

Place Card v1.0.6: User manual

Table of Contents

Introduction	1
Main features	1
System requirements	1
Preparing USB readers	2
Preparing the Z-2 MF CCID reader	4
Working with the program	4
Format Settings	6
Pattern and format parameters	9
Program settings	14
Key codes	18

Introduction

Main features

Place Card is a program designed to transfer key numbers from an IronLogic reader to another program (this program will be conventionally referred to as ACS – software for access control and management systems).

The program allows you to perform the following actions:

- Reading ID keys using the IronLogic reader
- Keyboard typing emulation
- Copying the key number to the clipboard
- Flexible configuration of the transmitted card number format
- Reading Temic numbers (T5557, T5577) using Z-2 USB, Z-2 EHR
- Reading a number from the Mifare Classic, Mifare Plus, Mifare Ultralight, and Temic data block (if supported by the reader)

System requirements

Supported reader models:

- Z-2 (mod. RD_ALL) / Z-2 USB
- Z-2 (mod. MF) / Z-2 USB MF
- Z-2 (mod. MF-I)

- Z-2 (мод. MF CCID)
- Z-2 (mod. E HTZ RF) / Z-2 EHR
- Z-2 (мод. E HT Hotel) / Z-2 RF-1996
- Z-1 (mod. N Z) / Z-2 Base
- Matrix-III (mod. RD_All)
- Matrix-III (mod. MF K Net) / Matrix-III Net
- Matrix-V (mod. E S RF) / Matrix-V
- Matrix-VI (mod. NFC K Net)

Reader firmware: factory versions only.

Preparing USB readers

Readers and converters with FTDI chip (Z-2 (mod. RD_ALL), Z-2 (mod. MF), Z-2 (mod. E HTZ RF), Z-2 (мод. E HT Hotel), Z-397, Z-397 Guard) must have default VID/PID for FTDI (VID 0x403, PID 0x6001) and must have the description string "Manufacturer" equal to "FTDI" (You can use "ILogic" or "IL" if supported by the driver). These parameters can be changed using the utility https://ftdichip.com/utilities/#ft_prog [FT_Prog]:

- In Windows OS, download and install the FT_Prog program
- Connect the device. To avoid errors, disconnect the “extra” devices with the FTDI chip (if any)
- Install the drivers that came with it or download them from the website. <https://ironlogic.ru>. The instructions for installing the drivers are in the driver archive file
- Run FT_Prog. In the "Devices" menu, select "Scan and Parse" (or press F5). A list of found devices appears
- For the desired device, select "USB_Device_Descriptor" on the left. Then, on the right, in the "Custom VID/PID" properties, select "FTDI_Default"
- On the left, select "USB_String_Descriptors". Then enter "FTDI" in the "Manufacturer:" field
- In the "Devices" menu, select "Program" (or press Ctrl+P)
- A recording window appears. In the window, check the box next to the device in the "Device List" list
- Uncheck the "Only Program Blank Device" box at the bottom
- Click the "Program" button
- Turning off the device. It will now be identified as the "FTDI Serial port".

To work with USB readers, give access to the port. By default, users from the dialout group have access to /dev/tty* devices. You can verify this by typing

```
ls -l /dev/ttyUSB0
```

The response will appear

```
crw-rw---- 1 root dialout 188, 0 фев 25 20:56 /dev/ttyUSB0
```

From where you can see that read and write access is open for the root user and for the dialout group. Add yourself to this group:

```
sudo usermod -a -G dialout $USER  
sudo reboot
```

where \$USER is the user's name, for example administrator. It is not necessary to reboot the system, it is enough to log out and log in again.

To type on the keyboard, the program requires access to /dev/uinput. To check if the program has access, try passing any key number using the "Keyboard Typing" method. If the key number appears in the "Key" field, access is granted. Otherwise, access is denied and the error message "Cannot type on the keyboard" is displayed.

To grant access:

1. Create a new group (if one doesn't already exist, you can check with `getent group uinput`).

```
sudo groupadd uinput
```

2. Add your user to the new group.

```
sudo usermod -aG uinput $USER
```

где \$USER - user name.

3. Create a udev rule file to set permissions. Create a new file in /etc/udev/rules.d, for example, /etc/udev/rules.d/99-uinput.rules, with the following content:

```
KERNEL=="uinput", MODE="0660", GROUP="uinput", OPTIONS+="static_node=uinput"
```

You can create a file using the command:

```
sudo nano /etc/udev/rules.d/99-uinput.rules
```

- `MODE="0660"` gives read/write access to the owner (root) and the specified group.
 - `OPTIONS+="static_node=uinput"` is often needed to ensure the node is managed correctly across systems.
4. Reload udev rules and trigger the changes.

```
sudo udevadm control --reload-rules
sudo udevadm trigger --subsystem-match=misc
```

5. Log out and log back in for the group changes to take effect.

Preparing the Z-2 MF CCID reader

1. Install **libccid**, **opense** and **pcsc-tools** components:

```
sudo apt install libccid opense pcsc-tools
```

2. Connect Z-2 MF CCID to the computer and check if it is found by the system using the command:

```
pcsc_scan
```

or

```
opense-tool --list-readers
```

3. If the reader is not found, open the file `"/usr/lib/pcsc/drivers/ifd-ccid.bundle/Contents/Info.plist"` in a text editor as administrator. In this file:
 - Find the array `<key>ifdVendorID</key>` and add the string `<string>0x3168</string>` to it
 - Find the array `<key>ifdProductID</key>` and add the string `<string>0x1356</string>` to it
 - Find the array `<key>ifdFriendlyName</key>` and add the string `<string>IronLogic Z-2 CCID</string>` to it
 - Make sure the strings are added at the same position relative to the beginning of the corresponding array. Save the changes to the file.
 - Disconnect the reader from the computer.
 - Reboot the system.
 - Connect the reader to the computer and check the reader's operation again using the **pcsc_scan** command.

