# Idesco Order Guide

This guide will assist you when placing an order.

Its main purpose is to help you to send out an order which is complete. Your order will be processed faster and you will receive the order confirmation without delays.

Please read through this document carefully, it will prove to be a valuable help in placing orders and prevent a long delay because of follow ups.

**Pages 2 and 3**
On these pages you can see a step by step guide. The checklist will help you to place a complete order. At the end you need to mention the configuration card and, in case of Mifare sector readers, the keys.
Concerning the Mifare sector readers, we have two default "transportation keys". These keys are used while shipping and storing the readers.

The transportation keys are:

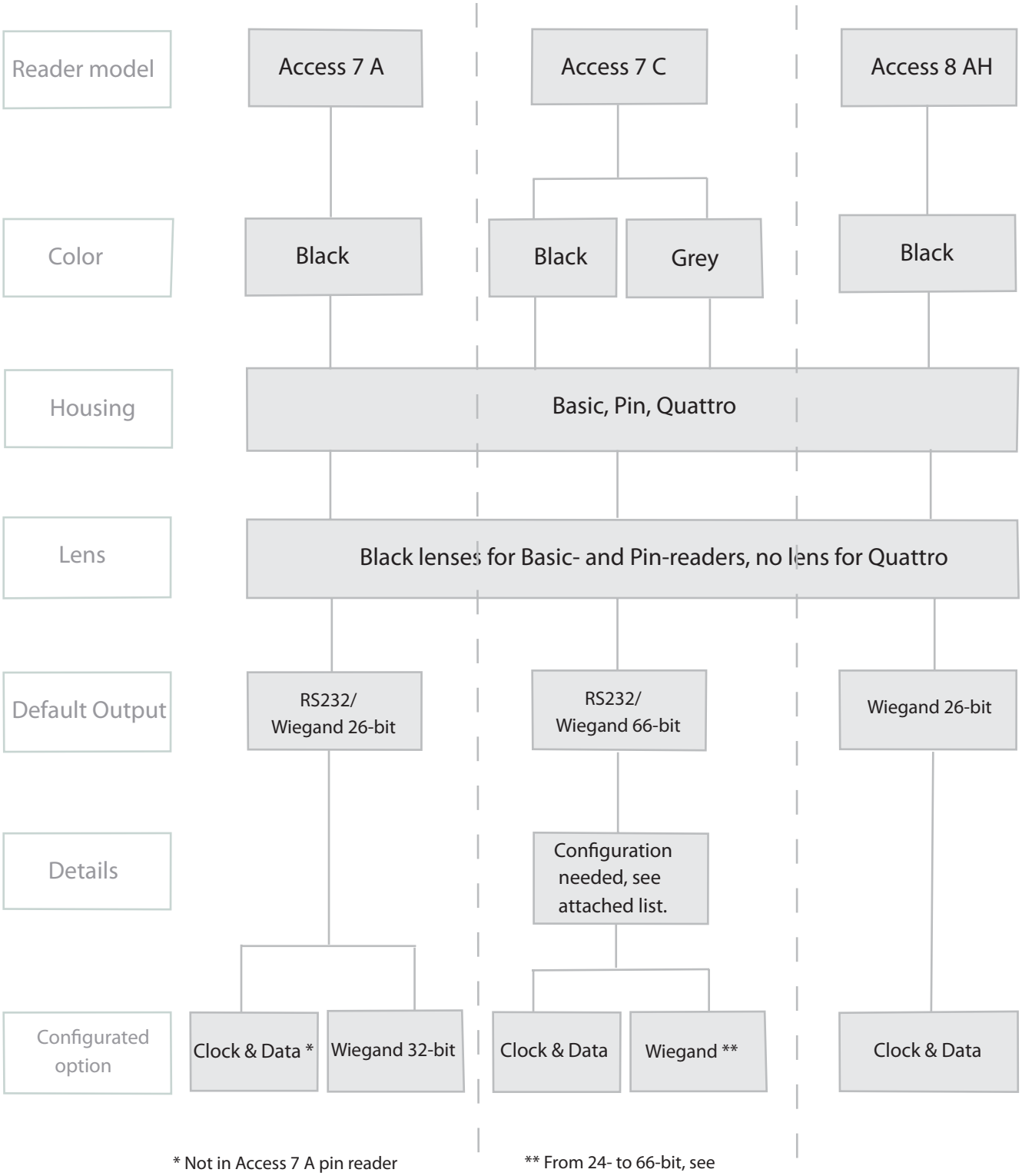
| | |
|---|---|
| Access 8 CM | FFFFFFFFF |
| Access 8CM t | 414343455353 |

