User's Guide

——1106B UHF long distance integrating reader

Chapter 1: Summary

1106B is an integrated RFID machine including reader and antenna. It supports ISO18000-6B, and this kind of tag has a globally unique serial number of 64 bits as the card number .

There is a linear polarization antenna with gain of 7 dBi in 1106B ,normally the read distance is more than 6 m .

After identifying a RFID tag, it sends ID card number through communication interface(RS232, Wiegand26.) to background devices(MCU controller, PC).

1106B has been widely applied in parking management, access control.

Chapter 2: Appearance and Technical Parameters

2.1 Appearance

Exterior look of 1106B reader is shown in the following figure. The shell is designed for outdoor environment and working all day.

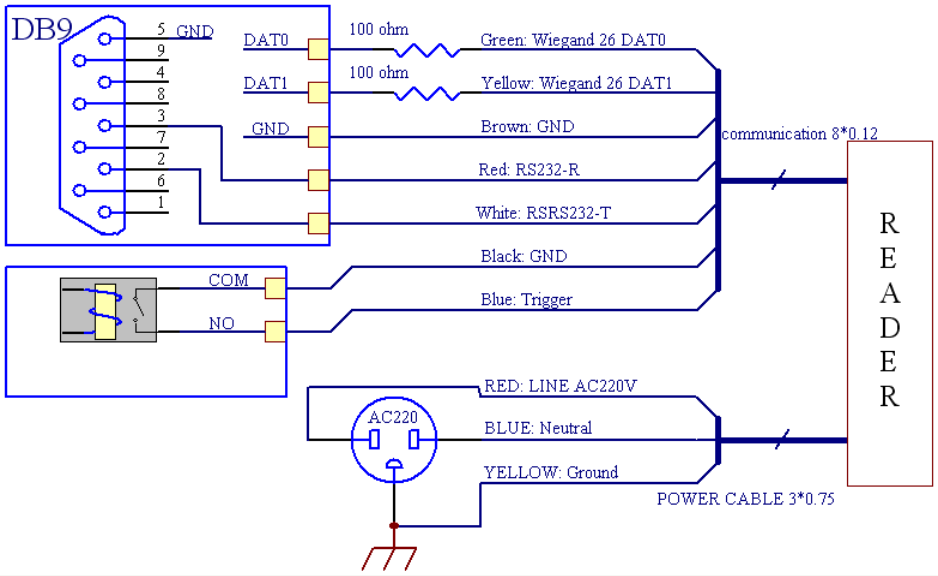
It has 2 wires ,one for power supply ,AC220V ,the other is for data communication .

1106B is standard outfitted with a set of wall fixer, also it could be fixed with cylindrical.

Fig. 1 Appearance of 1106B

2.2 Ports

2.2.1 connection diagram



On AC 220V aerial socket, No. 1 is neutral, No. 2 is hot, and No. 3 is ground.

Definition of Data wire as follows

Fig. 2 Back interface array

RS232		Wiegand26		Digital Input	GND
RS232-T	RS232-R	DAT0	DAT1		
White	Red	Green	Yellow	Blue	Black/Brown
9600 N 8 1		Wiegand 26		EN_read	Reference for all communication

NOTE: read tag when the blue wire connected with GND, otherwise keep quiet .

RS-232 cable should have a length less than 10 meters to obtain the stable connection.

2.2.2 RS232/RS485 protocal

2.2.2.1. RS232/RS485 port setting as "9600 n 8 1"

2.2.2.2. control word:

STX：0x02 ; ETX：0x03;

DLE：0x10 (when data byte is 0x02 ,0x03 or 0x10 , DLE should be inserted before the data)

2.2.2..3.frame format：

STX+Length +Message type +RFU1+RFU2+8 bytes UID +3bytes wiegand26 +RFU3+ Checksum +ETX

① STX: 1 byte, 0x02;

② length: 1 byte, 0x11;

③ Message type: 1 byte, 0x01;

④RFU1: 1 byte , 0x00;

⑤RFU2: 1 byte, 0x00;

