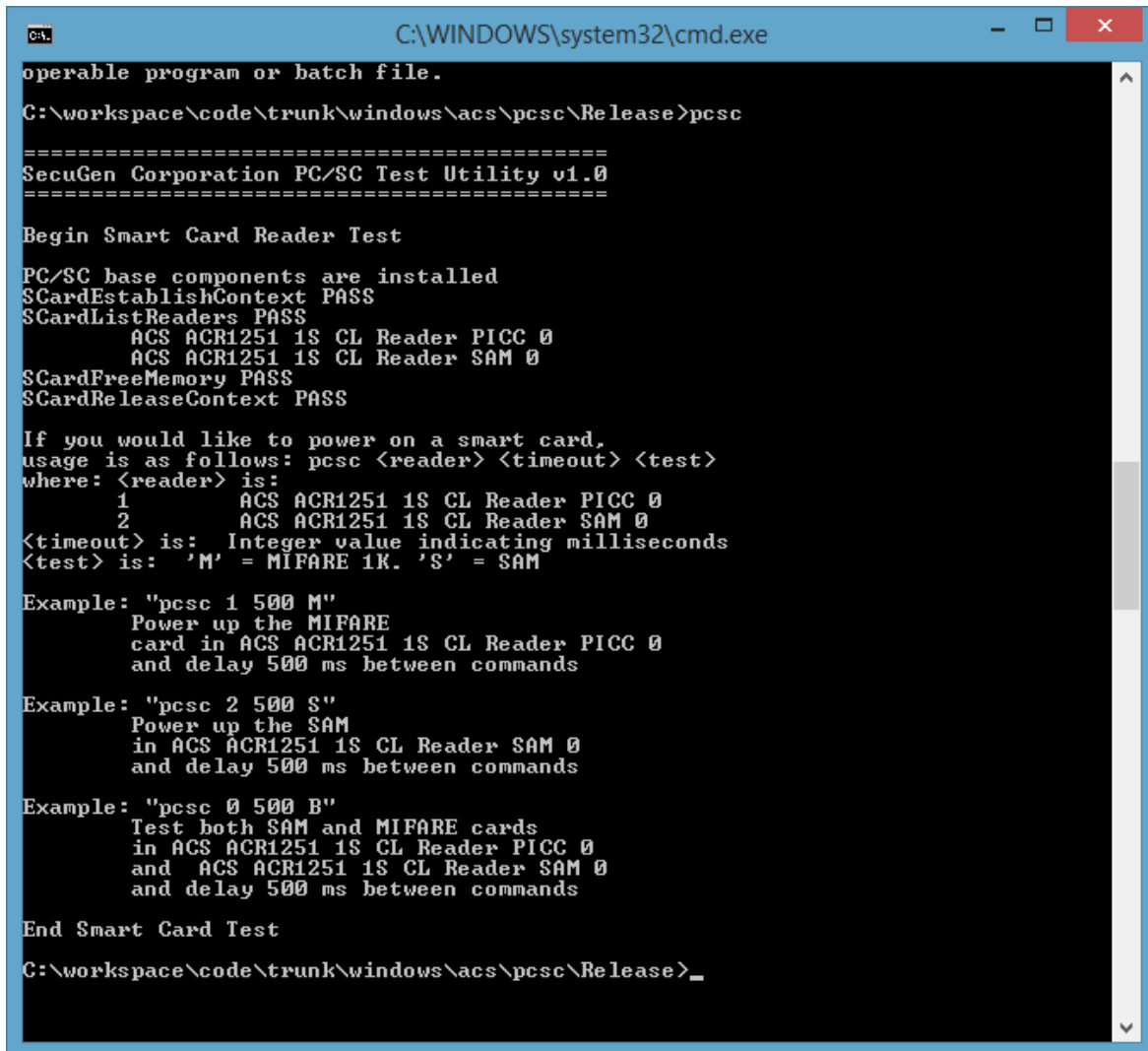
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2. USING PCSC.EXE

PCSC.EXE must be invoked in a command prompt so that the necessary command-line arguments can be specified

