
HF 3D Gate SR-RH-G3D

User's Manual V1.6

Contents

1 Introduction.....	1
2 Function Introductions.....	1
2.1 System function	2
2.2 Tag Operation.....	2
2.3 Security surveillance.....	3
2.4 People Counting.....	3
2.5 Sound/light alarm function	4
2.6 Communication function	5
3 Installation Guide.....	5
3.1 Device appearance	6
3.2 Installation regulation	6
3.3 Cable Connection.....	7
3.4 Relay Connection.....	13
4 Operation Instructions	14
4.1 Operation Description.....	14
4.2 Operation Procedure	16
5 Technical Parameter.....	21
6 Troubleshooting	21
7 Remarks	23

1 Introduction

SR-RH-G3D is a high performance ISO/IEC15693 protocol HF tag gate device. Designed upon fully self-intellectual property, it supports fast tag anti-collision operation with high identification rate, 2 line infrared motion sensor with intelligent people movement direction determination and counting, EAS/AFI security surveillance, multiple channel synchronization, RS232/485 and TCPIP interface, remote configuration and management. It is an ideal choice for various HF RFID application systems such as library anti-theft, open access control, conference attendance and logistics etc.

Terms and Definitions

3D Gate, Omni-directional Gate, Channel Device

Refer to the same gate device which supports full dimensional tag operation.

Panel

One single piece of a channel. Two panels comprise a one-channel-gate.

Channel

One passageway of the gate. The most widely used gate is one-channel gate and two-channel-gate.

Channel Device

Another name of gate device

FEATURES

- Self-intellectual property;
- Support mainstream ISO15693 protocol tag (TI, PHILIPS, ST, INFINEON, FUJITSU, EM...) omni-directional operation;
- Channel width up to 98cm^{*};
- Low power dissipation design with RF output power up to 8W (adjustable);
- 2 line infrared motion sensor with intelligent movement direction determination and people counting;
- Support EAS/AFI security surveillance;
- Support single channel standalone or multiple channels synchronized work mode;
- Support RS232/RS485 interface;
- Support remote configuration and management;
- Support further development and customization with on-the-site firmware upgrade.

*Effective channel width depends on tag and working environment.

2 Function Introductions

SR-RH-G3D omni-directional gate device has 6 functions: System function, tag

operation function, security surveillance function, people counting function, sound/light alarm function and communication function.

2.1 System function

2.1.1 Basic parameter query and modification

- ◆ Device system information query
- ◆ Infrared controller firmware version query
- ◆ Device ID number query and modification
- ◆ Master/Slave panel synchronization parameter query and modification
- ◆ Baud rate query and modify
- ◆ Main controller unit work mode setting (security surveillance/answer mode)
- ◆ Alarm setting

2.1.2 Security Surveillance mode setting

- ◆ AFI detect mode
- ◆ EAS detect mode
- ◆ EAS+AFI detect mode

2.2 Tag Operation

- ◆ Get the tag UID
- ◆ Select or Stay-quiet the tag
- ◆ Read data content of defined tag data block
- ◆ Write data to defined tag data block

◆ Get detailed information of a tag such as maximum block numbers, bytes of each block etc.

- ◆ lock tag data block;
- ◆ Read/write tag AFI;
- ◆ Read/write tag DSFID;
- ◆ Enable, Disable and lock tag EAS bit

The tag operation functions are only available when the gate device is in answer mode.

2.3 Security surveillance

- ◆ Support AFI anti-theft operation
- ◆ Support EAS anti-theft operation
- ◆ Support AFI+EAS mixed anti-theft operation

2.4 People Counting

SR-RH-G3D uses embedded 2 line infrared sensors to determine the movement direction and do people counting. The 8 digit LED display on each panel will show the forward passing/reversely passing people counting result, device ID and master/slave panel setting with the following format:

- ◆ A-XXXXXX: forward passing people counting
- ◆ E-XXXXXX reversely passing people counting
- ◆ H.XXXXX-E: Master panel, Device ID and EAS security surveillance mode
- ◆ C.XXXXX- A: Slave panel, Device ID and AFI security surveillance mode

For example:

A-000160 means 160 people forward passed;

E-000160 means 160 people reversely passed;

H-0006-E: this panel is a master panel and its device ID is 6. This panel is working in EAS security surveillance mode;

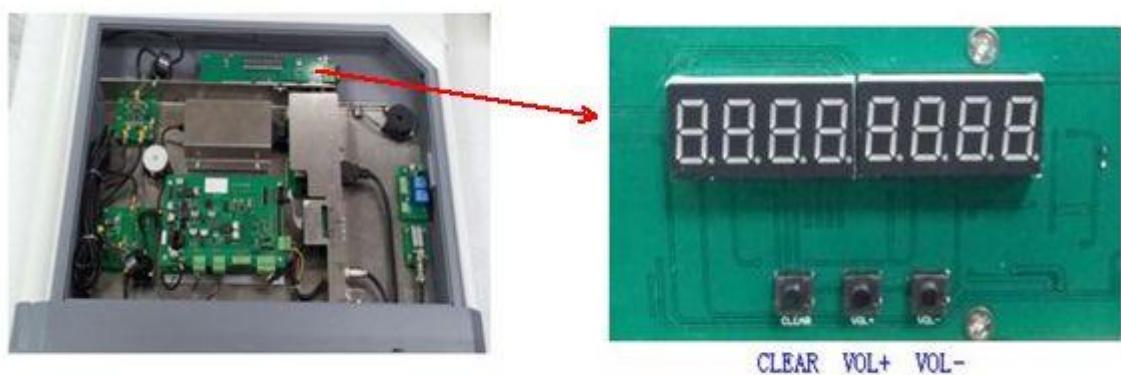
C.00009-A: this panel is a slave panel and its device ID is 9. This panel is working in AFI security surveillance mode;