**Pages 4 and 5**
You can find an overview of all the 7C and 8CMt configurations which are available.
If you are not sure which configuration is yours please do not hesitate to contact the sales department at Idesco Oy.

It is possible that none of the configurations are suitable to your needs (you are a new customer, you have a new system, it is a very specific project with special settings…).
That is not a problem; please contact our sales department and we will provide you with the correct support in order to create a new configuration for you.

**Page 6 and onwards**
You will find an overview of all the default configurations of our reader models. In case the default configuration is what you are looking for, it is of course not necessary to mention a configuration card number. Simply "default configuration" will do.

# Step by step guide
1/2




* Not in Access 7 A pin reader

** From 24- to 66-bit, see attached configuration list

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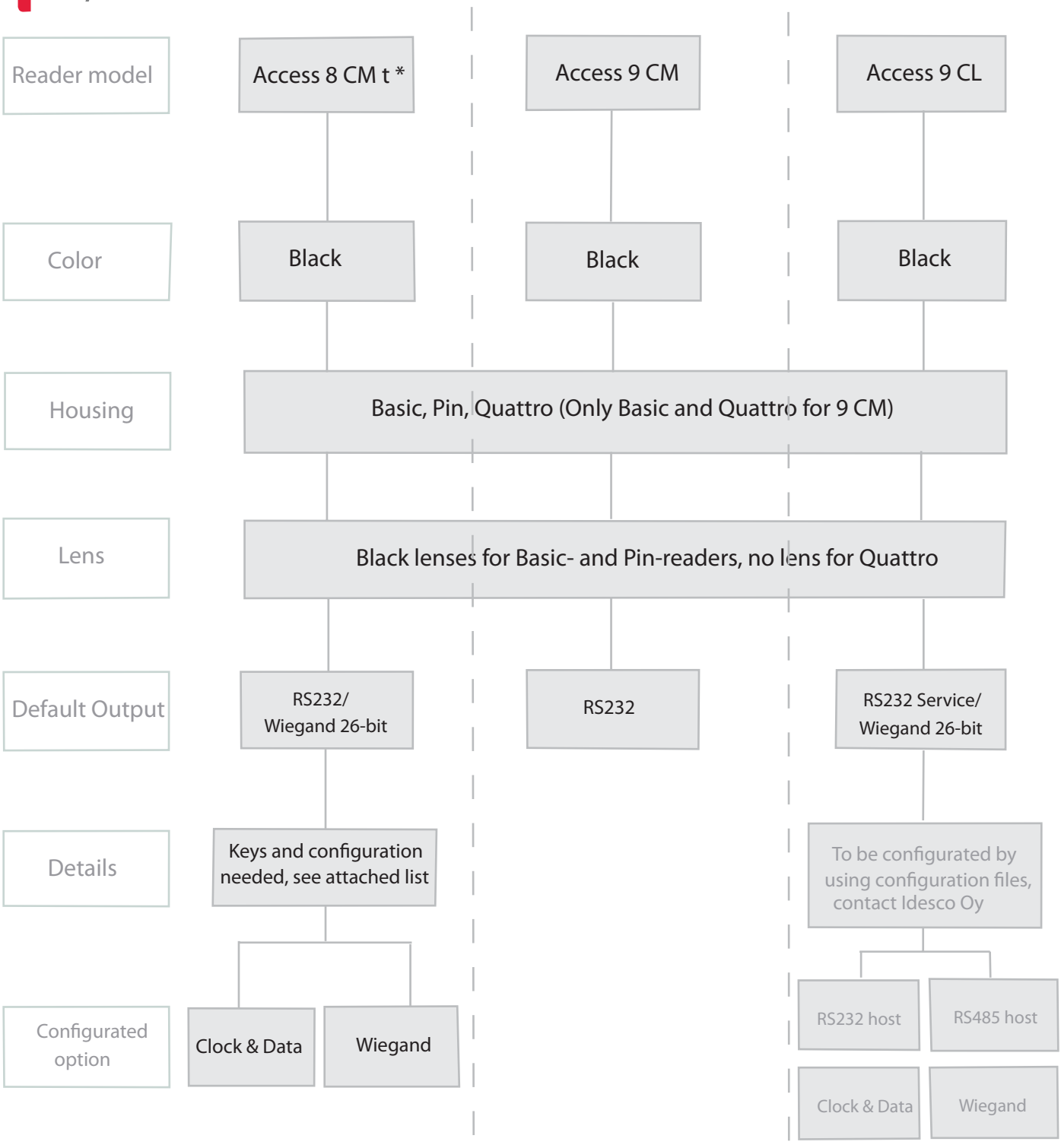
# Step by step guide
2/2




