

# **R781/R782-8DB**

## **Long distance UHF electronic tag reader an instruction manual**



## Brief introduction

- This product has multi protocol compatibility, fast reading speed and waterproof appearance design, meeting the requirements of harsh working environment
- Fully support electronic labels conforming to iso-18000-6c (EPC G2);
- Support USB, RS232, wiegand26 / 34 and other communication modes;
- The output power is adjustable up to 30dBm, and supports multiple working modes such as timing mode, master-slave mode and trigger mode;
- Application suitable for: vehicle access control, automatic toll collection without stopping, personnel access control management, logistics monitoring, production automation management and other fields

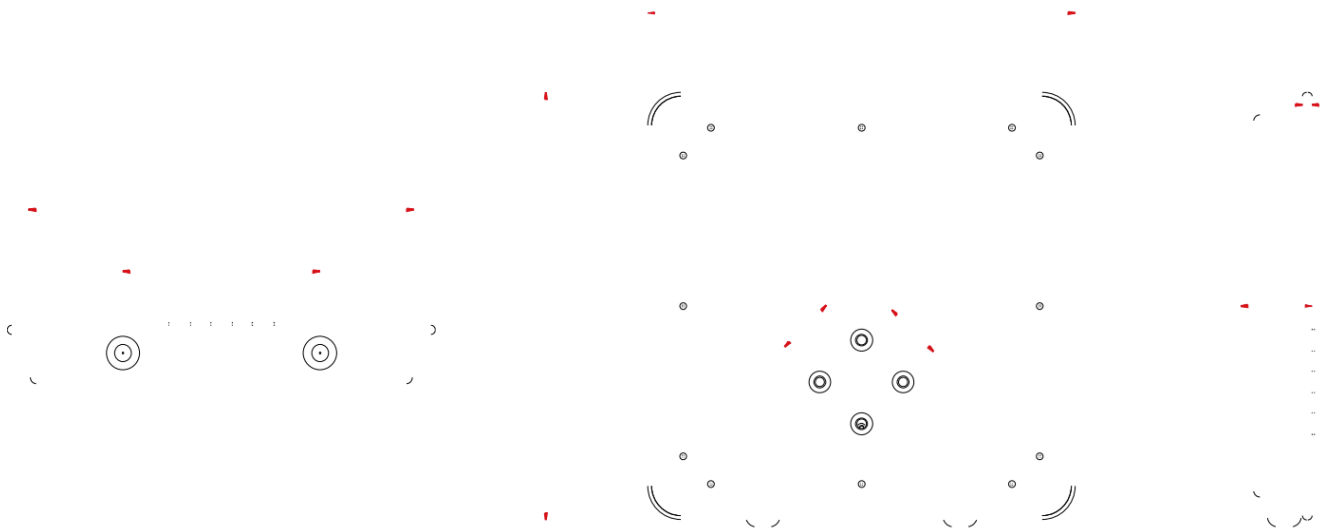
## Technical parameter

Working Frequency	Standard configuration ism 902 ~ 928mhz or ism 865 ~ 868 mhz optional, other frequency bands can be customized
Antenna gain	Built in circular polarization antenna, gain 8dbi
Agreement	ISO18000-6C (EPC G2)
Development package	Provide SDK development packages, and provide C #, VC, VB, Java, Delphi development routines
Software	Provide test demo, automatic card writing and card reading demo to facilitate customers to issue and write cards
Output power	0 ~ 30dBm, software adjustable
Communication interface	N type: wiegand26 / 34, RS232 / RS485, USB Type E: wiegand26 / 34, RS232 / RS485, TCP, USB
Input interface	1 channel trigger input
Card reading mode	Timed automatic card reading and external trigger controlled card reading, set by software
Card reading speed	Set by software, the average reading time of a single card is less than 6ms per 64bits
Read distance	0-5 m (high power 0 ~ 8m) (reading distance is related to label and site environment)
Working temperature	-40℃~+65℃
Storage temperature	-45℃~+95℃