2.1 Invoking PCSC with no command-line arguments

When the PCSC.EXE utility is invoked without command-line arguments, the available smart card readers will be displayed as shown below.



```
C:\WINDOWS\system32\cmd.exe

operable program or batch file.
C:\workspace\code\trunk\windows\acs\pcsc\Release>pcsc

=====
SecuGen Corporation PC/SC Test Utility v1.0
=====

Begin Smart Card Reader Test

PC/SC base components are installed
SCardEstablishContext PASS
SCardListReaders PASS
    ACS ACR1251 1S CL Reader PICC 0
    ACS ACR1251 1S CL Reader SAM 0
SCardFreeMemory PASS
SCardReleaseContext PASS

If you would like to power on a smart card,
usage is as follows: pcsc <reader> <timeout> <test>
where: <reader> is:
    1      ACS ACR1251 1S CL Reader PICC 0
    2      ACS ACR1251 1S CL Reader SAM 0
<timeout> is: Integer value indicating milliseconds
<test> is:  'M' = MIFARE 1K. 'S' = SAM

Example: "pcsc 1 500 M"
    Power up the MIFARE
    card in ACS ACR1251 1S CL Reader PICC 0
    and delay 500 ms between commands

Example: "pcsc 2 500 S"
    Power up the SAM
    in ACS ACR1251 1S CL Reader SAM 0
    and delay 500 ms between commands

Example: "pcsc 0 500 B"
    Test both SAM and MIFARE cards
    in ACS ACR1251 1S CL Reader PICC 0
    and ACS ACR1251 1S CL Reader SAM 0
    and delay 500 ms between commands

End Smart Card Test

C:\workspace\code\trunk\windows\acs\pcsc\Release>_
```

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Two readers should be enumerated:

1. ACS ACR1251 1S CL Reader PICC 0 – This is the contactless card reader.
The MIFARE 1K card is used with this reader



2. ACS ACR1251 1S CL Reader SAM 0 – This is the SAM reader.
The ACOS6-SAM card will be used with this reader



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2.2 PCSC Command-line Arguments

PCSC is invoked with three command-line arguments;

PCSC.EXE <reader> <delay> <test>

<reader> - The number of the enumerated reader

1	ACS	ACR1251	1S	CL	Reader	PICC	0
2	ACS	ACR1251	1S	CL	Reader	SAM	0

<delay> - The number of milliseconds to delay between smart card commands.

This must be an integer value greater than or equal to zero.

<test> - The type of card test to be performed.

M = Mifare and must be run with the PICC reader

S = SAM and must be run with the SAM reader

There is a special set of command-line arguments to be used in the case where both readers are to be tested at the same time