Working with the program

After launching the PlaceCard, the main program window will appear on the screen:

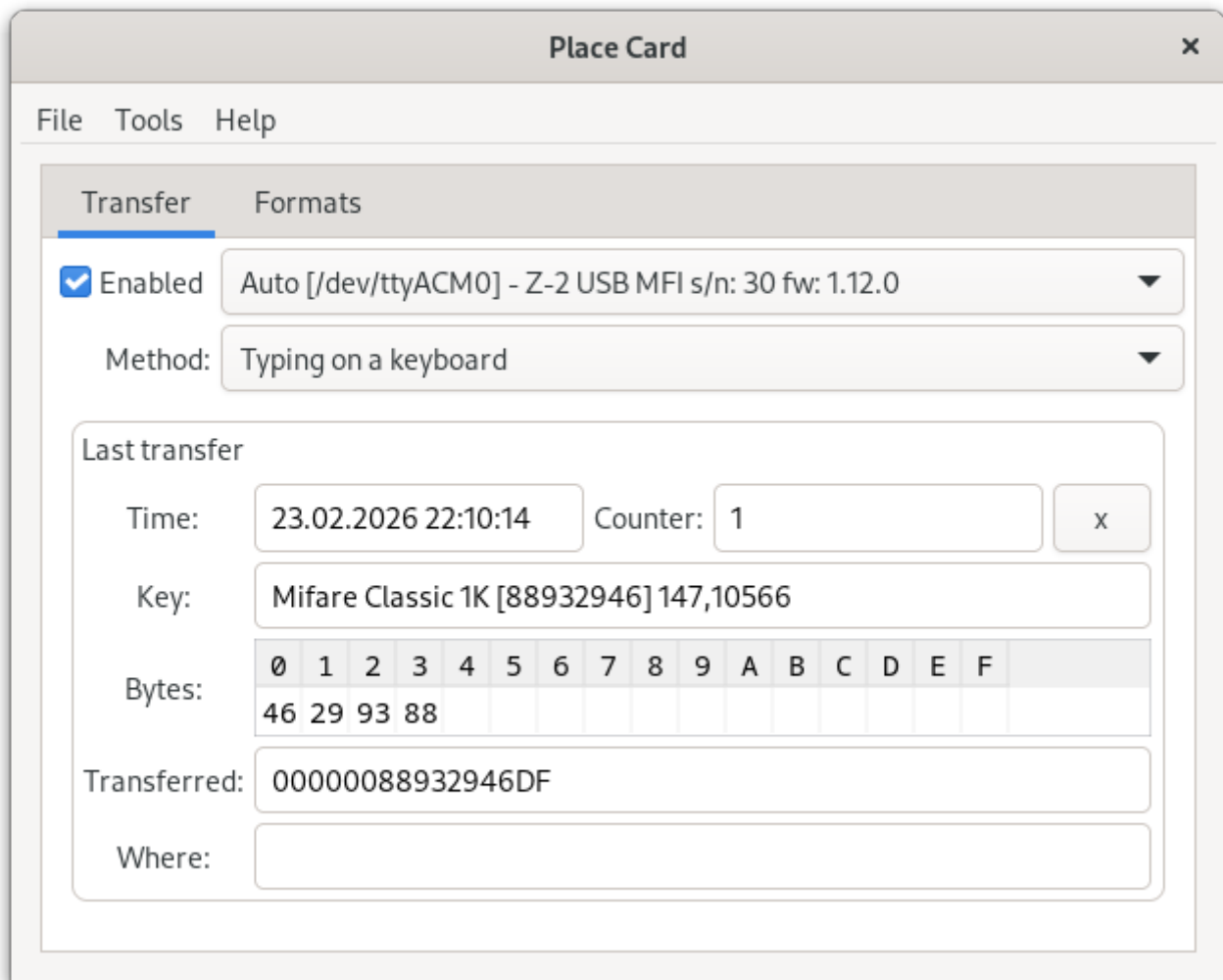


Figure 1. Main window

The main menu offers the following commands:

- **File**
 - **Quit** – closes the program
- **Tools**
 - **Settings...** – opens the "Settings" window, for more information, see [Program settings](#)
- **Help**
 - **Help** – opens the user's manual in pdf format
 - **About Place Card** – opens the "About the program" window, shows the version of the Place Card, links to the program's website and to the support email.

Tabs "Transfer", "Formats" - switch between pages of options.

The "Enabled" flag – enables/disables key transfer mode. Before turning on, you need to connect the reader to USB and select its COM port name in the field on the right. The number is transmitted when the card is held up to the reader.

The "Method" drop-down list – allows you to select the key transfer method to another program:

- **Keyboard typing** – types the text with the key number into the active window (first you need to

set the focus on the input field). The typing is affected by the current keyboard layout. To correctly transfer English letters, you need to switch the layout to English. If the letters get lost or distorted during typing, try increasing the delays (menu **Tools** > **Settings...** > **Keyboard typing**).

- **Copy to Clipboard** – clears the clipboard and copies the last submitted key into it in text format.
- "Last transfer" group* – shows information about the last transmission:
- **Time** – the hour, minute, and second of the last event
- **Counter** – the number of successfully transferred keys. The counter can be reset with the button on the right
- **Key** – Original key number: type, hexadecimal number in square brackets, "Em-Marine" number (2 decimal numbers separated by a comma). Or it shows the connection status to the reader for the connection/disconnect event
- **Bytes** – bytes of the key number in hexadecimal format
- **Transferred** – text sent to another program
- **Where** – the name of the place where the number was sent, or empty when it could not be determined.

Format Settings

The formats are designed to convert the key into a format compatible for entering into the ACS software. To configure and select the format, go to the "Formats" tab.