The host could also get the infrared sensor and alarm statistical information through RS232 or RS485 interface.

2.5 Sound/light alarm function

In security surveillance mode, the panel will buzz and flash when alarm triggered.

The buzzing and flashing mode can be defined and the embedded relay can be activated as configured. The alarming sound volume is adjustable using button placed under the LED display as the following Pic.1 depicted.



Pic. 1 Alarming sound volume adjustment button

The volume can be adjusted for 7 levels. The volume goes up when pressing VOL+ and goes down when pressing VOL-. The volume level (0~7) is also displayed on the LED. Volume 7 is for loudest sound and volume 0 for silence. The light flash is also active even the sound level is set to volume 0.

Button CLEAR is used to clear the people counting to 0.

2.6 Communication function

- ◆ Each panel supports RS232 interface with the host for device configuration and control
- ◆ Each panel supports RS485 interface and multiple panels could be linked as a group to facilitate the host's remote management.

3 Installation Guide

The packing list of the device includes:

- 1、 one panel SR-RH-G3D device
- 2、 one AC power cable
- 3、 one RS232 cable。

3.1 Device appearance

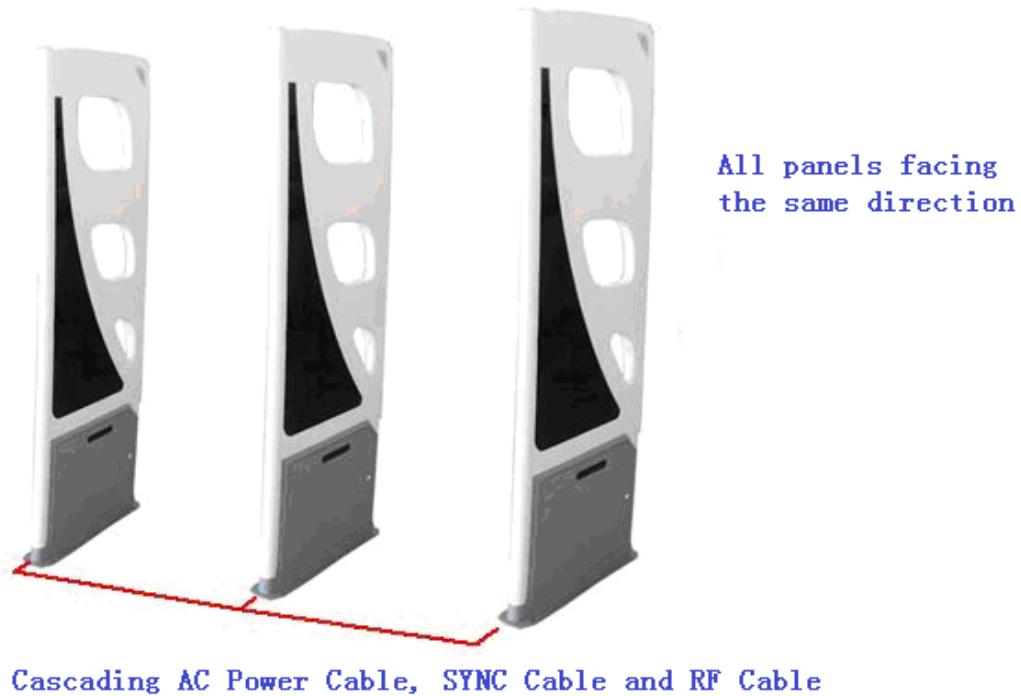
SR-RH-G3D is as Pic. 2:



Pic. 2

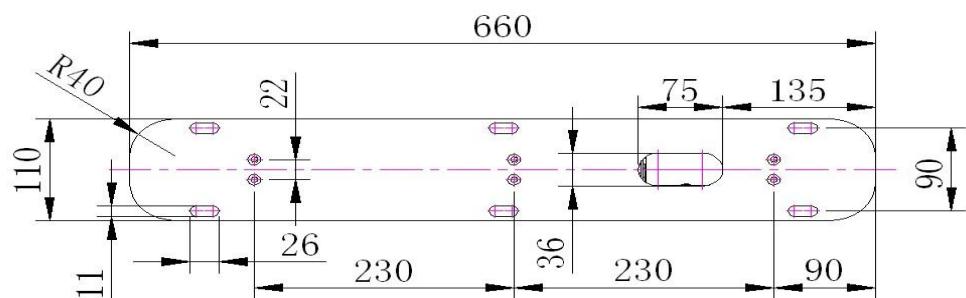
3.2 Installation regulation

SR-RH-G3D can be used in various ways such as single standalone panel, two panels (single channel) or synchronized multiple panels (multiple channels). When installing multiple panels, please make sure to place all panels facing the same direction like Pic. 3 depicted:



Pic. 3

SR-RH-G3D should be fixed to the ground using screw. The location of the screws is illustrated as Pic. 4:



Pic. 4

3.3 Cable Connection

SR-RH-G3D uses 4 kinds of cables for normal operation including synchronizing (SYNC) cable, RF cable, serial communication (UART) cable and AC power (AC) cable.

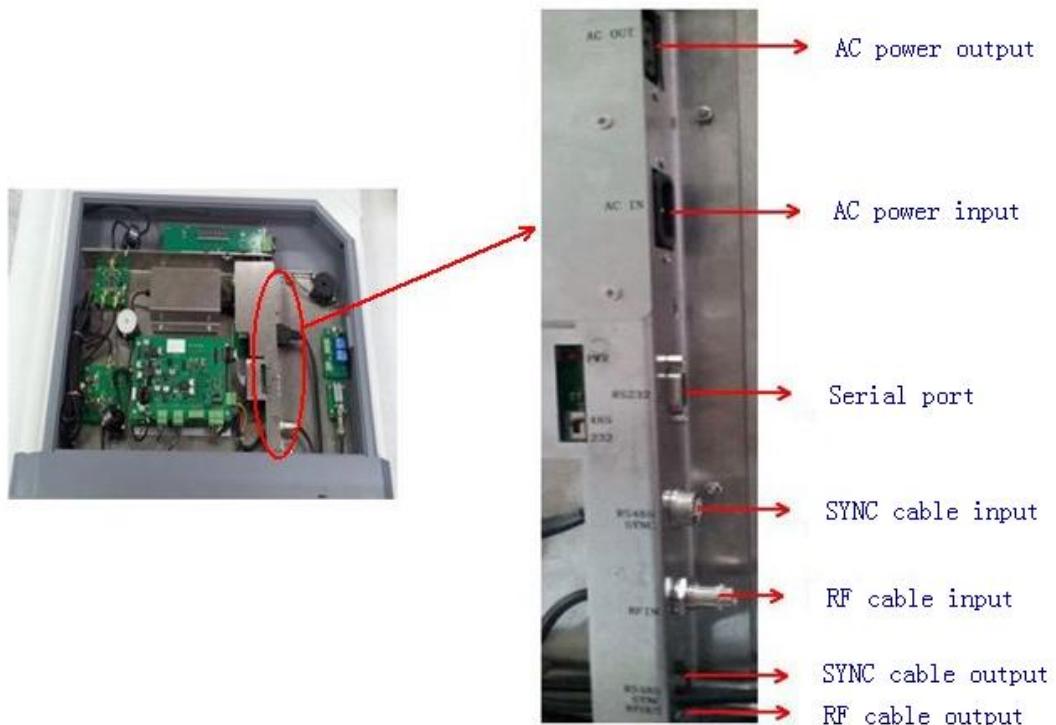
1. Cover open

The cover of the device's base box needs to be opened for cable connection as following Pic.5:



Pic. 5

The socket arrangement for cable connection is as following Pic.6:



Pic. 6

2. Connect SYNC cable

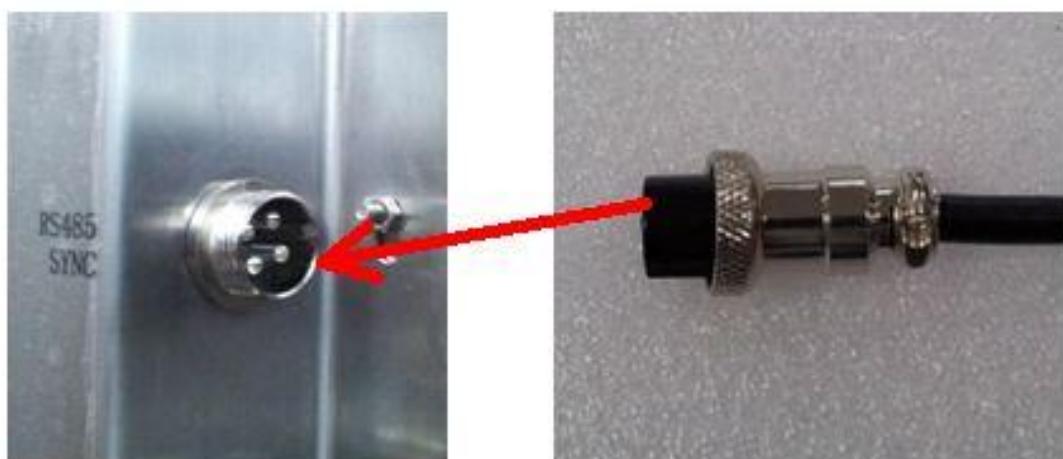
The SYNC cable is a 4-pin cable as Pic.7. It has 2 functions. The first is for multiple panels synchronization which is mandatory required for multiple panel application. The second is for multiple panel network constitution.