PCSC.EXE 0 <delay> B

Reader=0 – Both readers will be tested

Test=B – Both SAM and MIFARE tests will be executed

3. TESTING THE MIFARE CARD

3.1 Place the MIFARE 1K card on the device.

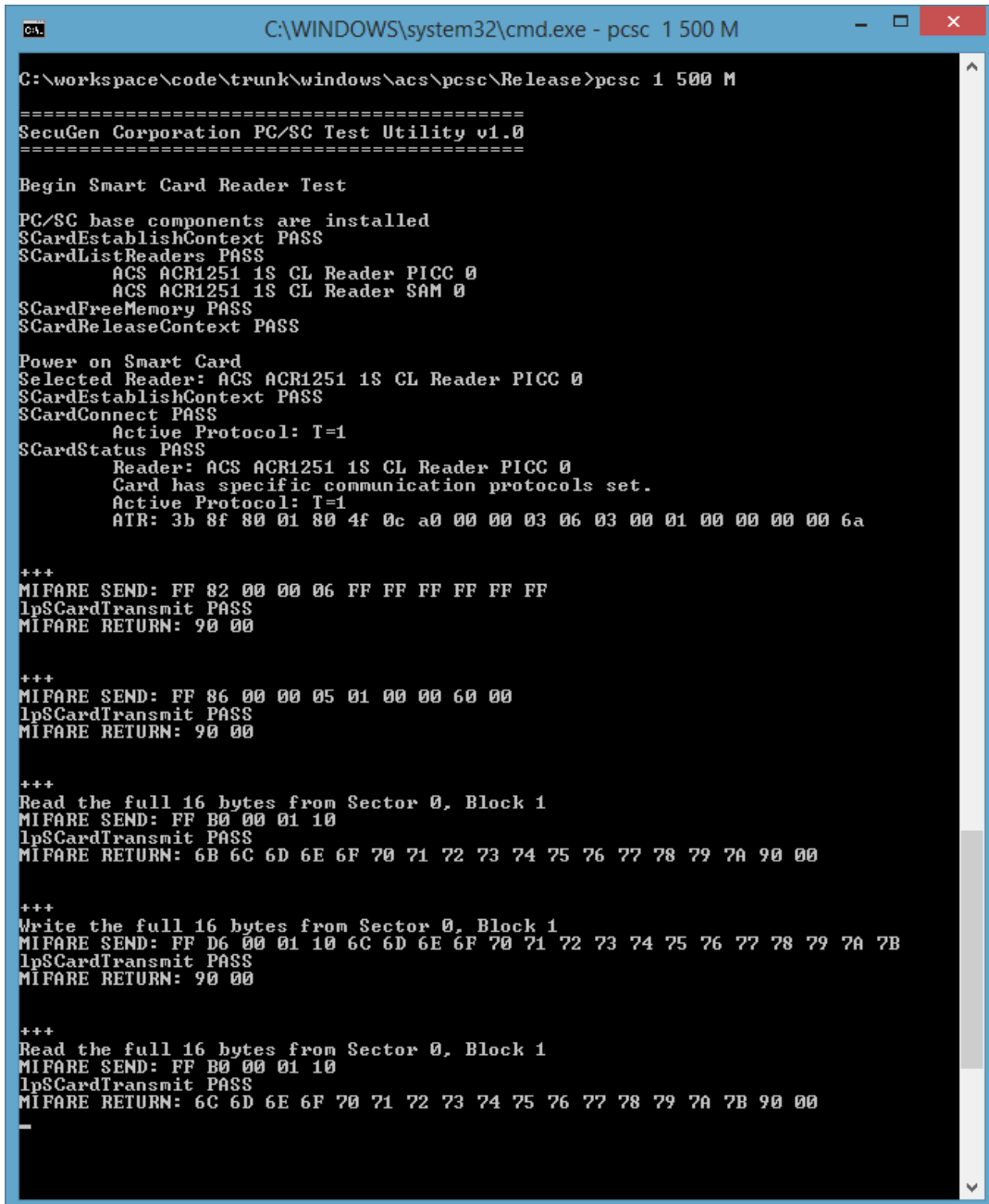


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3.2 Invoke PCSC.EXE with the correct command-line options

```
pcsc 1 500 M
```

3.3 The test will start. The Answer-to-Reset (ATR) of the card will be reported and then the test will proceed with repetitive read and write operations to the card.



```
C:\WINDOWS\system32\cmd.exe - pcsc 1 500 M

C:\workspace\code\trunk\windows\acs\pcsc\Release>pcsc 1 500 M

=====
SecuGen Corporation PC/SC Test Utility v1.0
=====

Begin Smart Card Reader Test

PC/SC base components are installed
SCardEstablishContext PASS
SCardListReaders PASS
    ACS ACR1251 1S CL Reader PICC 0
    ACS ACR1251 1S CL Reader SAM 0
SCardFreeMemory PASS
SCardReleaseContext PASS

Power on Smart Card
Selected Reader: ACS ACR1251 1S CL Reader PICC 0
SCardEstablishContext PASS
SCardConnect PASS
    Active Protocol: T=1
SCardStatus PASS
    Reader: ACS ACR1251 1S CL Reader PICC 0
    Card has specific communication protocols set.
    Active Protocol: T=1
    ATR: 3b 8f 80 01 80 4f 0c a0 00 00 03 06 03 00 01 00 00 00 00 6a

+++
MIFARE SEND: FF 82 00 00 06 FF FF FF FF FF FF
lpSCardTransmit PASS
MIFARE RETURN: 90 00

+++
MIFARE SEND: FF 86 00 00 05 01 00 00 60 00
lpSCardTransmit PASS
MIFARE RETURN: 90 00

+++
Read the full 16 bytes from Sector 0, Block 1
MIFARE SEND: FF B0 00 01 10
lpSCardTransmit PASS
MIFARE RETURN: 6B 6C 6D 6E 6F 70 71 72 73 74 75 76 77 78 79 7A 90 00

+++
Write the full 16 bytes from Sector 0, Block 1
MIFARE SEND: FF D6 00 01 10 6C 6D 6E 6F 70 71 72 73 74 75 76 77 78 79 7A 7B
lpSCardTransmit PASS
MIFARE RETURN: 90 00

+++
Read the full 16 bytes from Sector 0, Block 1
MIFARE SEND: FF B0 00 01 10
lpSCardTransmit PASS
MIFARE RETURN: 6C 6D 6E 6F 70 71 72 73 74 75 76 77 78 79 7A 7B 90 00
```

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3.4 Press <Ctrl>-C to end the test.

4. TESTING THE SAM CARD

4.1 Insert the SAM Card in the receiver.



4.2 Invoke PCSC.EXE with the correct command-line options

```
pcsc 2 500 S.
```

4.3 The test will start. The Answer-to-Reset (ATR) of the card will be reported and then the test will proceed with repetitive formatting, read and write operations to the card.