Power requirements	DC12V,3A
Size	240mm×240mm×50mm
Weighte	-1.2 kg (2.2kg with package)

## Size structure of reader / writer

Unit:mm



## Purpose of reader / writer

It can be used for article identification and data collection. With its good characteristics, it can be widely used in the following fields:

- 1) Transportation management: highway, railway transportation management and container transportation management;
- 2) Motor vehicle management: monitoring and management of various motor vehicles by public security, transportation and other departments;
- 3) Road and bridge charging: since this product has the ability to read label data at a high speed from a long distance, road and bridge charging can be carried out without stopping;
- 4) Customs clearance management: management of materials and vehicles for customs clearance and transfer;

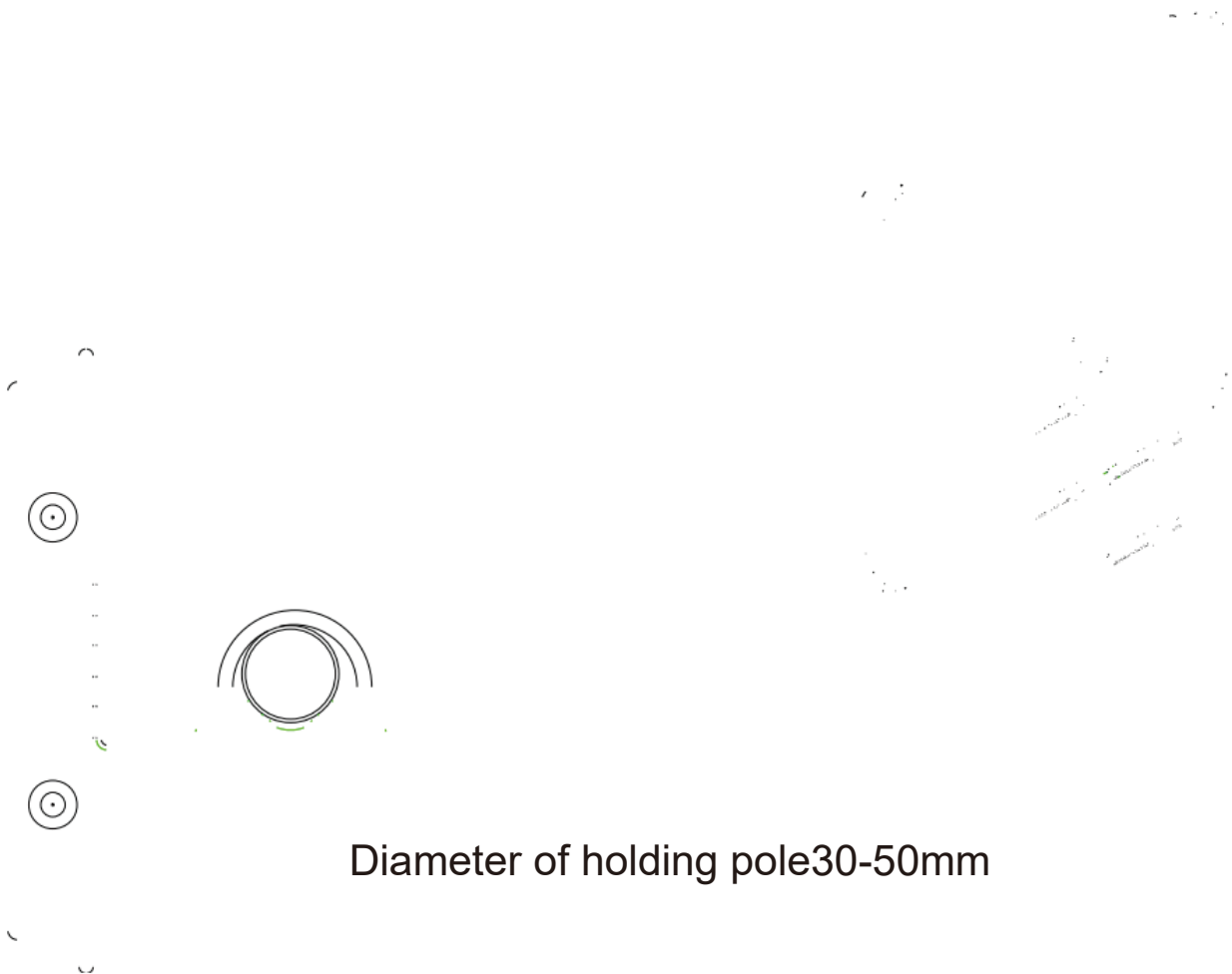
- 5) Warehousing and logistics management: commodity flow and warehousing management, as well as the flow management of mail, parcels, air baggage, etc;
- 6) Parking lot management: realize the automation of management and charging;
- 7) Access control management: including vehicle and personnel access management;
- 8) Process production process: monitor parts in the whole production process;