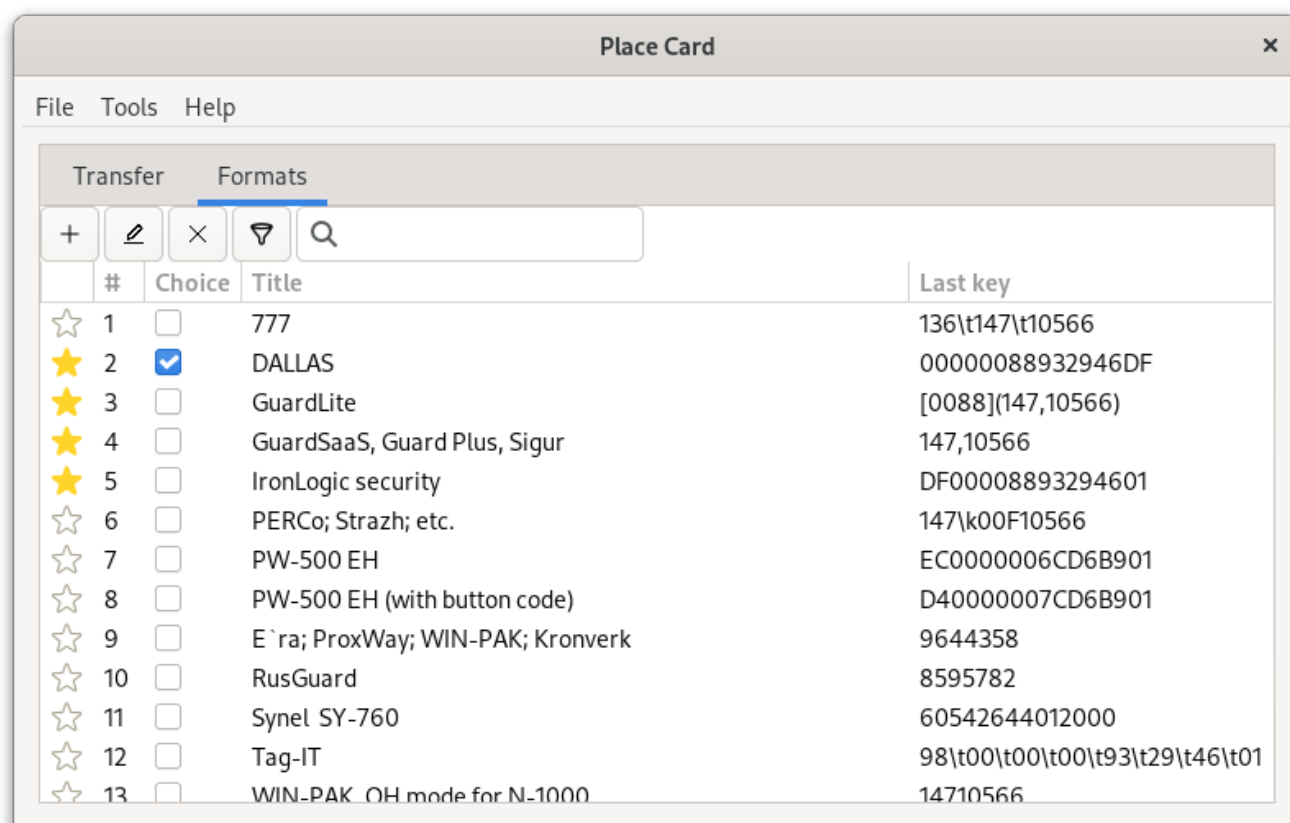


Figure 2. The Formats tab

The Choice column displays checkboxes for selecting the current format.

The first column displays star switches that make the format a favorite or a regular one. This allows you to use a filter to hide unnecessary formats (regular or favorites, this is configured in the context menu of the list).

The "#" column displays the serial number of the format in the table.

The format name is displayed in the Title column.






The "Last key" column displays the formatted number of the last key entered. The key number can be entered using the reader (turn on the transmission and bring the key to the reader) or with the command "Enter key..." in the context menu of the list.

Clicking the LMB on the column header allows you to sort the list.

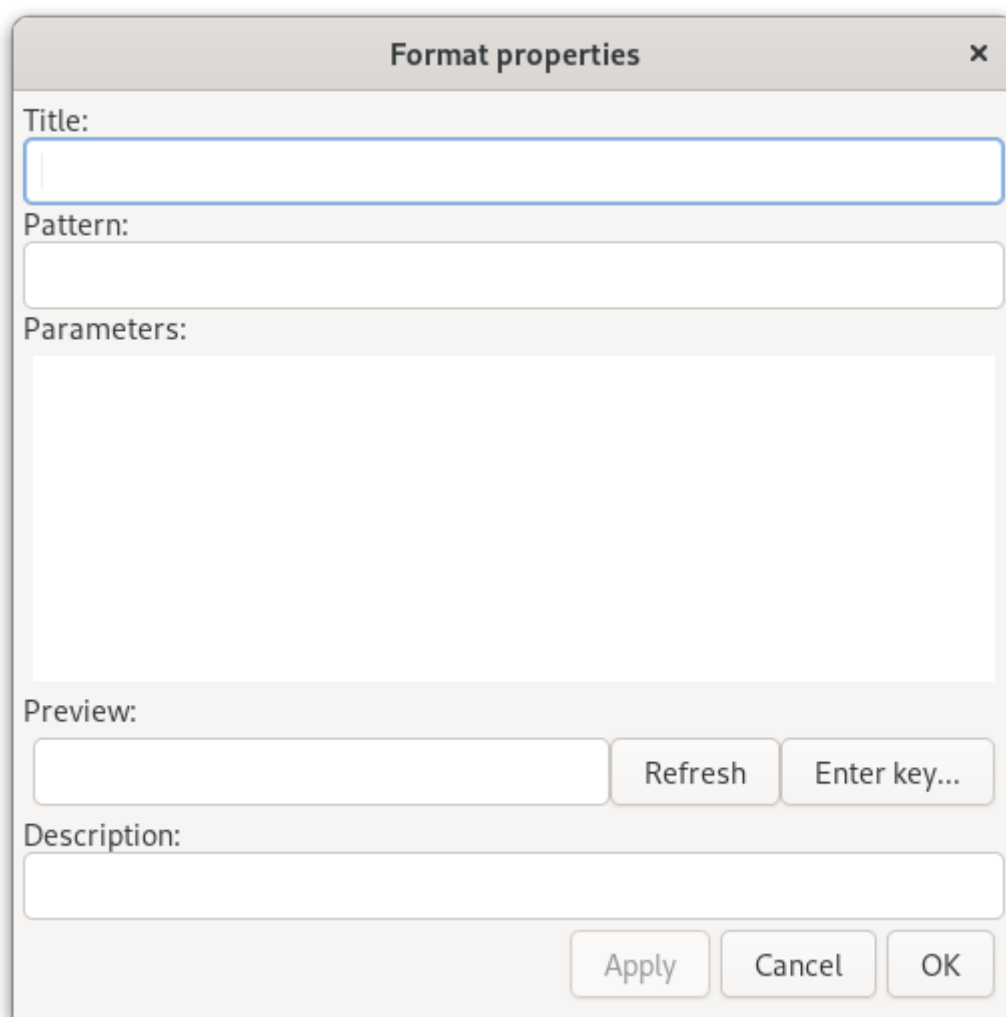
Right-clicking on the list opens a context menu with the following commands:

- **Add...** – creates a new format, opens the "Format Parameters" window
- **Change...** – edits the selected formats, opens the "Format Parameters" window
- **Delete** – deletes the selected formats. Requests confirmation before deletion
- The **"Filter"** submenu allows you to hide/show formats with the "Favorites" flag set/unchecked
 - **Enabled** – enables/disables the filter
 - **Show favorites** – shows/hides favorite formats (if the filter is enabled)
 - **Show regular** – shows/hides regular formats (if the filter is enabled)
- The **"Import"** submenu contains commands for importing a list of formats.
 - **Import from CSV file...** – imports a list of formats from a CSV file (separated by a comma)
 - **Import preset formats** – imports a list of default formats
- The **"Export"** submenu contains commands for exporting a list of formats
 - **Export to CSV file...** – exports a list of formats to a CSV file (separated by a comma)
- **Enter key...** – sets the type and number of the last key, opens the "Key Parameters" window.

The toolbar (above the table) allows you to:

	Create a format.
	Edit the selected format.
	Delete the selected format.
	Enable/disable the format filter (favorites/regular).
	Search for a format by name.

To create a new format, press Ctrl+N, a window will appear:



The image shows a 'Format properties' dialog box. It has a title bar with the text 'Format properties' and a close button (X). The dialog is divided into several sections: 'Title' with a text input field; 'Pattern' with a text input field; 'Parameters' with a large text area; 'Preview' with a text input field, a 'Refresh' button, and an 'Enter key...' button; and 'Description' with a text input field. At the bottom right are 'Apply', 'Cancel', and 'OK' buttons.

Figure 3. The "Format properties" window

Title

Enter any unique format name.

Pattern, Parameters

Enter the values that specify the desired key conversion algorithm. For more information, see the [Pattern and format parameters](#) section.

Preview

Shows the formatted number of the last key.

Button "Refresh"

Updates the "Preview" field.

Button "Enter key..."

Allows you to change the number of the last key.

Pattern and format parameters

The pattern and parameters are designed to convert the key into text, in a format suitable for ACS software.

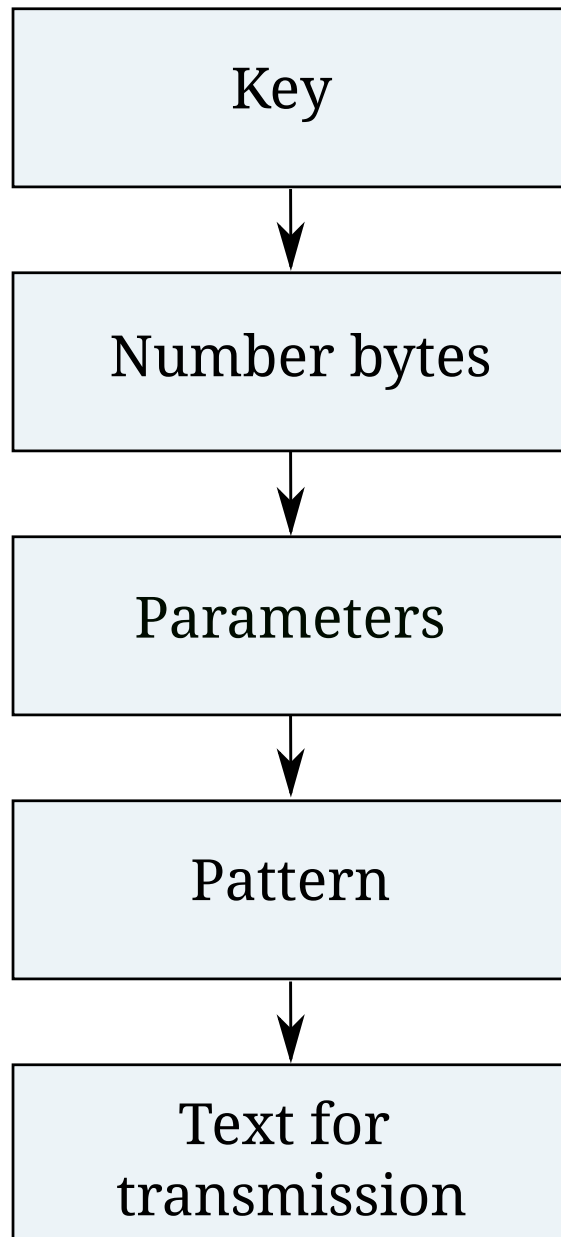


Figure 4. Key conversion scheme

Pattern syntax

The Pattern consists of regular characters, special control sequences of characters, and format specifiers. Regular characters and control sequences are simply copied into the result in the order they appear.

The specifier is defined by the character "%", which can be followed by up to three fields in the following order:

```
%[width] [.precision] type
```

The number of format specifiers must be equal to the number of output values that are specified in the "Parameters" field. Optional fields are shown in square brackets.

type

The required **type** field specifies the type of output value.

Symbol	Format
d	Signed decimal integer
i	Signed decimal integer
u	Unsigned decimal integer
o	Unsigned octal integer
x	Unsigned hexadecimal integer using the characters "abcdef"
X	Unsigned hexadecimal integer using the characters "ABCDEF"

width

The width field contains the minimum number of characters to output, which is a non-negative integer. If the output value contains fewer characters, it is expanded with spaces. If the width field contains an asterisk (*), then the field value is an integer from the list of arguments preceding the output value.

precision

The precision field is also a non-negative integer. The precision specifies the minimum number of characters to be printed. If the number contains fewer characters, it is expanded with zeros. If the **precision** field contains an asterisk (*), then an integer from the list of arguments preceding the output value is taken as the field value.

