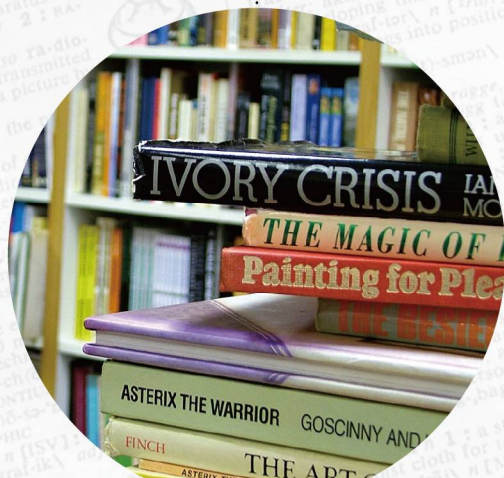




# IDS smart UHF Security Gate User Manual



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**IDS smart**  
Smarter Life with RFID

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## IDSmart UHF Security Gate User Manual

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IDSmart UHF Security Gate User Manual

## Revision History

Revision	Date	Author	Description
E1.0	2014.01.02	Alex Choo Nick Chen	Revise documentation for international security gate model deployment.

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## IDSmart UHF Security Gate User Manual

### 1. Overview

The purpose of this user manual is to facilitate users in deploying the IDSmart™ UHF Security Gate (hereafter referred to as "the equipment"). The manual describes the software included in the equipment and how they could be used to verify the functionality of the equipment.

The main peripheral of the equipment includes a UHF RFID Reader with antennas that supports EPC C1G2 UHF RFID protocols, an embedded board, a retro-reflective type photoelectric sensors (IR Sensor), a Passive Infrared Sensor (PIR Sensor), a pair of two-color LED light bar, a counter and a piezo electric buzzer.

#### 1.1. Specification

The specification of the equipment is as follows.

General Specification	
Dimension	760mm (D) x 120mm (W) x 1700mm (H)
Material	White acrylics with extruded aluminum
Color	White (Standard Corporate Identity)
Weight	76.5Kg (Single Lane)
Power	AC100~240V, 0.8A, 50/60HZ
Operating Temperature	0°C~55°C
Storage Temperature	-20°C~85°C
Humidity	0%~95% non-condensing
Hardware Specification	
Embedded Board	ARM Cortex A8@1Ghz 1GB RAM
Storage	2GB SD Card (1GB available for user)
Operating System	Embedded Linux
Communication Interface	Ethernet, TCP/IP x1 for LAN Ethernet, TCP/IP x1 for UHF Reader Setup/Tuning
UHF RFID Reader	Ethernet Interface (Connected internally to embedded board) 16 Port, EPC UHF Class 1 Gen 2
IR Sensor	Retro-Reflective Type 2M
PIR Motion Sensor	Max 5M (w/o top LED lampshade). Approx. 1.5-2M (with top LED lampshade)
LED Light Strip	12V, two color (blue and red) LED
Buzzer	Oscillation frequency 2.5 ±0.5 KHz
Counter	Built-in battery powered 7-segment LCD with 8 digits

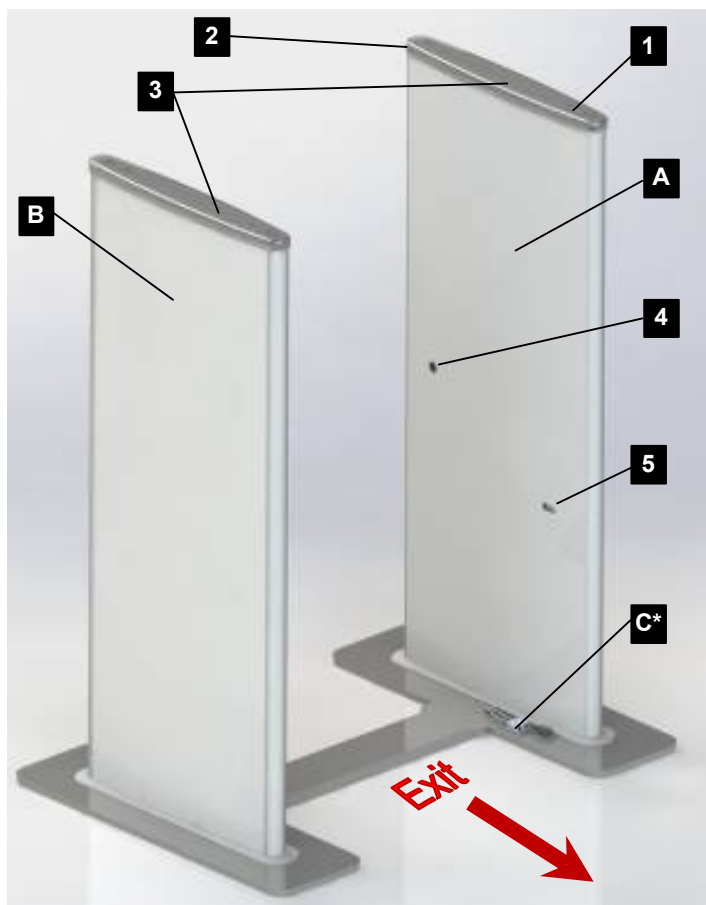


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UHF RFID Specification	
Protocol	EPC UHF Class 1 Gen 2, ISO18000-6C
Operating Frequency	US: 902 – 928MHz / TW: 922 – 928MHz / SG, HK: 920 – 925MHz / CHN: 920.5 – 924.5MHz / JP: 916.8-923.4MHz
RF Output Power	28dBm
Antenna Gain	5.5dBi

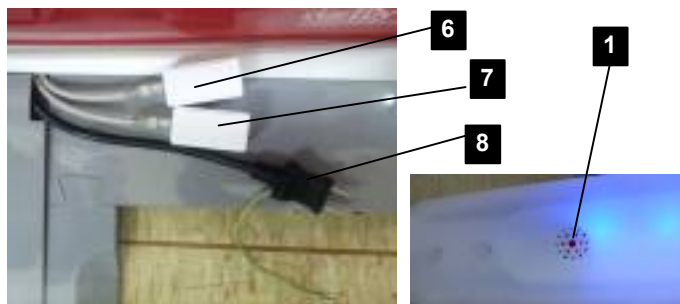
**1.2. Equipment Exterior Overview**

The following exhibits provide a general concept of whereabouts the peripheral located.



45° view from the outer area of the equipment

- A. Main Panel
- B. Secondary Panel
- 1. On/Off Switch
- 2. PIR Sensor
- 3. Two-color LED Light Bar (Warning Indicator)
- 4. IR Sensor
- 5. Counter



- C. Ethernet Port and Power
- 6. LAN Communication Port
- 7. Reader Setup Port
- 8. Power Cable

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\* Ethernet Port and Power outlet could be located at the inner side or outer side of the door panel