## **Main functions of reader / writer**

- 1) Wake up tag: only the awakened tag can communicate with the reader / writer, prevent interference from other tags outside the system, and ensure reliable and accurate information exchange between the reader / writer and the system tag.
- 2) Read tag data: not only the ID number of the tag can be read, but also the data of the specified tag storage area can be read; Not only the data of a single tag but also the data of multiple tags within the antenna wave range can be read at the same time.
- 3) Write label data: you can write data to the specified label storage area.
- 4) It can be directly connected with control equipment with standard wiegand26 / 34 interface, without development, and is easy to use.
- 5) Connect with controller or PC through standard communication interface for data communication and exchange; Provide SDK development packages for users to further develop applications.
- 6) Precautions for use

- a) R781 series readers are generally connected with computers through RS232 data interface for data exchange. Since R781 series readers can only read and write electronic tags after receiving the control command from the controller, we will provide SDK development packages to customers so that users can develop application software.
- b) The operating temperature of the reader / writer is: - 40 °C ~ + 65 °C. Therefore, when using this reader / writer in cold areas and seasons, attention should be paid to starting up and preheating 15 minutes before the reader / writer is officially used to ensure the normal operation of the reader / writer.
- c) It is recommended that during the test, there should be no objects within at least 30 meters in front of the reader / writer; When holding a card, please touch the edges of both sides of the card with your fingers. Since this antenna is horizontally polarized, place the card horizontally facing the reader / writer during the test to ensure the card reading effect.
- d) Wigan communication interface must be connected to GND ground wire.
- e) The installation height is above 1.8m, and the diameter of the upright is 30-50cm.

Installation drawing



Diameter of holding pole 30-50mm

## Operating mode and wiring description of reader / writer

### Wiring instructions of reader / writer

Red	Black	Green	White	Gray	Purple
DC+(7-12V)	GND	RX	TX	WG-D1	WG-D0

## Label operation

### EPC GEN2 (ISO18000-6C) label

- Single label initialization: defines the EPC length of the label, generally 96 bits.
- Single tag write: write EPC of tag, one address or multiple addresses can be written at a time (based on one address).
- Single tag locking: lock the EPC of the tag. After locking, the EPC of the label cannot be overwritten.
- Single label destruction: destroy labels. After destruction, the label can no longer be used.

## Operation mode

1) Master slave working mode(COMMAND): In this mode of operation, the reader / writer operates under the control of a PC or other controller. The reader / writer and the controller can communicate through one of RS232, RS485 or Ethernet interfaces. This working mode supports all functions provided by the secondary development package.

2) Timed working mode(TIMING READ): The reader / writer automatically reads the card in a certain cycle (configurable), and the read data is output through the specified communication port. This method is read-only for label operation.