Multiple panel synchronization:

SR-RH-G3D uses RS485 communication method for synchronizing data exchange between various panels. This will take 2 pin in the 4-pin SYNC cable. For synchronization, the multiple panels need to be cascaded. That means the output SYNC cable of one panel needs to be connected to input SYNC port of its following panel as Pic.8. All panels should be cascaded sequentially in a correct order.



Pic.7



Pic. 8

Multiple panel networking:

Multiple panels can be networked together for facilitating the host to realize remote management. Multiple panel networking is designed in RS485 way and this will take another 2 pin of the 4-pin SYNC cable.

For multiple panels RS485 networking, the communication switch of each panel needs to be set to RS485. When the switch is set to RS485, the RS232 port of the panel will act as a RS232/RS485 converter and the host can easily access to the RS485 panel network by connecting to panel's RS232 socket. The addressing of each panel in the panel RS485 network relies on each panel's device ID. Please refer to the following "UART cable connection".

3. AC Cable Connection

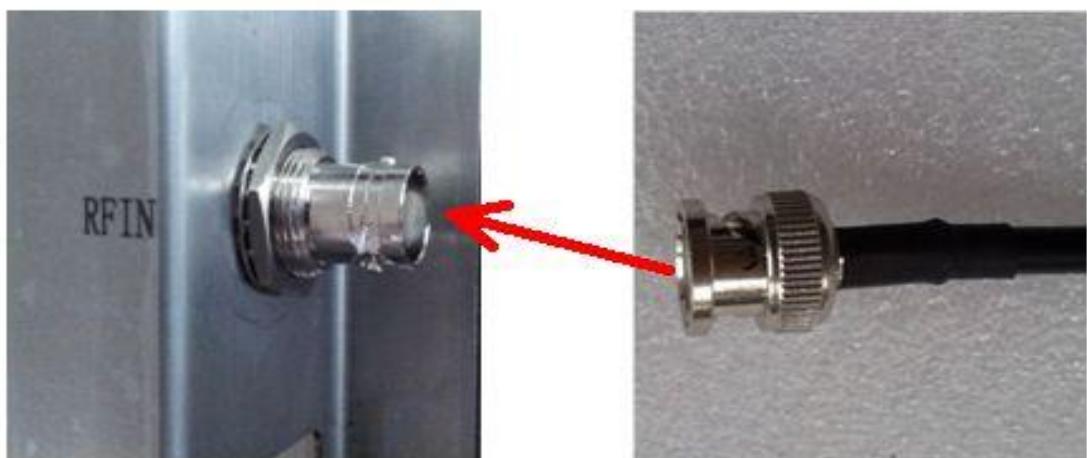
SR-RH-G3D provides two AC power cable socket for cascading connection of each panels AC power cable. This is useful in practice to make the power supply to whole system neat and easy to installation. If one panel gets AC power supply at its AC power-in socket, it can provide AC power for next panel through its AC power-out socket as Pic.9:



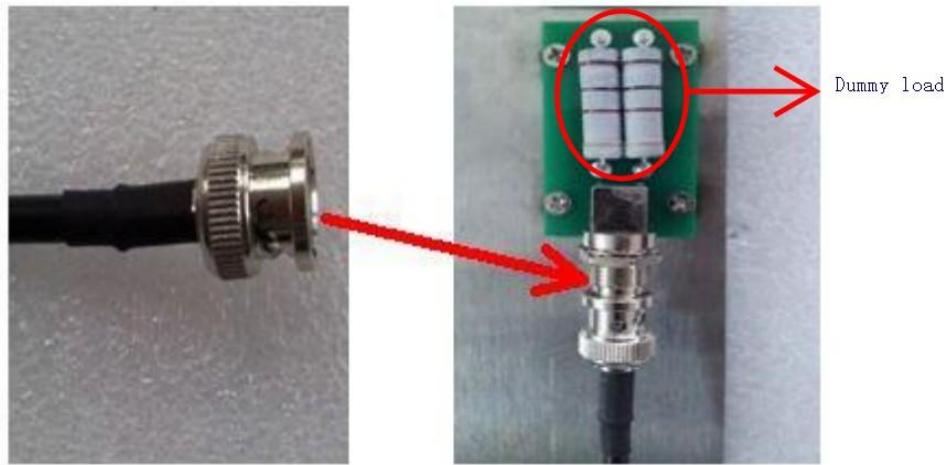
Pic.9

4. RF cable connection

RF cable of each panel should be correctly connected for normal operation. The RFOUT of one panel should be routed to RFIN of the adjacent following panel to cascading all panels as Pic.10. The last panel should route its RFOUT to the dummy 50ohm load embedded in the base box as Pic.11.