45° view from the inner area  
of the equipment

A. Main Panel

B. Secondary Panel

D. Slot Fitting (Holds both  
panels and connect the  
mounting plates)

E. Mounting Plate

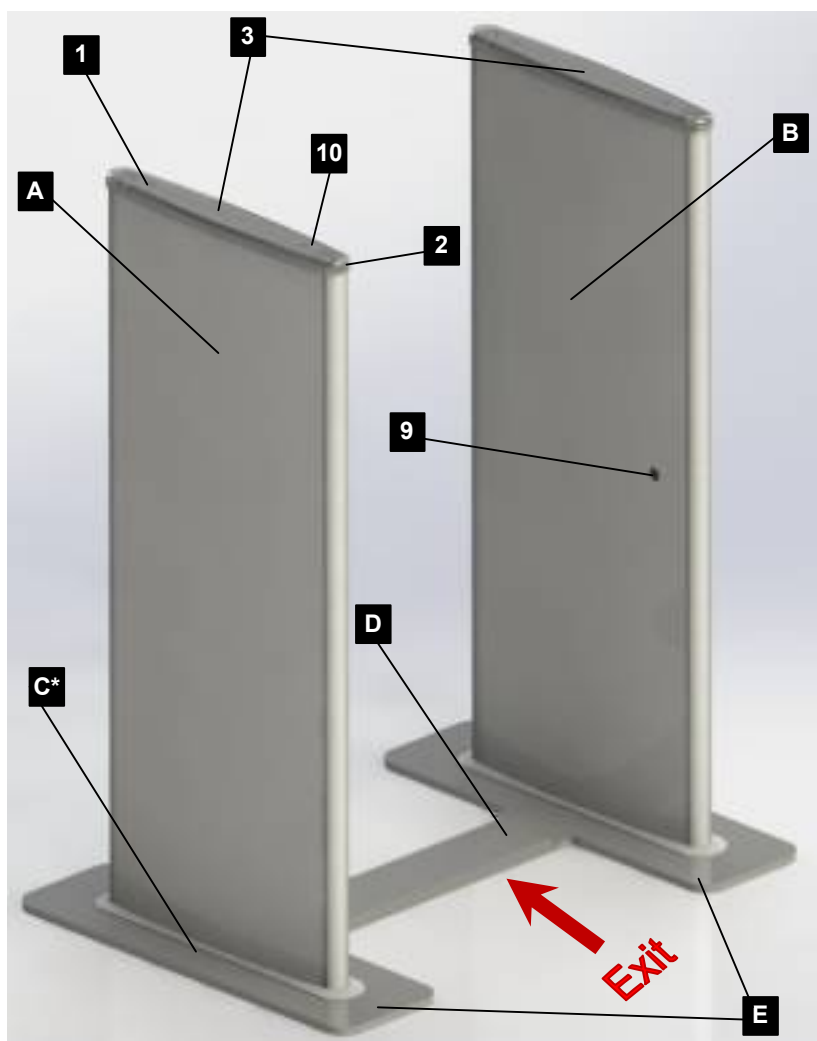
1. On/Off Switch

2. PIR Sensor

3. Two-color LED Light  
Bar (Warning Indicator)

9. IR Reflector

10. Buzzer outlet

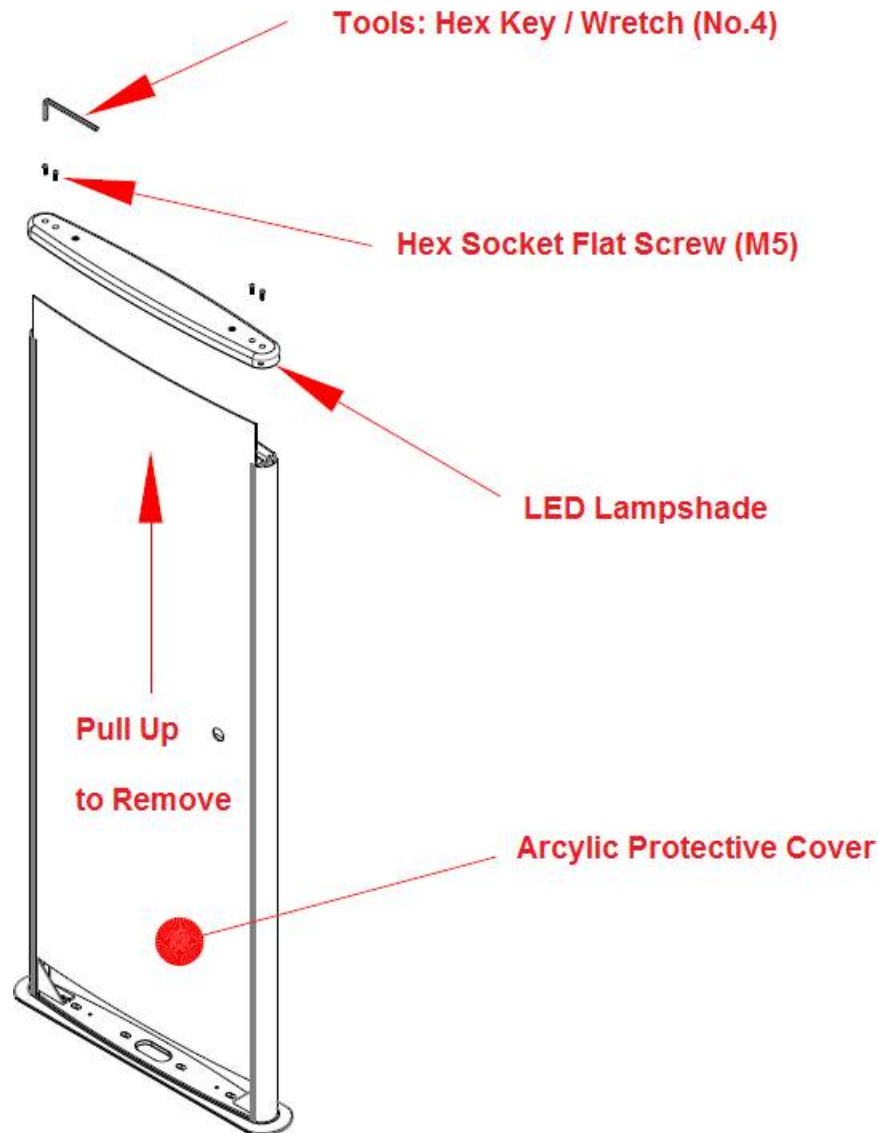


### 1.3. Maintenance Access

The equipment maintenance required proper tools and training. The scope of the security gate maintenance is not covered in this user manual. In general, the deployment of application and control of peripherals can be done through the Ethernet interface. The equipment maintenance access is only required when there is component failure. Users should consult Claridy technical personnel for proper training before performing any maintenance activity on the equipment. The security gate maintenance access can be gained through removing the lampshade of the gate and the acrylic protective cover with a no.4 hex key or wrench. Note that unauthorized changes, removal or tampering to the component/structure/wiring of the equipment makes the provided warranty/guarantee null and void.



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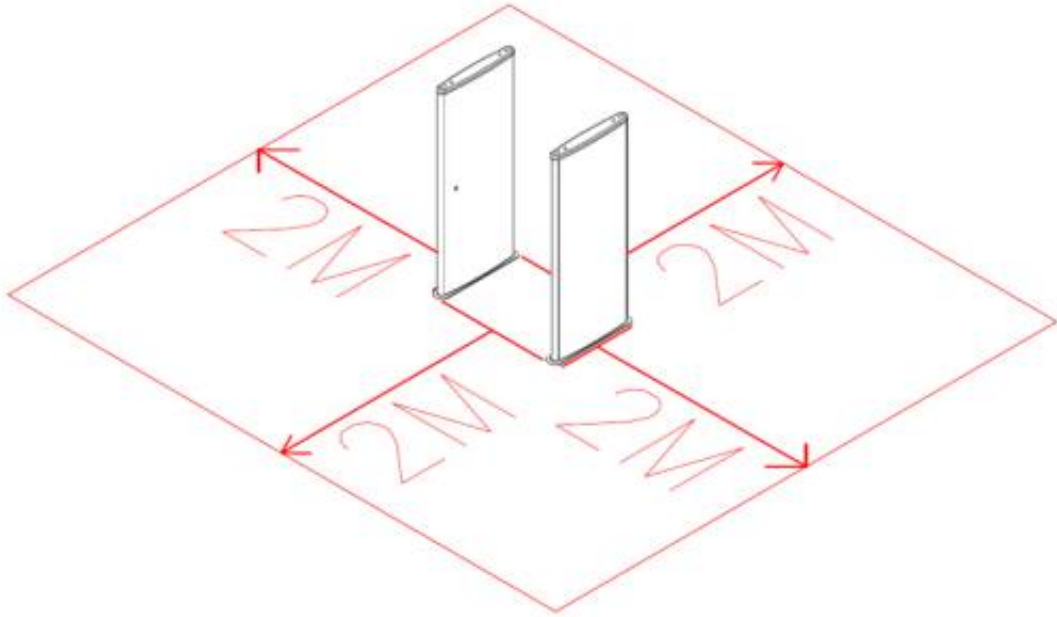
#### 1.4. Quick Start

There are four different parts in the delivery package, which is, (a) the main panel of the gate, (b) the secondary panel of the gate, (c) the slot fitting that connects the mounting plate of the gate panels, (d) the cover of the slot fitting.

The standard product does not come with mounting plate or base plate. The enclosed mounting plates and slot fitting are designed to facilitate the testing of the equipment. In actual deployment, the equipment is mounted to the floor and cabling is done through a wiring conduit or duct (See section 7. Appendix - Security Gate Mounting).

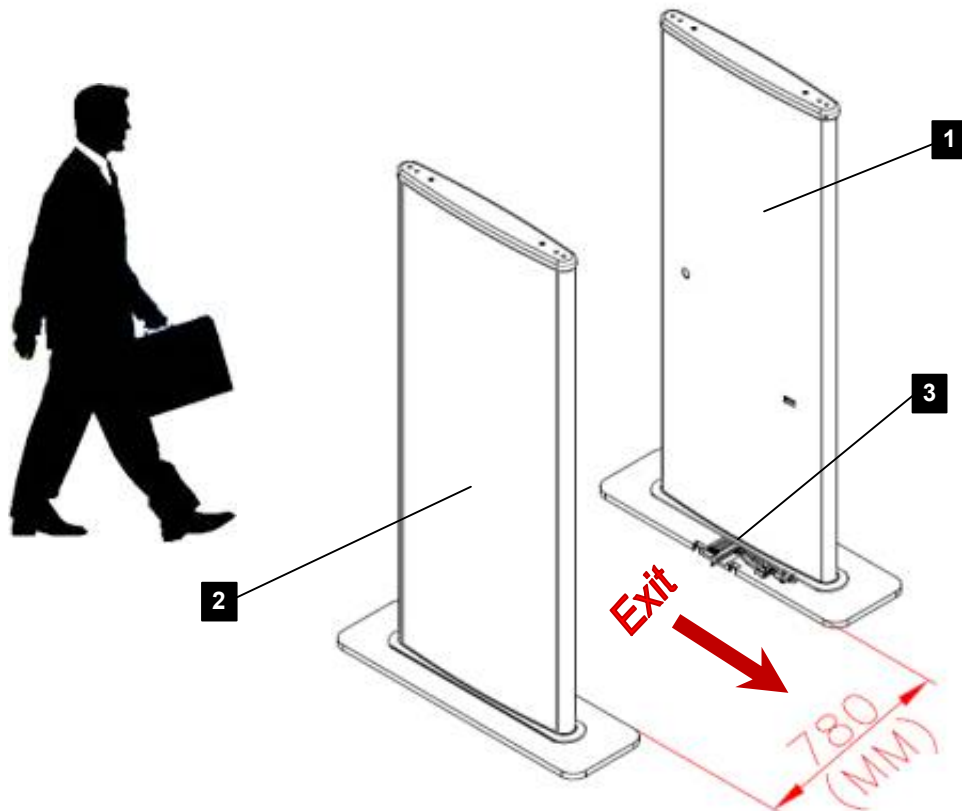
Upon unpacking the equipment, users should assemble the security gate in accordance to the steps described in this section. The equipment must be assembled on a flat and level floor. Failure of doing so will cause unexpected behavior and result. For best result, allow a 2 meter clearance space for the equipment, as illustrated below.

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### 1.4.1. Raising the Panels

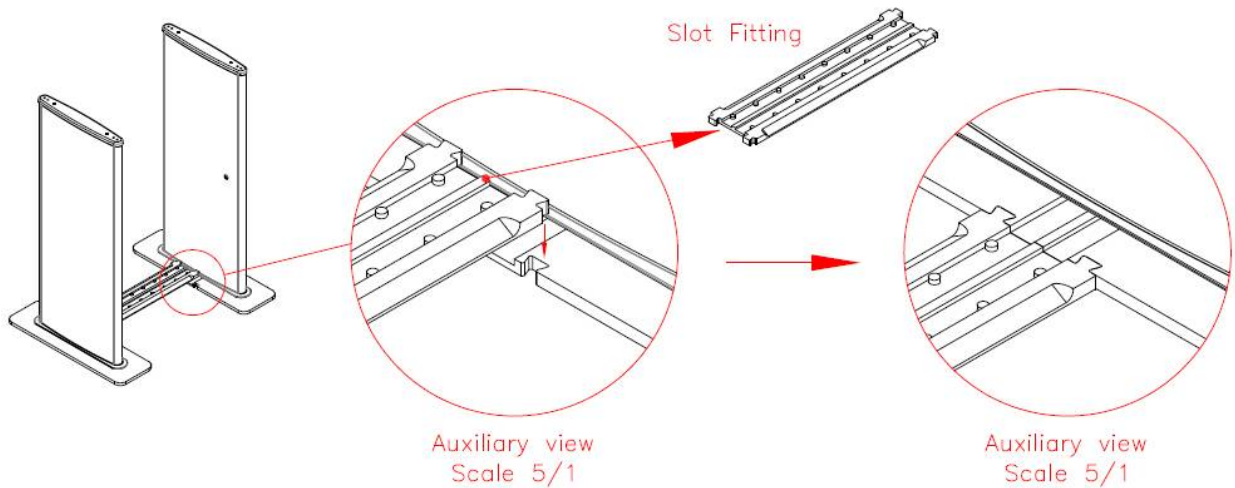
Unpack the main and secondary panel. The main panel can be identified by either looking at the cable or the counter of the panel. The main panel should have 4 short RF cables, 2 Ethernet connector socket, a signal cable and a power cable coming out from the mounting plate. Whereas, the secondary panel has 4 longer RF cables and a signal cable. The main panel (item #1 in the following diagram) and the secondary panel (item #2) should be 780mm apart standing with their mounting plate opening (#3) facing each other.