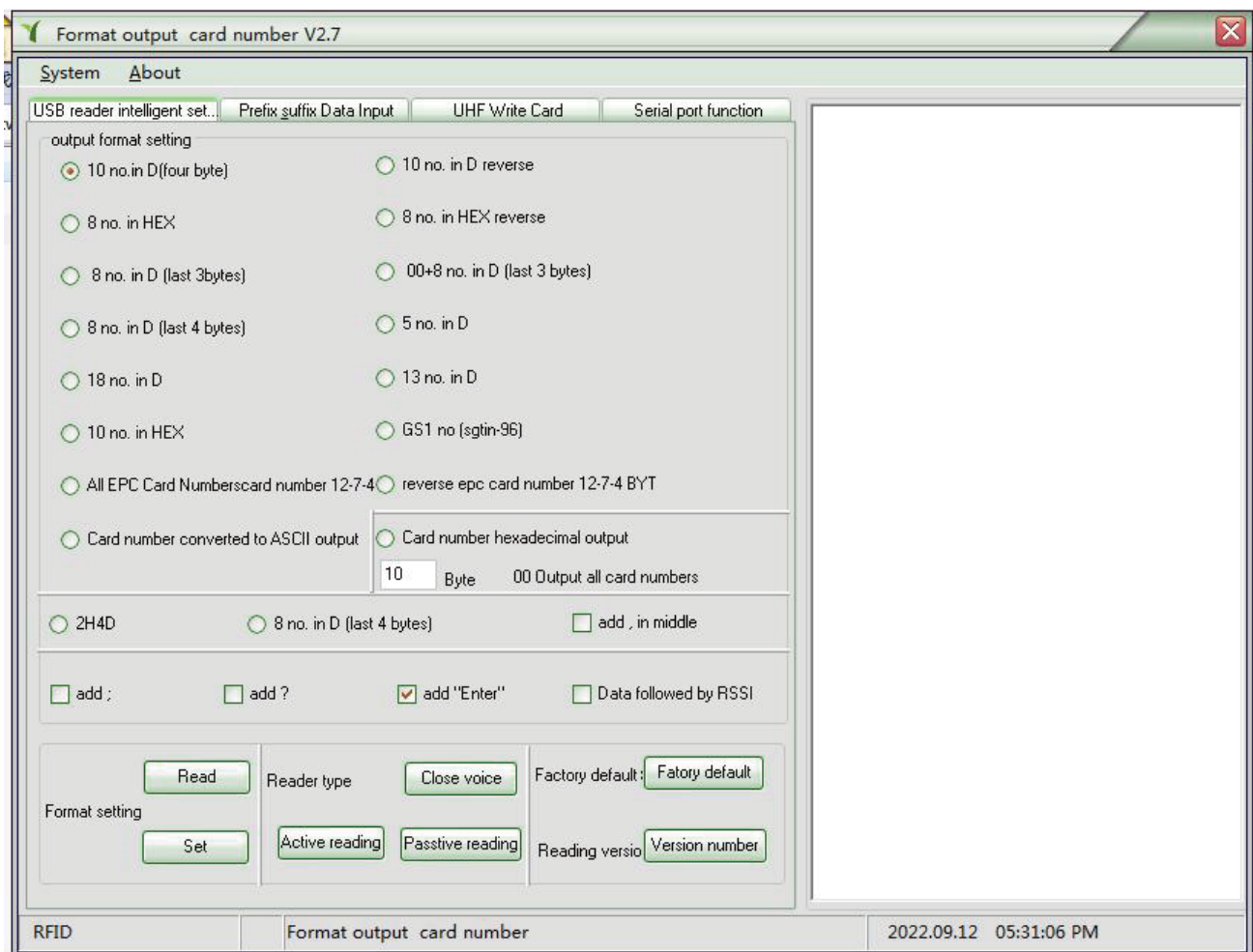
3) Trigger mode(TRIGGER READ): When a low level is input on the trigger input port, the reader / writer starts to read the card periodically and automatically shuts down after a period of time.

## ID adjacency discrimination

ID adjacency discrimination is designed to reduce the redundancy of uploaded data by the reader / writer. When this function is selected, when the reader / writer reads the card number of the same tag several times in succession, only one set of data will be uploaded within the set time. The effective time can be selected for adjacent discrimination, that is, if the time interval between two adjacent card reads exceeds the effective time, they will not be compared. Users shall select according to specific needs. It is often used in Wigan communication.