⑥UID： 8 bytes , 0x00-0xff;

⑦Wiegand26： 3 bytes, 0x00-0xff;

⑧RFU3: 1 byte, 0x00;

⑨Checksum: 1 byte , complement number from "Length" to "RFU3",
=0x100-((0x11+0x01+0x00+0x00+UIDs+W26s+0x00)&0x00ff);

⑩ETX： 1 byte, 0x03;

2.2.2..4. examples of return data

①: 02 11 01 00 00 e0 04 bc 98 c8 00 00 00 8c 80 00 00 e2 03

②: 02 11 01 00 00 e0 04 00 00 a2 97 79 01 0a 29 71 00 b3 03

2.2.3 Wiegand26 output

According to Wiegand standard, in the 26 bits format, the middle 24 bits are card number, remain 2 bits at the beginning and end are odd and even check digits.

2.3 Technical Parameters

Operating Frequency: 915-928 MHz, in a frequency range available without certification by FCC

Antenna: Internal linear polarized antenna of 7dBi

Read Angle: 40°

Read Distance: 6-10 m as the farthest, variable with the environment

Power: AC 220V±10%, 50/60Hz, 0.5A

Output Ports: RS232, Wiegand26

Operating Temperature: -30° C to +65° C
Operating Humidity: ＜95% RH
Dimension(maximum): about 28cm *38cm*14cm
Weight: about 2.5kg

Chapter 3: Application

This product can be applied in item identification and data collection. The excellent read function can be widely resorted in the following fields:

Transportation management: road, railway transportation management and container transportation management;

Mobile vehicle management: supervision of police, transportation and other administration on mobile vehicles;

Road/bridge toll collection: with tag data read ability at a high speed from a long distance, this product can perform non-stop toll collection;

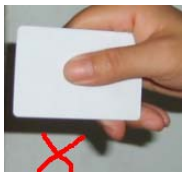
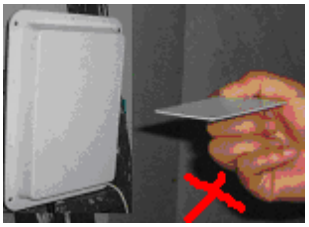
Logistics management: commodity circulation and logistics management, circulation management of mails, packages and aviation parcels;

Parking management: identification for management and charge;

Manufacture process: supervise parts in the whole manufacture process;

3.1 fixture


3.2 tag matching

 	linear polarization antenna
 	Inner antenna of Tag would be affected by hand
 	polarization antenna mismatching

Chapter 4: Guide for the field application of vehicles

4.1 Field application of the reader

4.1.1 Principles for choosing installing position for 1106B reader

Guarantee enough read time (at least 20ms) for the vehicles at a certain speed to get through reader, and render controlling devices enough operation time to perform brake control action.

No metallic objects block between the reader and the tag

Make the distance between the reader and controlling devices as close as possible. Take the application of parking management as an example as the following:

Installing method 1:

Without safety island as a middle partition, the road control devices (the brake) are mounted on the two sides of the road and the vehicles pass the read area at 30 km/h. In this circumstance, 1106B should be close to the brake and its read range (the largest distance in the beeline is 0.5-8 m) should cover the loop coils at entrance and exit, as in Figure 3.