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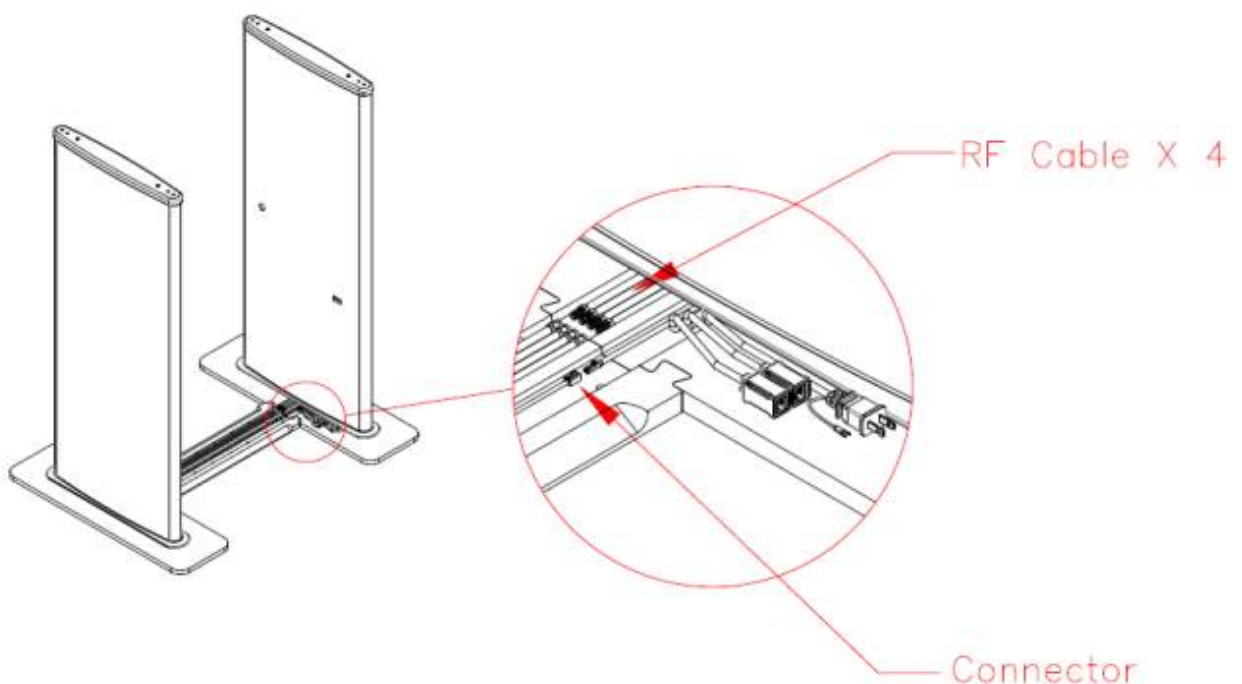
### 1.4.2. Connecting and Holding the Panels Together

Get the slot fitting part and snap one side to the secondary panel and the other side to the main panel as illustrated below. The cables (not seen in the diagram below) should remain on top of the mounting plate. By snapping both the mounting plate with the slot fitting, the main and secondary panel are hold together and stand firmly on the floor.

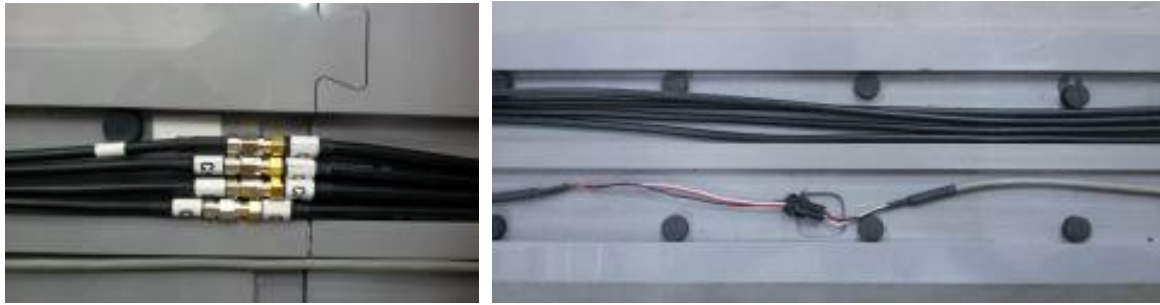


### 1.4.3. Arranging and Wiring the Cables

After securing the panels on the floor, put the RF cables and signal cables on the slot. Place RF cables together away from the signal cable. Connect the RF cables and the signal cable by plugging the male plug to the female jack. Make sure that the RF cables are tightly secured.



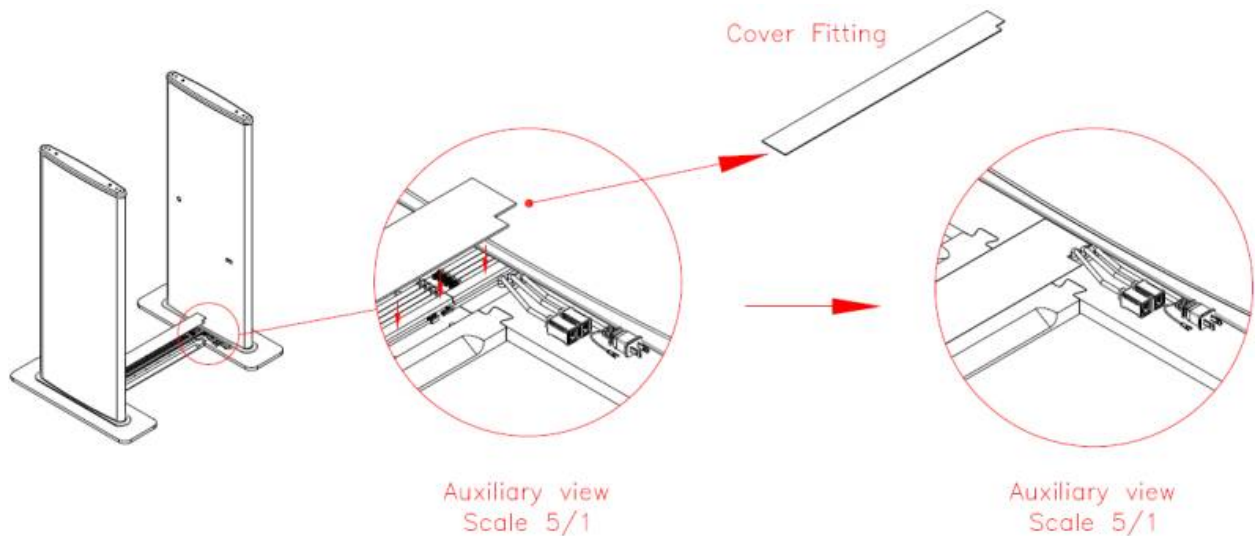
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The RF cables are labeled with Channel "A" to "D", be sure that cable with the same channel labeled are connected together. The signal connector is a fool-proof connector.

### 1.4.4. Covering Up the Slot Fitting

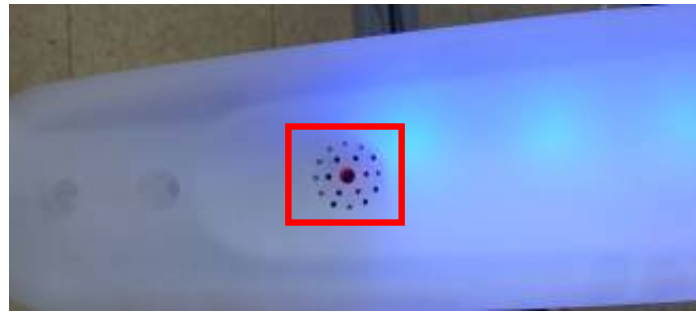
When the wiring is done, take the cover and slide it into the top area of the slot. The left end of the cover has a small opening that allow Ethernet cable and power cable to go through. In standard installation, power and Ethernet cable are within the equipment itself.



### 1.4.5 Switching On the Equipment

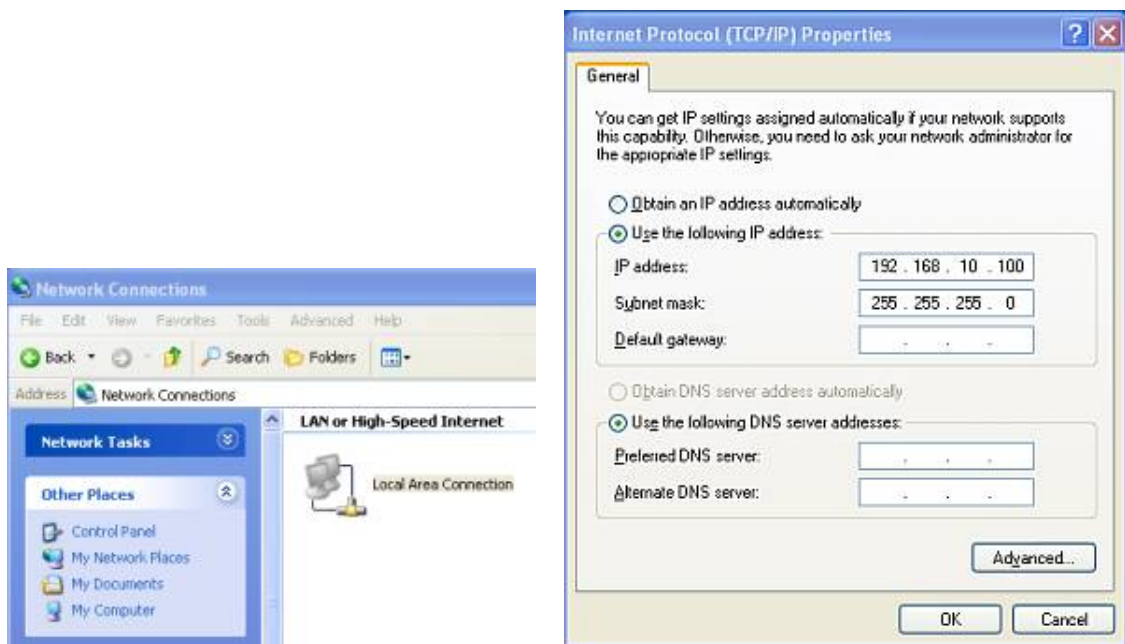
Ensure that proper power (115VAC for Model J, 230VAC for Model A & C) is supplied to the equipment by plugging the power cable to the socket. The on/off switch is underneath the lamp shade of the main panel to prevent tampering. Use a thin rod to push the switch to turn on the power. When the equipment is ready, the blue LED light bar on top of the gate will be lit.

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### 1.4.6 Preparation for Testing the Equipment

A notebook or computer with Ethernet adapter is required in order to setup the equipment for testing. The default IP address of the equipment is set to 192.168.10.210 with subnet mask of 255.255.255.0. Users are advised to set their notebook or computer Ethernet adapter to the same network (i.e. 192.168.10.x). Then, plug one end of the Ethernet cable to the LAN communication port of the equipment and the other end to the Ethernet adapter of the computer or notebook. Follow instructions on section "1.5. Installation of the UHF Security Gate Tools" to install the software tools to the notebook or computer.



### 1.5. Installation of the UHF Security Gate Tools

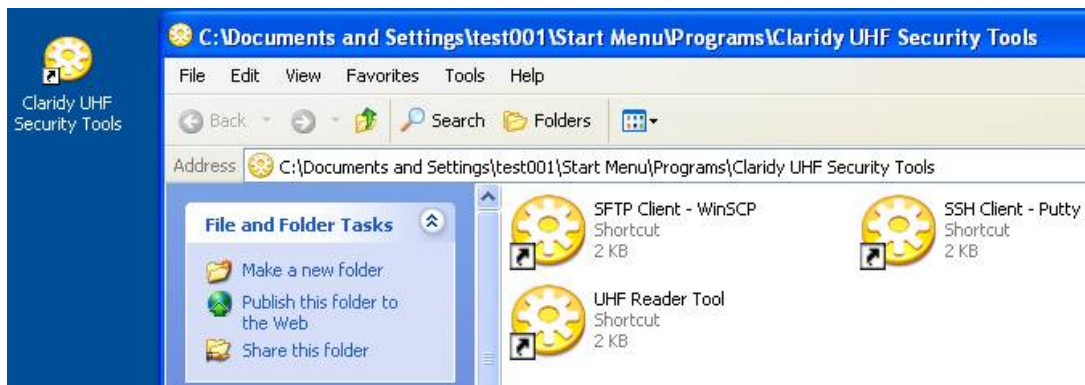
The release media include installation package for UHF Security Gate Tools. These tools are useful in verifying the security gate peripheral functionalities. To install the package, run "setup.exe". Dependency packages such as .NET Framework and Visual C++ Runtime are installed first following by the setup welcome screen. Proceed as instructed.