## Reader writer configuration

The company provides demo software program to configure the operating parameters of the reader / writer. The parameter configuration program interface is shown in the Following figure:

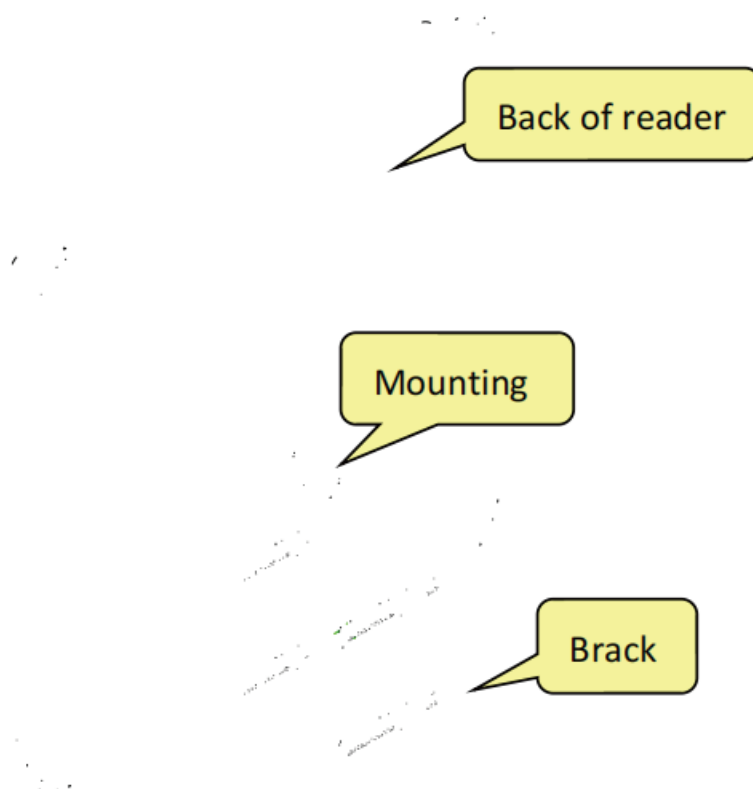




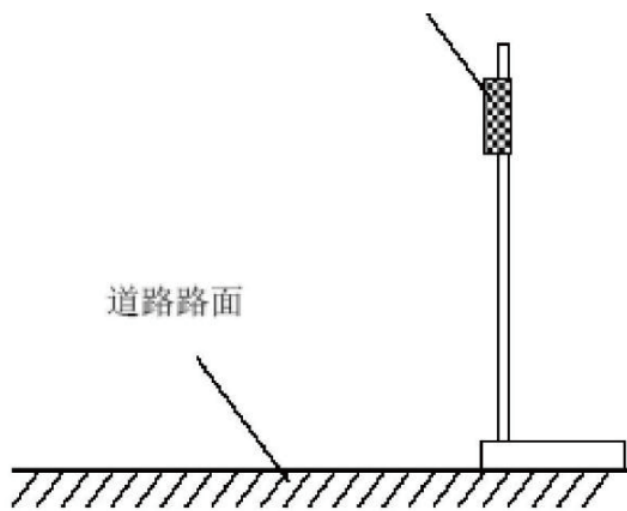
For the use of demo software, please refer to the UHF setting software manual

