

# Access Reader

183U-Module/ AR-723-U/ AR-721-K/ AR-725-U/ AR-725-K/ AR-661U



## Table of Contents

<b><a href="#">01. Contents</a></b> .....	01
<b><a href="#">02. Installation</a></b> .....	02
<b><a href="#">03. AR-723-U Terminal Cable</a></b> .....	03
• AR-723-UB (125kHz)	
• AR-723-UD (13.56MHz)	
<b><a href="#">04. AR-723-UD (13.56MHz) Terminal Cable</a></b> .....	03
• Standard RS485 connection	
• RS485 simulates one-way output of RS232	
• Controller connected to reader	
<b><a href="#">05. AR-661U Terminal Cable</a></b> .....	04
<b><a href="#">06. AR-661U Diagram</a></b> .....	04
• 721-H with 2 pcs of 661U for two-door anti-pass-back	
• Improvement of RF interference for 2 pcs of 661U	
• Controller / AR-661U Diagram	
<b><a href="#">07. AR-721-K &amp; AR-725-K/U (125kHz) Terminal Cable / Diagram</a></b> .....	05
<b><a href="#">08. AR-721-K &amp; AR-725-K/U (13.56MHz) Terminal Cable / Diagram</a></b> .....	05
<b><a href="#">09. 183U-Module Terminal Cable / Diagram</a></b> .....	06
<b><a href="#">10. Communication Protocol Function Description</a></b> .....	06
<b><a href="#">11. Extension Function</a></b> .....	07

## 01. Contents

### AR-723-U

1 Product



2 Terminal Cables



### 183U-Module

1 Product



2 Terminal Cables

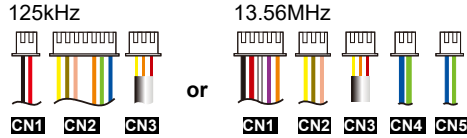


### AR-721-K

1 Product



2 Terminal Cables



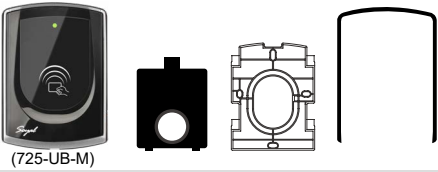
3 Tools



e x1

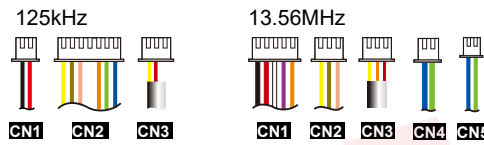
### AR-725-U-M

1 Products

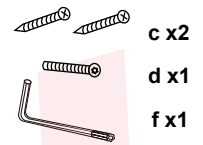


(725-UB-M)

2 Terminal Cables



3 Tools



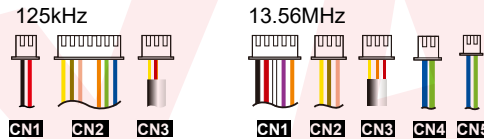
### AR-725-U

1 Products



(725-UB)

