



Advanced Card Systems Ltd.
Card & Reader Technologies

ACR1281U-C2 Card UID Reader



Reference Manual 1.00



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1.0. Introduction

ACR1281U-C2 is a contactless card UID (Unique Identification Number) reader especially designed to get the UID of any ISO 14443 Parts 1-4 Type A and B-compliant contactless card in an efficient way.

When a contactless card (e.g., MIFARE® DESFire® card) is tapped onto the ACR1281U-C2, the reader retrieves the UID and automatically returns the UID to the computer. Since it is HID (Human Interface Device)-compliant, this device does not require any additional driver to be installed in the computer. However, its only function is to retrieve the card's UID and display it directly in any text editor such as Notepad, Microsoft® Excel and Microsoft® Word. The ACR1281U-C2 also has an anti-collision feature that ensures only one card is accessed when multiple cards are presented at the same time.

ACR1281U-C2 Card UID Reader is HID-compliant. It can also support Windows®, Linux®, Mac OS®, and other embedded systems.

This document will discuss the commands and instructions on how the ACR1281U-C2 Reader Card UID output can be configured using escape commands.



Figure 1: ACR1281U-C2 Sample Application



2.0. Features

- USB 2.0 Full Speed Interface
- USB HID Keyboard Class Emulation
- USB Firmware Upgradability
- Contactless Card Support:
 - Read/Write speed of up to 848 Kbps
 - Built-in antenna for contactless tag access, with card reading distance of up to 50 mm (depending on tag type)
 - Supports ISO 14443 Part 4 Type A and B cards, and MIFARE® cards
 - Built-in anti-collision feature (only one tag is accessed at any time)
- Compliant with the following standards:
 - ISO 14443
 - CE
 - FCC
 - RoHS 2



3.0. Typical Applications

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



4.0. UID Output Settings

4.1. Output Format

Command to configure: E0 00 00 40 02 AB XX

Parameter Detail:

A – Read Mode Configure

- **Caps Lock/Caps Unlock**
 - = 1xxx b -> Reserved
 - = 00x0 b -> No Caps Lock before and after output
 - = 00x1 b -> Caps Lock before and after output
- **Length of UID**
 - = 000x b -> Only Support 4 bytes UID
 - = 001x b -> Support 4, 7, 10 bytes UID

B – Output Format/Display Mode

- = 0000 b = 0h -> Hex
- = 0001 b = 1h -> Dec (byte by byte)
- = 0010 b = 2h -> Dec

XX – Output Order

- = 00h -> Default order (UID Byte 0, UID Byte 1 ... UID Byte N)
Example: aa cc bb dd (original /actual UID order)
- = 01h -> Reverse order (UID Byte N, UID Byte N-1 ... UID Byte 0)
Example: dd bb cc aa (reverse the UID order)



4.2. Character between each UID bytes

Command to configure: E0 00 00 41 02 YY ZZ

Parameter Detail:

YY - the character between each UID

= FFh means no character between or

= for other character table, refer to http://www.usb.org/developers/hidpage/Hut1_12v2.pdf, p53 - p59

4.2.1. Reference Document

The following related document is available from <http://www.usb.org/developers/hidpage/>.

- HID Usage Table document defines constants that can be interpreted by an application to identify the purpose and meaning of a data filed in HID report.

Note: For keyboards, look at the usage table sections in both the HID Specifications and Usage Table document.

Refer to this link: http://www.usb.org/developers/hidpage/Hut1_12v2.pdf, under pages 53 to 59

Usage ID (Dec)	Usage ID (Hex)	Usage Name
40	28	Keyboard Return (Enter)
41	29	Keyboard Escape
43	2B	Keyboard Tab
44	2C	Keyboard Spacebar

Figure 2: HID Usage Table

4.3. Character at the end of UID bytes

Command to configure: E0 00 00 41 02 YY ZZ

Parameter Detail:

ZZ - the character end of output

= FFh means no character follow or

= for other character table, refer to http://www.usb.org/developers/hidpage/Hut1_12v2.pdf, p53 - p59

4.4. Current Output Settings

Below are the commands used in order to check the current UID output settings saved in the EEPROM of ACR1281U-C2 UID Reader.