## Installation of reader / writer

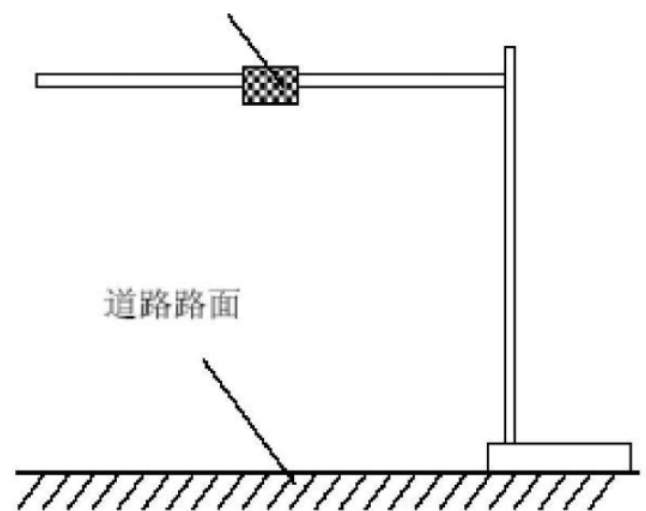
### Installation method of reader / writer



There are two installation methods of the reader writer stand: "side 1-shaped installation" and "L-shaped stand type installation". See the figure below: the installation method can be selected according to the application needs and the actual situation on site. Generally, the side mounted reader writer is closer, but the installation is simple; The top mounted mode has a longer reading and writing distance, but the installation is complicated.



1-shaped installation on the side of the reader / writer

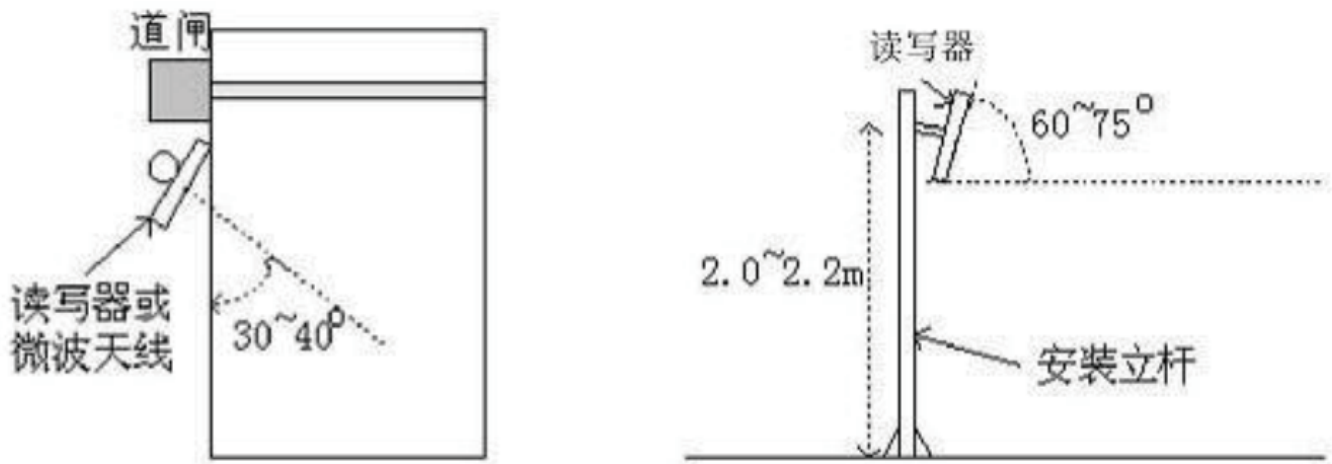


Reader / writer I stand type installation

## Fixing and height adjustment of reader / writer

When the 1-shaped stand is installed on the side, it is required to install the R781-8db reader / writer with a diameter of 30 ~ 50mm and a length of 2.2m. It is better to use stainless steel with a wall thickness greater than 1.2mm. Use the self-contained fasteners in the R781-8db reader writer package to fix the reader writer on the top of the upright. Adjust the height from the R781-8db reader center to the lane level according to the vehicle type (mainly refers to large vehicles and small vehicles), which is generally about 2.0m (1.8 ~ 2.2m). When the L-shaped stand is installed on top, it is required to install the L-shaped stand pole (or gantry) with a diameter of 60 ~ 80mm and the cross bar with a diameter of 30 ~ 50mm. It is better to use stainless steel with a wall thickness greater than 1.2 ~ 2.0mm. The R781-8db reader / writer is also fixed on the cross bar near the middle of the lane with the self-contained fasteners in the packaging box. The height of the cross bar from the ground shall be adjusted between 3.5m and 4.0m according to the vehicle height.