* Access 8 CM: Contact Idesco Oy

# Configuration overview
## Access 7 C

| Conf_number | W/CD | Datalength | Parity | Re-read | Buzzer and LED | Pin-code | RS232/USB | Timings 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 7 CW/C2 | Wiegand | 66-bit | on | 3 sec | 8 | 8 beep on | C2 | 640 | 640 | 640 | 640 |
| 7 CD | CD | 64-bit | on | 3 sec | 8 | | C2 | 70 | 270 | 130 | 150 |
| 7 CW 26b | Wiegand | 26-bit | on | 3 sec | 8 | 8 beep on | C2 | 100 | 2100 | 100 | 2100 |
| 7 CW s | Wiegand | 66-bit | on | 1 sec | 8 | 8 beep on | C2 | 500 | 500 | 500 | 500 |
| Conf_1 | Wiegand | 37-bit | on | 3 sec | 8 | 6 beep off | HID | 500 | 500 | 500 | 500 |
| Conf_2 | Wiegand | 66-bit | on | 3 sec | 8 | 4 beeb on | C2 | 500 | 500 | 500 | 500 |
| Conf_3 | Wiegand | 34-bit | on | 3 sec | 8 | 8 beep on | C2 | 80 | 1000 | 80 | 1000 |
| Conf_4 | Wiegand | 26-bit | on | 3 sec | 8 | 26 beep on | C2 | 100 | 2000 | 100 | 2000 |
| Conf_5 | Wiegand | 26-bit | on | 3 sec | 8 | 4 beeb on | C2 | 100 | 1000 | 100 | 1000 |
| Conf_6 | Wiegand | 26-bit | on | 3 sec | 8 | 8 beep on | C2 | 100 | 1000 | 100 | 1000 |
| Conf_7 | Wiegand | 34-bit | on | 3 sec | 8 | off | C2 | 100 | 1000 | 100 | 1000 |
| Conf_8 | CD | BCD 10 | on | 3 sec | 8 | | C2 | 70 | 530 | 210 | 320 |
| Conf_9 | CD | BCD 13 | on | 3 sec | 8 | | C2 | 110 | 700 | 300 | 400 |
| Conf_10 | Wiegand | 34-bit | on | 3 sec | 8 | 8 beep on | C2 | 500 | 500 | 500 | 500 |
| Conf_11 | Wiegand | 34-bit | on | 3 sec | 8 | off | C2 | 500 | 500 | 500 | 500 |
| Conf_12 | Wiegand | 32-bit | off | 3 sec | 8 | 8 beep on | C2 | 100 | 1000 | 100 | 1000 |
| Conf_13 | Wiegand | 34-bit | on | 3 sec | 8 | 8 beep on | C2 | 70 | 940 | 70 | 940 |
| Conf_14 | Wiegand | 66-bit | on | 3 sec | 8 | off | C2 | 70 | 940 | 70 | 940 |
| Conf_15 | Wiegand | 26-bit | on | 3 sec | 2 | off | C2 | 100 | 1000 | 100 | 1000 |
| Conf_16 | CD | 40-bit | on | 3 sec | 2 | 4 beeb on | C2 | 50 | 250 | 170 | 110 |
