USB Card Reader Configuration Utility

User Manual

Draft !

SB Research ApS • Birkholmsvej 33 • DK-2800 Kgs. Lyngby • Tel +45 87 30 04 45 • Fax +45 87 30 04 46

The Configuration Utility for USB card reader family:

Concept:

To allow for field programming of the USB card readers a configuration mode has been introduced with firmware 2.25. When the USB device is started in boot loader mode, the device will allow update of the firmware and read/write the E^2prom of the USB card reader.
The E^2prom holds the configuration data for Field Programmable Formats and the data to enable reading of Mifare® sector data.

Hardware:

USB card reader hardware :
SBR 0814 with firmware 2.31 or later.
SBR 0904 with firmware 2.31 or later.
SBR 0940 with firmware 1.xx or later.
SBR 0951 with firmware 2.31 or later.

Software:

The Configuration Utility requires Microsoft .net framework version 3.5 to be installed prior to launching the program.
The .net framework can be downloaded from:
www.microsoft.com/net

Boot loader Mode:

To bring a USB reader into boot loader / configuration mode one of the following procedures must be used depending on USB Reader hardware type:

SBR 0814 / SBR 0904:

- Disconnect the USB cable.
- Set DIP switch to :

1	2	3	4	5	6	7	8
Off	Off	Off	Off	Off	Off	Off	On

- Reconnect the USB cable.
- The LED will turn red and then yellow.
- The USB reader is now in boot loader / configuration mode and will be automatically detected by the Configuration Utility.

To return to normal mode of operation

- Disconnect the USB cable.
- Set DIP switch to the desired format.
- Reconnect the USB cable.

SBR 0940 / SBR 0950:

- Disconnect the USB cable.
- Press and HOLD the mode switch.
- Reconnect the USB cable.
- The LED will turn red and then yellow.
- Release the mode switch.
- The USB reader is now in boot loader / configuration mode and will be automatically detected by the Configuration Utility.

To return to normal mode of operation

- Disconnect the USB cable.
- Reconnect the USB cable.

Configuration:

There is up to 4 parameter blocks in the USB Reader that can be configured:

- Clock/Data Programmable Format.
- Wiegand Programmable Format.
- Mifare Sector Parameters.
- Software Selected Format.

Please see below table for applicable parameters per device:

Device	Clock/Data	Wiegand	Mifare Parameters	Software Select
SBR 0814	Yes	Yes	No	Option*
SBR 0904	Yes	Yes	Option**	Option*
SBR 0940	No	Yes	Yes	Yes
SBR 0950	Yes	Yes	No	Yes

* Activating Software Selected Format will override DIP settings.

** Only valid for SBR 0904 MIS (Mifare sector reader onboard).

Clock/Data Programmable Format:

When using SBR 0814/SBR 0904/SBR 0950 with a card reading module that outputs data using Clock/Data interface (aka ABA2 or ISO 7918 – Track 2), format no. 31 can be selected using DIP or Software Select, which allows for in field programming of format parameters listed below:

Size - Number of characters to be received (1 - 37)
Offset - Characters that will be skipped (0 - 36)
Length – Characters that will be send (1 - 37)
Pre – Character that is send BEFORE data (See appendix A)
Post – Character that is send AFTER data (See appendix A)
Output Type – Select Decimal or Hexidecimal

Example:

Card data received: 00001230001234567890
Required output: 0123456789 + 'Enter'
Size: 20
Offset: 9
Length: 10
Pre: Non
Post: CR
Output Type: Dec

Wiegand Programmable Format:

When using SBR 0814/SBR 0904/SBR 0950 with a card reading module that outputs data using Wiegand interface, format no. 63 can be selected using DIP or Software Select, which allows for in field programming of format parameters listed below:

Size - Number of bits to be received (1 - 128)
Offset – Number of bits that will be skipped (0 - 127)
Length – Number of bits that will be send (1–128 Hex/1–40 Dec)
Pre – Character that is send BEFORE data (See appendix A)
Post – Character that is send AFTER data (See appendix A)
Output Length – Number characters to be send
Output Type – Select Decimal, Hexidecimal or ASCII

Example:

Card data received: 0x012F0123AE (37 bit)
b0000100101111000000010010001110101110 (37 bit)
Required data: ^^^^^^^^^^^^^^^^^^^
Required output: '%' + 37335 + '%'
Size: 37
Offset: 13
Length: 18
Pre: %
Post: %
Output Length: 5 - Removes leading zero in 037335
Output Type: Dec

Mifare Sector Parameters:

When using SBR 0904 MIS or SBR 0940 for reading data encode into a Mifare sector, the access key and block number must be specified.
To format the data read from a Mifare sector format no. 63 must be used – Please see the Wiegand Programmable Format section above.

Mifare Block: Memory location in card (0x00 – 0x3F for S50)
Mifare key type: A-key or B-key
Mifare key: Specify key Hex (0x00000000000 – 0xFFFFFFFFFFF)

Example:

ASCII encoded card number (7 digits) in sector 04, first block.
Mifare A-key = 0x44B0FE872C8A

Mifare Section:

Mifare Block: 0x10
Mifare key type: A-key
Mifare key: 44B0FE872C8A

Wiegand Section:

Size: 128
Offset: 72
Length: 56 – 7 x 8 Bits ASCII code
Pre: Non
Post: Non
Output Length: 7
Output Type: ASCII

Software Selected Format:

When using SBR 0814/SBR 0904 the format selection CAN be done in software, but when using SBR 0940/SBR 0950 the format selection MUST be done in software as there is no DIP switch.
Please note that activating Software Selected Format will override DIP settings.

Format Number: (Off, 0 – 63)

Revision history:

Date:	Notes:
2009-08-12	Formatting changed & Microsoft link changed.
2009-07-30	First draft

Pre and Post characters available for selection:

ID	Character	ASCII	ID	Character	ASCII
0	Space	0x20	32	@	0x40
1	!	0x21	33	A	0x41
2	"	0x22	34	B	0x42
3	#	0x23	35	C	0x43
4	$	0x24	36	D	0x44
5	%	0x25	37	E	0x45
6	&	0x26	38	F	0x46
7	'	0x27	39	G	0x47
8	(	0x28	40	H	0x48
9	)	0x29	41	I	0x49
10	*	0x2A	42	J	0x4A
11	+	0x2B	43	K	0x4B
12	,	0x2C	44	L	0x4C
13	-	0x2D	45	M	0x4D
14	.	0x2E	46	N	0x4E
15	/	0x2F	47	O	0x4F
16	0	0x30	48	P	0x50
17	1	0x31	49	Q	0x51
18	2	0x32	50	R	0x52
19	3	0x33	51	S	0x53
20	4	0x34	52	T	0x54
21	5	0x35	53	U	0x55
22	6	0x36	54	V	0x56
23	7	0x37	55	W	0x57
24	8	0x38	56	X	0x58
25	9	0x39	57	Y	0x59
26	:	0x3A	58	Z	0x5A
27	;	0x3B	59	[	0x5B
28	<	0x3C	60	\	0x5C
29	=	0x3D	61	]	0x5D
30	>	0x3E	62	Tab	0x09
31	?	0x3F	63	CR (Enter)	0x0D