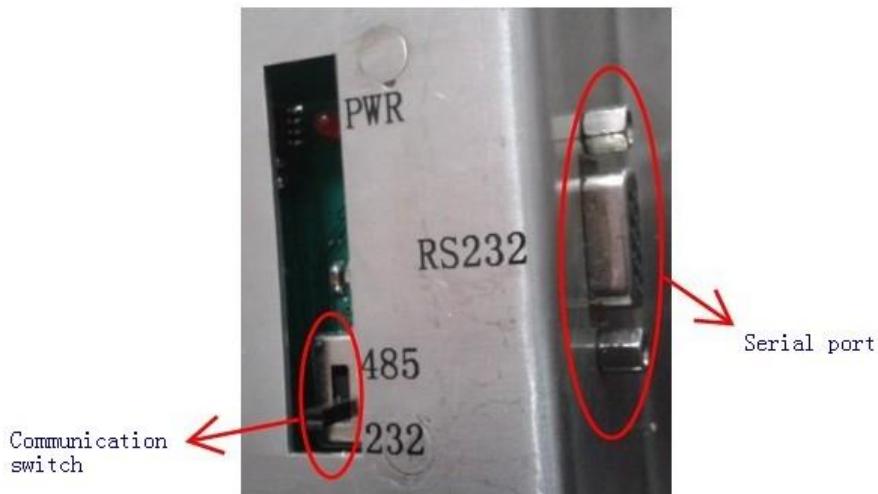
Pic.10



Pic. 11

5. UART Cable Connection

Each panel can be individually managed by the host through its RS232 port with the UART cable connected. To do the work in this way, the communication switch should be set to RS232 as Pic.12A:



Pic. 12A

When multiple panels have been RS485 networked (the communication switch of each panel needs to be set to RS485) by SYNC cable, the host can talk with every panel in the network. In this case, the RS232 port of the panel acts as a RS232/RS485 converter and the host can easily access to the RS485 panel network

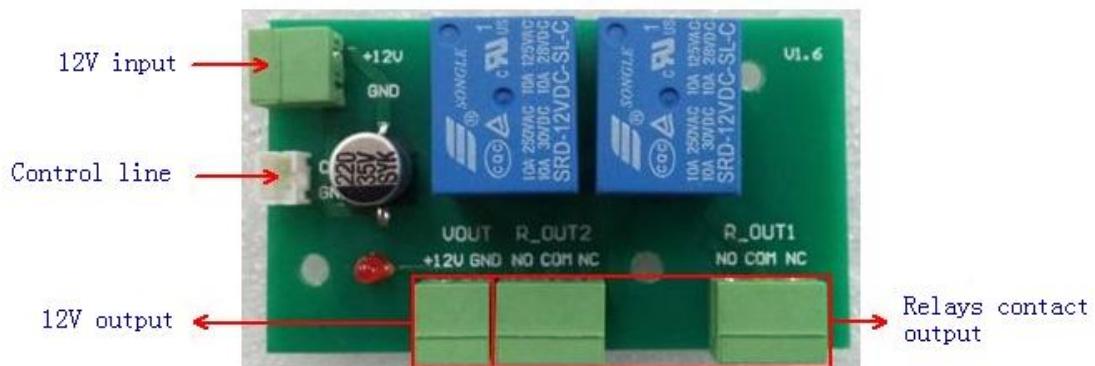
by connecting to any panel's RS232 socket. The addressing of each panel in the RS485 panel network relies on each panel's device ID.



Pic. 12B

3.4 Relay Connection

SR-RH-G3D has 2 embedded relays as Pic.13:



Pic. 13

The 2 relays will be activated when device alarming. The pick-up time can be configured. NO, COM and NC are relay's three contact terminal as Normal OPEN, COMMON and Normal CLOSE.

4 Operation Instructions

SR-RH-G3D should be correctly configured before operation. Users could use provided configuration software to do this work. The most commonly used parameter-configuring procedure is carried out through RS232 communication between the host and the device.

When delivered, the default parameter setting of the device is as list:

Device ID: 0001

Panel SYNC Parameter: Master

Communication Interface: RS232

Baud Rate: 38400 bps

Security Surveillance Parameter: AFI anti-theft

AFI Value: 0x00

Alarm: Buzzing 3 times

Work Mode: Security Surveillance Mode

4.1 Operation Description

The configuration software on the host is designed for Windows OS platform. User could use this tool software to manage the device, set operation parameters and get operation results.

4.1.1 Device Parameter Setting

Device parameters (also called system parameters) could be configured in the tool software's SYSTEM CONFIGURATION Tab.

Device parameters include:

Device ID: Each panel should have its unique ID number. The adjacent panels' ID numbers should be interleavedly set to odd or even number. If one panel's ID number is even, its adjacent panels ID numbers must be odd.

SYNC Parameter: Set the panel as Master or Slave. Among all cascaded panels, only one panel can be set as Master and all others should be set as slaves. Generally the most outside panel will be set as the Master.

Baud Rate: Default baud rate is 38400. It can be set to 9600, 19200, 38400, 57600 or 115200.

Alarm Pattern: Set the buzzer beeping times when alarming. It can be set from 0 to 3. The device will be silent when alarm pattern parameter set to 0. That means the buzzer will no beep and the alarm light will not flash either.