| Conf_17 | Wiegand | 58-bit | on | 3 sec | 8 | 8 beep on | C2 | 70 | 940 | 70 | 940 |
| Conf_18 | Wiegand | 50-bit | on | 3 sec | 8 | 8 beep on | C2 | 70 | 940 | 70 | 940 |
| Conf_19 | Wiegand | 66-bit | on | 3 sec | 8 | 8 beep on | C2 | 100 | 900 | 100 | 900 |
| Conf_20 | Wiegand | 32-bit | off | 3 sec | 8 | 8 beep on | C2 | 640 | 640 | 640 | 640 |
| Conf_21 | Wiegand | 32-bit | off | 1 sec | 8 | 8 beep on | C2 | 70 | 2000 | 70 | 2000 |
| Conf_22 | Wiegand | 32-bit | off | 3 sec | 6 | 8 beep on | C2 | 70 | 2000 | 70 | 2000 |
| Conf_23 | Wiegand | 34-bit | on | 3 sec | 9 | off | C2 | 100 | 1000 | 100 | 1000 |
| Conf_24 | Wiegand | 34-bit | on | 3 sec | 0 | off | C2 | 100 | 1000 | 100 | 1000 |
| Conf_25 | Wiegand | 32-bit | off | 3 sec | 8 | 8 beep on | C2 | 70 | 2000 | 70 | 2000 |
| Conf_26 | CD | BCD 13 16 LZ | on | 3 sec | 6 | 4 beeb on | C2 | 150 | 850 | 420 | 420 |
| Conf_27 | Wiegand | 32/56/64-bit | off | 1 sec | 8 | 8 beep on | C2 | 100 | 2000 | 100 | 2000 |
| Conf_28 | CD | 64-bit | on | 3 sec | 0 | | C2 | 70 | 270 | 130 | 150 |
| Conf_29 | Wiegand | 34-bit | on | 0 sec | 8 | 8 beep on | C2 | 80 | 1000 | 80 | 1000 |
| Conf_30 | Wiegand | 56-bit | off | 3 sec | 8 | 8 beep on | C2 | 100 | 2000 | 100 | 2000 |
| Conf_31 | Wiegand | 34- bit | on | 3 sec | 8 | 8 beep on | C2 | 100 | 1000 | 100 | 1000 |
| Conf_32 | CD | 64-bit | on | 3 sec | 9 | 4 beeb on | C2 | 70 | 270 | 130 | 150 |
| Conf_33 | Wiegand | 34-bit | on | 3 sec | 6 | 8 beep on | C2 | 100 | 1000 | 100 | 1000 |
| Conf_34 | Wiegand | 66-bit | on | 3 sec | 2 | 8 beep on | C2 | 100 | 1000 | 100 | 1000 |
| Conf_35 | Wiegand | 26-bit | on | 3 sec | 8 | off | C2 | 50 | 2000 | 50 | 2000 |
| Conf_36 | Wiegand | 64- bit | off | 3 sec | 8 | 8 beep on | C2 | 50 | 2000 | 50 | 2000 |
| Conf_37 | CD | 40-bit | on | 3 sec | 8 | 8 beep on | C2 | 70 | 270 | 130 | 150 |
| Conf_38 | Wiegand | 32- bit | off | 3 sec | 8 | 8 beep on | C2 | 70 | 930 | 70 | 930 |