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Upon completing the installation process, the system creates a shortcut named "UHF Security Gate Tools" on the desktop.



The tools installed are WinSCP, Putty and UHF Reader Tool. These tools are used to access the equipment in the upcoming section of the user manual.

Alternatively, users could also install their choice of ssh client or obtain tool pack that doesn't required installation from technical support.

### 1.6. SAFETY NOTES

The equipment can only be operated at the stated supply voltage. If the supply voltage is too high, there is a risk of fire.

Always turn off power before performing any maintenance activities or touching any interior part and exterior connection cables of the equipment. Failure to do so might lead to injuries. There is a risk of health.

Appropriate means are provided to dissipate the heat generated within this equipment. The equipment must however not be installed in a cabinet or on shelves with insufficient ventilation.. There is a risk of fire.

Protect the equipment from moisture, dripping water and spraying water. The equipment must not be placed close to sources of heat, exposed to direct sunlight or operated in a damp environment. The equipment may only be operated in the condition stated in the specification.



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Do not place anything which has a naked flame on the equipment. There is a risk of fire.

Connection, installation and maintenance work, as well as all other work on the unit, may only be carried out by properly qualified and trained personnel. Unauthorized changes to the unit and the use of spare parts and peripheral devices which are not sold or recommended by the manufacturer can result in fires, electric shocks and injuries. Such actions therefore result in exclusion of liability and make the manufacturer's warranty/guarantee null and void.

## 2. Deploying the Security Gate

Once the security gate has been installed in the designated area, most likely somewhere near the exit, users may examine the functionality of the security gate by walking through the gate with books that has been encoded.

The security gate can operate even without network connectivity. This design ensures security policies continue to be enforced during network or server failure. The security gate will trigger the alarm and switch to alert status if there is any book with security flag enabled. By default, books returned to the library will have security flag enabled whereas books successfully borrowed by patron will have security flag disabled. The security gate has blue light lit when it's in normal status. The security gate will trigger the alarm, which is the combination of buzzer sound and red light flashing when it's in alert status.

To validate the security gate, users can perform three basic scenarios below and check the corresponding light and sound of the security gate.

Scenario	Light and Sound
1. Walk through the gate without carrying any books	Blue
2. Carry a book that has not been borrowed (security flag enabled)	Red with Buzzer
3. Carry a book that has been borrowed (security flag disabled)	Blue



Security Gate Normal



Security Gate Alert

If the security gate is not functioning as expected, users may perform diagnosis by referring to steps in section 5. Testing the Component of the Equipment.

### 3. The System Connectivity

The system is configured to boot up automatically into embedded Linux. The blue LED light bar will be turned on when the equipment is ready. The following section provides user with more information regarding the configuration of the peripherals or components.

#### 3.1. Ethernet Port

Two Ethernet port sockets are located at the lower part of the main panel. One of the port is labeled as "Reader Setup Port" and the other is labeled as "LAN Comm. Port"



	Reader Setup Port (Item #2)	LAN Comm. Port (Item #1)
MAC Address	00:05:7B:82:02:5C	48:D8:FE:F0:00:01
IP Address	192.168.25.203	192.168.10.210
Usage	Reserved for reader setup, debug and testing only, not for application.	Connect to Local Area Network for communication with other system and remote access to the system.

Both port are set to static IP address. The reader setup port doesn't need to be connected to the network, it is only use for setup and tuning. The LAN communication port is the main interface between the equipment and the network server or remote access client.

To make the equipment accessible for local area network, either adjust the network to 192.168.10.x or change the default IP address of the LAN Comm. Port. Refer to section 4.2. Accessing and Changing the UHF Security Gate Network Configuration for information on how to change IP address of the LAN Communication. Port.

**Note: Users should not change the IP Address of the reader through the Reader Setup Port. Changing the IP Address will disconnect the reader from the embedded board. If user has accidentally change the IP address using the reader test tool. Use the tool to search the reader and change it back to the default IP address.**

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### 3.2. LED Light Bar

The LED light bar is used primarily as warning indicators. To accommodate various requirement, two type of LED light are available for control, namely Red and Blue. In general, red lights represent warning/alert and blue lights represent normal condition. The LED lights are control with different digital output of the embedded board, making it also possible to turn both LED on simultaneously. In general application, either red or blue light are used at a single point of time.

### 3.3. Buzzer

The buzzer is used together with the LED light to constitute the effect of alarm. Only on/off control can be set.

### 3.4. Counter

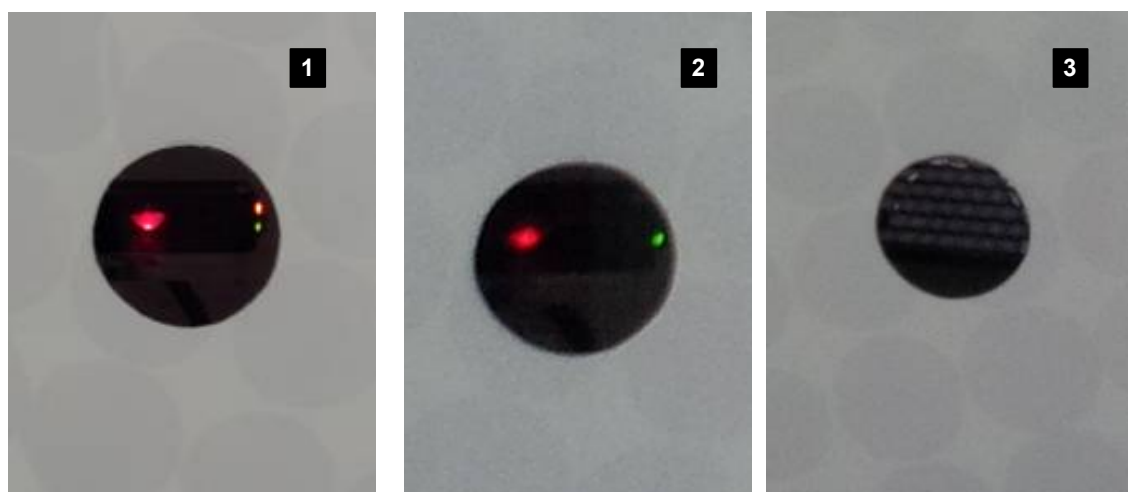
The eight digits counter is used to record the amount of people that go through the gate. The detection is normally done through IR sensor. The counter can also be reset programmatically if there is special request. In general application, software counter is used because software counter offers the flexibility of counting visitor within a period of time.

### 3.5. PIR Sensor and IR Sensor

The PIR sensor is meant to detect human motion that it faced within a distance of approximately 2M. The IR sensor is meant to detect people walking through the equipment. Both sensors can be used to trigger activity such as tag detection, alarm or counting.

The IR sensor installed is retro-reflective type. A reflector is located at the other side of the panel (image #3 as shown below). If an object or person comes in between of the IR sensor and the reflector, the IR sensor signal is triggered. This can be determined by looking at the orange LED light of the IR sensor. When there is nothing detected, the orange LED is off (image #2).

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### 3.6. UHF RFID Reader

The 16-port UHF RFID reader is conformed to EPC UHF Class 1 Gen 2 and capable of supporting ISO18000-6C protocol. It is connected to the Ethernet interface of the embedded board. The reader and the embedded board each has a fixed IP address assigned ensuring direct communication between these two units..

Setting	Value
Embedded Board Ethernet Port IP	192.168.25.210
Embedded Board Network Mask	255.255.255.0
UHF RFID Reader IP	192.168.25.203
UHF RFID Reader Network Mask	255.255.255.0

**Note: User should not change the default IP address of the UHF RFID Reader. Besides the internal Ethernet interface that connected to the Embedded Board. The equipment also includes an external Ethernet Port (i.e. The Reader Setup Port) for accessing the reader externally. This is particularly useful when user wish to calibrate and tune the equipment for tag detection.**

## 4. Modifying the Default Network Configuration

The security gate's network configuration (i.e. the configuration of LAN communication port) can be changed by accessing the equipment through remote access terminal. SSH protocol is selected for better security. This LAN communication port is the only port that user may change according to the deployed networking environment.

### 4.1. Initial Network Configuration of UHF Security Gate

The factory default network configuration of the UHF Security Gate is as follows.

<b>IP Address</b>	<b>192.168.10.210</b>
-------------------	-----------------------

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<b>Netmask</b>	<b>255.255.255.0</b>
<b>Gateway</b>	<b>192.168.10.253</b>
<b>Preferred DNS Server</b>	<b>8.8.8.8</b>
<b>Alternative DNS Server</b>	<b>8.8.4.4</b>

### 4.2. Accessing and Changing the UHF Security Gate Network Configuration

There are two approaches to make the equipment accessible, either through changing the network configuration of the equipment or the network configuration of the local area network. Normally, changing equipment's network configuration is more feasible and practical. To access the reader, please follow the steps below.

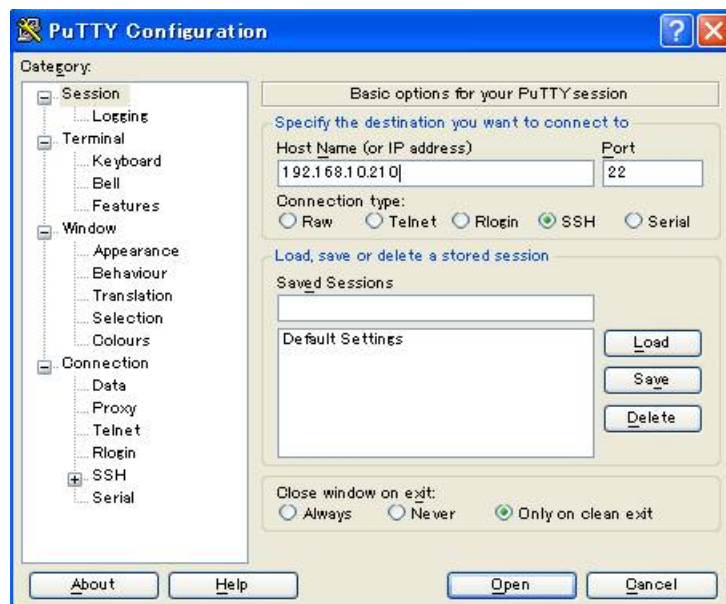
- Prepare a Notebook or computer with Ethernet adapter.
- Modify the network configuration with static IP and netmask. This will make the computer or Notebook resides at the same network as the equipment.

<b>IP Address</b>	<b>192.168.10.x (x can be any number between 1 to 252)</b>
<b>Netmask</b>	<b>255.255.255.0</b>

- Connect the Ethernet port of the computer or Notebook and UHF Security Gate "LAN Comm. Port" with a standard cat 5 network cable.
- Use SSH client to connect to the equipment. If this is the first time connecting to the equipment, a security alert dialog pops up. Select "Yes" to continue. The username and password to be used is as follows.

**Username:** sshuser

**Password :** IDSmart



- Modify `"/home/sshuser/outgoing_network.config"` to fit the current network environment settings by typing `"vi outgoing_network.config"` at the command prompt. This opens an editor window for changing the configuration.



