AB305 and AB305X

2.4GHz Long Range Active Tag Reader

User Manual

AB305

AB305X

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1. Introduction

AB305 and AB305X Long Range RFID Active Tag reader is widely used for labor , vehicle , Smart Assets , GPS , School , Hospital , Mining , Surveillance , Car Park , Logistic , Zoo and so on.

Thanks to the innovation of RFID technology, AB305 and AB305X have been developed to recognised any RFID active tags automatically. It operates at 2.4GHz to 2.45GHz. It can automatically all the active tags within about 16 meters with adjustable range.

AB305 and AB305X communicate with Host PC through the USB port. Host PC collects tags ID information and upload to the system database for further processing. We have provided the source code of the Demo application. Customer can make use of the Demo Application code for further application development.

AB305 and AB305X RFID reader work with AB82 and AB65 active tags which are built-in batteries. They transmits Tags' ID every 3 seconds. For example, the life time of AB81 can be as long as 4 years.

2. General Specification

Items	Specifications	Remarks
Dimension	103mm*66mm*27mm	Exclude Antenna
Weight	138g	
Chassis Material	Aluminium alloy	
COM Port	Mini-USB	Baud Rate 9600bps
Range Adjust	Dip Switch	5 positions
Read Rate	➢ 100 tags/s	
LED Indicator	Power	Red
RF Parameters	Frequency : 2.4GHz	
	Modulation : GFSK	
Antenna	2dBi	Omnidirectional
	SMA (Female)	
Power	< 500mW	

3. Read Range Settings

The read range can be adjusted according to the dip switch setting as below (0 ~31dB)

Dip Switch	1	2	3	4	5
Attenuation (dB)	16	8	4	2	1

Read-range Estimation with Different Antenna

Antenna Type	Tags Read-range distance (meters)
On-board micro strip-line	16
2dBi Omnidirectional	16
5dBi Omnidirectional	20
10dBi Omnidirectional	26
14dBi Omnidirectional	30
14dBi directional	50

Read Range Performance

Below read range performance is based on using 2dBi omnidirectional antenna.

Attenuation (dB)	Read Range (m)	Attenuation (dB)	Read Range (m)
0	8.00 ~ 16.00	16	2.64 ~ 5.28
1	7.46 ~ 14.92	17	2.46 ~ 4.92
2	6.96 ~ 13.92	18	2.30 ~ 4.60
3	6.50 ~ 13.00	19	2.14 ~ 4.28
4	6.06 ~ 12.12	20	2.00 ~ 4.00
5	5.66 ~ 11.32	21	1.87 ~ 3.74
6	5.28 ~ 10.56	22	1.74 ~ 3.48
7	4.92 ~ 9.84	23	1.62 ~ 3.24
8	4.59 ~ 9.18	24	1.52 ~ 3.04
9	4.29 ~ 8.58	25	1.41 ~ 2.82
10	4.00 ~ 8.00	26	1.32 ~ 2.62
11	3.73 ~ 7.46	27	1.23 ~ 2.46
12	3.48 ~ 6.96	28	1.15 ~ 2.30
13	3.25 ~ 6.50	29	1.07 ~ 2.14
14	3.03 ~ 6.06	30	1.00 ~ 2.00
15	2.83 ~ 5.66	31	0.93 ~ 1.86

Remarks:

Formula : X*2^(dB/10) = Y

dB : Attenuation (dB)

X : Distance after attenuation

Y : Distance without attenuation

4. Communication Protocol

After the RFID Reader AB305 or AB305X connected to the Host PC via the mini-USB cable, the PC will assign a serial port number for this device.

4.1 Serial Port Settings

Data Bit : 8

Stop Bit : 1

Parity : NA

Flow Control : NA

Baud Rate : 9600

4.2 Data Format

	Preamble	Address	Status	Tag ID	Checksum
Bytes	5	1	1	4	1
Contents	FF FF FF FF FF	01 (default)	01	01 00 00 4A	4B

Remarks:

(i) Tag Status Byte : When the highest bit is set to 1, it presents the battery level in the RFID active tag is low. For example, 81H represents battery low. 01H represents that the battery level is normal.