## Azimuth adjustment of reader / writer



Antenna depression angle: refers to the angle between the inclination of the antenna to the ground and the horizontal line, about  $60^{\circ} \sim 75^{\circ}$   
Antenna azimuth: refers to the offset angle of the antenna toward the lane, about  $30^{\circ} \sim 40^{\circ}$

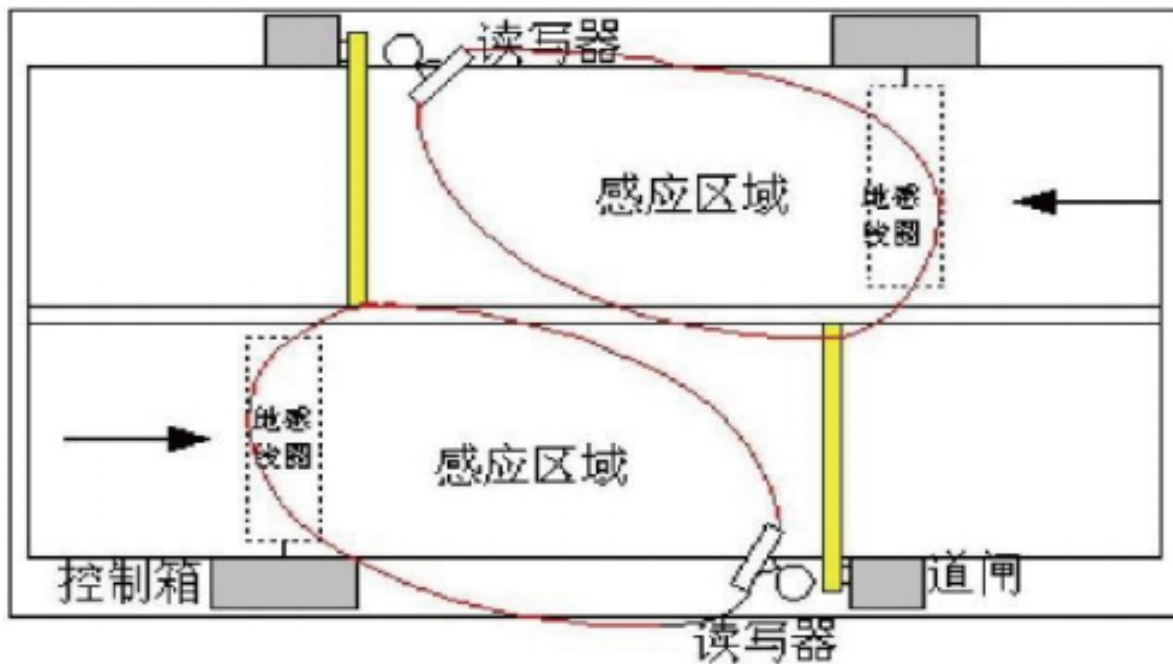
## Installation example - vehicle parking lot management

The principles for selecting the installation location of R781-8db reader / writer system are as follows:

- 1) The straight-line distance between R781-8db reader and gate shall not exceed 1m
- 2) There is no object between the R781-8db reader and the tag card
- 3) The R781-8db reader / writer shall be as close as possible to the control equipment (or PC), and shielded communication cable shall be used for installation. The specific site installation implementation is generally determined according to the site conditions. The following description is given.