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```
sshuser@freescale ~$ vi outgoing network.config
```

```
#!/bin/bash
export OUTGOING_IPADDR="192.168.10.210"
export OUTGOING_NETMASK="255.255.255.0"
export DEL_GATEWAY="192.168.10.253"
export ADD_GATEWAY="192.168.10.253"
export DNS_SERVER1="8.8.8.8"
export DNS_SERVER2="8.8.4.4"
```

- After finish editing the network configuration, type `":wq"` to save the configuration file.
- Restart or reboot the equipment.

Always remember the IP Address (OUTGOING\_IPADDR) and the Subnet Mask (OUTGOING\_NETMASK) that are changed. When the equipment restarts, the remote access will no longer available if the network of the notebook or computer are different from the equipment. If for any reason users can no longer access remotely, the configuration can also only be changed through accessing the system via console port. The console port can only be connected through maintenance access of the equipment.

Gateway is used when the equipment communicates across different network. Be sure that the DEL\_GATEWAY and ADD\_GATEWAY has the same address.

DNS\_SERVER1 and DNS\_SERVER2 must be set if the equipment is communicating with other devices on the network using naming system instead of IP address.

## 5. Testing the Component of the Equipment

Once the equipment is ready, an illegal item such as an un-borrowed book will trigger alarm when it is carry through the security gate. If the security gate is not function as expected, users may switch to debug mode and perform diagnostic on each component during troubleshooting.

The equipment is remotely accessed using SSH remote access software such as "Putty". The remote access software should be installed on a computer. To simplify the testing process, the remote access software can be installed on a notebook. A direct connection can be hooked up between the notebook and the equipment using Ethernet cable without changing the network configuration of the equipment (see section 1.4.6 Preparation for Testing the Equipment).

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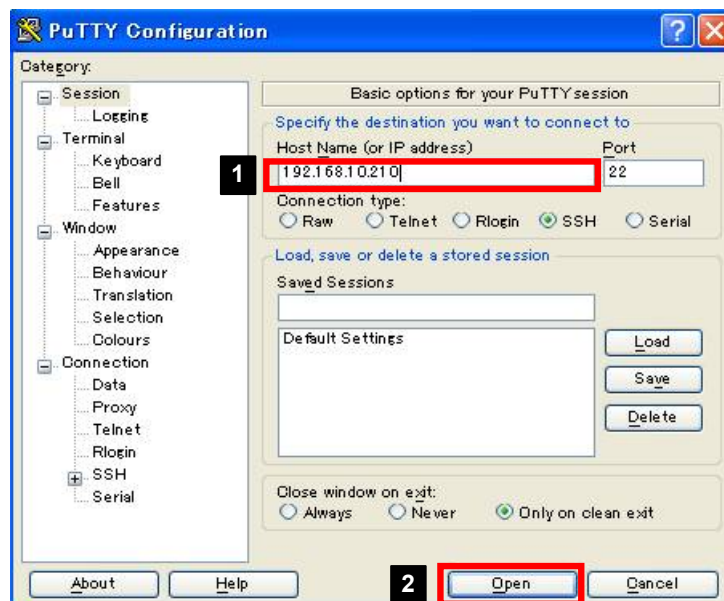
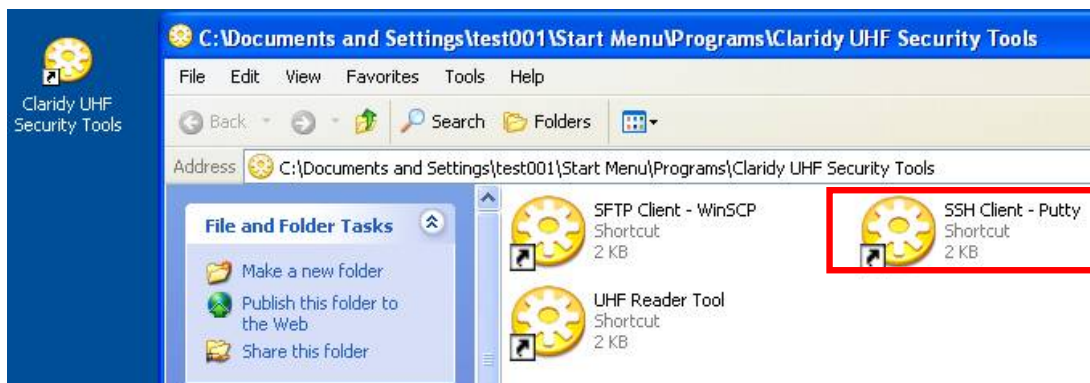
The connection can only be made if the computer that has the remote access software installed can reach the equipment.

- Ping the equipment from the computer to ensure that network connectivity is OK. If it is a direct connection, check cable if the equipment has no response.
- Allow bi-directional access of port 22 as the equipment SSH protocol is configured to listen and communicate through port 22. If it is a direct connection, check if there is any antivirus or firewall security software that blocks this port when connection fails.

Consult the network administrator for further advice and information on the local area network configuration. If the equipment and the computer is located on two different networks, the gateway configuration of the equipment must be changed.

### 5.1. Connecting to the Equipment

Start the SSH remote access tool. "Putty" is used as the SSH remote access tool throughout this user manual, users are free to choose different tool. Type the IP address of the equipment in the "Host Name (or IP address)" textbox and click "Open" button.



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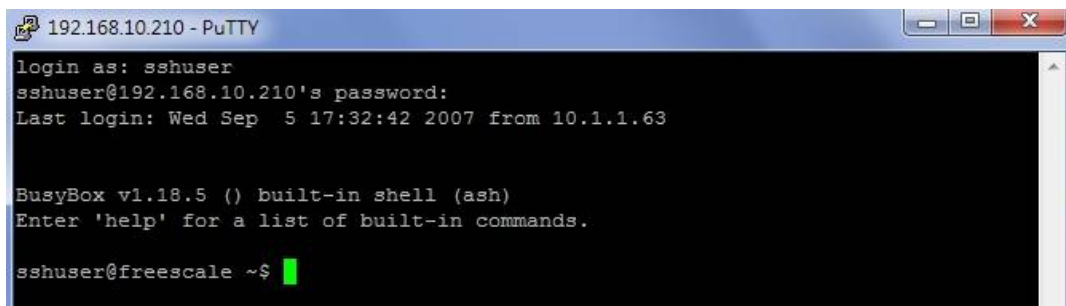
If this is a first time connection, a security alert will be shown. Choose "Yes" to accept the security key for future connection, as we are pretty sure that we are connecting to the intended equipment.

The default username and password is listed below. User can change the password with Linux change password command once connected.

**Username:** sshuser

**Password :** IDSmart

A command shell is shown when the login is successful. Most of the common Linux command works under this shell, but some may not since it is embedded Linux.



```
192.168.10.210 - PuTTY
login as: sshuser
sshuser@192.168.10.210's password:
Last login: Wed Sep  5 17:32:42 2007 from 10.1.1.63

BusyBox v1.18.5 () built-in shell (ash)
Enter 'help' for a list of built-in commands.

sshuser@freescale ~$
```

### 5.2. Switching to Debug Mode

The security gate is started up in service mode. To perform diagnostic, the user **must** switch the security gate to debug mode.

After successful logged in with the "sshuser" account, user should be in the home directory of the user, run the debug mode script by typing `./security-gate-DebugMode.sh` in the shell.

```
sshuser@freescale ~$ ./security-gate-DebugMode.sh
```

When the script executed, the security gate will reboot and user can log in to the system running the debug mode. Always switch to debug mode when performing diagnostic and configuration of the system.

The reboot process will kick the remote access connection so users will need to reconnect to the system once the system restart. The LED light of the security gate will not turn to blue after reboot to debug mode.

### 5.3. Running the Demo Program for Diagnosis

A demo program is developed to facilitate the testing of the equipment. The demo program can test individual components of the equipment and is therefore very handy when performing diagnosis. Before running the demo program, be sure that the system is in **"debug mode"**.

The demo program is preinstalled in the equipment. It is located under the directory `"/usr/local/security-gate-demo/"`. When login, change the directory to "security-gate-demo" and

## IDS<sup>Smart</sup> UHF Security Gate User Manual

run the "./demo.sh" shell script.

```
sshuser@freescale ~$ cd /usr/local/security-gate-demo
```

```
sshuser@freescale /usr/local/security-gate-demo$ ./demo.sh
```

After executing the demo program, the context shell of the demo program is loaded. Type "help" to see commands available for the demo program. Please refer to the SDK reference manual for detailed usage.

```
sshuser@freescale ~$ cd /usr/local/security-gate-demo
sshuser@freescale /usr/local/security-gate-demo$ ./demo.sh
[Demo] Start Demo Program.
$>
$>help
[Demo] Commands ::
[Demo] Command Description
[Demo] "help" "Display all command and description"
[Demo] "connect" "Connect to CS468"
[Demo] "disconnect" "Disconnect from CS468"
[Demo] "inventory" "Start Inventory"
[Demo] "read-user-memory" "Read the user memory data"
[Demo] "read-tid" "Read the TID data"
[Demo] "stop" "Stop Operation"
[Demo] "set-power" "Set the antenna power."
[Demo] "get-power" "Get the antenna power."
[Demo] "enable-ant" "Enable the antenna port"
[Demo] "disable-ant" "Disable the antenna port"
[Demo] "set-fix-q" "Set Fix-Q Algorithm"
[Demo] "set-dwell-time" "Set the dwell time of the antenna"
[Demo] "set-ant-inv-count" "Set the inventory round counts of the antenna"
[Demo] "start-scenario" "Run Scenario"
[Demo] "stop-scenario" "Stop Scenario"
[Demo] "get-ir-state" "Get the state of the IR pin (0 or 1)"
[Demo] "start-ir" "Start monitor the IR pin state."
[Demo] "stop-ir" "Stop monitor the IR pin state"
[Demo] "get-pir-state" "Get the state of the PIR pin (0 or 1)"
[Demo] "start-pir" "Start monitor the PIR pin state."
[Demo] "stop-pir" "Stop monitor the PIR pin state"
[Demo] "turn-red-led-on" "Turn red led on"
[Demo] "turn-red-led-off" "Turn red led off"
[Demo] "blink-red-led" "Blink the red led"
[Demo] "turn-blue-led-on" "Turn blue led on"
[Demo] "turn-blue-led-off" "Turn blue led off"
[Demo] "blink-blue-led" "Blink the blue led"
[Demo] "add-counter" "Add counter by 1"
[Demo] "reset-counter" "Reset counter "
[Demo] "beep" "Make beep."
[Demo] "trigger-alarm" "Trigger Alram."
[Demo] "turn-reserved-port-on" "Turn on the reserved port."
[Demo] "turn-reserved-port-off" "Turn off the reserved port"
[Demo] "q" "quit "
$>
```

### 5.4. LED Light Bar Verification

The two-color LED light bar can be controlled separately. The following example turns the blue LED off and turn the red LED on. The blink function allows user to blink the LED light bar for a desired time in seconds. The example also makes the red LED blink for 5 seconds.

```
[Demo] Start Demo Program.
$>
$>turn-blue-led-off
[Demo] Turn Blue led off
$>turn-red-led-on
[Demo] Turn the red led on
```

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```
$>blink-red-led 5  
[Demo] Blink red led :: "5" seconds  
$>
```

From left to right: Both LED lights are off, blue LED lights on, red LED lights on.