Security Surveillance: Three anti-theft modes are supported. They are AFI anti-theft, EAS anti-theft and AFI/EAS mixed anti-theft.

AFI Value: Set the AFI value the device used when in AFI anti-theft security surveillance mode. 0x00 is broadcasting value and all tags will answer.

Work Mode: the device supports 2 work modes as Security Surveillance mode and Answer mode. In Security Surveillance mode, the device supports AFI anti-theft, EAS anti-theft or AFI/EAS mixed anti-theft operation. In Answer mode, the device will not autonomously work. The device will wait the command from the host and feedback results after command execution. The Answer mode is major used for tag read/write operation.

Relay Pick-up Time: It defines the relay pick-up time when the device alarming.

The time ranges from 0.1s~25.5s with 0.1s unit. Default time is 3s.

4.1.2 Tag Operation

Tag operation could be carried out in tool software's "Tag Operation" tab. The device supports tag inventory, read, write and other operations.

4.1.3 Statistical Information

User could use tool software to acquire or clean some statistical information such as alarming times counting and people counting.

4.2 Operation Procedure

Users should refer to the following typical installation and configuration procedure in device application:

1. Installation

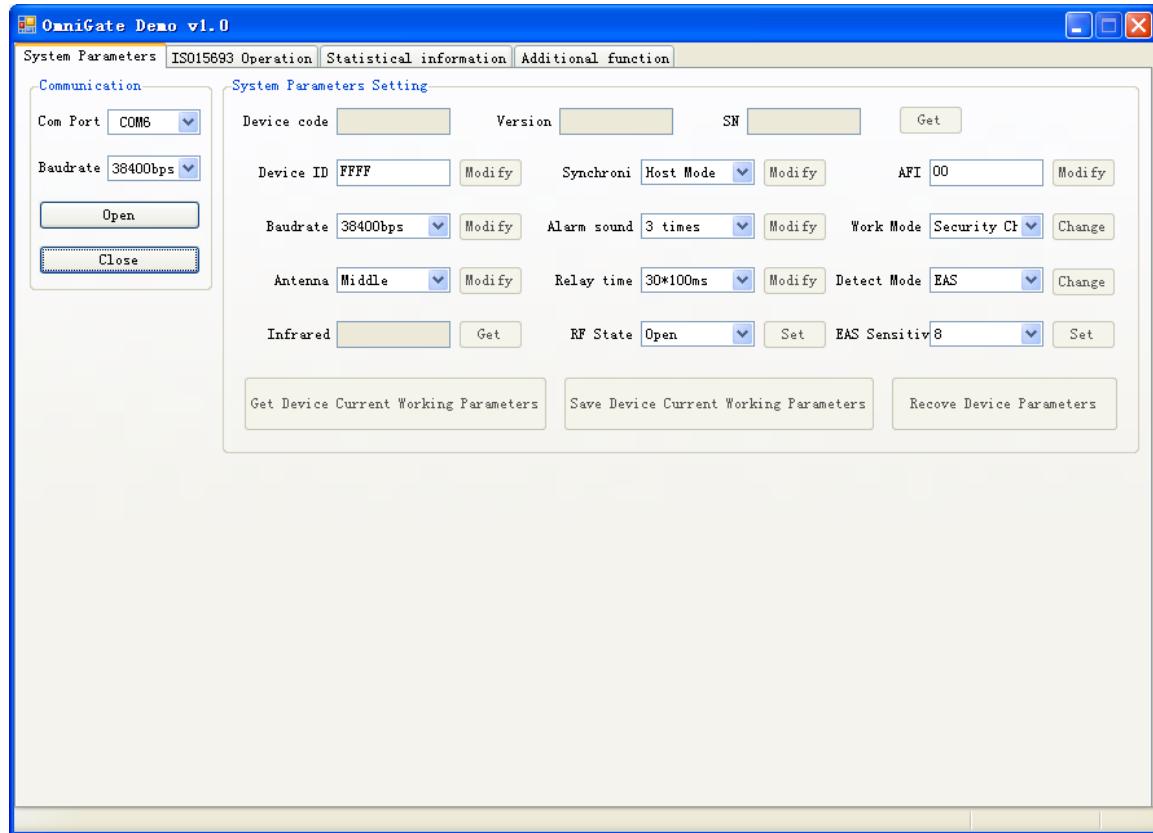
Refer to the former corresponding chapter of this manual to correctly install the gate device and connect all necessary cables. The commonly-used channel width is around 90cm.

2. Configuration

◆ The simplest way to configure the panel is configuring it one by one through its RS232 port. All panels can also be RS485 networked together for centralized management. Users can try this advanced operation when familiar with the whole device. The following example illustration is based on single panel individual operation through RS232.