The control sequences include the following character sequences:

Table 1. Управляющие последовательности

Sequence	Action
\n	New line
\r	Carriage return
\t	Horizontal tabulation
\\	Backslash

Sequence	Action								
\khhh	Pressing a keyboard shortcut. The first h is a set of modifier flags: <table border="1"> <thead> <tr> <th>Flag value</th><th>Modifier</th></tr> </thead> <tbody> <tr> <td>1</td><td>Left Alt</td></tr> <tr> <td>2</td><td>Left Ctrl</td></tr> <tr> <td>4</td><td>Left Shift</td></tr> </tbody> </table> <p>The last hh is the key code in hexadecimal notation (see the Key codes section). For example, "\k01C" presses the Enter key</p>	Flag value	Modifier	1	Left Alt	2	Left Ctrl	4	Left Shift
Flag value	Modifier								
1	Left Alt								
2	Left Ctrl								
4	Left Shift								
\pdddd	Delay in milliseconds, for example "\p1000" pauses the transmission for 1 second								

Parameter syntax

Parameters are separated by spaces or newlines. Each parameter can consist of mathematical expressions and integers in octal, decimal, and hexadecimal notations.

The parameter can be:

- specific byte number (b0,b1,...,bF или x[0],...,x[15]);
- double byte, i.e. word (w00,...,wFF);
- quadruple byte, i.e. long (l0000,...,lFFFF);
- octal byte, i.e. double long (m00000000,...,mFFFFFFFF)
- a specific function, for example bX or ds(...), which calculates the Dallas checksum for the key number
- a mathematical expression, such as adding the first two bytes of a key number (b0 + b1)

Integer syntax:

```
[bit depth]digits
```

0x is a hexadecimal number, digits: 0 1 2 3 4 5 6 7 8 9 a b c d e f. The case of letters in the prefix and in numbers is not taken into account.

0b is a binary number, digits: 0 1. The case of the letter in the prefix is ignored.

0 is an octal number, digits: 0 1 2 3 4 5 6 7

by default (without prefix) – decimal number, digits: 0 1 2 3 4 5 6 7 8 9

Constants:

Constant	Size, Bytes	Description
x[A]	1	The value of the byte with the index A in the key number
bA	1	Byte. Where A is the byte index. = x[A]. If A = 'Z', then = 0. If A = 'X', then = ds(1, x[0], x[1], x[2], x[3], x[4], x[5]). If A = 'Y', then = ds(1, x[0], x[1], x[2], 0, 0, 0).
wAB	2	Word. Where A,B are byte indexes. = bA (bB << 8)
lABCD	4	A double word. Where A,B,C,D are the byte indexes. = bA (bB << 8) (bC << 16) (bD << 24)
iABCD	4	identical to lABCD
m01234567	8	A 64-bit integer. Where 0,1,2,3,4,5,6,7 are byte indexes. = b0 (b1 << 8) (b2 << 16) (b3 << 24) (b4 << 32) (b5 << 40) (b6 << 48) (b7 << 54)
hA	1/2	Nibble. Where A is the nibble index. = (x[A/2] >> (4 * (A & 1))) & 0xF
bhAB	1	Byte. Where A,B are the nibble indexes
whABCD	2	Word. Where A,B,C,D are the nibble indexes
lh01234567	4	A double word. Where 0,...,7 are the nibble indexes
mh0123456789ABCDEF	8	A 64-bit integer. Where 0,...,F are the nibble indexes

Operators:

Operator	Priority	Operation performed
Arithmetic		
a + b	4	Addition
a - b	4	Subtraction
+a	2	
-a	2	Change of sign
a * b	3	Multiplication

Operator	Priority	Operation performed
a / b	3	Division
a % b	3	Remainder from division
a ^ b	7	Bitwise exclusive OR
Logical		
a & b	6	Bitwise logical AND
a && b	9	Logical AND (conjunction)
a b	8	Bitwise logical OR
a b	10	Logical OR (disjunction)
!a	2	Logical negation (NOT) (negation)
~a	2	Bitwise negation (NOT)
a << b	5	Logical left shift
a >> b	5	Logical shift right
Other		
()	1	Parentheses
[]	1	Indexing operation

Operators in decreasing order of priority: (,); -, !, ~; *, /, %; +, -; <<, >>; &; ^; |; &&; ||.

Functions:

Function	Description
a = ds(size, b,c,d,...)	Calculating the Dallas checksum. Parameters: size – the size of the following arguments in bytes, b, c, d,... – numbers from least significant to most significant
a = rbit(size, b)	Bit flip. Parameters: size – size of the next argument in bytes, b – number
a = cbit(size, b)	Calculates the number of bits set. Parameters: size – the size of the next argument in bytes, b – a number
a = w(26, size, b,c,...)	Calculates a number in Wiegand encoding with the addition of an encoding flag. Parameters: 26 – specifies the encoding (26,32,...), size – the size of the following arguments in bytes, b,c,... – numbers from least significant to most significant

Function	Description
<code>a = w2(26, size, b,c,...)</code>	Calculates a number in Wiegand encoding without adding an encoding flag. Parameters: 26 – specifies the encoding (26,32,...), size – the size of the following arguments in bytes, b,c,... – numbers from least significant to most significant
<code>a = set(idx, a)</code>	Stores the value a into a temporary variable with index idx , then returns the value a
<code>a = get(idx)</code>	Returns the value a that was previously stored in the temporary variable with the number idx
<code>a=log10(b)</code>	Calculates the base-10 logarithm. If $b = 0$, it returns -1

Program settings

To open the program settings, click the "Main menu" button and select the "Settings..." command. The "Settings" window will appear.