2 Terminal Cables



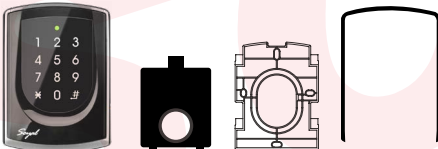
3 Tools



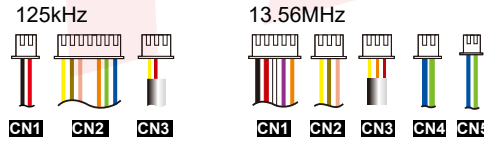
e x1

### AR-725-K-M

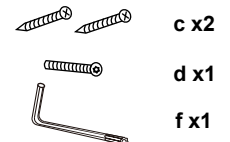
1 Products



2 Terminal Cables

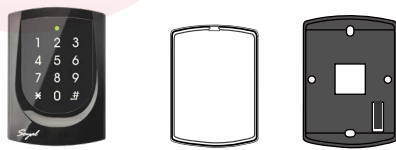


3 Tools

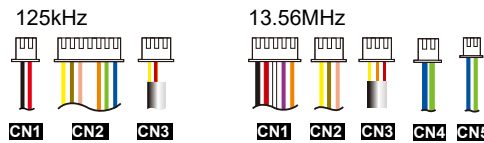


### AR-725-K

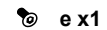
1 Products



2 Terminal Cables



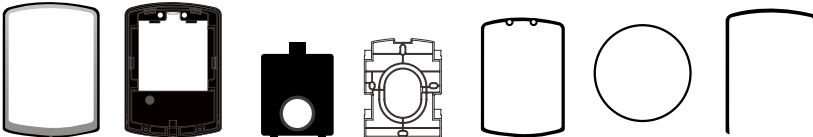
3 Tools



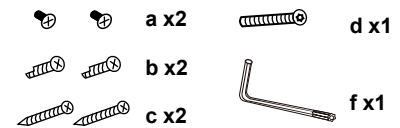
e x1

### AR-725X

1 Products



2 Tools



### AR-661U [Long Range Proximity Reader]

1 Product



2 User Guide



x2

3 Standard Card

[Read Only and Thick]



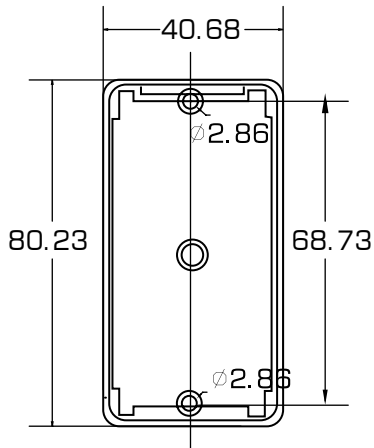
x4

## Parts Description

- a. Button Head Pozidriv Tapping Screw: M3x10
- b. Button Head Pozidriv Slotting Screw: 2.5x10
- c. Flat Head Cap Philips Tapping Screw: 4x19.1
- d. Security Torx Screw: M3.5x15
- e. Flat Head Hex Socket Screw: M3x8
- f. Hex Socket

