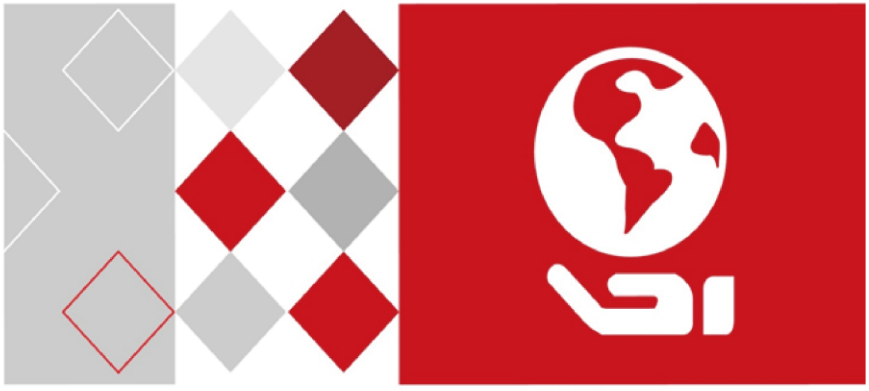


Wiegand Camera Operation Manual

Contents

1 Introduction

This manual is about the Wiegand configuration and features of network cameras.
The manual is created as a guide for the technical support engineer, sales engineer, etc.

Currently overseas license plate cameras support 4 Wiegand protocols: Card ID 26-bit Wiegand protocol, Hik 34-bit Wiegand protocol, NEWG 72bit Wiegand protocol and SHA-1 26-bit Wiegand protocol. The various protocols are explained as follows.

2 Cameras

2.1 Available Models

The available models of network cameras are:
iDS-2CD7A26G0/P-IZHSY (2.8-12 mm)(C)
iDS-2CD7A26G0/P-IZHSY (8 to 32 mm)(C)
iDS-2CD7A46G0/P-IZHSY (2.8-12 mm)(C)
iDS-2CD7A46G0/P-IZHSY (8 to 32 mm)(C)

2.2 Wiegand Interface Appearance

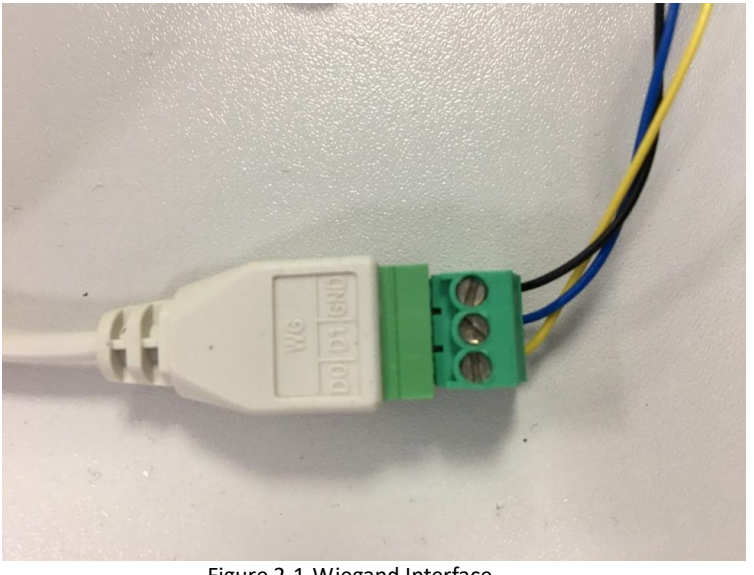


Figure 2-1 Wiegand Interface

Connection:

Connect the block's D0, D1 and GND to those of receiving terminal accordingly.

Note: The transmission distance is up to 15 meters.

3 Transfer Plate Number via Wiegand Protocol

3.1 Card ID 26-bit

3.1.1 Protocol Standard

Map the license plate number with the access control card number.

Find the related card number in allowlist and blocklist, and transfer the card information (26 bit) via Wiegand interface.

Determine whether the car has permission to pass according to the card ID.

Compatible with any standard access control system which supports standard Wiegand 26-bit protocol.

Card No. Encoding Mode:

1. The ID number should have 8 digits in total. The first 5 digits are Card ID, the last 3 digits are Site Code.
2. The value range for Card ID are: 0-65535, the value rage for Site Code are 0-255.
3. If you enter a number more than 8 digits, the last 8 digits will be kept. For example, if you enter 98984 2118, the effective number will be 89842 118.
4. If you enter a number less than 8 digits, 0 will be added before the number until it is a 8-digit number. For example, 984 2119 will be saved as 09842 119.