### 5.5. Buzzer and Alarm Triggering

Users can control the number of second that a buzzer beeps. By combining the buzzer beeping and red LED light bar blinking, alarm effect can be created. The example causes the buzzer to beep for 7 seconds and then sound the alarm for 3 seconds (red lights and buzzer will be activated for 3 seconds).

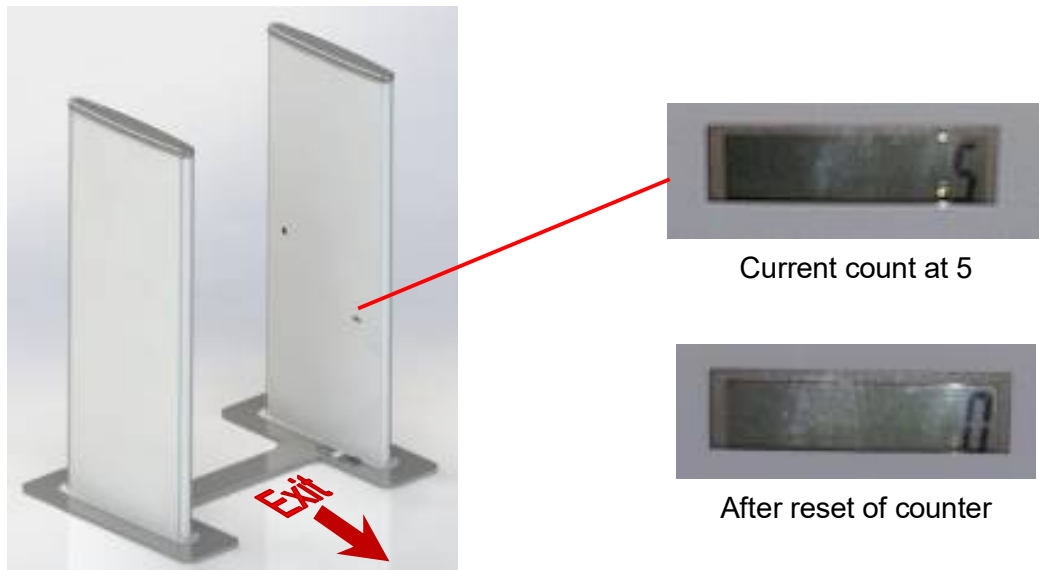
```
[Demo] Start Demo Program.  
$>  
$>beep 7  
[Demo] Beep in "7" seconds  
$>trigger-alarm 3  
[Demo] Trigger alarm in "3" seconds  
$>
```

### 5.6. Counter

Users may increase the counting or reset the counting of the counter. The following example increases the counter five times and then reset it. The counter current count can be checked by looking at the lower part of the main panel. The reset counter is per request special feature which might not available for most model.

```
[Demo] Start Demo Program.  
$>  
$>add-counter  
[Demo] Plus 1 in the Counter  
$>add-counter  
[Demo] Plus 1 in the Counter  
$>add-counter  
[Demo] Plus 1 in the Counter  
$>add-counter  
[Demo] Plus 1 in the Counter  
$>add-counter  
[Demo] Plus 1 in the Counter  
$>  
$>reset-counter  
[Demo] Reset the Counter  
$>
```

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### 5.7. PIR Sensor and IR Sensor

Both sensors are input to the system, which mean that they are triggered by external event. The sensors are put to monitoring the external event, which is people coming near the equipment or passing through the equipment.

To make the testing straight forward, the buzzer beeps once when the sensors are triggered. Due to the nature of fast sensor response, the sensor response are deliberately slowed down through software programming so that the equipment is not over reacted or too sensitive to motion. The following example starts the PIR sensor monitoring process and stop it

```
[Demo] Start Demo Program.  
$>  
$>start-pir  
[Demo] Start Monitor the PIR  
$>[Demo] PIR Detected  
[Demo] PIR Detected  
[Demo] PIR Detected  
[Demo] PIR Detected  
$>  
$>stop-pir  
[Demo] Stop Monitor the PIR  
$>
```

When PIR sensor monitoring process started, stand in front of the equipment and move around (e.g. walk toward the gate). When the PIR sensor detects the motion, the buzzer's beep can be heard. Once detected, the PIR sensor stop detecting until one second later.



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The following example starts the IR sensor monitoring process and stop it

```
[Demo] Start Demo Program.  
$>  
$>start-ir  
[Demo] Start Monitor the IR  
$>[Demo] IR Detected  
[Demo] IR Detected  
[Demo] IR Detected  
[Demo] IR Detected  
$>  
$>stop-ir  
[Demo] Stop Monitor the IR  
$>
```

When IR sensor is started, walk through the security gate. The buzzer beeps when the user passes through the IR sensor.



### 5.8. UHF RFID Reader Verification

The reader is connected internally to the embedded board through Ethernet port. The

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reader is assigned a static IP address and connected to a designated IP address of the embedded board. User should not change this IP address as they are private internal IP address. The internal IP address of the UHF reader is set to 192.168.25.203. The following example starts a reader connection and set the Q value parameter of the reader. Q value is one of many parameters of UHF EPC C1G2. The parameters can be adjusted based on various scenario, this is out of the scope of this user manual. Consult RFID technical expert for optimization of these values. Connection to the reader is required before performing any inventory or tag reading operation.

```
[Demo] Start Demo Program.
$>
$>connect 192.168.25.203
[Demo] Connect to the Reader. IP : "192.168.25.203"
[Demo] CS468 Connected!!
[Demo] Initial the default parameters.
[Demo] Disable 0-port antenna and enable the 8 ~ 15 port antenna.
[Demo] Set dwell time as 250
[Demo] Set antenna power as 270
$>
$>set-fix-q
[Demo] Error :: The count of parameters is not match with the command. CMD:: "set-fix-q"
[Demo] Usages ::
    "set-fix-q [q-value] [retry-count] [toggle] [runTillZero]"
$>
$>set-fix-q 4 0 1 1
[Demo] Set Fix Q : 4 ,Retry Count : 0 , is Toggle : true , is Run Till Zero : true
$>
```

Prepare several books with tag or UHF RFID tag and place those tags near the equipment. Depending on the environment, the reading radius could be around one to two meters. To test the reader, we place the UHF RFID tags in between the two panels of the security gate. The following example performs an inventory cycle. Information of tags, i.e. PC, EPC and RSSI of the detected tags are displayed, regardless of whether it repeats on different antenna.

```
$>
$>set-fix-q 4 0 1 1
[Demo] Set Fix Q : 4 ,Retry Count : 0 , is Toggle : true , is Run Till Zero : true
$>
$>inventory
[Demo] Start Inventory
[Demo] Tag PC:: "4800" EPC :: "104000000001023a80000003525c00010000" , RSSI :: "66.4"
[Demo] Tag Detected
[Demo] Tag PC:: "4800" EPC :: "104000000001023a80000003525c00010000" , RSSI :: "60"
[Demo] Tag Detected
[Demo] Tag PC:: "4800" EPC :: "104000000001023a80000003525c00010000" , RSSI :: "64"
[Demo] Tag Detected
[Demo] Tag PC:: "4800" EPC :: "104000000001023a80000003525c00010000" , RSSI :: "61.6"
[Demo] Tag Detected
[Demo] Tag PC:: "4800" EPC :: "104000000001023a80000003525c00010000" , RSSI :: "62.4"
[Demo] Tag Detected
[Demo] Tag PC:: "4800" EPC :: "104000000001023a80000003525c00010000" , RSSI :: "62.4"
[Demo] Tag Detected
[Demo] Tag PC:: "4800" EPC :: "104000000001023a80000003525c00010000" , RSSI :: "76.8"
[Demo] Tag Detected
[Demo] Tag PC:: "4800" EPC :: "104000000001023a80000003525c00010000" , RSSI :: "76.8"
[Demo] Tag Detected
[Demo] Tag PC:: "3000" EPC :: "300833b2ddd9014000000000" , RSSI :: "50.4"
[Demo] Tag Detected
[Demo] Tag PC:: "3000" EPC :: "300833b2ddd9014000000000" , RSSI :: "48.8"
[Demo] Tag Detected
```

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```
[Demo] Tag PC:: "4800" EPC :: "10400000001023a80000003525c00010000" , RSSI :: "73.6"
[Demo] Tag Detected
[Demo] Tag PC:: "4800" EPC :: "10400000001023a80000003525c00010000" , RSSI :: "67.2"
[Demo] Tag Detected
[Demo] Tag PC:: "4800" EPC :: "10400000001023a80000003525c00010000" , RSSI :: "74.4"
[Demo] Tag Detected
[Demo] Tag PC:: "4800" EPC :: "10400000001023a80000003525c00010000" , RSSI :: "76"

: (truncated)
:

$>
```

There are eight antenna (port 8 to port 15) installed for the equipment, to set antenna power and dwell time, run the command with appropriate parameter, check the SDK reference manual for further usage. The following example disables antenna on port no.8 and enables it. Then, a disconnection to the reader is done follows by exiting the context shell.

**Note: only one connection can be connected to the reader at the same time.**

```
$>
$>disable-ant 8
[Demo] Disable Antenna :: 8
$>
$>enable-ant 8
[Demo] Enable Antenna :: 8
$>
$>disconnect
$>
$>q
sshuser@freescale ~/security-gate-demo$
```

### 5.9. Switching to Service Mode

Once the user has completed the diagnosis, the system should be switched to service mode. The service mode script is located in the home directory of the "sshuser". Change the directory to "/home/sshuser". the run the debug mode script by typing "./security-gate-DebugMode.sh" in the shell.