## 02. Installation

### AR-723-U

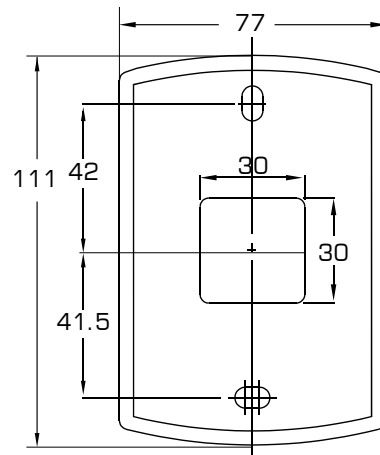


Front View

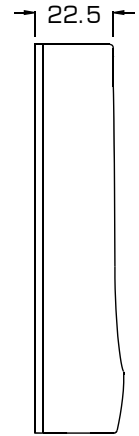


Side view

### AR-721-K

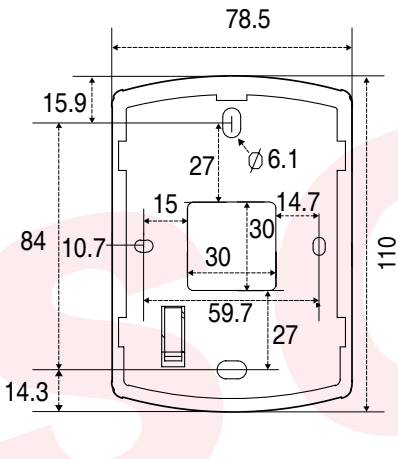


Front View

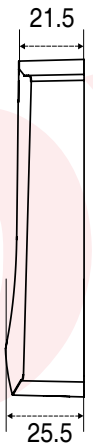


Side view

### AR-725-K/U

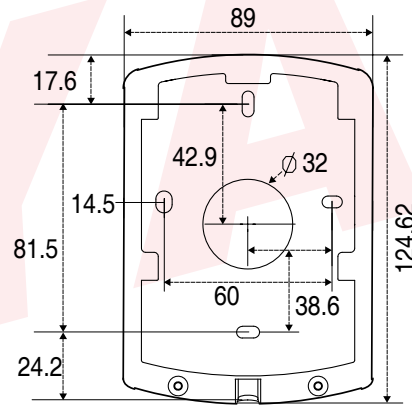


Front View



Side view

### AR-725-K/U(Metal Housing)

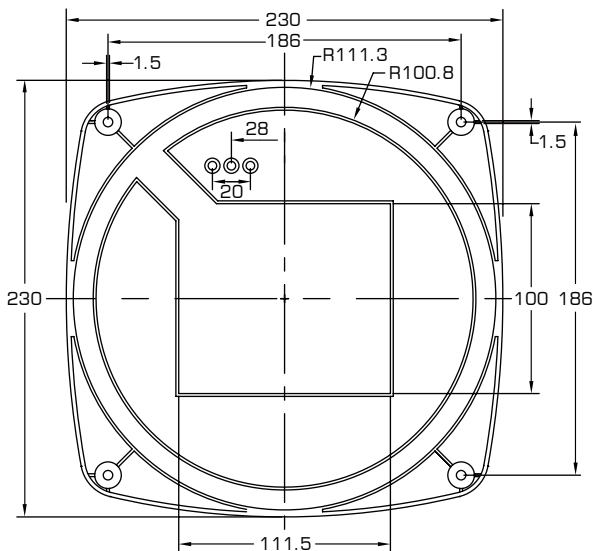


Front View

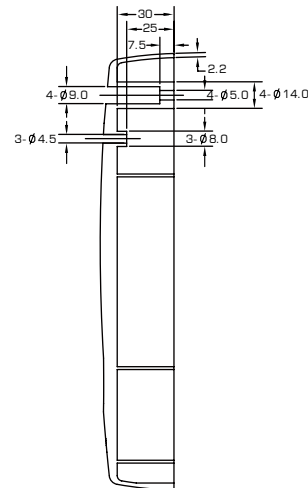


Side view

### AR-661-U



Front View



Side view



## 03. AR-723-U Terminal Cable

### AR-723-UB (125kHz) ※Default Value

Wire Application	Wire	Color	Description
Power	1	Black	DC Power 0V (GND)
	2	Red	DC Power 12V
Beeper	3	Purple	Beeper Input (Low Sound)
LED	4	Brown	LED Green Input
LED	5	Yellow	LED Red Input
Card Present	6	White	Card Present
Wiegand	7	Green	Wiegand DAT:0 Output
	8	Blue	Wiegand DAT:1 Output
Beeper	9	Gray	Beeper Output
	10	Orange	--

AR-723-U RS-232 TTL:(By order) Format: 9600, N, 8, 1  
 DAT:0: TTL Inverted Serial Output.(Connect to PC COM port)  
 DAT:1: TTL Serial Output. (Connect to PC COM port through RS-232 invert driver)

### AR-723-UD (13.56MHz)

Wire Application	Wire	Color	Description
Power	1	Black	DC Power 0V (GND)
	2	Red	DC Power 12V
Beeper	3	Purple	Beeper Input (Low Sound)
LED	4	Brown	LED Green Input
LED	5	Yellow	LED Red Input
Card Present	6	White	Card Present
Wiegand	7	Green	Wiegand DAT:0 Output
	8	Blue	Wiegand DAT:1 Output
Networking	9	Gray	RS-485(A+)
	10	Orange	RS-485(B-)

※Default Value

#### Output Selection

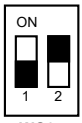
Output	232 (TTL)/ ABA (DIP_SW1)	26/34 (DIP_SW2)
WG26	OFF	OFF
※WG34	OFF	ON
RS-232(TTL:By order)	ON	OFF
ABA II	ON	ON

#### Output Selection

Output	26/34(DIP_SW1)	232(TTL)/ ABA(DIP_SW2)
WG26	ON	OFF
※WG34	OFF	OFF
ABAII	OFF	ON
RS-232(TTL:By order)	ON	ON



WG34  
AR-723-UD[13.56MHz]