Invert ID: off
RS485 addr: 0

# Configuration overview
## Access 8 CM t

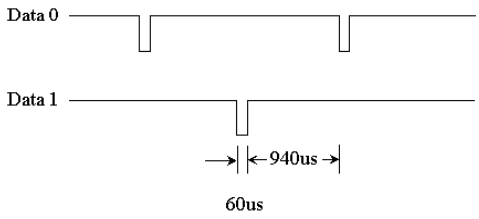
| Conf_number | W/CD | Datalength | Parity | Invert ID | Pin-code | Send UID | Backlight | | Timings | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 1 | 2 | 3 | 4 |
| Conf_1 | Wiegand | 26-bit | on | off | 8 beep on | on | off | | 70 | 930 | 70 | 930 |
| Conf_2 | Wiegand | 64-bit | off | off | 8 beep on | on | on | | 100 | 2000 | 100 | 2000 |
| Conf_3 | Wiegand | 32-bit | off | off | 4 beep on | on | off | | 70 | 930 | 70 | 930 |
| Conf_4 | Wiegand | 88-bit | off | off | 8 beep on | on | off | | 70 | 930 | 70 | 930 |
| Conf_5 | Wiegand | 36-bit | on | off | 4 beep on | off | off | | 100 | 1000 | 100 | 1000 |
| Conf_6 | Wiegand | 66-bit | on | off | 8 beep on | on | off | | 70 | 930 | 70 | 930 |
| Conf_7 | CD | BCD 10 | off | off | 4 beep on | off | off | | 100 | 1000 | 100 | 1000 |
| Conf_8 | Wiegand | 26-bit | on | off | 8 beep on | off | on | | 70 | 930 | 70 | 930 |
| Conf_9 | Wiegand | 62-bit | on | off | 8 beep on | on | on | | 100 | 1000 | 100 | 1000 |
| Conf_10 | Wiegand | 34-bit | on | off | 8 beep on | on | off | | 70 | 930 | 70 | 930 |
| Conf_11 | Wiegand | 34-bit | on | off | 8 beep on | on | off | | 70 | 930 | 70 | 930 |
| Conf_12 | Wiegand | 34- bit | off | off | 8 beep on | off | off | | 70 | 930 | 70 | 930 |
| Conf_13 | Wiegand | 34- bit | off | off | 8 beep on | off | off | | 70 | 930 | 70 | 930 |
| Conf_14 | Wiegand | 26- bit | off | off | 8 beep on | off | off | | 100 | 2000 | 100 | 2000 |

# Default configurations

## Access 7 A Wiegand 26-bit

**Default Output** W26-bit
PE E E E E E E E E E E E E O O O O O O O O O O O O PO
PE = Even parity
E = Bits counted into even parity
O = Bits counted into odd parity
PO = Odd parity

**Wiegand Timing**
DATA0 and DATA1 outputs are used for transmission. DATA0 is used for output 0-bits and DATA1 for 1-bits. Each pulse has active time of 60 us, followed by a delay of 940 us. This gives a total bit time of 1 ms. The pulse is active when the open collector output is in the conductive state. In case of no communication both pins are normally high.




**Byte Coding**
Byte length is five (5) bits. The first four (4) bits are used for information and the fifth is odd parity calculated from information bits. The bit order is LSB first.
Example: 2 -> 01000b.

**Output string format**
10 leading Zeros > SS 14DataDigits ES LRC < 10 Trailing Zeros
SS = Start Sentinel, example: 11010
ES = End Sentinel, example: 11111
LRC = Longitudinal Redundancy Check.

To overcome the problem of transmitting data with 'F' characters that would be seen as a terminator (11111) the data is converted into an ordinary numerical base 10 string. See example below.

The hexadecimal code of a transponder being 00004567AF will be converted into 00000004548527. Note that this string is always 14 digits long and is calculated as follows, referred to the initial hexadecimal value:

(F* 160 + A* 161 + 7 *162 + 6 * 163 + 5 * 164 + 4*165 + 0 * 166 + 0 * 167 + 0 * 168 + 0 * 169)
= 15+160+1792+24576+327680+4194304+0+0+0+0= 00000004548527)

**Longitudinal Redundancy Check**
LRC is calculated by XORing all data bits (excluding start, stop and CR/LF).

# Default configurations
## Access 7 A RS232

**Default Output** RS232

Communication
RS-232 connection is in accordance with standards. Communication is done at 9600 bauds, no parity, 8 databits, 1 start bit, 1 stop bit. Both of RxD- and TxD –lines must always be connected.