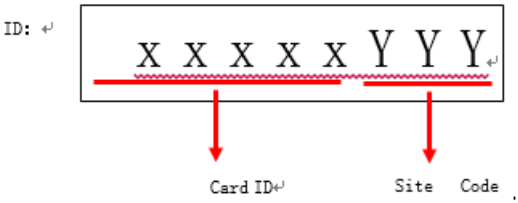


Figure 3-1 Card ID No. Encoding Mode

Format Description:

The 26-bit Wiegand format contains 2 parity bits and 24 data bits.

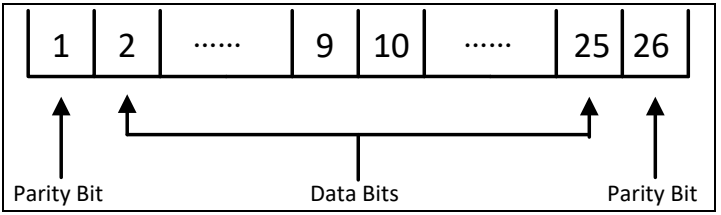


Figure 3-2 Wiegand Format

- Bit 1 is an even parity bit for the first 12 bits (bit 2 to bit 13).
- Bit 26 is an odd parity bit for the last 12 bits (bit 14 to bit 25).
- Bit 2 to bit 9 is site code in binary format, if the site code ID is less than 8 digits, 0 will be added before the ID until it is 8-digit number.
- Bit 10 to bit 25 is site code in binary format, if the card ID is less than 8 digits, 0 will be added before the ID until it is 16-digit number.

Example:

Here we take card number: 12345 011 as example.

The coding process are show as below.

Steps:

Split the card number as the **card ID (12345)** and site code (011).

1. Convert 12345 to binary format, as: 0011000000111001.
2. Convert 011 to binary format, as: 00001011.
3. Site data and card data as: 0000 1011 0011 0000 0011 1001.
4. Bit 1 is an even parity bit for the first 12 bits (bit 2 to bit 13), as 1.
5. Bit 26 is an odd parity bit for the last 12 bits (bit 14 to bit 25), as 1.
6. According to the converting mode(Even parity bit + site data + card data + odd parity bit), you can get a binary code as: 1 00001011 0011000000111001 1.

3.1.2 Configuration

1. Set Wiegand Type as Card ID 26bit

Steps:

Go to **Configuration**-> **System Settings**->**Wiegand** to enable wiegand transfer and select protocol type.

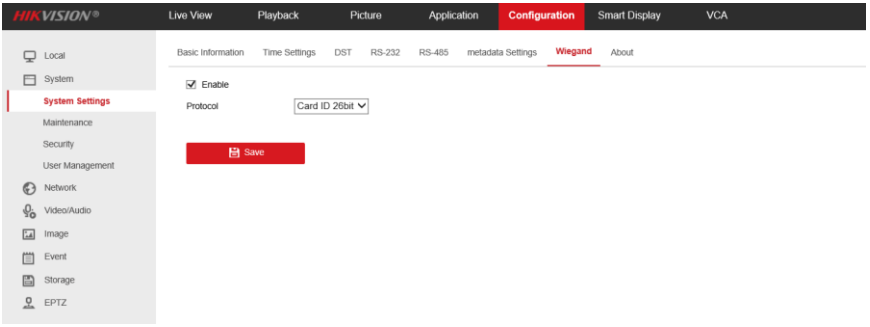


Figure 3-3 Wiegand Configuration Interface

2. Vehicle Detection Configuration

Steps:

1) Go to **VCA**->**Road Traffic**->**Detection Configuration**.
2) Check the checkbox of **Enable** to enable Vehicle Detection.
3) Set the specific detection parameters, which are the same as those of conventional ANPR cameras.