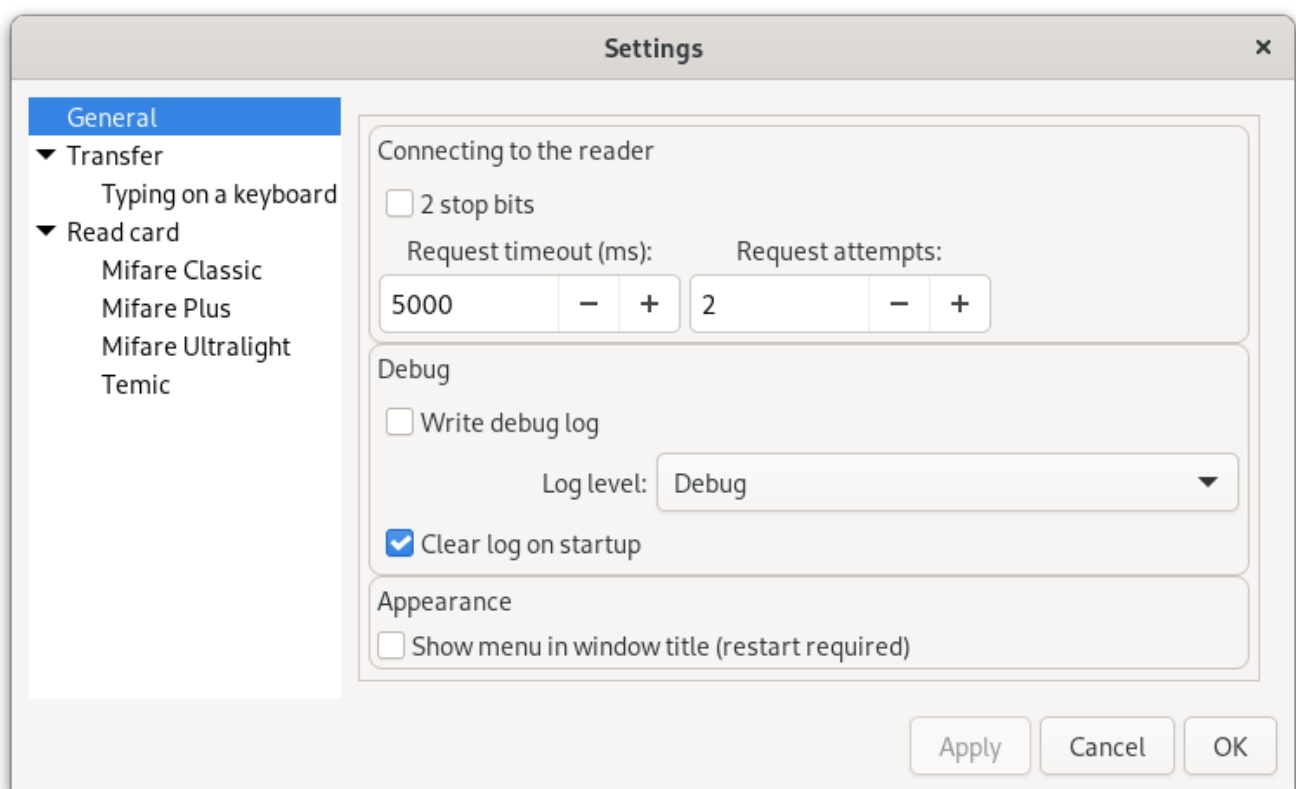


Figure 5. The Settings window

General

The "Connection to the reader" group

2 stop bits

If the flag is set, it sets 2 stop bits when opening the COM port; otherwise, it sets 1 stop bit. It's unset by default.

Request timeout (ms)

The timeout in milliseconds for the reader to complete a request. Defaults to 5000.

Request attempts

The number of attempts to fulfill one request to the reader. Default is 2.

The "Debug" group

Write debug log

If this flag is set, the program writes debugging information to the log file. It's unset by default.

Log level

Filters the written debug information by type:

- **Error** – Only error messages are written to the log;
- **Warning** – Error and warning messages are written to the log;
- **Info** – Error messages, warnings, and regular informational messages are written to the log;
- **Debug** – All information is written to the log without filtering.. Default is **Debug**.

Clear log on startup

If this flag is set, Place Card clears the log file contents upon startup. This flag is set by default.

The "Appearance" group

Show menu in window title (requires restart)

If checked, displays a compact "Main Menu" button in the window title bar instead of the menu bar below the title bar. It's unset by default. This may not work correctly on some systems.



Button "Main Menu".

Transfer

Save information about the last Transfer

If this flag is set, the program saves the last key information to a file when the program terminates and restores it when the program starts. This flag is set by default.

Typing on a keyboard

Transfer settings by typing on the keyboard.

Delay after creating a virtual keyboard (ms)

The time for which the dial is suspended when the keyboard is activated for the first time after the transfer mode is turned on. By default, 300.

Delay after press the key (ms)

The time for which typing is suspended after each keystroke (in milliseconds). The default is 10.

Delay after release the key (ms)

The time for which typing is suspended after each release of the key (in milliseconds). By default, 10.

Read card

Card reader settings using the reader.

Mifare Classic

Settings for reading numbers from Mifare Classic user data.

Enabled

If the flag is set, it reads the number from the specified block of Mifare Classic cards; otherwise, it reads the card's original ID. It's unset by default.

Sector, Block

The Mifare data address, which contains the transmitted number. Mifare Classic 1K has 16 sectors, each divided into four blocks of 16 bytes. Mifare Classic 4K has 32 sectors of four blocks and 8 sectors of 16 blocks, each block consisting of 16 bytes. Default values are 0 and 1.

Authentication by

Determines which key should be used to authorize the Mifare card sector: key A or key B. By default, key A.

Key

Specifies the value of the authentication key used to authorize the sector. The key can be specified explicitly as a hexadecimal number (maximum 6 bytes, least significant byte on the right) or by selecting one or more keys from the reader's memory. The default explicit key is 0xfffffffffff.

NOTE

The reader does not allow reading stored keys from its memory.

Mifare Plus

Settings for reading numbers from the Mifare Plus SL3 unit.

Enabled

If the flag is set, it reads the number from the specified block of Mifare Plus cards; otherwise, it reads the card's original ID. It's unset by default.

Sector, Block

The Mifare data address, which contains the transmitted number. Mifare Plus 1K has 16 sectors, each divided into four blocks of 16 bytes. Mifare Plus 4K has 32 sectors of four blocks and 8 sectors of 16 blocks, each block consisting of 16 bytes. Default values are 0 and 1.

Authentication by

Determines which key should be used to authorize the Mifare card sector: key A or key B. By default, key A.

Key

Defines the value of the authentication key used to authorize the sector. The key can be specified explicitly as a hexadecimal number (maximum 16 bytes, least significant byte on the right) or by selecting one or more keys from the reader's memory. By default, the explicit key is 0xffffffffffffffffffffffffffff.

NOTE The reader does not allow reading stored keys from its memory.

Mifare Ultralight

Settings for reading numbers from Mifare Ultralight user data.

Enabled

If this flag is set, the key number is read from the Mifare Ultralight page. It's unset by default.

Page

The number of the first page to read for Mifare Ultralight. Default is 4.