E0 00 00 40 00

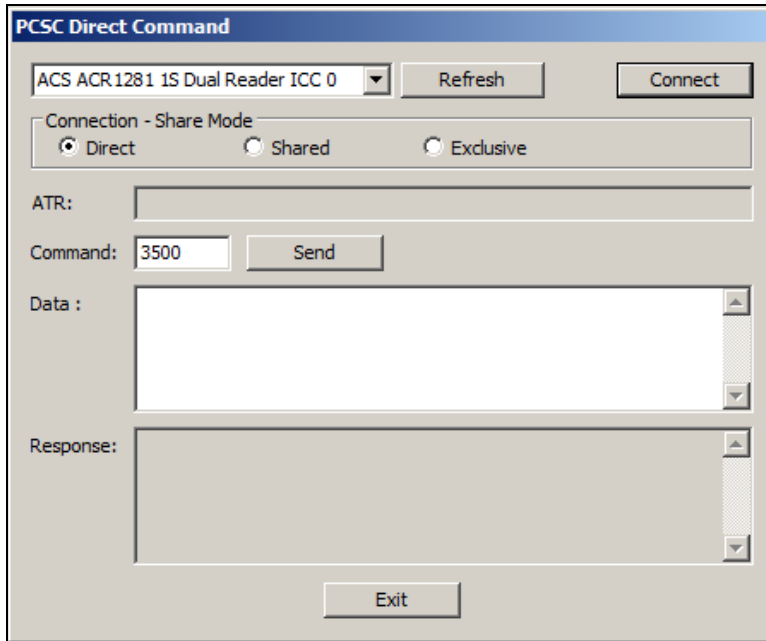
E0 00 00 41 00



5.0. Configure the UID using escape command

To configure the ACR1281U-C2 using the escape command:

1. Connect the ACR1281U-C2 smart card reader to your computer.
2. Run the **PCSC Direct Command Application**.
3. Under **Connection – Share Mode**, select **Direct** and then click **Connect**.
4. In the Data field, enter the **Commands to configure** and click **Send**.





5.1. Example 1

Here's the example of the output data given the following settings:

Display Mode: Hex Bytes

Length of UID: support 4, 7, 10

Letter Case: Caps Unlock

Order: Default order

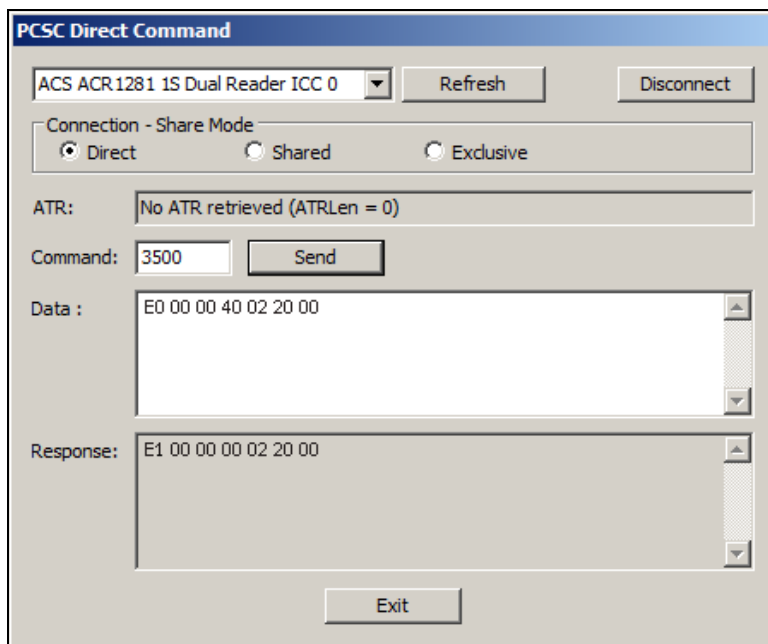
Character: Space character between UID, "Enter" later all the UID