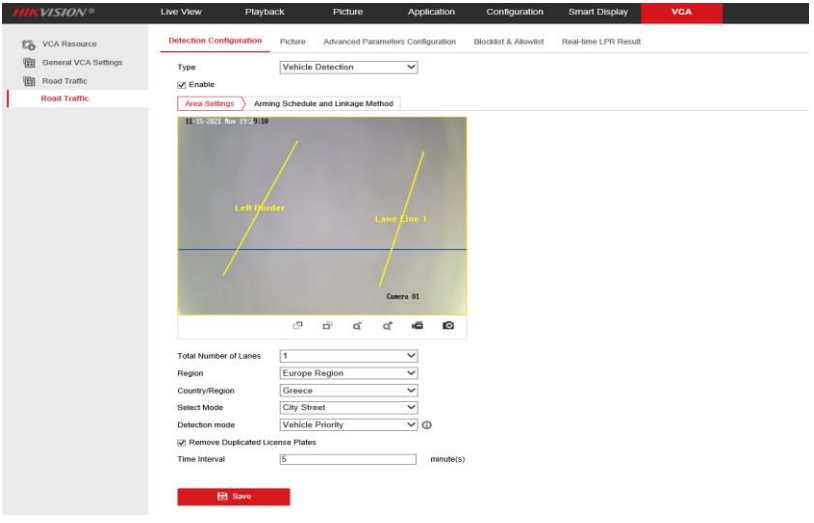
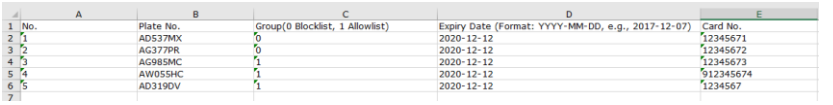


Figure 3-4 Detection Configuration Interface

3. Configure Blocklist & Allowlist

Steps:

1) Go to **VCA**->**Road Traffic**->**Blocklist & Allowlist**.
2) Click **Export** to download Blocklist & Allowlist template.
3) Fill in the template.



	A	B	C	D	E
1	No.	Plate No.	Group(0 Blocklist, 1 Allowlist)	Expiry Date (Format: YYYY-MM-DD, e.g., 2017-12-07)	Card No.
2	1	AD537MX	0	2020-12-12	12345671
3	2	AG377PR	0	2020-12-12	12345672
4	3	AG985MC	1	2020-12-12	12345673
5	4	AW055HC	1	2020-12-12	912345674
6	5	AD319DV	1	2020-12-12	1234567
7					

For more details please refer to ***H8 ANPR Camera Installation Configuration Guide***
The URL path is as follows:
ftp://hikftp.hikvision.com:400/Product File(Overseas)/00 Oversea Products/01 IP/01 IPC/11 Installation & How to/14 AI/01 Installation & How to/04 ANPR/H8_ANPR_iDS-2CD7xxx (C)/

Note:
When importing the plates' list.
- The Card No. is required, and cannot larger than 8 digits.
- 10000 license plates are supported in allowlist and blocklist in total.
- Make sure there are no repeated plate number and/or Card No. in the list.

3.2 Hik 34bit

3.2.1 Protocol Standard

Map the license plate number with the access control card number.
Find the related card number in allowlist and blocklist, and transfer the card information (34 bit) via Wiegand interface.
Determine whether the car has permission to pass according to the card number.
The protocol for directly transferring the access control card No. through the Wiegand interface is a private protocol of Hikvision, compatible with Hikvision access control system.

Card No. Encoding Mode:

Support up to 10-digit card number. If you enter a card number of more than 10 digits, only the first 10 digits are kept. Currently, the maximum supported card number is 2147483647.

Format Description:

The 34-bit Wiegand format contains 2 parity bits and 32 data bits.

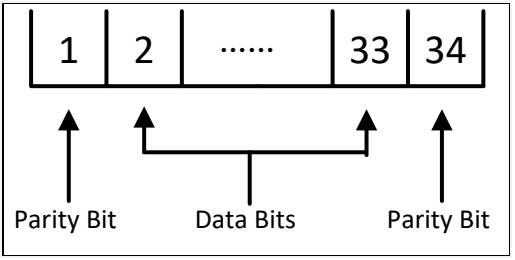


Figure 3-5 Wiegand Format

- The return result (even parity bit + card data +odd parity bit) will be sent to Hikvision access control device supporting Wiegand protocol.
- The front parity bit is the even parity bit of the first 16 bits of the card number.
- The rear parity bit is the odd parity bit of the last 16 bits of the card number.

Example:

Take Card number:1234567890

The coding process are show as below.

1. Convert 1234567890 to hexadecimal format, as: 0x49 0x96 0x02 0xD2.
2. Convert 0x49 0x96 0x02 0xD2 to binary format, as: 0100 1001 1001 0110 0000 0010 1101 0010.
3. Bit 1 is an even parity bit for the first 16 bits (bit 2 to bit 17), as 1.
4. Bit 34 is an odd parity bit for the last 16 bits (bit 18 to bit 33), as 0.
5. According to the converting mode(even parity bit + card data + odd parity bit), you can get a binary code as: 1 0100 1001 1001 0110 0000 0010 1101 0010 0

3.2.2 Configuration

1. Set Wiegand Type as Hik 34bit

Steps:

Go to **Configuration**-> **System Settings**->**Wiegand** to enable wiegand transfer and select protocol type.

