ER303 Scan Data Protocol

The ER303 reader can works on 3 modes.

1) Mode 1: Auto read card UID (default mode)

2) Mode 2: Auto read M1 blocks data and NFC text or web data

3) Mode 0: Commands mode, needs to send command from the host, compatible with the ER302.

Mode 1:

This mode the reader will only read the full UID of the cards and send to the host. The M1 chip has 4 bytes UID and the UL chip has 7 bytes UID. The reader will recognize these chips itself.
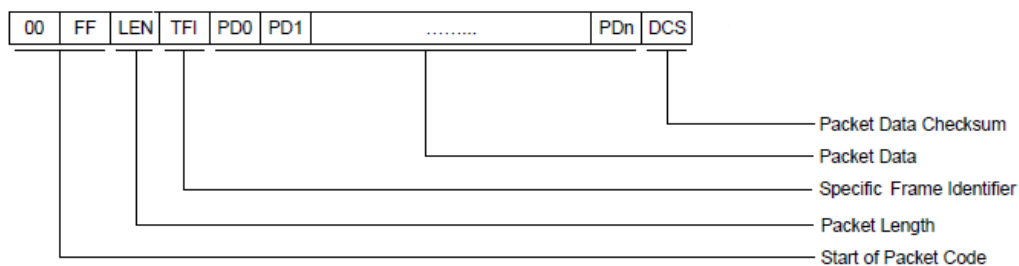
Mode 2:

This mode the reader will read the sector's blocks of M1 or NFC NDEF data of the NTAG213 chip, on the tail of the data it will include the UID of the chip.

If you want to read the appointed blocks, you need to download the start and end block number and authenticated keys into the reader.

The NFC NDEF data was stored by UTF8 protocol. It is same with the NFC smart phone.

Next figure is about the upload information frame from the reader.

| 00 | FF | LEN | TFI | PD0 | PD1 | .... | PDn | DCS |

- Packet Data Checksum
- Packet Data
- Specific Frame Identifier
- Packet Length
- Start of Packet Code

Upload information frame

START CODE: 2 bytes (0x00 and 0xFF),

LEN: 1 byte indicating the number of bytes in the data field(TFI and PD0 to PDn),

TFI: 2 bytes frame identifier, the first byte is 0xD5, the second byte depends on the way of the message

-0x01 in case of a frame of 4 bytes UID,

-0x02 in case of a frame of 7 bytes UID,

-0x03 in case of a frame of M1 block data,

-0x04 in case of a frame of NFC data,

DATA: LEN-2 bytes of packet data information

DCS: 1 data checksum DCS byte that satisfies the relation（XOR byte one by one from TFI byte to the last byte of PDn): $TFI \oplus PD0 \oplus PD1 \oplus ... \oplus PDn$
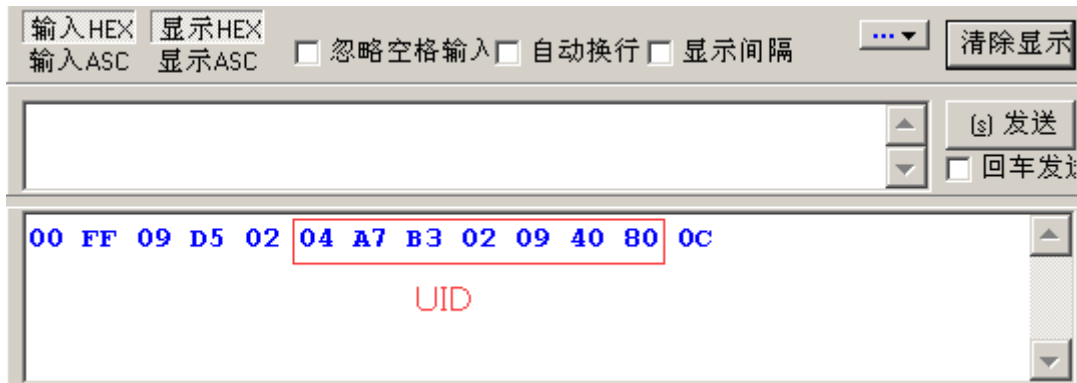
Examples:

1) TFI[1]=0x01, this frame includes a UID of 4 bytes.
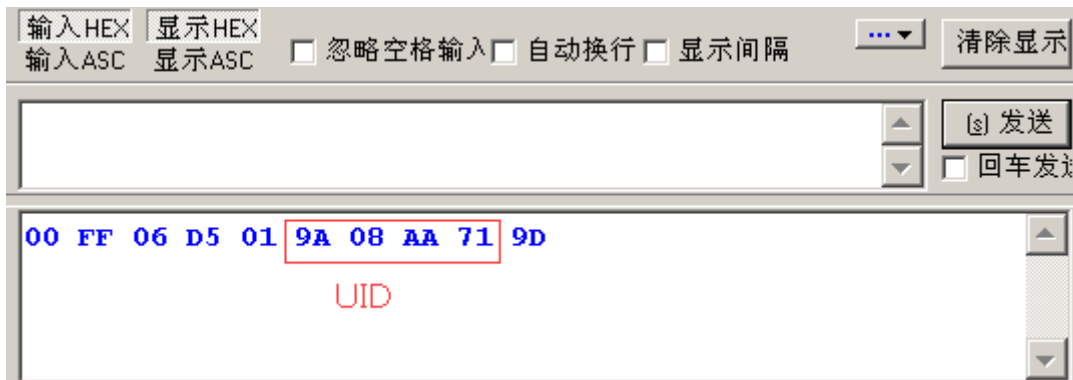
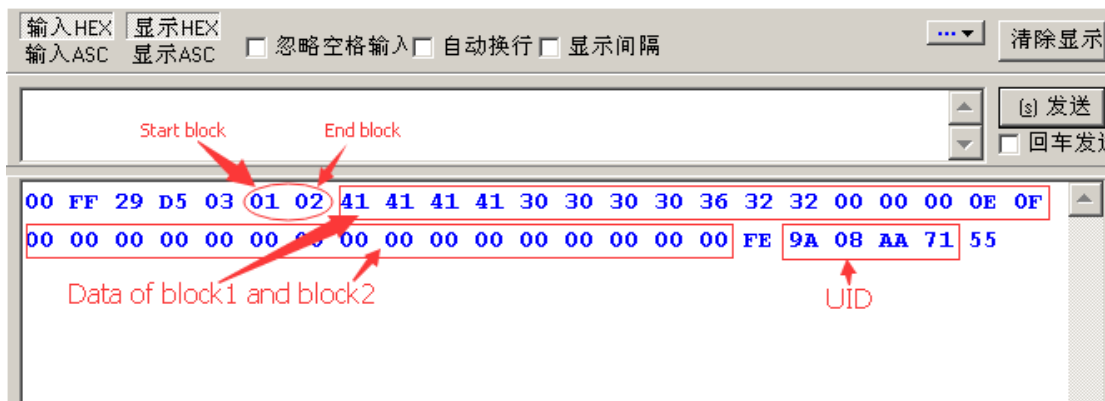
Len=0x06, "D5 01" is TFI，"9A08AA71" is UID, 9D is check sum from D5 to 71 XOR byte one byte.

2) TFI[1]=0x02 this frame includes a UID of 7 bytes.

3）TFI[1]=0x03, this frame includes M1 blocks data, PD0 is start block and PD1 is end block. The start and end block must be in a same sector. End of the block data it ends with 0xFE, then the UID of the M1 chip, at the end is the check sum bytet, it shows below figure.