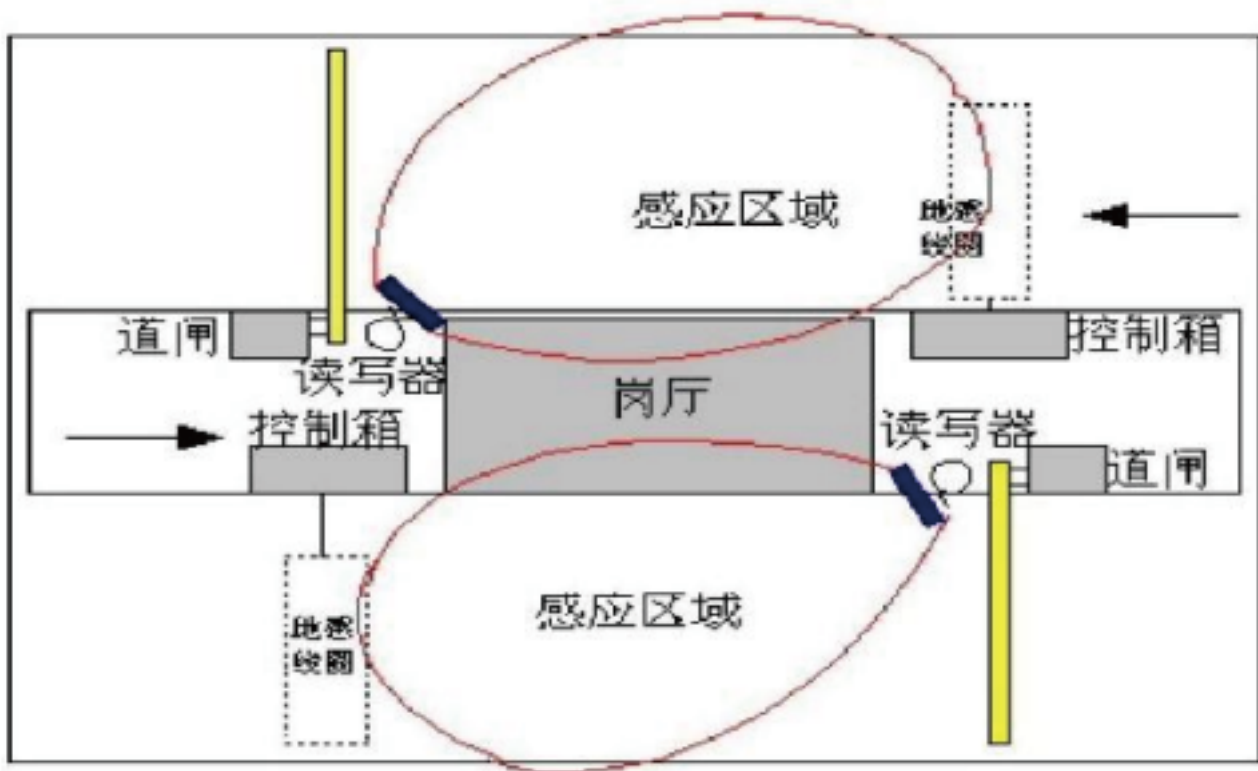
a) On site installation mode I: there is no safety island in the middle of the road. Road control equipment (road gates) are installed on both sides of the road. Vehicles pass through the card reading area at a speed of less than 30km / h.

In this case, it is required that the reader / writer (antenna) should be close to the barrier gate equipment, and the effective range (the farthest straight-line distance is 0.5m ~ 8m) of the tag reading can cover the inlet ground induction coil or the outlet ground induction coil at the entrance and exit, as shown in the figure below.



a) On site installation mode 2: the road has an intermediate isolated safety island, and the control equipment (road gate) is installed on the intermediate isolated safety island. The vehicle passes through the card reading area at a speed of less than 10km / h.

In this case: it is required that R781-8db reader / writer should be close to the barrier gate equipment, and the effective range (the farthest linear distance is 0.5m ~ 8m) of the label reading can cover the inlet ground induction coil or outlet ground induction coil at the entrance and exit, as shown in the figure below.



## Secondary development of R781 / R782-8db

The user can develop the application software of the reader / writer according to needs. We provide C #, VC, VB, Delphi, Java and other calling routines, and provide wince and Linux driver development. Please refer to the SDK development guide for the use of development packages.