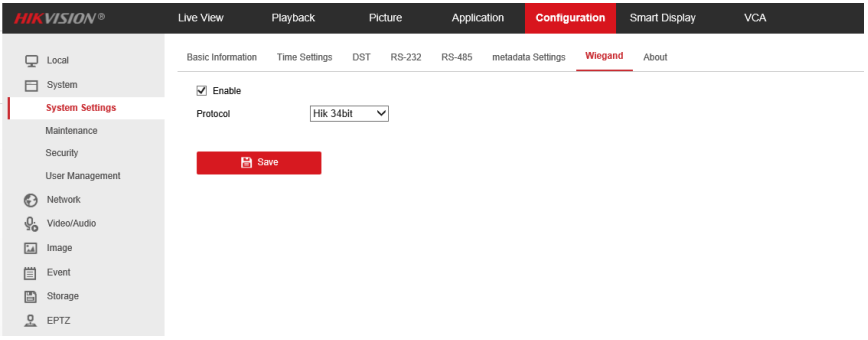


Figure 3-6 Wiegand Configuration Interface

2. For the steps to enable Vehicle Detection and Blocklist &Allowlist Configuration, please see 3.1.2 Configuration.

Note:

When importing the plates' list.

- The Card No. is required, and cannot larger than 10 digits.
- 10000 license plates are supported in allowlist and blocklist in total.
- Make sure there are no repeated plate number and/or Card No. in the list.

3.3 SHA-1 26bit

3.3.1 Protocol Standard

The Wiegand interface directly transmits the license plate number, and performs a hash operation on the license plate number.

The 24 bits are taken through the Wiegand standard interface, and an even parity bit and an odd parity bit are added before and after the 24 bits respectively according to the standard 26 bit protocol. The result will be sent to Wiegand access control (third parties like Paxton or Salto) equipment.

Compatible directly with access control system and platform of Paxton in the UK and Salto in Europe.

Card No. Encoding Mode:

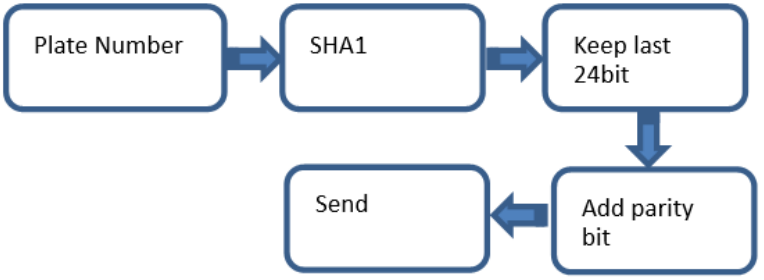


Figure 3-7 Wiegand Protocol Flow Chart

Example:

Here we take the license plate number HK55EVB as example.
The coding steps are shown as follows.

Steps:

1. Convert HK55EVB by SHA1 mode is: 0x80cf15.
2. Output a 8-bit binary code for each set of number via the Wiegand interface: 1000 0000 1100 1111 0001 0101
3. Bit 1 is an even parity bit for the first 12 bits (bit 2 to bit 13), as 1.
4. Bit 26 is an odd parity bit for the last 12 bits (bit 14 to bit 25), as 0.

Results:

You can get a binary code as 1 1000 0000 1100 1111 0001 0101 0.

3.3.2 Configuration

1. Set Wiegand Type as SHA-1 26bit

Steps:

Go to **Configuration**-> **System Settings**->**Wiegand** to enable wiegand transfer and select protocol type.