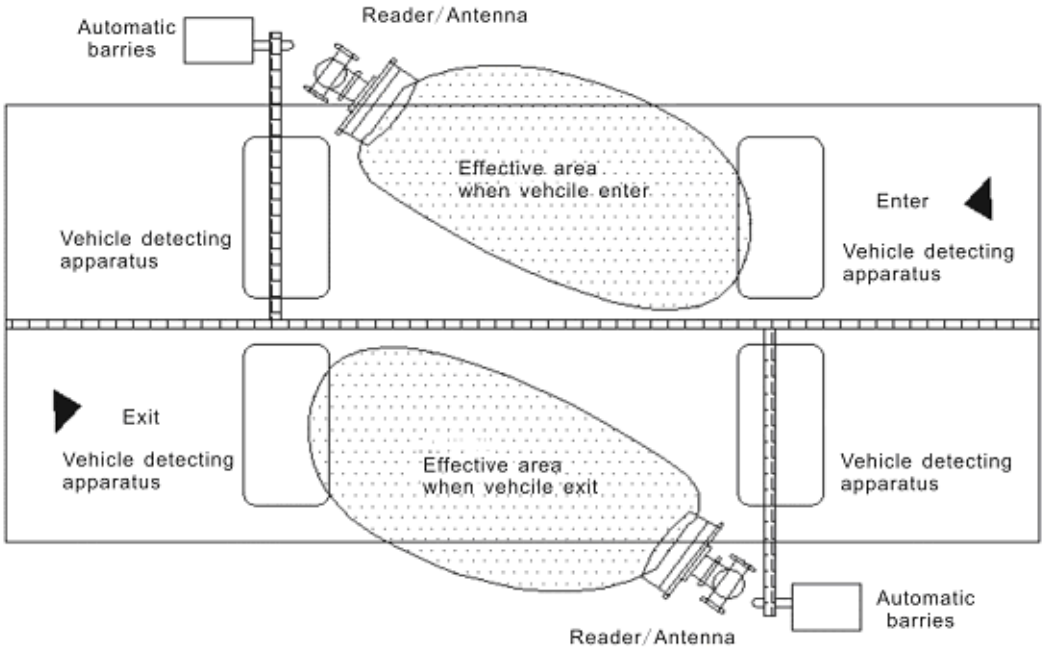


Figure 3 Installing method 1

Installing method 2:

With safety island as a middle partition, the road control devices (the brake) are mounted on the safety island and the vehicles pass the read area at 30 km/h. In this circumstance, 1106B should be close to the brake and its read range (the largest distance in the beeline is 0.5-8 m) should cover the loop coils at entrance and exit, as in Figure 4.

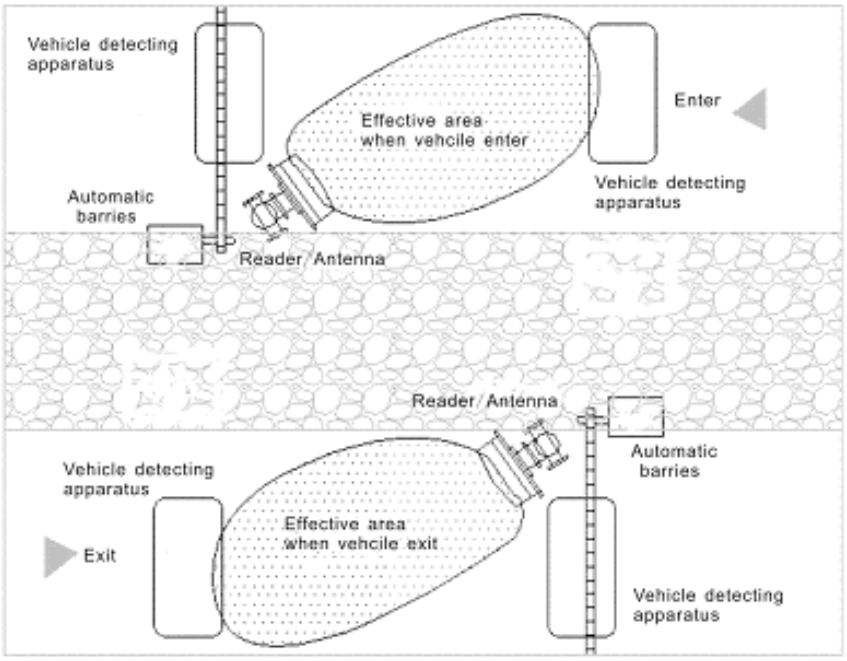


Figure 4 Installing method 2

4.2 Usage of ISO 18000-6B electronic tags

4.2.1 Mounting position of RFID tags on the vehicles

RFID tag application in vehicle management system is to mount tags on the windshield of the vehicles, as in Figure 5. The specific mounting position should be decided by the mounting position of the reader.