- ◆ Running configuration tool software on the host and the main GUI is as

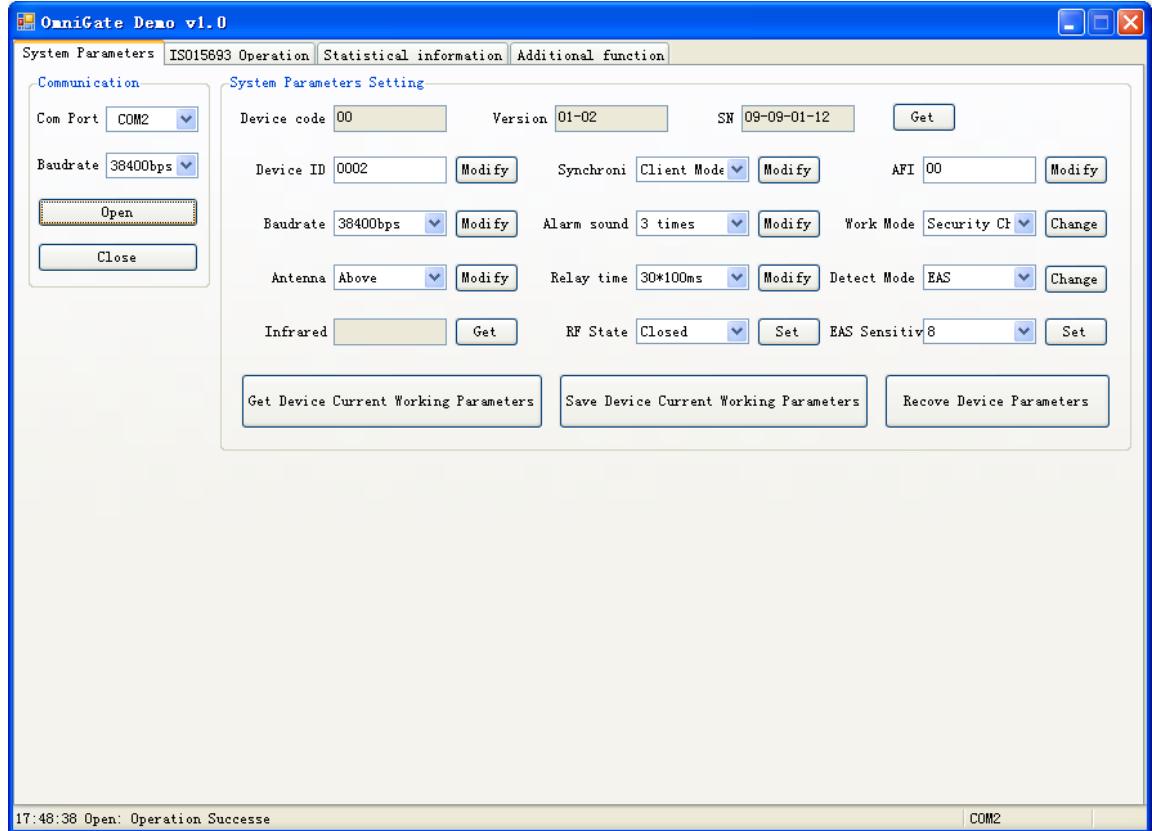
Pic.14:



Pic. 14

- ◆ Input device ID in the “Device ID”. The default device ID is 0001. Broadcast address “FFFF” can also be used in this single panel case.

Click “Open” button, the current using parameter will be showed as Pic.15:



Pic.15

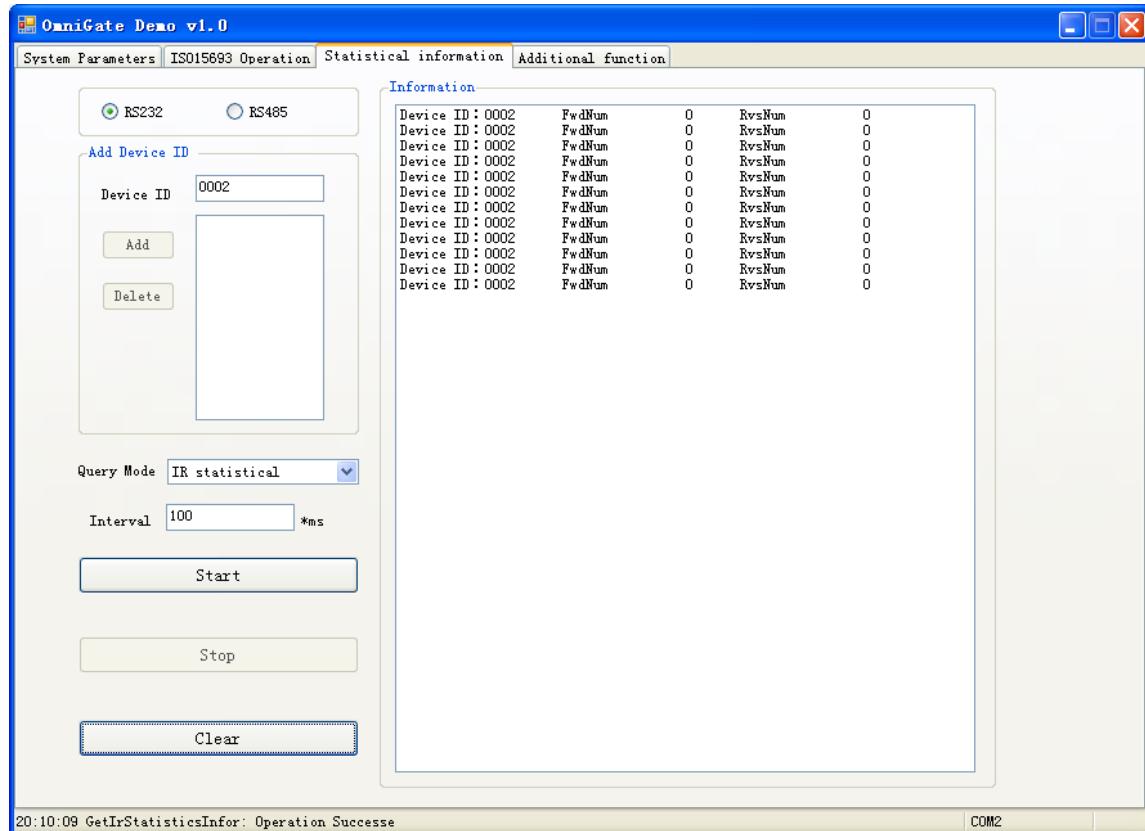
◆ Set Parameters: Set Device ID, SYNC parameter, AFI value, baud rate, anti-theft mode, work mode and so on.