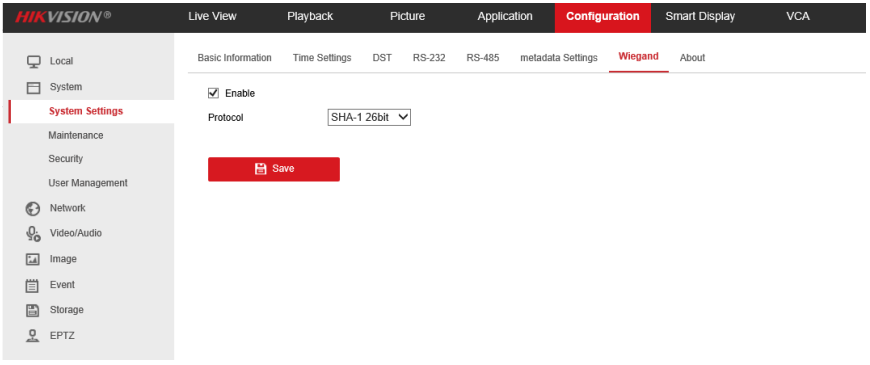


Figure 3-8 Wiegand Configuration Interface

2. For the steps to enable Vehicle Detection, please see 3.1.2 Configuration. Blocklist &Allowlist Configuration is not required.

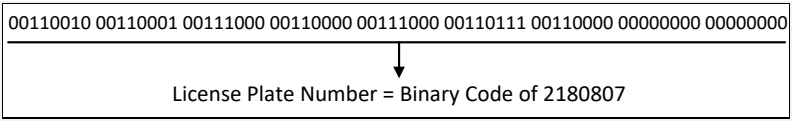
3.4 NEWG 72bit

3.4.1 Protocol Standard

The 72-bit Wiegand format contains 72 data bits and no parity bit.
72 data bits represents for the license plate number information.

Example:
Here we take the license plate number 2180807 as example.
The coding steps are as follows.
Steps:
1. Convert 2180807 to a ASSIC code: 0x32 0x31 0x38 0x30 0x38 0x37 0x30.
2. Add another 2 bytes in the end of the ASSIC code: 0x32 0x31 0x38 0x30 0x38 0x37 0x30 0x00 0x00.
3. Output a binary code of the ASSIC code via the Wiegand interface.

Results:
You can get a binary code as shown in below.



Note:

NEWG 72bit Wiegand protocol does not support transfer license plate number with non-English characters.

3.4.2 Configuration

1. Set Wiegand Type as NEWG 72bit

Steps:

Go to **Configuration**-> **System Settings**->**Wiegand** to enable wiegand transfer and select protocol type.

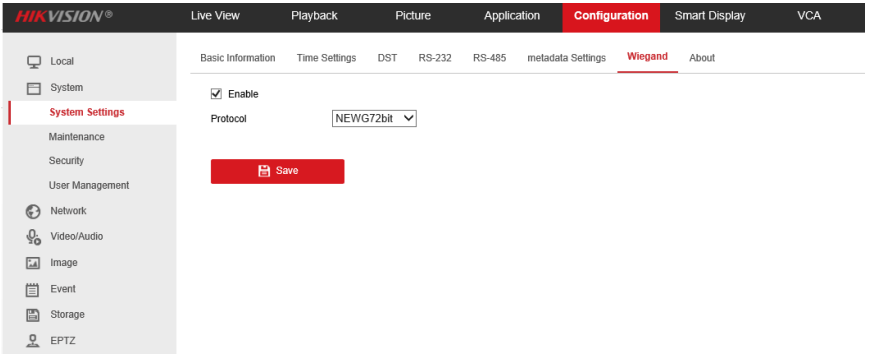


Figure 3-9 Wiegand Configuration Interface

2. For the steps to enable Vehicle Detection, please see 3.1.2 Configuration. Blocklist &Allowlist Configuration is not required.

4 Testing Method

4.1 Software

Collect camera SSH log to check if the license plate is successfully recognized and sent through Wiegand.

Steps:

1. Go to **Configuration**-> **System**->**Security->Security Service** to enable SSH.

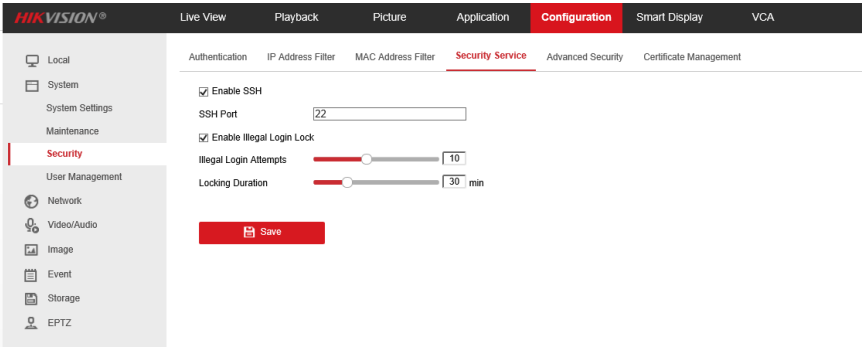


Figure 4-1 SSH Enable Interface

2. Access device via SecureCRT software, enter device debug mode, input the print information that we need:

   setDebug -l 7 –d 111 –m ROAD_TRAFFIC

   setDebug -l 7 –d 111 –m IPC

For more details please refer to ***How to enable SSH and collect the print information***
The URL path is as follows:
ftp://hikftp.hikvision.com:400/Product File(Overseas)/00 Oversea Products/01 IP/01 IPC/11 Installation & How to/09 Serial Port & FTP/How to enable SSH and collect the print information.docx