4)TFI[1]=0x04, this frame includes NTAG213 NDEF data, it may be a web or text frame, if PD0= 0x54 then it means that this frame includes a text frame, else if PD0=0x55 then it means that this frame includes a web frame. End of the frame data it ends with 0xFE, then the UID of the NTAG213 chip, at the end is the check sum byte, it shows below figure.
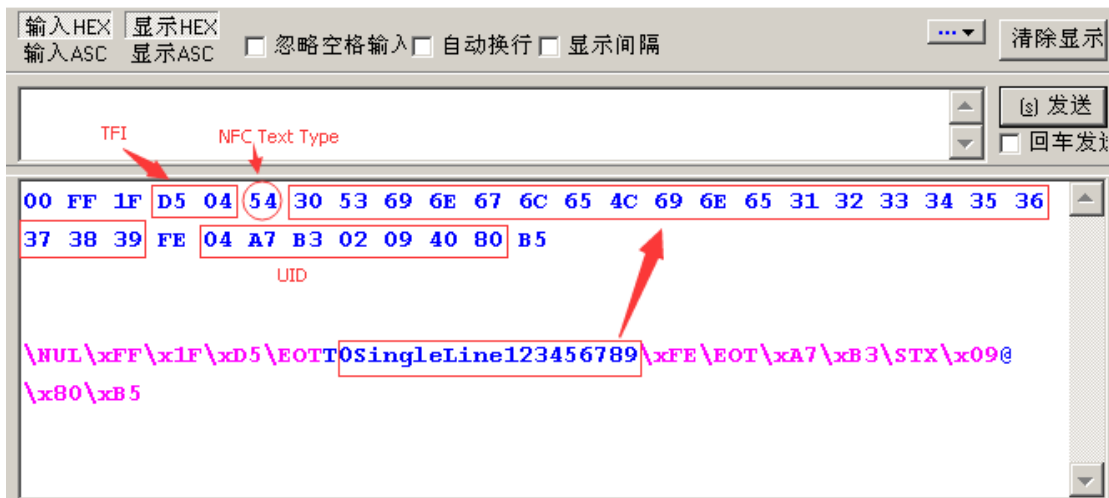
Next figure is NFC web frame.
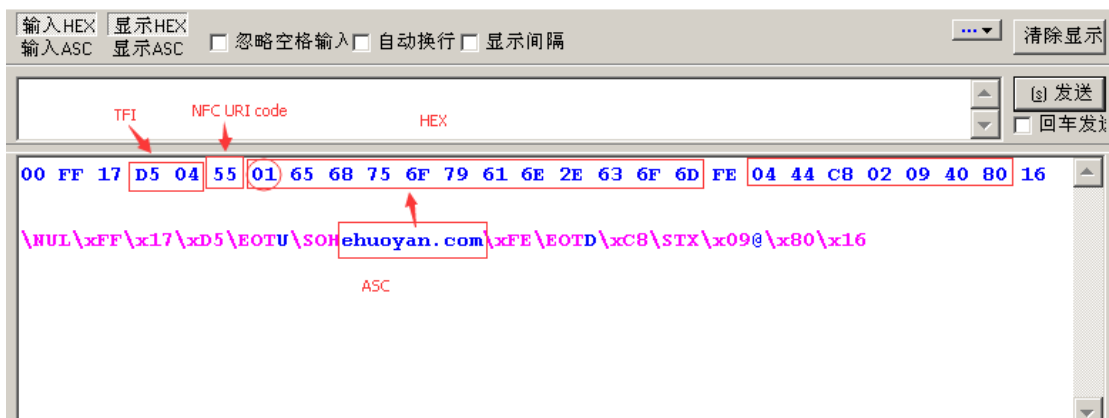
How to configure scan mode?

1, Mode 1: Scan UID mode command.

Host to reader: aa bb 06 00 00 00 08 01 01 08

Reply from Reader to host: aa bb 06 00 00 00 08 01 00 09

2，Mode 2: Scan M1 or NFC text mode command.

Host to reader: aa bb 06 00 00 00 08 01 02 0B

Reply from Reader to host

Note:

If you want to read M1 card's block data, then you need to load the appointed block number and authenticated keys into the reader.

Example:

Send: aa bb 10 00 00 00 11 02 50 02 00 02 60 ff ff ff ff ff ff 23

The red 0x00 and 0x02 is the start and end block number, the red 0x60 is key A mode（ Key B is 0x61） "ff ff ff ff ff ff" is the authenticate keys. The last bytes 0x23 is the checksum from the command fifth byte to the last byte.

Reply: aa bb 07 00 00 00 11 02 00 50 43

3, Mode 0: Commands mode, needs to send command from the host, compatible with the ER302.

Send：aa bb 06 00 00 00 08 01 00 07

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