◆ Save parameters: Save your configuration parameters into device's non-volatile memory. All the parameters will remain unchanged until next configuration. If saved parameters corrupt, the default value will be used instead.

3. Statistical Information

User could use tool software to acquire or clean some statistical information such as alarming times counting and people counting.

The statistical information tab is as Pic.16:



Pic.16

Select “RS232 Query”:

- ◆ The communication switch should be at RS232 position;
- ◆ Press Start Query button to get statistical information;

When the host need to access a panel in a RS485 networked multiple panels environment, please select “RS485 Query”:

- ◆ The communication switch should be at RS485 position;
- ◆ Add all device IDs to the text box. The software will poll and retrieve each panel's information one by one;
- ◆ Choose the information to be acquired, press “Start Query” button and all the information will be displayed on the right column.

4. Additional parameter

The parameters in this tab are mainly used to set some work parameters for the HF High Power RFID Reader embedded in the device. Users should let it unchanged as its default value in most cases.

Default values are:

Power: 23 (6W)

Parse mode: DPPM 100%

5 Technical Parameter

Electric Parameter	Frequency	13.56MHz±7KHz
	Protocol	ISO/IEC 15693
	Effective Gate Width	≥90cm (depends on tag and working environment)
	Interface	RS232/RS485
	Supply Voltage	100~240VAC 50/60Hz
	Power Dissipation	<20W
	RF power	>3W
	RF Output Impedance	50Ω
	Infrared Sensor	2 lines
Environment Parameter	Work Temperature	-25°C~60°C
	Storage Temperature	-40°C~85°C
	Relative humidity	30%~95% RH
Physical Parameter	Dimension	L*W 170*62cm T 3.5cm (upper) 6cm (box) 11cm (base)
	Weight	30Kg
	Color	Light grey
	Material	ABS

6 Troubleshooting

(1) Q: The com. Port of demo software cannot be open.

A: If the device is connected to the system through RS232 interface, please check if

the RS232 cable is connected correctly; if the device is connected to the system through RS485 interface, please check if the RS485 SYNC cable is connected to the device correctly. In addition, please remember to input device ID before opening the port. When using RS232 interface, if the device ID can not be confirmed, please input “FFFF” broadcast address instead.

(2) Q: RS485 SYNC cable connecting method

A: Adopt cascading method. For example: RS485 SYNC output of the first panel will be connected to RS485 SYNC input of the second panel, RS485 SYNC output of second panel will be connected to RS485 SYNC input of the third panel and so on.

(3) Q: When a tag passes the gate, the alarm light flashes but the buzzer no beeping.

A: The buzzer is adjusted to be silent. Please increase the volume using volume-adjusting button of the panel or the configuration software on the host.

(4) When a tag passing, there is no alarm.

A: Check if the device has been set to be silent;

Check if the cables are connected correctly and only one panel has been set to Master;

Check if the device is in security surveillance mode and if the current security surveillance anti-theft mode matches the tag function. For example, if the device is set to AFI anti-theft mode, please check if the AFI value of the tag is the same as the one set in the device; if the device is set to EAS anti-theft mode, check if the EAS bit has been set to active in the tag.

(5) why do some panels show a longer effective distance than other panels?

A: The possible reasons are: 2 or more panels are set as Master among all the cascading panels. Please make sure that only one panel is set to Master.

7 Remarks

A. Support on-the-site firmware upgrading, further development and

customization.

B. Please contact us if encountering any problem.

FCC Caution.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

IC Caution.

This device complies with Industry Canada licence-exempt RSS standard(s).

Operation is subject to the following two conditions: (1) This device may not cause interference, and (2) This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

- (1) l'appareil ne doit pas produire de brouillage, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This Class [B] digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe [B] est conforme à la norme NMB-003 du Canada.