(ii) Checksum Byte : XOR = Address ^ Tag ID

For example, 4B = 01^01^01^00^00^4A

5. Demo Application

5.1 PC Driver Installation

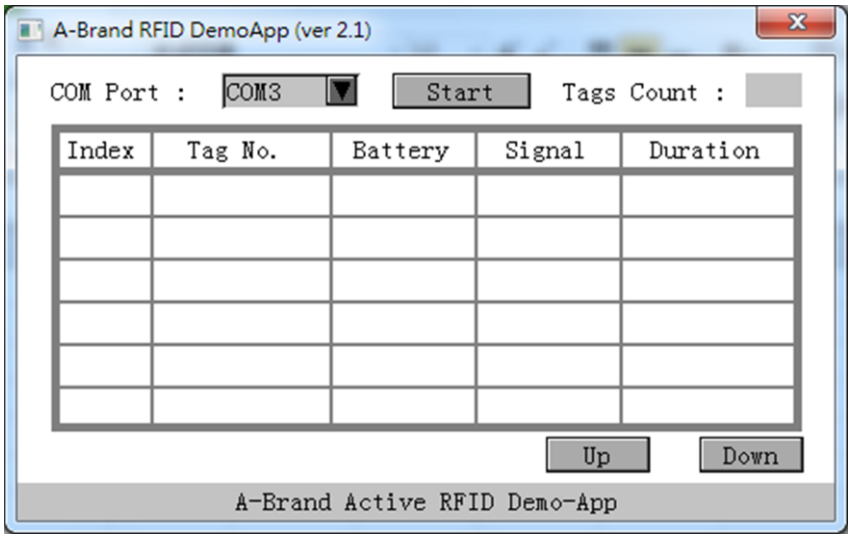
For XP , Window 7 or above , there is no need for driver installation normally. If needed, please install the driver within the CDROM.

After installation, user can plug in the AB305 or AB305X device. There is a "USB-to- Serial Com Port " device if you review the Device Manager of you PC. In another words, you PC has assigned a COM port to AB305 or AB305X.

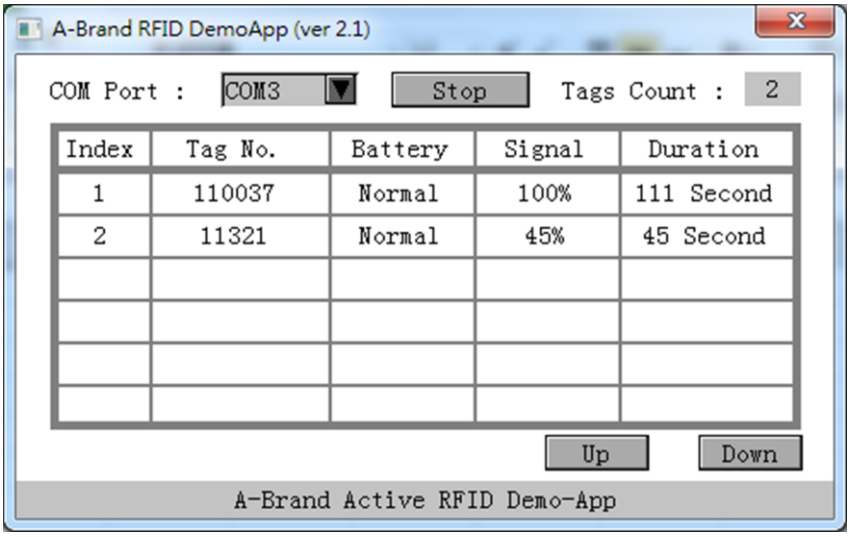
5.2 Demo App Operation

Below shows the Demo Application

After entered the Demo Application, it will automatically get the COM port number.



After user clicking the “Start” button, AB305 or AB305X will automatically search for ALL RFID active tags within the reading range. Then it will display the relevant Tags’ information accordingly. Below shows the example of the display.



It provides the information bellows

(i) Quantity of unique active tags and their corresponding ID

(ii) Battery level status of each active tag. If below safety level, it will alert customer for replacement.

(iii) Show the received signal strength quality

(iv) Duration of each RFID active tags being linked to the reader

Customers can use our open-sourced DemoApp to customer their Applications accordingly

Long-range Active Tags Suitable for AB305 and AB305X

Tag Model No.	Descriptions
AB81	Long-range active tag with 4 year life time. Button cell battery cannot be replaceable by user
AB82	Long-range active tag with 2 year life time. Button cell battery can be replaceable by user
AB65	Long-range active tag with 1 year life time. Button cell battery can be replaceable by user
AB90	Long-range active tag with 2 year life time. Button cell battery cannot be replaceable by user
AB10T	Long-range active tag with button cell battery replaceable by user. When user press its tact-switch, it will give out (i) an audible beep sound and (ii) a visual alert with red LED light up. Therefore user can notice that it already successfully transmit the signal to AB302/ AB301

For detail, please refer to specific listings accordingly

End of Document