- Command to configure:** E0 00 00 40 02 ABXX
A = 0010b = 2h B = 0000b = 0h XX = 00h
- Command to configure:** E0 00 00 41 02 YYZZ
From "HID Usage Table," p53 - p59
YY = "Spacing" = Keyboard Spacebar = 2Ch
ZZ = "Enter" = Keyboard Return = 28h

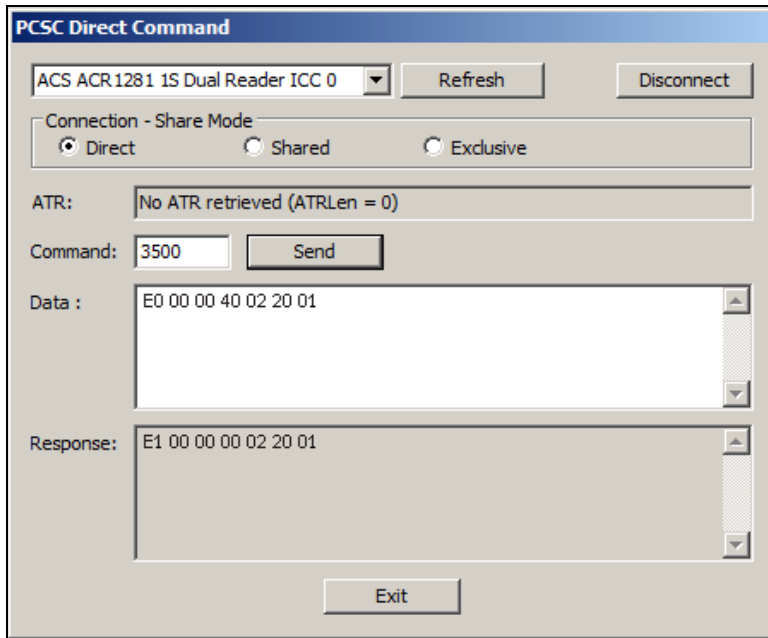
40	28	Keyboard Return (ENTER) ⁵	43	√	√	√	4/101/104
41	29	Keyboard ESCAPE	110	√	√	√	4/101/104
42	2A	Keyboard DELETE (Backspace) ¹³	15	√	√	√	4/101/104
43	2B	Keyboard Tab	16	√	√	√	4/101/104
44	2C	Keyboard Spacebar	61	√	√	√	4/101/104

Commands to configure:

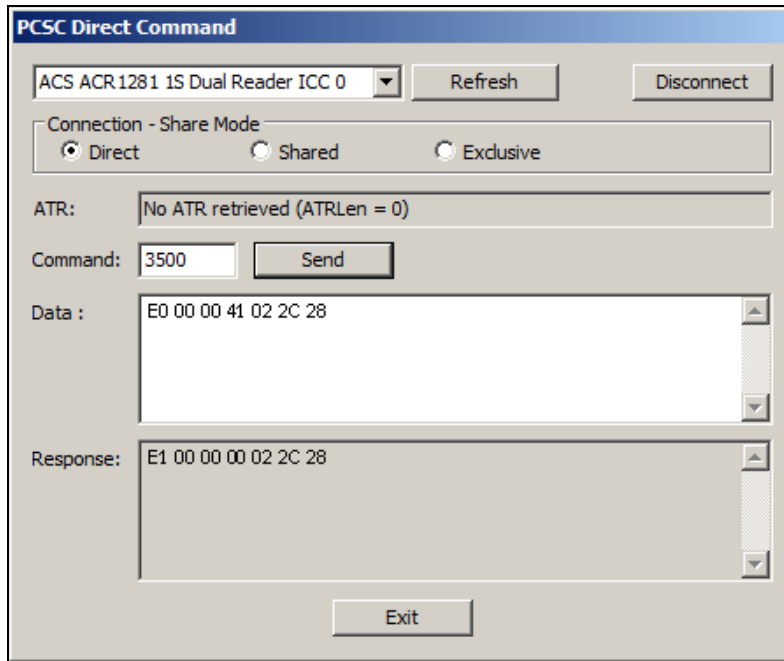
- E0 00 00 40 02 20 00



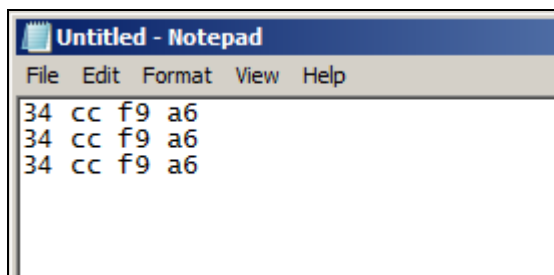
- E0 00 00 40 02 20 01



- E0 00 00 41 02 2C 28



- Display Result (UID = 34 CC F9 A6)



5.2. Example 2

Display Mode: Hex Bytes

Length of UID: support 4, 7, 10 bytes UID

Letter Case: Caps Lock

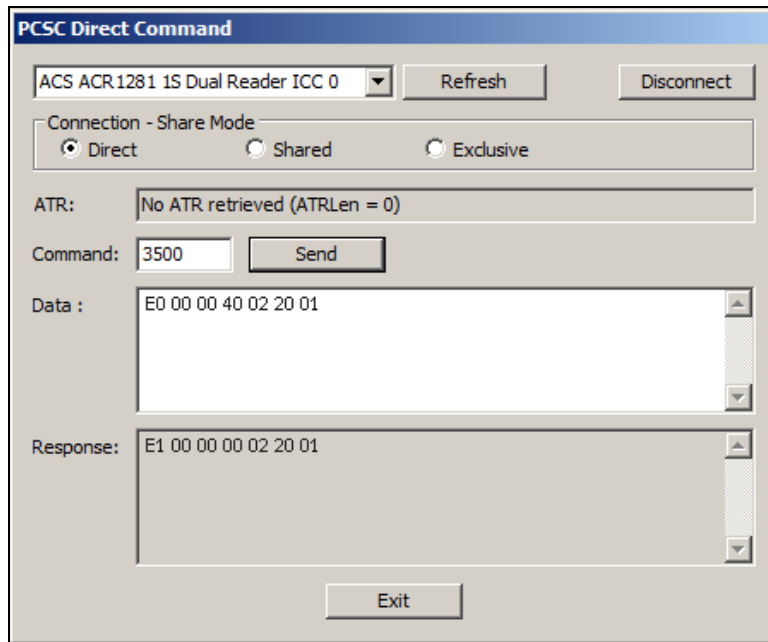
Order: Reverse order

Character: No character between UID, "Enter" later all the UID

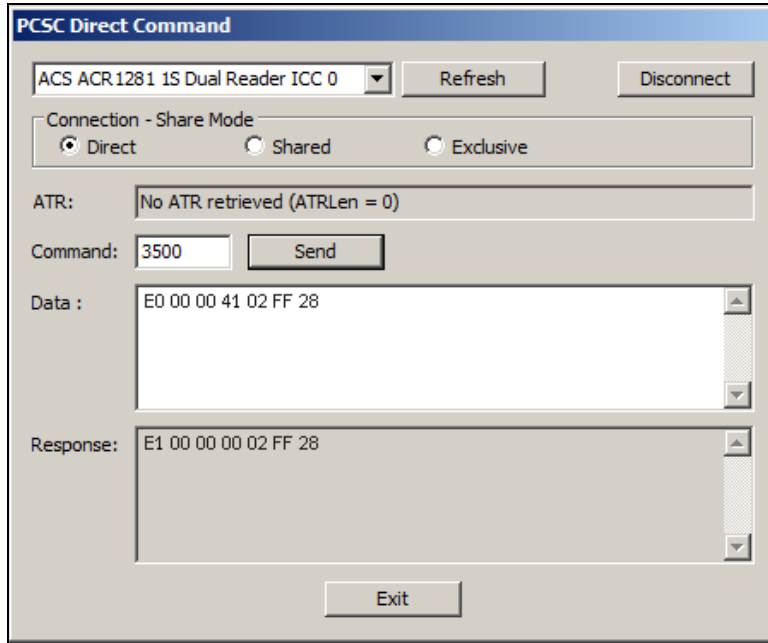
1. **Command to configure:** E0 00 00 40 02 ABXX
 A = 0010b = 2h B = 0000b = 0h XX = 01h
2. **Command to configure:** E0 00 00 41 02 YYZZ
 From "HID Usage Table," p53 - p59
 YY = "No character between UID" = FFh
 ZZ = "Enter" = Keyboard Return = 28h