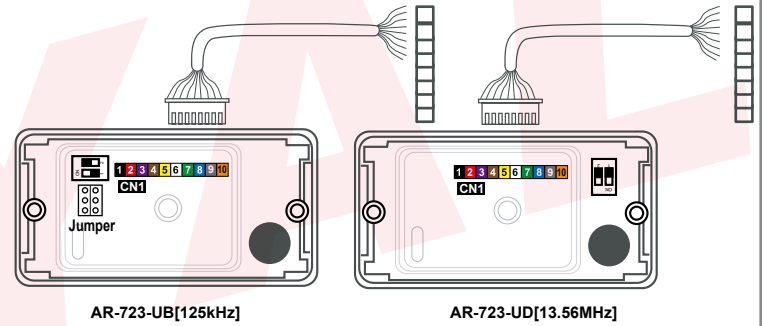


WG34  
AR-723-UB[125kHz]

#### Communication Option (Jumper)

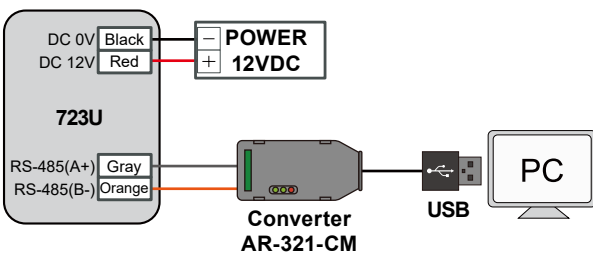
Communication Mode	Jumper adjustment	Wiegand DAT:0 Output	Wiegand DAT:1 Output
※WG Mode	DAT :1 DAT :0 	WG-D0	WG-D1
UART Mode	Tx Rx 	Rx	Tx

When selecting UART Mode, it is suggested to purchase additional converter (AR-321L485-12V)

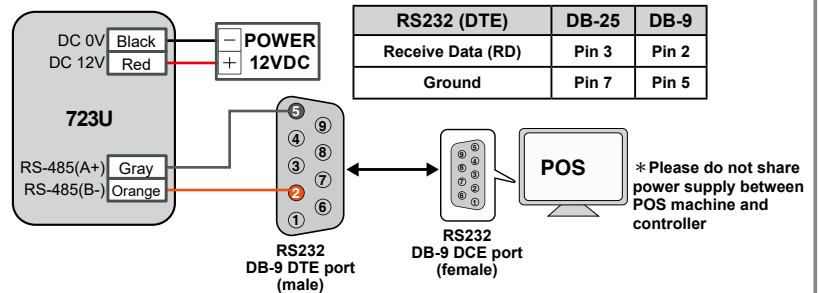


## 04. AR-723-UD (13.56MHz) Terminal Cable

### Standard RS485 connection

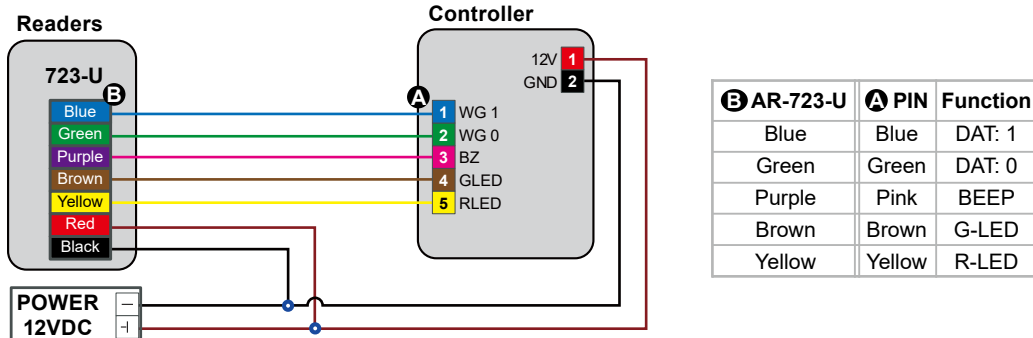


### RS485 simulates one-way output of RS232



\* Please do not share power supply between POS machine and controller

## Controller connected to reader



③ AR-723-U	① PIN	Function
Blue	Blue	DAT: 1
Green	Green	DAT: 0
Purple	Pink	BEEP
Brown	Brown	G-LED
Yellow	Yellow	R-LED