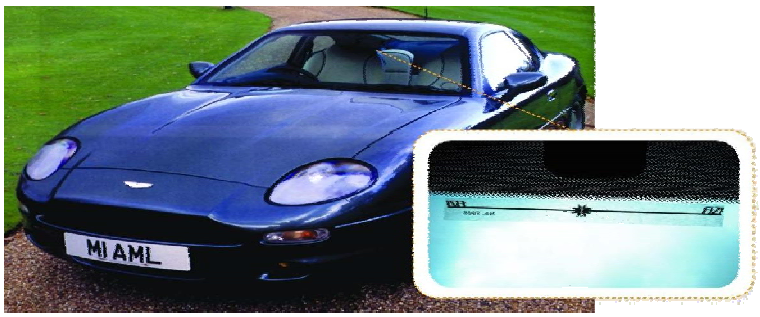


Figure 5 RFID tag mounted on the windshield

The best position for RFID tags: if the reader mounted on the left side of the road, the tag should also be mounted on the left side of the windshield and vice versa. If the reader mounted on the right above position, the tag should be mounted nearby the inside rearview mirror the middle line of the windshield. For the small cars, RFID tags should be mounted on the upper area of the windshield. For the big cars, RFID tags should be mounted on the lower area of the windshield. The principle is not to curtain off the sight of the driver.

4.2.2 Distribution and management of RFID tags

It includes two parts of user registration and management and tag distribution and management.

User registration and management

Before the reader user distributes RFID tags, all the clients should be registered and designated

with card numbers. The registration information includes:
Tag user name: Full name of the unit or the person;
Card number: Compiled by the reader user, also called as serial number of tags;
Card distribution time: Record the last date of the card distribution to the clients;
Distribution times: Record whether the clients receive the card. If the cards are missing, the distribution number will be recorded.
Tag ID number: Record the ID number of the RFID tags distributed.
Tag distribution and management
When reading tag ID number: read ID number of the current electronic tags;
Registration of tag clients: add “card number”, “user” and other information into the management data base;
RFID tag authorization check: distinguish the current RFID tag number;
Tag ID record: write the ID number of the electronic tags read into database.

4.2.3 Attention for RFID tag mounting
1) Two methods for mounting the numbered tags on the correspondent vehicles:
* Sticky tags for the vehicle glass can be attached directly to the windshield: use the tags enclosed with soft gooey of strong adhesive;
* RFID tags with credit card enclosure need to be put into special socket attached to the windshield: usually the tags in the form of card enclosed with ABS, PVC and other materials.
2) If there is metal membrane on the windshield, the electronic tags should be mounted according to the following method:
* Original windshield with membrane anti ultraviolet radiation: according to European standard, in the area of rearview mirror on the windshield, the manufacturer has left previously a microwave window of 180mm*70mm without containing metal ion specifically for RFID tags.
* Non-original windshield with membrane anti ultraviolet radiation: cut out a naked glass window of 180mm*70mm specifically for electronic tag mounting at a comparatively hidden place.
* Metal tags could be mounted in open air at places like the car brand, rain scraper and other position with anti disassembly measures.

Chapter 5 After services

5.1 Service attention
* Product quality guarantee period is 1 year. Within this period, the supplier will keep it in good repair without charge for the impair due to its own deficiency in quality;
* The product should not be returned once sold, except repair and change due to the deficiency in the quality of the product;
* When return the readers for repair, please put it and its accessories into package into the original foam wrapper or another package to protect them.
* Non-commitment clause: Any radio transmit device could possibly cause electromagnetic interference to other industrial, medical and scientific research devices. This non-commitment clause suggests: this device could cause electromagnetic interference to other electric devices and we do not commit any responsibility for this. Our suggestion is: we need to obey the relevant local regulations. If any interference occurs, we could consult with the manufacturers for the devices against interference, or use only one device one time.

5.2 Product packaging

Title for accessories	Quantity	Remark
1106B reader	1	
User’s Guide	1	
ferrule	2	