Commands to configure:

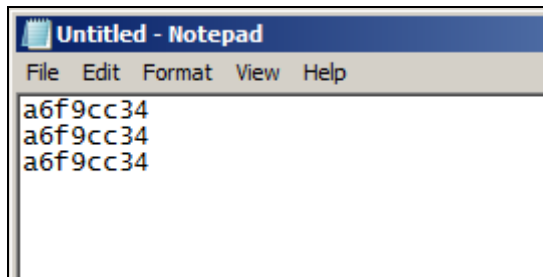
- E0 00 00 40 02 20 01



- E0 00 00 41 02 FF 28



- Display Result (UID = 34 CC F9 A6)



5.3. Example 3

Display Mode: Dec Bytes

Length of UID: support 4, 7, 10 bytes UID

Letter Case: Caps Unlock

Order: Default

Character: Space character between UID, "Enter" later all the UID

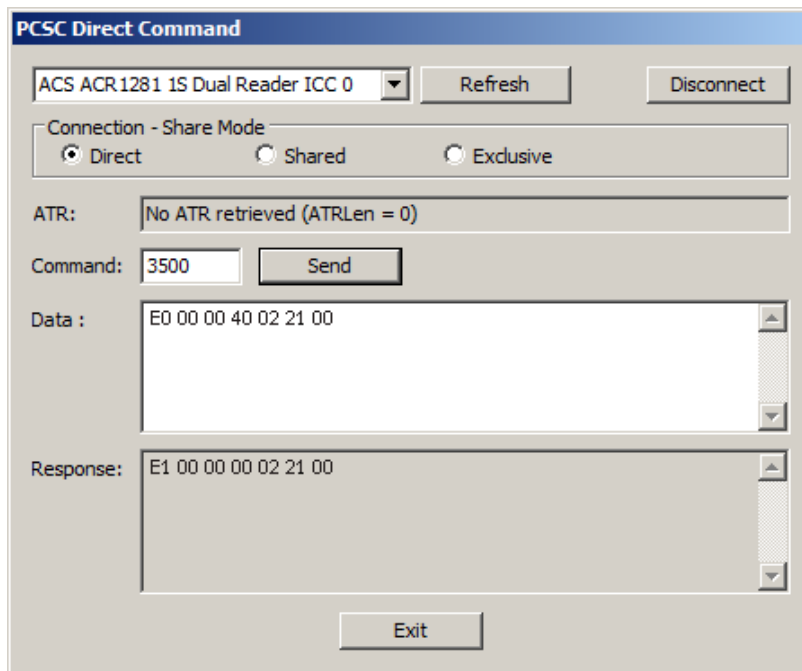
- Command to configure:** E0 00 00 40 02 ABXX
A = 0010b = 2h B = 0001b = 1h XX = 00h

- Command to configure:** E0 00 00 41 02 YYZZ
From "HID Usage Table," p53 - p59
YY = "Spacing" = Keyboard Spacebar =2Ch
ZZ = "Enter" = Keyboard Return = 28h