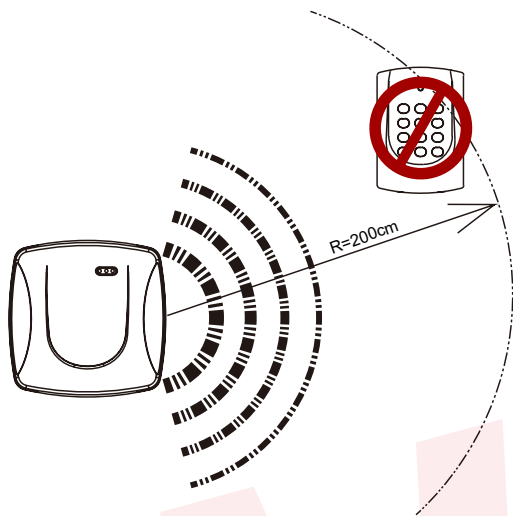
## 05. AR-661U Terminal Cable

Wire Application	Wire	Color	Description	Remark
Power	1	Black	DC 0V (GND)	regulated
	2	Red	DC 12V~18V	
Beeper	3	Purple	Beeper Output	
Wiegand	4	Green	Wiegand DAT:0	Open collected
	5	White	Card Present	
Wiegand	6	Blue	Wiegand DAT:1	Open collected
Output Selection	7	Yellow	SET1	
	8	Brown	SET2	
	9	Gray	SET3	Reserve

Output Selection	WG26	WG34	RS-232 (TTL)	WG34 + 4
SET 1	Open	Short to GND	Open	Short to GND
SET 2	Open	Open	Short to GND	Short to GND

※ **Note:**  
WG34+4: Follow 0101 after WG34 data stream for reader identification.

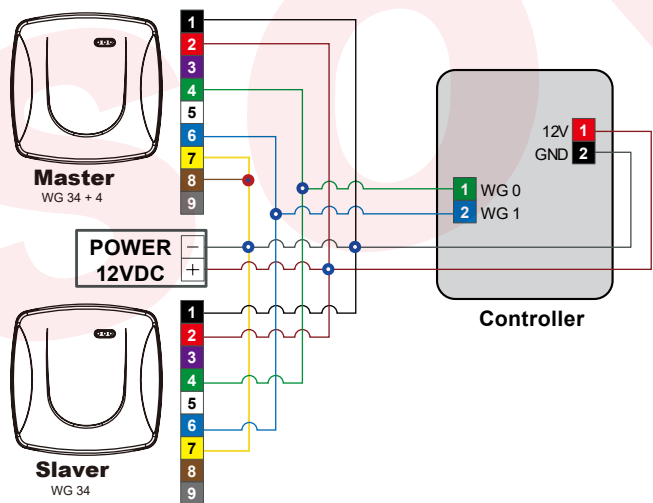
※ Minimum distance between AR-661U & other proximity reader should be over 200cm; otherwise, both readers might interfere each other.



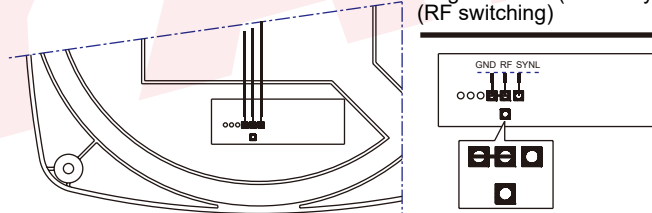
## 06. AR-661U Diagram

721-H with 2 pcs of 661U for two-door anti-pass-back

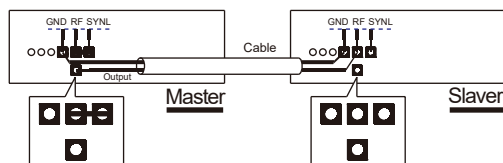
Improvement of RF interference for 2 pcs of 661U anti-pass-back



Single Reader (RF always ON) (RF switching)

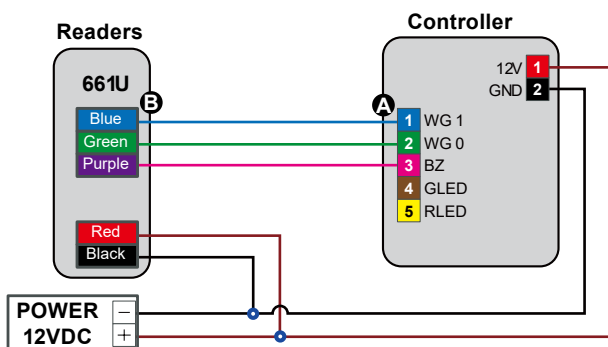


Two AR-661U Readers Wiring



※ When the distance between two AR-661U readers is less than 6m (recommended value), the sensing distance will be shortened. However, you can use this method to avoid interference.