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```
C:\WINDOWS\system32\cmd.exe - pcsc 2 500 S
C:\workspace\code\trunk\windows\acs\pcsc\Release>pcsc 2 500 S

=====
SecuGen Corporation PC/SC Test Utility v1.0
=====

Begin Smart Card Reader Test

PC/SC base components are installed
SCardEstablishContext PASS
SCardListReaders PASS
    ACS ACR1251 1S CL Reader PICC 0
    ACS ACR1251 1S CL Reader SAM 0
SCardFreeMemory PASS
SCardReleaseContext PASS

Power on Smart Card
Selected Reader: ACS ACR1251 1S CL Reader SAM 0
SCardEstablishContext PASS
SCardConnect PASS
    Active Protocol: T=0
SCardStatus PASS
    Reader: ACS ACR1251 1S CL Reader SAM 0
    Card has specific communication protocols set.
    Active Protocol: T=0
    ATR: 3b be 95 00 00 41 03 00 00 00 00 00 00 00 02 90 00

+++
CLEAR CARD
SAM SEND: 80 14 00 00 00
lpSCardTransmit PASS
SAM RETURN: 90 00

+++
CREATE MF 3F00
SAM SEND: 80 14 00 00 00
lpSCardTransmit PASS
SAM RETURN: 90 00

+++
READ SAM S/N
SAM SEND: 80 14 00 00 08
lpSCardTransmit PASS
SAM RETURN: 22 CD C6 19 27 39 8D 03 90 00

+++
READ SAM CARD ID
SAM SEND: 80 14 04 00 06
lpSCardTransmit PASS
SAM RETURN: FF FF FF FF FF FF 90 00

+++
READ SAM EEPROM SIZE
SAM SEND: 80 14 05 00 00
lpSCardTransmit PASS
SAM RETURN: 90 20

+++
READ SAM VERSION
SAM SEND: 80 14 06 00 08
lpSCardTransmit PASS
SAM RETURN: 41 43 4F 53 06 04 10 20 90 00
```


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4.4 Press <Ctrl>-C to end the test.

5. TESTING THE SAM AND MIFARE CARD

5.1 Place the SAM and MIFARE 1K cards as described in sections 3 and 4 above.

5.2 Invoke PCSC.EXE with the correct command-line options

```
pcsc 0 500 B
```

5.3 The test will start. The tests described in section 3 and 4 will be performed iteratively with both MIFARE and SAM tests being executed.

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```

C:\WINDOWS\system32\cmd.exe - pcsc 0 500 B
C:\workspace\code\trunk\windows\acs\pcsc\Release>pcsc 0 500 B

=====
SecuGen Corporation PC/SC Test Utility v1.0
=====

Begin Smart Card Reader Test

PC/SC base components are installed
SCardEstablishContext PASS
SCardListReaders PASS
    ACS ACR1251 1S CL Reader PICC 0
    ACS ACR1251 1S CL Reader SAM 0
SCardFreeMemory PASS
SCardReleaseContext PASS

Power on Smart Card
Selected Reader: ACS ACR1251 1S CL Reader PICC 0
SCardEstablishContext PASS
SCardConnect PASS
    Active Protocol: T=1
SCardStatus PASS
    Reader: ACS ACR1251 1S CL Reader PICC 0
    Card has specific communication protocols set.
    Active Protocol: T=1
    ATR: 3b 8f 80 01 80 4f 0c a0 00 00 03 06 03 00 01 00 00 00 00 6a

+++
MIFARE SEND: FF 82 00 00 06 FF FF FF FF FF FF
lpSCardTransmit PASS
MIFARE RETURN: 90 00

+++
MIFARE SEND: FF 86 00 00 05 01 00 00 60 00
lpSCardTransmit PASS
MIFARE RETURN: 90 00

+++
Read the full 16 bytes from Sector 0, Block 1
MIFARE SEND: FF B0 00 01 10
lpSCardTransmit PASS
MIFARE RETURN: C2 C3 C4 C5 C6 C7 C8 C9 CA CB CC CD CE CF D0 D1 90 00

+++
Write the full 16 bytes from Sector 0, Block 1
MIFARE SEND: FF D6 00 01 10 C3 C4 C5 C6 C7 C8 C9 CA CB CC CD CE CF D0 D1 D2
lpSCardTransmit PASS
MIFARE RETURN: 90 00
SCardDisconnect PASS
SCardReleaseContext PASS

Power on Smart Card
Selected Reader: ACS ACR1251 1S CL Reader SAM 0
SCardEstablishContext PASS
SCardConnect PASS
    Active Protocol: T=0
SCardStatus PASS
    Reader: ACS ACR1251 1S CL Reader SAM 0
    Card has specific communication protocols set.
    Active Protocol: T=0
    ATR: 3b be 95 00 00 41 03 00 00 00 00 00 00 00 00 02 90 00

+++
CLEAR CARD
SAM SEND: 80 14 00 00 00
lpSCardTransmit PASS
SAM RETURN: 90 00

+++

```

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5.4 Press <Ctrl>-C to end the test.

FCC (Federal Communications Commission) approval

This device complies with Part 15 of the FCC's Rules. Operation is subject to the following two Conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This product complies with FCC radiation exposure limits for an uncontrolled environment. Avoid operating this product at a distance less than 20 cm from the user.

Caution: Any changed or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.