**Output string format**
<STX>SSSSSSSSSCC<CR><LF><ETX>
where

| Data | Length | Description |
|---|---|---|
| S | 10 bytes | Serial number |
| C | 2 bytes | LRC-checksum, explained later. Only 4 information bits are used |

Control characters in ASCII:
STX = 02
LF = 10
CR = 13
ETX = 03

**Checksum calculation**
Checksum is calculated by XOR:ing all bytes of serial number leading the checksum itself. ASCII characters are converted to binary values before calculation
(example 'A'-> 1010b).

Example of a string with the correct checksum: <STX>01026A72FFE4<CR><LF><ETX>

# Default configurations
## Access 7 C Wiegand 66-bit

**Data String Format**
Output string has the format OSSSSSSSS…SSSSSSSSE

| Data | Length | Description |
|---|---|---|
| O | 1 bit | Odd parity calculated from 36 first bits of the serial number *) |
| S | 64 bits | Serial number in binary form |
| E | 1 bit | Even parity calculated from 36 last bits of the serial number *) |

*) 4+4 bits in the middle is used to both parity bits

Data is sent MSB first. The first bit sent is Odd parity.

```
O  D0D1…D26D27  D28D29D30D31D32D33D34D35   D36D37... D62D63 E
  |------------ Odd parity ----------------------------|
           |---------------------- Even parity ------------------|
```

D0 : First data byte bit 7.
D1 : First data byte bit 6.
…
D7 : First data byte bit 0
D8 : Second data byte bit 7.
…

Only two parity bits of totally 66 bits are not enough to guarantee a reliable error detection. This communication mode is recommended only on 'noise free' environment and short distances, for example inside chassis.

**Wiegand timing**
WIE0 and WIE1 outputs are used for transmission. WIE0 is used to output 0-bits and WIE1 for 1-bits. Each pulse has active time of 640 us, followed by delay of 640 us. This gives total bit time of 1,3 ms. Pulse is active when the open collector output is in the conductive stage.

# Default configurations
## Access 7 C RS232 format 1

**RS232 formats**
Communication settings: 9600 bauds, no parity, 8 databits, 1 start bit, 1 stop bit.

**RS 232 Format 1**

Output string has a format:
BSSSSSSSSSSSSSSS=PPPPMTC<LF><CR>

where

| Data | Length | Description |
|---|---|---|
| B | 1 byte | Start character, constant 'B' |
| S | 16 bytes | Serial number |
| = | 1 byte | Separation character, constant '=' |
| P | 4 bytes | constant 0000h |
| M | 1 byte | Tag type 1=Mifare, 2=ICODE, 3=PICO, 4=ISO 15693, 5=FeliCa, 6=Topaz |
| T | 1 byte | End character, constant 'T' |
| C | 1 byte | LRC-checksum, explained in chapter 2.7.1. Only 4 information bits are used. |

All transmitted characters are ASCII characters.
Mifare Standard has a serial number length of 32 bits, remaining 8 characters are always zeroes.

**Checksum calculation**
Checksum is calculated by XOR:ing all 4-bit bytes leading the checksum itself. ASCII characters are converted to binary values before calculation (example 'A'-> 1010b). Constants are interpreted to checksum calculation values as follows:

'B' = 0x05
'=' = 0x05
'T' = 0x05
Tag type is converted as follows:
'1' = 0x00
'2' = 0x01
'3' = 0x01
'4' = 0x02
'5' = 0x02
'6' = 0x03

Detailed information on calculation can be requested from Idesco Oy.

# Default configurations
## Access 7 C RS232 format 2

**RS 232 Format 2**

Output string has a format:
BBDDDDDDDDDDCC

where

| Data | Length | Description |
|---|---|---|
| BB | 2 bytes | Start character |
| DD | 10 bytes | Serial number |
| CC | 2 bytes | LRC checksum |

All transmitted characters are ASCII characters.

Output string example:
MIFARE card ID number B5402BA2:
The card's ID number is only 32 bits long, so additional zeroes are added to the original data.