```
sshuser@freescale /usr/local/security-gate-demo$ cd /home/sshuser
sshuser@freescale ~$ ./security-gate-ServiceMode.sh
```

When the script executed, the security gate will reboot and switch to service mode. Always switch to debug mode when performing diagnostic and configuration of the system. In service mode, the security gate LED will be red when restarting and turn to blue when it is ready to service. If the LED doesn't switch from red to blue within 20sec, login to the system again to correct the issue.

## 6. Accessing the UHF RFID Reader with Security Gate Tools

The UHF RFID Reader is internally connected to the embedded board. To facilitate testing and tuning, the security gate tools include a program that can directly connect to the reader through the Ethernet Port labeled "Reader Setup Port". This tool is especially useful when developers wish to test different setting of the reader and antenna to optimize the result of the

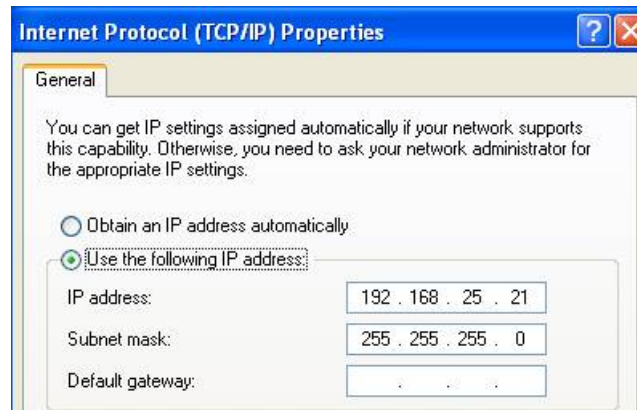
## IDSmart UHF Security Gate User Manual

security gate detection. One of the key successful factors of UHF RFID equipment deployment is environment. This tool provides a way to easily perform on site tuning with portable computer such as Notebook.

### 6.1. Prerequisite of using the UHF Reader Tool

Before using the tool, install the tool to the computer according to the instructions described in section 1.5. Installation of the UHF Security Gate Tools.

The computer Ethernet interface configuration will need to be changed to ensure the computer residing on the same network as the UHF RFID reader. The reader has a static IP address of 192.168.25.203 and subnet mask of 255.255.255.0. As a result, the IP address of the computer should be set to 192.168.25.X (except 192.168.25.0 and 192.168.25.203) with the same subnet mask. The following example set the computer IP address to 192.168.25.21



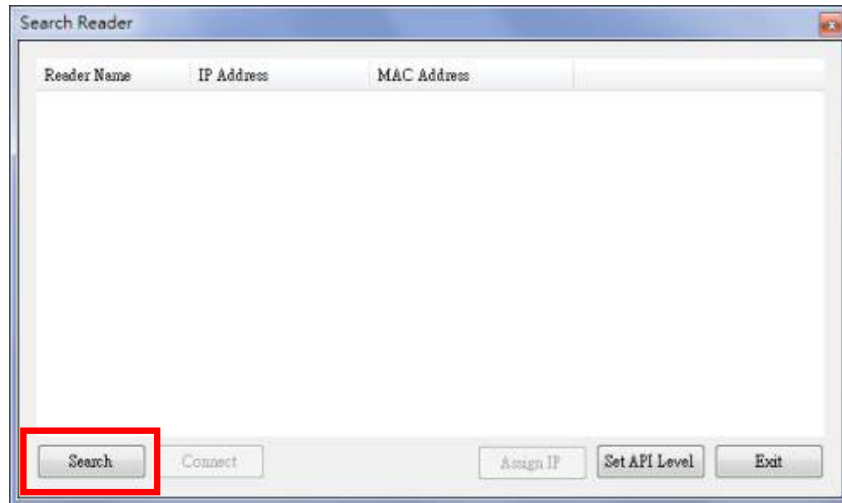
### 6.2. Connecting to the UHF RFID Reader

Double click "Claridy UHF Security Gate Tools" shortcut on the desktop and double click the "UHF Reader Tool" shortcut to run the tool.



An initial search dialog is presented when the program is executed. Click "Search" button to discover the reader. Since the UHF RFID reader and the computer are allocated to the same network, the discovery process is pretty straight forward.

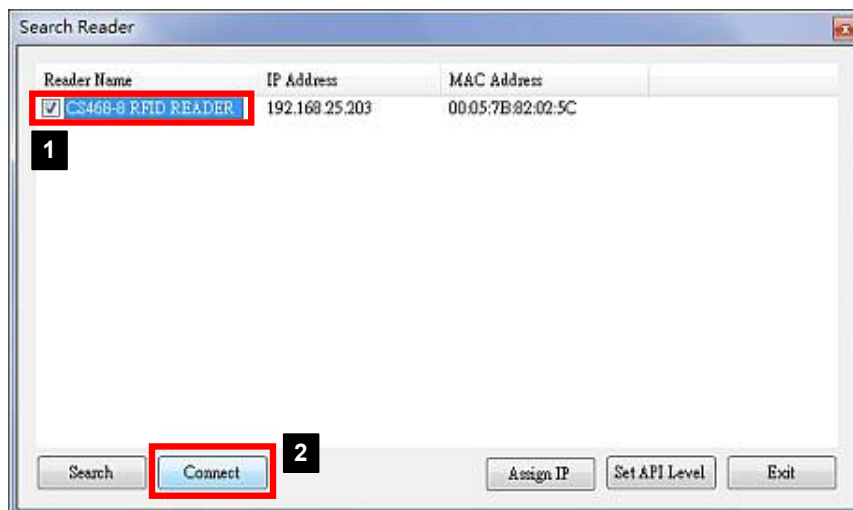
## IDSmart UHF Security Gate User Manual



After searching the network, the installed UHF RFID reader at 192.168.25.203 is found. Stop the search by clicking the "Stop" button.



Check the checkbox next to the reader name and click "Connect" button to connect to the reader. A splash screen will be shown while the program attempts to access the UHF RFID reader.



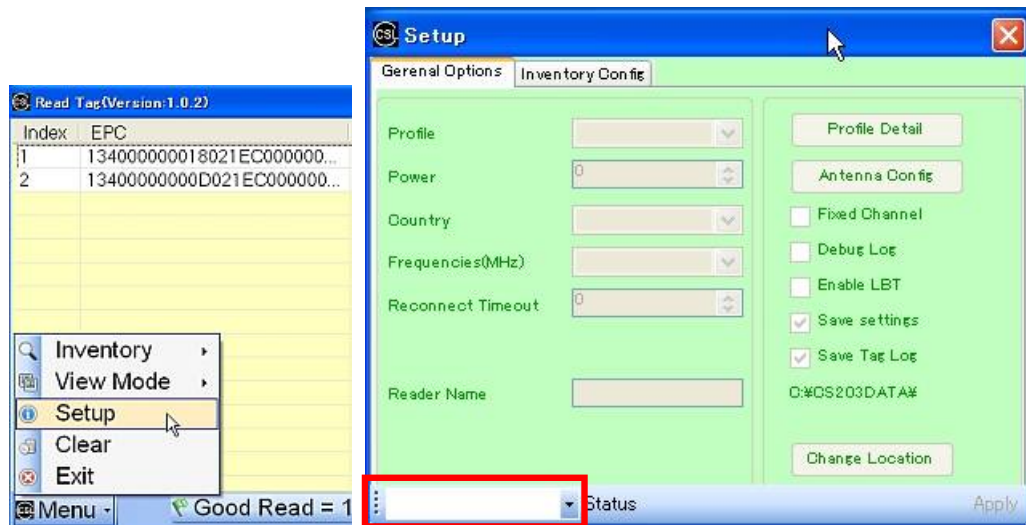
## IDSmart UHF Security Gate User Manual

After connected to the reader. Users may choose the intended operation using the "Menu" located at the lower left corner.



### 6.3. Configuring the UHF RFID Reader and Antenna Settings

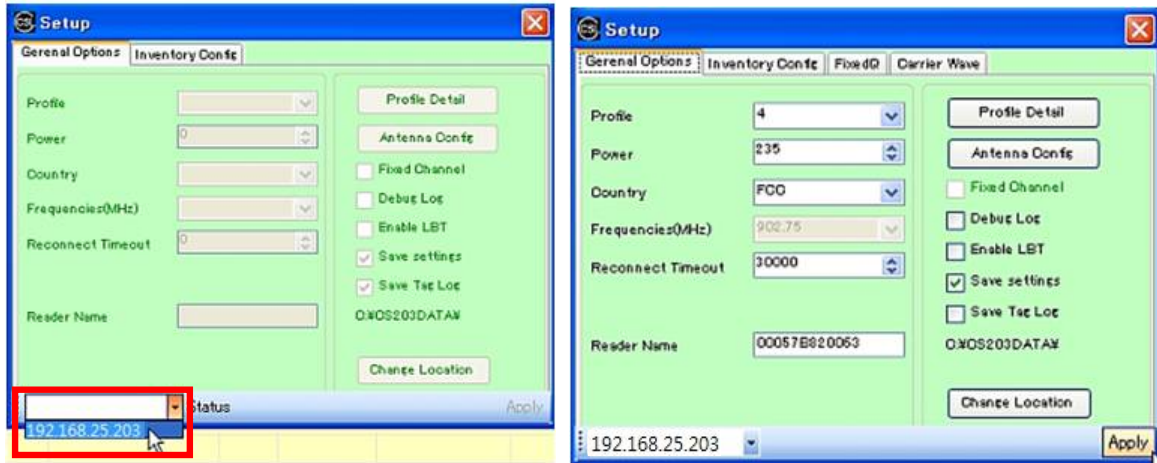
To configure the UHF RFID reader, select "Setup" from the "Menu". The setup dialog pops up showing various parameters that can be refined. To start configuring the UHF RFID reader, select the IP address of the UHF RFID reader by clicking the combo box located at the lower left corner of the dialog.



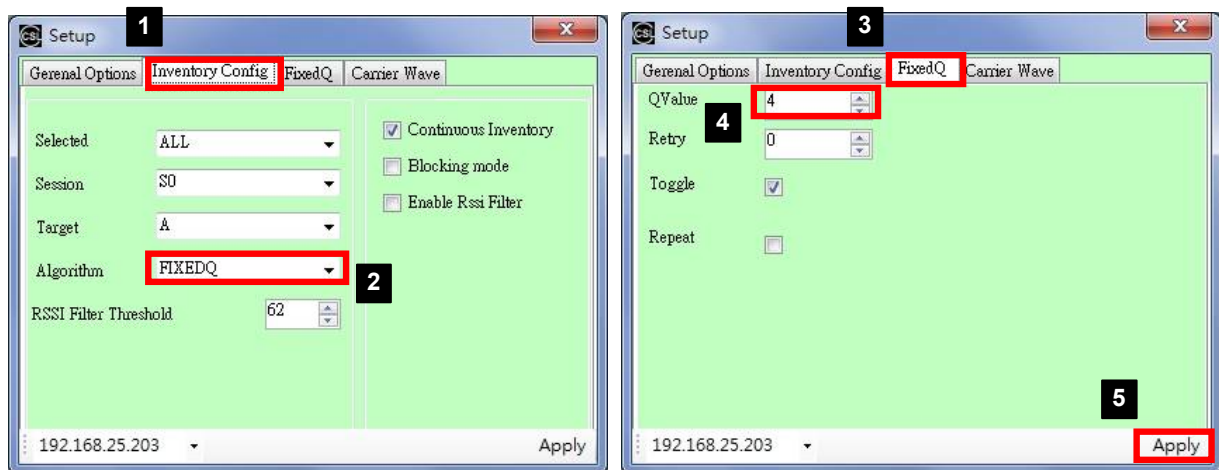
After choosing the designated UHF RFID reader. The configuration tabs and options are enabled with additional FixedQ and Carrier Wave tabs available for access.



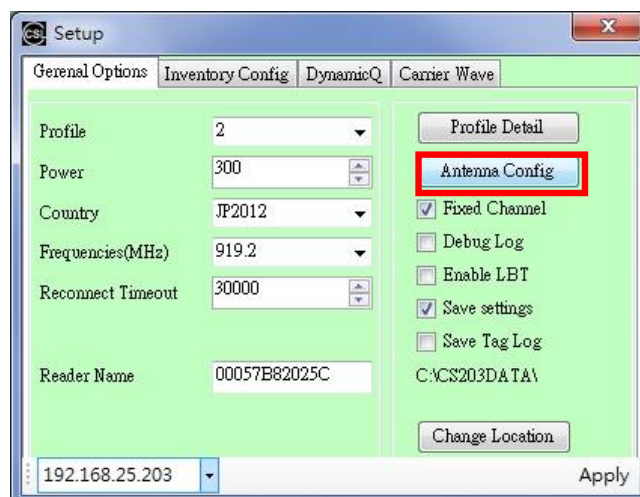
## IDSmart UHF Security Gate User Manual



The general options tab allows setting of profile, power, country regulation and reconnect timeout of the UHF RFID reader. The following example setup the reader to adopt Fixed Q algorithm with a Q value of 4. After changing the value of the setting, remember to click the "Apply" button located at the lower right corner.



Antenna configuration can be accessed and set by clicking "Antenna Config" button in the general options tab.