Count

The number of Mifare Ultralight pages read. Default: 1.

Temic

Temic card reading settings: reading UID or reading number from Temic user data.

Enabled

If the flag is set, it allows scanning of Temic (otherwise Temic is not scanned). It's unset by default.

Mode

Determines where to read the key number:

- **UID** – from page 1 with manufacturer data. By default UID;
- **User data** – from page 0 with user data, configuration and password.

Block

Block number of page 0 from which the key number should be read. Default is 1.

Count

Number of page blocks 0. Default is 1.

Password

Password for accessing Temic card data. Value is a hexadecimal number (4 bytes, least significant byte on the right). No password by default.

Key codes

Code	Symbolic name	Description
0x01	KEY_ESC	Key Escape
0x02	KEY_1	Key 1
0x03	KEY_2	Key 2
0x04	KEY_3	Key 3
0x05	KEY_4	Key 4
0x06	KEY_5	Key 5
0x07	KEY_6	Key 6
0x08	KEY_7	Key 7
0x09	KEY_8	Key 8
0x0A	KEY_9	Key 9
0x0B	KEY_0	Key 0
0x0C	KEY_MINUS	Key minus (-)
0x0D	KEY_EQUAL	Key equal (=)
0x0E	KEY_BACKSPACE	Key Backspace
0x0F	KEY_TAB	Key Tab
0x10	KEY_Q	Key Q
0x11	KEY_W	Key W
0x12	KEY_E	Key E
0x13	KEY_R	Key R
0x14	KEY_T	Key T
0x15	KEY_Y	Key Y
0x16	KEY_U	Key U
0x17	KEY_I	Key I
0x18	KEY_O	Key O
0x19	KEY_P	Key P
0x1A	KEY_LEFTBRACE	Key [

Code	Symbolic name	Description
0x1B	KEY_RIGHTBRACE	Key]
0x1C	KEY_ENTER	Key Enter (ВВОД)
0x1D	KEY_LEFTCTRL	Key Left Ctrl
0x1E	KEY_A	Key A
0x1F	KEY_S	Key S
0x20	KEY_D	Key D
0x21	KEY_F	Key F
0x22	KEY_G	Key G
0x23	KEY_H	Key H
0x24	KEY_J	Key J
0x25	KEY_K	Key K
0x26	KEY_L	Key L
0x27	KEY_SEMICOLON	Key ;
0x28	KEY_APOSTROPHE	Key '
0x29	KEY_GRAVE	Key `
0x2A	KEY_LEFTSHIFT	Key Left Shift
0x2B	KEY_BACKSLASH	Key \
0x2C	KEY_Z	Key Z
0x2D	KEY_X	Key X
0x2E	KEY_C	Key C
0x2F	KEY_V	Key V
0x30	KEY_B	Key B
0x31	KEY_N	Key N
0x32	KEY_M	Key M
0x33	KEY_COMMA	Key ,
0x34	KEY_DOT	Key .
0x35	KEY_SLASH	Key /
0x36	KEY_RIGHTSHIFT	Key Right Shift
0x37	KEY_KPASTERISK	Key Asterisk (*)
0x38	KEY_LEFTALT	Key Left Alt
0x39	KEY_SPACE	Key Spacebar
0x3A	KEY_CAPSLOCK	Key Caps Lock
0x3B	KEY_F1	Key F1

Code	Symbolic name	Description
0x3C	KEY_F2	Key F2
0x3D	KEY_F3	Key F3
0x3E	KEY_F4	Key F4
0x3F	KEY_F5	Key F5
0x40	KEY_F6	Key F6
0x41	KEY_F7	Key F7
0x42	KEY_F8	Key F8
0x43	KEY_F9	Key F9
0x44	KEY_F10	Key F10
0x45	KEY_NUMLOCK	Key Num Lock
0x46	KEY_SCROLLLOCK	Key Scroll Lock
0x47	KEY_KP7	Key 7
0x48	KEY_KP8	Key 8
0x49	KEY_KP9	Key 9
0x4A	KEY_KPMINUS	Key minus (-)
0x4B	KEY_KP4	Key 4
0x4C	KEY_KP5	Key 5
0x4D	KEY_KP6	Key 6
0x4E	KEY_KPPLUS	Key plus (+)
0x4F	KEY_KP1	Key 1
0x50	KEY_KP2	Key 2
0x51	KEY_KP3	Key 3
0x52	KEY_KP0	Key 0
0x53	KEY_KPDOT	Key dot (.)
0x54		Not used
0x55	KEY_ZENKAKUHANKAKU	
0x56	KEY_102ND	
0x57	KEY_F11	Key F11
0x58	KEY_F12	Key F12
0x59	KEY_RO	
0x5A	KEY_KATAKANA	
0x5B	KEY_HIRAGANA	
0x5C	KEY_HENKAN	

Code	Symbolic name	Description
0x5D	KEY_KATAKANAHIRAGANA	
0x5E	KEY_MUHENKAN	
0x5F	KEY_KPJPCOMMA	
0x60	KEY_KPENTER	Key Enter
0x61	KEY_RIGHTCTRL	Key Right Ctrl
0x62	KEY_KPSLASH	Key slash (/)
0x63	KEY_SYSRQ	
0x64	KEY_RIGHTALT	Key Right Alt
0x65	KEY_LINEFEED	
0x66	KEY_HOME	Key Home
0x67	KEY_UP	Key Up Arrow
0x68	KEY_PAGEUP	Key Page Up
0x69	KEY_LEFT	Key Left Arrow
0x6A	KEY_RIGHT	Key Right Arrow
0x6B	KEY_END	Key End
0x6C	KEY_DOWN	Key Down Arrow
0x6D	KEY_PAGEDOWN	Key Page Down
0x6E	KEY_INSERT	Key Ins (insert)
0x6F	KEY_DELETE	Key Del (delete)
0x70	KEY_MACRO	
0x71	KEY_MUTE	Key Mute
0x72	KEY_VOLUMEDOWN	Key Volume Down
0x73	KEY_VOLUMEUP	Key Volume Up
0x74	KEY_POWER	SC System Power Down
0x75	KEY_KPEQUAL	Key equal (=)
0x76	KEY_KPPLUSMINUS	
0x77	KEY_PAUSE	Key Pause
0x78	KEY_SCALE	AL Compiz Scale (Expose)
0x79	KEY_KPCOMMA	
0x7A	KEY_HANGEUL	
0x7B	KEY_HANJA	
0x7C	KEY_YEN	
0x7D	KEY_LEFTMETA	