## Controller / AR-661U Diagram



※ No 661U needs to connect to LED

AR-661U	PIN	Function
Blue	Blue	DAT: 1
Green	Green	DAT: 0
Purple	Pink	BEEP
---	Brown	G-LED
---	Yellow	R-LED



## 07. AR-721-K & AR-725-K/U (125kHz) Terminal Cable / Diagram

### Cable: CN1

Wire Application	Wire	Color	Description
Power	1	Red	DC Power 12V
	2	Black	DC Power 0V

### Cable: CN2

Wire Application	Wire	Color	Description
Wiegand	1	Thin Blue	Wiegand DAT: 1 Input ABA Format: Clock
	2	Thin Green	Wiegand DAT: 0 Input ABA Format: Data
ABA	3	Orange	ABA Format: Card Present
	4		No Connection
Beeper	5	Pink	Beeper Input (Low Sound)
LED	6	Brown	LED Green Input (Low Bright)
	7	Yellow	LED Red Input (Low Bright)

### Cable: CN3

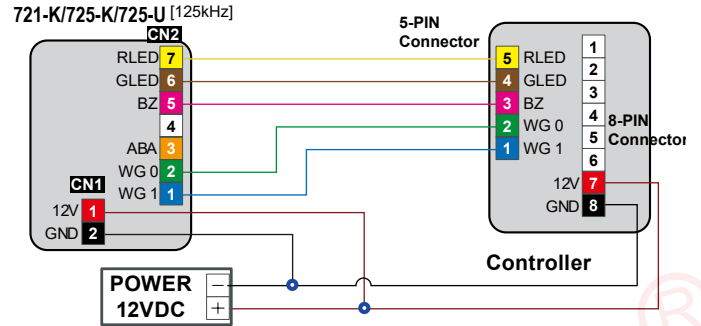
Wire Application	Wire	Color	Description
Tamper Switch	1	Red	N.C.
	2	Orange	COM
	3	Yellow	N.O.

### Wiegand Output Format

Output Format	WG	J2	RST/Bits
Wiegand 26 Bit	<input type="checkbox"/> Open	<input type="checkbox"/> Open	<input type="checkbox"/> Open
Wiegand 34 Bit	<input type="checkbox"/> Open	<input type="checkbox"/> Open	<input type="checkbox"/> Short
RS-232	<input type="checkbox"/> Short	<input type="checkbox"/> Open	<input type="checkbox"/> Open
Magnetic ( ABA 8 Digital )	<input type="checkbox"/> Short	<input type="checkbox"/> Open	<input type="checkbox"/> Short
Magnetic( ABA 10 Digital )	<input type="checkbox"/> Short	<input type="checkbox"/> Open	<input type="checkbox"/> Open

### EM(125kHz)

※ Cable position is showed in the Terminal Cable



## 08. AR-721-K & AR-725-K/U (13.56MHz) Terminal Cable / Diagram

### Cable: CN1

Wire Application	Wire	Color	Description
Output Format	1	Orange	SET2
	2	Purple	SET1
	3	White	Reading card
Power	4	Thick Red	DC 12V
	5	Thick Black	DC 0V (GND)

### Cable: CN2

Wire Application	Wire	Color	Description
Beeper	1	Pink	Beeper Input (Input Low)
LED	2	Brown	LED Green Input (Input Low)
	3	Yellow	LED Red Input (Input Low)

### Cable: CN3

Wire Application	Wire	Color	Description
Tamper Switch	1	Red	N.C.
	2	Orange	COM
	3	Yellow	N.O.

