Examples using a Mifare Ultralight card

When a Mifare Ultralight card with the UID 00070000B06304 is read the reader will output the following:

Description	Output
56 bit dec with leading zeros (always 17 digits)	00007696592954116
56 bit hex without leading zeros (max 14 digits)	70000B06304
56 bit dec reverse order with leading zeros (always 17 digits)	01235507472238336
56 bit hex reverse order without leading zeros (max 14 digits)	463B000000700
48 bit dec without leading zeros (max 15 digits)	7696592954116
48 bit hex with leading zeros (always 12 digits)	070000B06304
48 bit dec reverse order without leading zeros (max 15 digits)	109607565395712
48 bit hex reverse order with leading zeros (always 12 digits)	63B000000700
40 bit dec with leading zeros (always 13 digits)	0000011559684
40 bit hex without leading zeros (max 10 digits)	B06304
40 bit dec reverse order with leading zeros (always 13 digits)	755914245888
40 bit hex reverse order without leading zeros (max 10 digits)	B000000700
32 bit dec without leading zeros (max 10 digits)	11559684
32 bit hex with leading zeros (always 8 digits)	00B06304
32 bit dec reverse order without leading zeros (max 10 digits)	1792
32 bit hex reverse order with leading zeros (always 8 digits)	00000700
24 bit dec with leading zeros (always 8 digits)	11559684
24 bit hex without leading zeros (max 6 digits)	B06304
16 bit dec without leading zeros (max 5 digits)	25348
16 bit hex with leading zeros (always 4 digits)	6304
Variable length hex with leading zeros	00070000B06304
Custom format 3	73641984
Custom format 2	0000000000115596843

Custom format 3
When this format is selected the following keyboard sequence is output:

UID read least significant byte first; for 4 byte UID convert the 4 least significant bytes to decimal and truncate to 8 digits; for 7 byte UID convert the 4 most significant bytes to decimal and truncate to 8 digits.

Custom format 2
When this format is selected the following keyboard sequence is output:

19 decimal digits which include at least 8 leading zeros, followed by 10 digits (the decimal conversion of the last 32 bits of the card number), and then a modulus 10 checksum digit.

Tuning the antenna
Under the cover is a variable capacitor which may need to be adjusted to re-tune the antenna for different environments or different cards. To tune the antenna select Tune mode, and with a card in the field adjust the variable capacitor until the reader is beeping repeatedly. The best tuning is when the gaps between beeps is the shortest.

738-52 Rev 5 USB Mifare Desktop Reader

Data Sheet

The USB Mifare Desktop reader connects to a PC via USB. It reads the unique ID from a Mifare card and outputs the code in the form of keystrokes which enables the user to capture the transponder code into any PC application which accepts keyboard entry.

A 10 way DIP switch on the back of the unit is used to select the required output format. A green LED and a beeper are used to indicate a successful read and a red LED indicates an error condition.

The reader has a mini B USB socket and when connected to the PC the device enumerates as a Human Interface Device (HID class).

Specifications

- Power requirements: USB bus powered. Current consumption 60 mA (typical)
- Operating Frequency: 13.56 MHz
- Cards supported: Mifare Std, Mifare Plus S/X, Ultralight, DESFire, NTAG2xx
- Output formats supported: Hexadecimal or decimal digits with or without leading zeros
- Length formats: fixed 56, 48, 40, 32, 24 or16 bits; or variable bit length according to UID size
- Termination options: None, ENTER
- Operating temperature range: 0 ºC to +50 ºC
- Weight: 55 grams
- Dimensions: Reader 100 x 59 x 21 mm

Connections
To install the desktop reader:
Connect the reader to the PC with a mini B USB cable.

Output Mode Selection

The 10 way switch is used to select the output format, length and termination as per the following tables:

Leading zeros (SW1)

	SW1
Leading zeros included	ON
Leading zeros suppressed	OFF

Decimal/hexadecimal (SW2)

	SW2
Decimal format	ON
Hexadecimal format	OFF

Length (SW3 - SW5)

	SW3	SW4	SW5
56 bit	OFF	OFF	OFF
48 bit	OFF	OFF	ON
40 bit	OFF	ON	OFF
32 bit	OFF	ON	ON
24 bit	ON	OFF	OFF
16 bit	ON	OFF	ON
Variable length – 32 bit or 56 bit	ON	ON	OFF

The reader reads all available bits of the Mifare card (56 bits for cards with 7 byte UIDs and 32 bits for cards with 4 byte UIDs) but many applications require a shorter number. The length of the number is determined by the number of bits taken from the card and the format chosen (hexadecimal or decimal).

For the variable length output, the number of bits is automatically chosen to match the number of bits available from the card, 4 byte UIDs will output 32 bits and 7 byte UIDs will output 56 bits.

Order (SW6)

	SW6
Least significant byte first	ON
Most significant byte first	OFF

Special formats (SW7 – SW8)

	Note	SW7	SW8
Standard	1	OFF	OFF
Custom format 3	2	OFF	ON
Custom format 2	3	ON	OFF
Tune mode	4,5	ON	ON

Notes:
1. SW1 – SW6 will determine the exact output. See examples
2. When Custom format 3 is selected, SW1 – SW5 are ignored
3. When Custom format 2 is selected, SW1 – SW5 are ignored
4. For Tune mode, SW9 must also be OFF and SW6 must be ON
5. See 'Tuning the Antenna' at the end of this document

Termination (SW9)

The reader will generate the following keystroke after the number

	SW9
None	OFF
ENTER	ON

Keyboard layout (SW10)

	SW10
English keyboard	OFF
International keyboard	ON

If SW10 is ON the desktop reader outputs ASCII codes instead of scancodes. This has the advantage of being keyboard independent, but the output speed is slower.

Examples using a Mifare Std card

When a Mifare Std card with the UID 15B40BF2 is read the reader will output the following:

Description	Output
56 bit dec with leading zeros (always 17 digits)	00000000364121074
56 bit hex without leading zeros (max 14 digits)	15B40BF2
48 bit dec without leading zeros (max 15 digits)	364121074
48 bit hex with leading zeros (always 12 digits)	000015B40BF2
48 bit hex reverse order with leading zeros (always 12 digits)	0000F20BB415
48 bit dec reverse order without leading zeros (max 15 digits)	4060853269
40 bit dec with leading zeros (always 13 digits)	0000364121074
40 bit hex without leading zeros (max 10 digits)	15B40BF2
32 bit dec without leading zeros (max 10 digits)	364121074
32 bit hex with leading zeros (always 8 digits)	15B40BF2
32 bit hex reverse order with leading zeros (always 8 digits)	F20BB415
32 bit dec reverse order without leading zeros (max 10 digits)	4060853269
24 bit dec with leading zeros (always 8 digits)	11799538
24 bit hex without leading zeros (max 6 digits)	B40BF2
24 bit hex reverse order without leading zeros (max 6 digits)	BB415
24 bit dec reverse order with leading zeros (always 8 digits)	00766997
16 bit dec without leading zeros (max 5 digits)	3058
16 bit hex with leading zeros (always 4 digits)	0BF2
Variable length hex with leading zeros	15B40BF2
Custom format 3	64121074
Custom format 2	0000000003641210749