40	28	Keyboard Return (ENTER) ⁵	43	√	√	√	4/101/104
41	29	Keyboard ESCAPE	110	√	√	√	4/101/104
42	2A	Keyboard DELETE (Backspace) ¹³	15	√	√	√	4/101/104
43	2B	Keyboard Tab	16	√	√	√	4/101/104
44	2C	Keyboard Spacebar	61	√	√	√	4/101/104

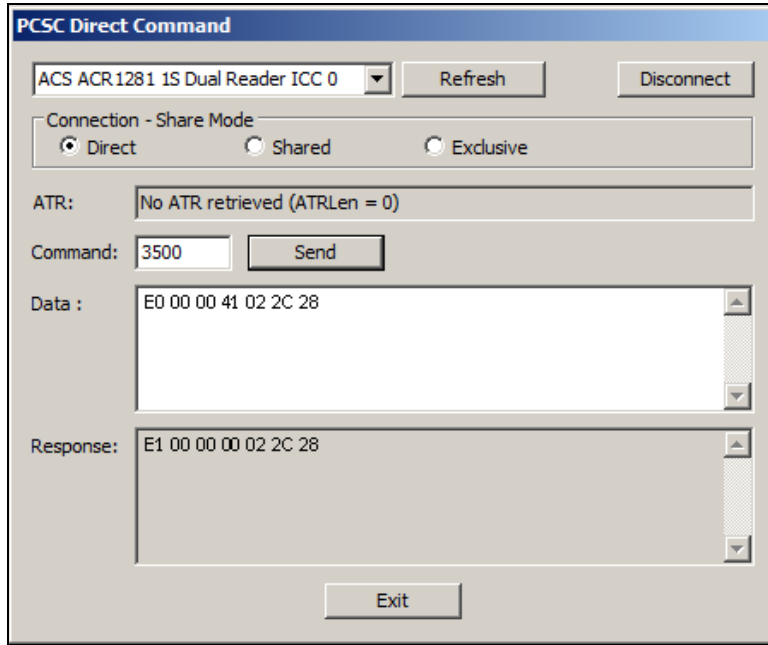
Commands to configure:

- E0 00 00 40 02 21 00

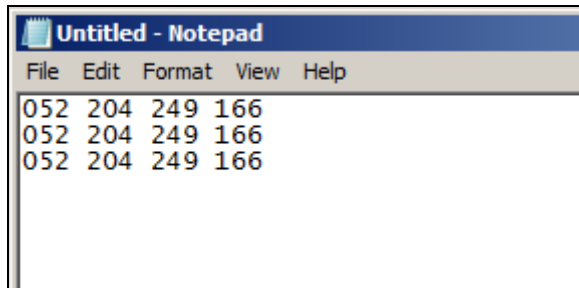




- E0 00 00 41 02 2C 28



- Display Result (UID = 34 CC F9 A6)





Appendix A. Example of Output Data Table

Below is an example of output data based on the settings configuration.

Output Settings						Output Data
Letter Case	Order	Format	Bytes	Between UID	Last UID	
Caps Unlock	Actual	Hex (Default)	4, 7, 10 (Default)	Space (Default)	Enter (Default)	ba 89 8a a2 ba 89 8a a2 ba 89 8a a2
Caps Lock	Actual	Hex (Default)	4, 7, 10 (Default)	Space (Default)	Enter (Default)	BA 89 8A A2 BA 89 8A A2 BA 89 8A A2
Caps Lock	Reverse	Hex (Default)	4, 7, 10 (Default)	No Spacing	Enter (Default)	A28A89BA A28A89BA A28A89BA
Caps Unlock	Actual	DEC in Byte	4, 7, 10 (Default)	Space (Default)	Enter (Default)	186 137 138 162 186 137 138 162 186 137 138 162
Caps Lock	Reverse	Hex (Default)	4, 7, 10 (Default)	TAB	Enter	A2 8A 89 BA A2 8A 89 BA A2 8A 89 BA
Caps Lock	Reverse	Hex (Default)	4, 7, 10 (Default)	TAB	TAB	A2 8A 89 BA A2 8A 89 BA

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