RS 232 message seen by the host:
00016A80574486 <CR><LF>
00 = Start character
86 = Checksum (Please see example below)

Remove the checksum and change the data to binary characters:
0000 0000 000 0 0001 0110 1010 1000 0000 0101 0111 0100 0100
0000 0000 000 p dddd dddd dddd dddd dddd dddd dddd dddd ddd p

The first eight bits are zeroes. p = parity bits (first even parity, last odd parity)

Remove the first 11 bits from the left
0 0001 0110 1010 1000 0000 0101 0111 0100 0100
Then drop both parity bits
0001 0110 1010 1000 0000 0101 0111 0100 010
This leaves 35 bits of the card number data.
000 1011 0101 0100 0000 0010 1011 1010 0010 = B5402BA2 hex

**Checksum calculation example**
Data 00 016A805744 86
Add together the ASCII-coded hex characters (6 bytes, from 00 to 44) and include the last eight bits to the result.
The result is the checksum.

# Default configurations
## Access 8 AH Wiegand 26-bit

The default 26- bit wiegand output data has a following format. Bits are described as sent:

| | |
|---|---|
| 1: | even parity of bits 2..13 (12 bits total) |
| 2-25: | 3 least significant bytes of serial number |
| 26: | odd parity of bits 14..25 (12 bits total) |

**Wiegand timings**
Reader timings can be changed by using command cards.

Pulse length:
20 s – 100 s (10 s steps)
Default time: 50 s

Pulse delay:
200 s – 20 ms (100 s steps)
Default time: 2 ms

# Default configurations

## Access 8 CM t Wiegand 26-bit and RS232

The reader can be configured to use wiegand or clock and data output format. Wiegand output is used as a default output format. The reader sends card data out also through the RS 232 serial communication line.
Different configurable parameters are listed in the chapter 3.

**Default wiegand data length**
As a default reader is sending out the data in the 26- bit format. Data is read from the sector 15 and from block 0. First three bytes are read out from the block and parity bits are added to this 24- bit data.

The following is an example about the 26-bit wiegand output format structure:

Output string has the format:
ESSSSSSSS…SSSSSSSSO

| Data | Length | Description |
|---|---|---|
| E | 1 bit | Even parity calculated from 12 first bits of data string |
| S | 24 bits | Data in binary form |
| O | 1 bit | Odd parity calculated from 12 last bits of data string |

Data is sent MSB first. First bit sent is Even parity.

E D0D1……..D10D11D12D13……D22D23 O
|-----Even parity-----| ------ Odd parity -------|

D0 : First data byte bit 7.
D1 : First data byte bit 6.
…
D22 : Last data byte bit 1
D23 : Last data byte bit 0

**Default wiegand data timings**
WIE0 and WIE1 outputs are used for transmission. WIE0 is used for output 0-bits and WIE1 for 1-bits.

**Default parameters**
The reader has default parameters where each pulse has active time of 70 us, followed by a delay of 930 us. This gives the total bit time of 1 ms.

**RS232**
RS 232 data string can also be configured. The user can configure what bytes from the Mifare sector are send out. Note, that only the full bytes are send out.
RS-232 connection is electrically according to the standard. Communication is done at 9600 baud, no parity, 8 databits, 1 start bit, 1 stop bit.
The complete serial number without parity bits is sent out via RS232.

# Default configurations
## Access 9CM and Access 9CL

**ACCESS 9 CM RS232**

**General**
The reader is able to support RS 232 output format. Default settings for serial communications are 9600 bauds, no parity, 8 databits, 1 start bit, 1 stop bit.
Baudrate can be changed with baud command.

**RS 232 output format**
Output string has a format: Data <CR> <LF>
Data is sent out as it is written to the card.

**ACCESS 9 CL RS232 SERVICE and Wiegand 26-bit**

In the default mode the reader is using 26-bit Wiegand as a default interface. The Service interface is using 9600 baud RS 232 by default. Both Host and Service interfaces can be configured to use different formats and interfaces.

**Wiegand 26-bit**
The default 26-bit Wiegand output data has the following format. The bits are sent in the same way:

| | |
|---|---|
| 1: | even parity of bits 2..13 (12 bits total) |
| 2-25: | 3 least significant bytes of serial number |
| 26: | odd parity of bits 14..25 (12 bits total) |