### Cable: CN4

Wire Application	Wire	Color	Description
Networking Module	1	Thick Green	RS-485 (B-)
	2	Thick Blue	RS-485 (A+)

### Cable: CN5

Wire Application	Wire	Color	Description
2-PIN Connector	1	Thin Green	WG DAT:0 Output ABA Format: Data
Wiegand	2	Thin Blue	WG DAT:1 Input ABA Format: Clock

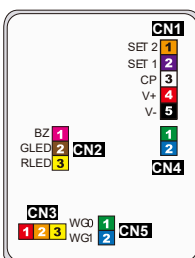
### Mifare(13.56MHz)

721-K/725-K/725-U [13.56MHz]

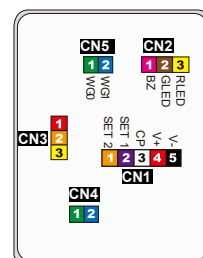
※ Cable position is showed in the Terminal Cable

### Output Format

Output Format	SET 1	SET 2	Note
WG-26	Open	Open	Hex
WG-34	Open	Short to GND	Hex
ABA-10	Short to GND	Open	BCD 10
ABA-5-5	Short to GND	Short to GND	BCD 5:5



AR-721-K [13.56MHz]



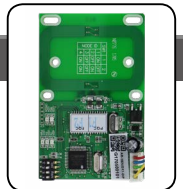
AR-725-K/U [13.56MHz]



Tag Format	J3
SOYAL Format	<input type="checkbox"/> Short
EM Format [Default]	<input type="checkbox"/> Open



## 09. 183U-Module Terminal Cable / Diagram



Cable: **CN1**

Wire Application	Wire	Color	Description
Power	1	Red	DC12V
Networking	2	Blue	RS-485 (A+)
	3	Green	RS-485 (B-)
Power	4	Black	DC 0V (GND)
--	5	Yellow	--

## 10. Communication Protocol Function Description

**Table 10-1. Explanation of Communication Protocol Functions.**

Echo	Value	Description	[i.e.] Card Number = 01234:56789
Head	7E	Initial Value	
Length	09	Compute the data length from Node to the end including XOR and SUM	
Node Function	00	The value 00 is fixed, the message would be sent to PC from the device	
Data Field	03	Receive data from AR-723-U (early version 71)	
	01		
UID 0~31bits	04	Site H	Site Code – High [UID31-24]
	D2	Site L	Site Code – Low [UID23-16]
	DD	Card H	Card Code – High [UID15-8]
	D5	Card L	Card Code – Low [UID7-0]
Type	01	- B (125kHz): CID [Bits(39~32)] - D (13.56MHz): Chip ID (Please refer to Table 10-2) - S (125kHz & 13.56MHz) : Tag Type (Please refer to Table 10-3)	
UID 32~64bits (For use with 183U module only)	04	Site H	Site Code – High [UID31-24]
	D2	Site L	Site Code – Low [UID23-16]
	DD	Card H	Card Code – High [UID15-8]
	D5	Card L	Card Code – Low [UID7-0]
XOR	51	XOR=FF^00^71^04^D2^DD^D5^01 =51	
SUM	4B	SUM=(00+71+04+D2+DD+D5+01+51) · FF=4B(LSB)	

Using card number = 27214:505380 as an example (format: Mifare DESFire 7 byte)

**7E 0D 00 03 01 6A 4E 15 04 05 80 5E C8 DB 5B**  
Card Number
Chip ID
Card Number
XOR
SUM

**Table 10-2. 13.56MHz Chip ID Mapping**

Chip	Unknown	Ultra Light	Standard 1K	Plus 4K	SOR-LAM	SOR-UIM	SOR-CIM	SOR-SIM
Code	0x00	0x01	0x02	0x03	0x22	0x42	0x42	0x82

**Table 10-3. Dual Band (125kHz & 13.56MHz) Tag Type Mapping**

Tags	ISO14443A	ISO14443B	ISO15693	125kHz (EM)
Code	0x00	0x01	0x02	0x03

## 10. Extension Function

- FAQ : [How to setup the access mode as card plus pin on main controller and card only on weigand reader?](#)
- FAQ : [How to setup the door number of controller and reader in different configurations?](#)
- FAQ : [Why I had set the new Wiegand Door Number, but it is still same to the Door Number?](#)
- FAQ : [How to set up WG format of AR-661U?](#)

SOYAL<sup>®</sup>