3. Check device SSH log information.

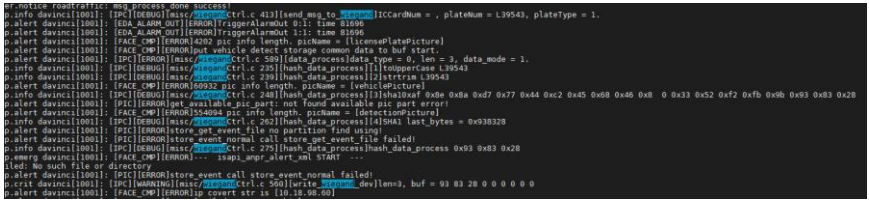


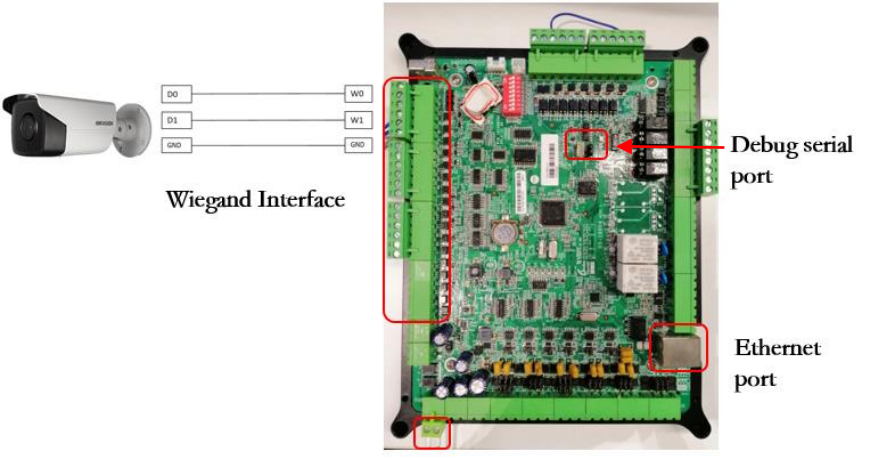
Figure 4-2 Log information

4.2 Hardware

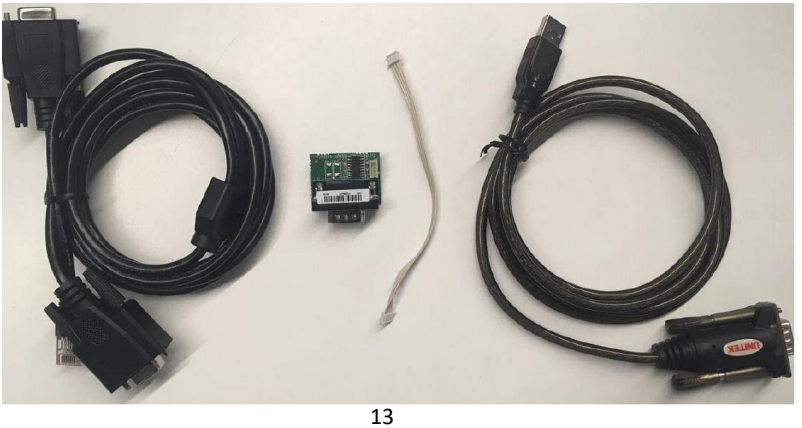
If you use Hik 34bit, CardID 26bit or SHA-1 26bit wiegand protocol, you can test hardware by Hikvison Access Control Controller.

Steps:

1. Connect camera to Hikvision access control controller wiegand interface.



2. Connect 4 pin RS232/RJ45 convertor board to Access Controller debug port and computer USB port.



3. Power on Access Controller.
4. Access device via SecureCRT software, input the print information that we need: **weigenDebugOn**
5. Login camera web page select the wiegand protocol you need. If it is CardID 26bit or HIK 34bit protocol, please configure Blocklist &Allowlist in advance.
6. Check Access Controller log.

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