Code	Symbolic name	Description
0x7E	KEY_RIGHTMETA	
0x7F	KEY_COMPOSE	
0x80	KEY_STOP	AC Stop
0x81	KEY_AGAIN	
0x82	KEY_PROPS	AC Properties
0x83	KEY_UNDO	AC Undo
0x84	KEY_FRONT	
0x85	KEY_COPY	AC Copy
0x86	KEY_OPEN	AC Open
0x87	KEY_PASTE	AC Paste
0x88	KEY_FIND	AC Search
0x89	KEY_CUT	AC Cut
0x8A	KEY_HELP	AL Integrated Help Center
0x8B	KEY_MENU	Menu (show menu)
0x8C	KEY_CALC	AL Calculator
0x8D	KEY_SETUP	
0x8E	KEY_SLEEP	SC System Sleep
0x8F	KEY_WAKEUP	System Wake Up
0x90	KEY_FILE	AL Local Machine Browser
0x91	KEY_SENDFILE	
0x92	KEY_DELETEFILE	
0x93	KEY_XFER	
0x94	KEY_PROG1	
0x95	KEY_PROG2	
0x96	KEY_WWW	AL Internet Browser
0x97	KEY_MSDOS	
0x98	KEY_SCREENLOCK	AL Terminal Lock/Screensaver
0x99	KEY_DIRECTION	Display orientation for e.g. tablets
0x9A	KEY_CYCLEWINDOWS	
0x9B	KEY_MAIL	
0x9C	KEY_BOOKMARKS	AC Bookmarks
0x9D	KEY_COMPUTER	
0x9E	KEY_BACK	AC Back

Code	Symbolic name	Description
0x9F	KEY_FORWARD	AC Forwar
0xA0	KEY_CLOSECD	
0xA1	KEY_EJECTCD	
0xA2	KEY_EJECTCLOSECD	
0xA3	KEY_NEXTSONG	
0xA4	KEY_PLAYPAUSE	
0xA5	KEY_PREVIOUSSONG	
0xA6	KEY_STOPCD	
0xA7	KEY_RECORD	
0xA8	KEY_REWIND	
0xA9	KEY_PHONE	Media Select Telephone
0xAA	KEY_ISO	
0xAB	KEY_CONFIG	AL Consumer Control Configuration
0xAC	KEY_HOMEPAGE	AC Home
0xAD	KEY_REFRESH	AC Refresh
0xAE	KEY_EXIT	AC Exit
0xAF	KEY_MOVE	
0xB0	KEY_EDIT	
0xB1	KEY_SCROLLUP	
0xB2	KEY_SCROLLDOWN	
0xB3	KEY_KPLEFTPAREN	
0xB4	KEY_KPRIGHTPAREN	
0xB5	KEY_NEW	AC New
0xB6	KEY_REDO	AC Redo/Repeat
0xB7	KEY_F13	
0xB8	KEY_F14	
0xB9	KEY_F15	
0xBA	KEY_F16	
0xBB	KEY_F17	
0xBC	KEY_F18	
0xBD	KEY_F19	
0xBE	KEY_F20	
0xBF	KEY_F21	

Code	Symbolic name	Description
0xC0	KEY_F22	
0xC1	KEY_F23	
0xC2	KEY_F24	
0xC3		Not used
0xC4		Not used
0xC5		Not used
0xC6		Not used
0xC7		Not used
0xC8	KEY_PLAYCD	
0xC9	KEY_PAUSECD	
0xCA	KEY_PROG3	
0xCB	KEY_PROG4	
0xCC	KEY_DASHBOARD	AC Desktop Show All Applications
0xCD	KEY_SUSPEND	
0xCE	KEY_CLOSE	AC Close
0xCF	KEY_PLAY	
0xD0	KEY_FASTFORWARD	
0xD1	KEY_BASSBOOST	
0xD2	KEY_PRINT	AC Print
0xD3	KEY_HP	
0xD4	KEY_CAMERA	
0xD5	KEY_SOUND	
0xD6	KEY_QUESTION	
0xD7	KEY_EMAIL	
0xD8	KEY_CHAT	
0xD9	KEY_SEARCH	
0xDA	KEY_CONNECT	
0xDB	KEY_FINANCE	AL Checkbook/Finance
0xDC	KEY_SPORT	
0xDD	KEY_SHOP	
0xDE	KEY_ALTERASE	
0xDF	KEY_CANCEL	AC Cancel
0xE0	KEY_BRIGHTNESSDOWN	

Code	Symbolic name	Description
0xE1	KEY_BRIGHTNESSUP	
0xE2	KEY_MEDIA	
0xE3	KEY_SWITCHVIDEOMODE	Cycle between available video
0xE4	KEY_KBDILLUMTOGGLE	
0xE5	KEY_KBDILLUMDOWN	
0xE6	KEY_KBDILLUMUP	
0xE7	KEY_SEND	AC Send
0xE8	KEY_REPLY	AC Reply
0xE9	KEY_FORWARDMAIL	AC Forward Msg
0xEA	KEY_SAVE	AC Save
0xEB	KEY_DOCUMENTS	
0xEC	KEY_BATTERY	
0xED	KEY_BLUETOOTH	
0xEE	KEY_WLAN	
0xEF	KEY_UWB	
0xF0	KEY_UNKNOWN	
0xF1	KEY_VIDEO_NEXT	drive next video source
0xF2	KEY_VIDEO_PREV	drive previous video source
0xF3	KEY_BRIGHTNESS_CYCLE	brightness up, after max is min
0xF4	KEY_BRIGHTNESS_ZERO	Set Auto Brightness: manual
0xF5	KEY_DISPLAY_OFF	display device to off state
0xF6	KEY_WIMAX	Wireless WAN (LTE, UMTS, GSM, etc.)
0xF7	KEY_RFKILL	Key that controls all radios
0xF8	KEY_MICMUTE	Mute / unmute the microphone
0xF9		Not used
0xFA		Not used
0xFB		Not used
0xFC		Not used
0xFD		Not used
0xFE		Not used
0xFF		Not used