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This equipment's UHF RFID reader is capable of controlling 16 antenna ports. Only 8 antenna ports (Port 8 to 15) are attached to antenna for this equipment. The tool automatically enables port 8 to 15 and disables port 0 to 7 when "Antenna Config" is executed for the first time. Users may configure the Dwell time, Inventory Cycle and Power Level of each antenna port. Click "Apply" button to apply setting to a single antenna port. Click "Apply All" to apply setting to all antenna ports according to what configured on the screen. The Antenna can be switched on and off by clicking the corresponding radio button. The following configuration will allow the equipment to scan through 8 antennas in 2 seconds as the dwell time for each antenna port is 250ms.

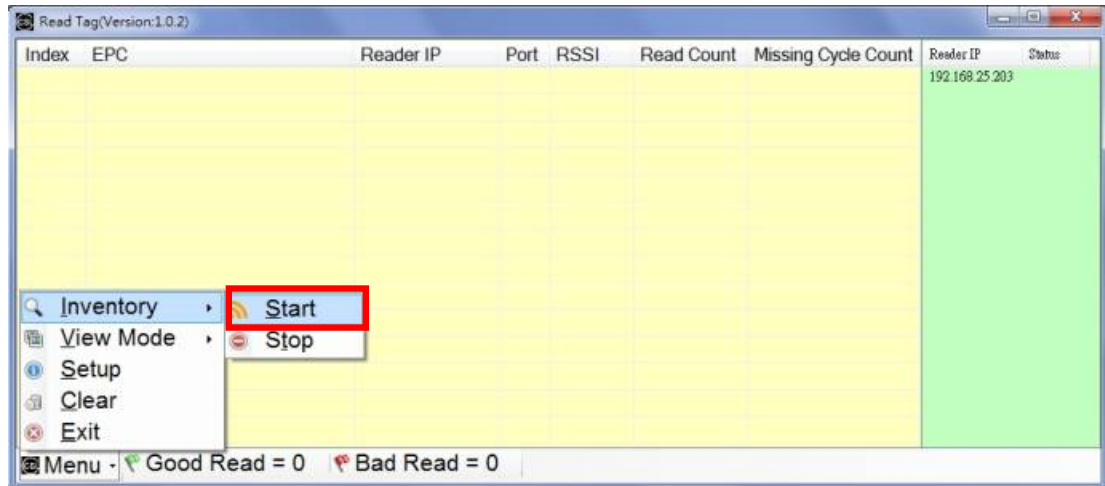
Further adjustment can be done. The tool is handy for experimenting with different setting of the equipment. Check the result of the setting by doing an inventory cycle.

Antenna	On	Off	Tx Phy Port	Rx Phy Port	Max. Dwell Time (ms)	Max. Inventory Cycles	Power Level (1/10 dBm)	Antenna Sense Threshold	Apply
0	<input type="radio"/>	<input checked="" type="radio"/>	0	0	250	0	270	1048575	Apply
1	<input type="radio"/>	<input checked="" type="radio"/>	4	4	250	0	270	1048575	Apply
2	<input type="radio"/>	<input checked="" type="radio"/>	8	8	250	0	270	1048575	Apply
3	<input type="radio"/>	<input checked="" type="radio"/>	12	12	250	0	270	1048575	Apply
4	<input type="radio"/>	<input checked="" type="radio"/>	1	1	250	0	270	1048575	Apply
5	<input type="radio"/>	<input checked="" type="radio"/>	5	5	250	0	270	1048575	Apply
6	<input type="radio"/>	<input checked="" type="radio"/>	9	9	250	0	270	1048575	Apply
7	<input type="radio"/>	<input checked="" type="radio"/>	13	13	250	0	270	1048575	Apply
8	<input checked="" type="radio"/>	<input type="radio"/>	2	2	250	0	270	1048575	Apply
9	<input checked="" type="radio"/>	<input type="radio"/>	6	6	250	0	270	1048575	Apply
10	<input checked="" type="radio"/>	<input type="radio"/>	10	10	250	0	270	1048575	Apply
11	<input checked="" type="radio"/>	<input type="radio"/>	14	14	250	0	270	1048575	Apply
12	<input checked="" type="radio"/>	<input type="radio"/>	3	3	250	0	270	1048575	Apply
13	<input checked="" type="radio"/>	<input type="radio"/>	7	7	250	0	270	1048575	Apply
14	<input checked="" type="radio"/>	<input type="radio"/>	11	11	250	0	270	1048575	Apply
15	<input checked="" type="radio"/>	<input type="radio"/>	15	15	250	0	270	1048575	Apply

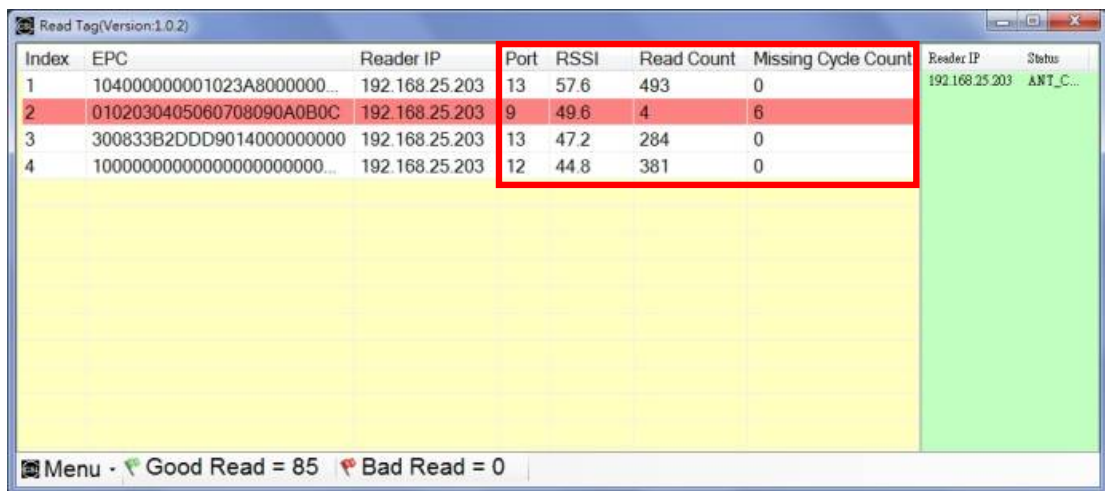
### 6.4. Performing Inventory Operation

After setting up the desired value for the reader and antenna ports, users can then check the result by performing inventory operation through the tool. Start the inventory operation by selecting "Start" under the "Inventory" sub menu.

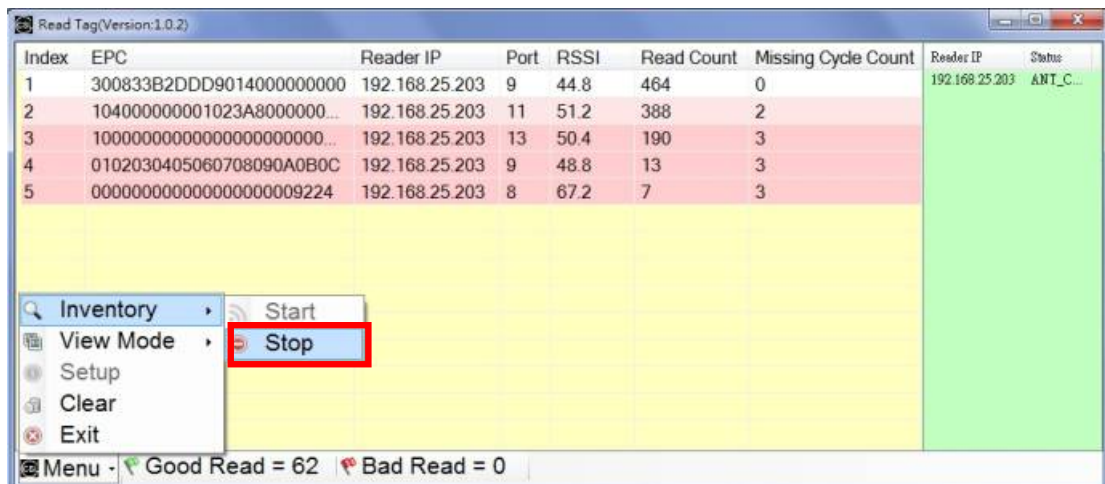
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Place tags near the equipment and the detected tag information shall display on the grid. Port, RSSI, Read Count and Missing Cycle Count can be used to determine the effect of the parameter set for the reader and antenna ports.



Stop the inventory by selecting "Stop" under the "Inventory" sub menu.



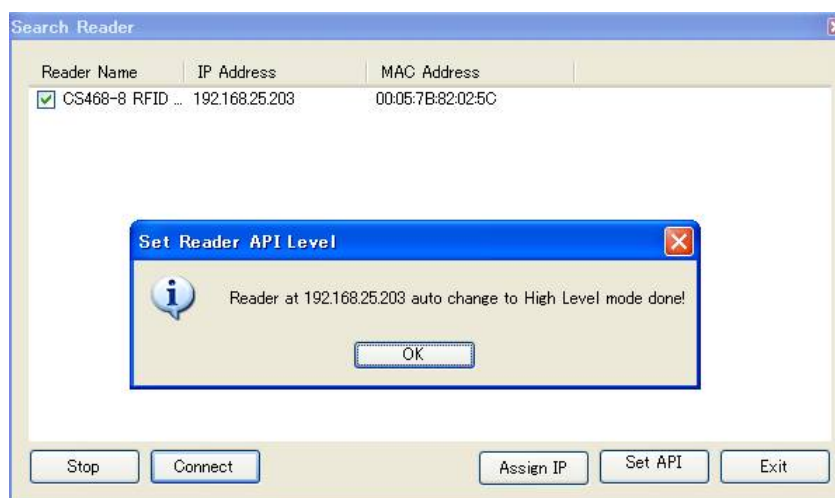
Select "Exit" from the menu if users wish to end current connection with the reader. Note

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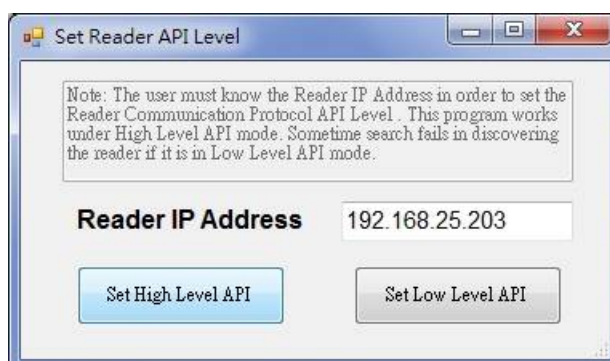
that only one connection can be made to the reader at the same time.

### 6.5. Setting the API Level of the UHF RFID Reader

The UHF RFID reader has two modes when it comes to API. The demo program provided with the equipment uses low level API to communicate with the reader. Whereas, the UHF reader tool uses high level API to communicate with the reader. When connecting to the reader using the UHF reader tool, the tool automatically checks the mode of the API. The tool automatically switches to high level API mode if it finds that the reader is in low level API mode. A message box pops up if automatic switching of low level to high level API occurs. Click "OK" button to proceed if the message box pops up.



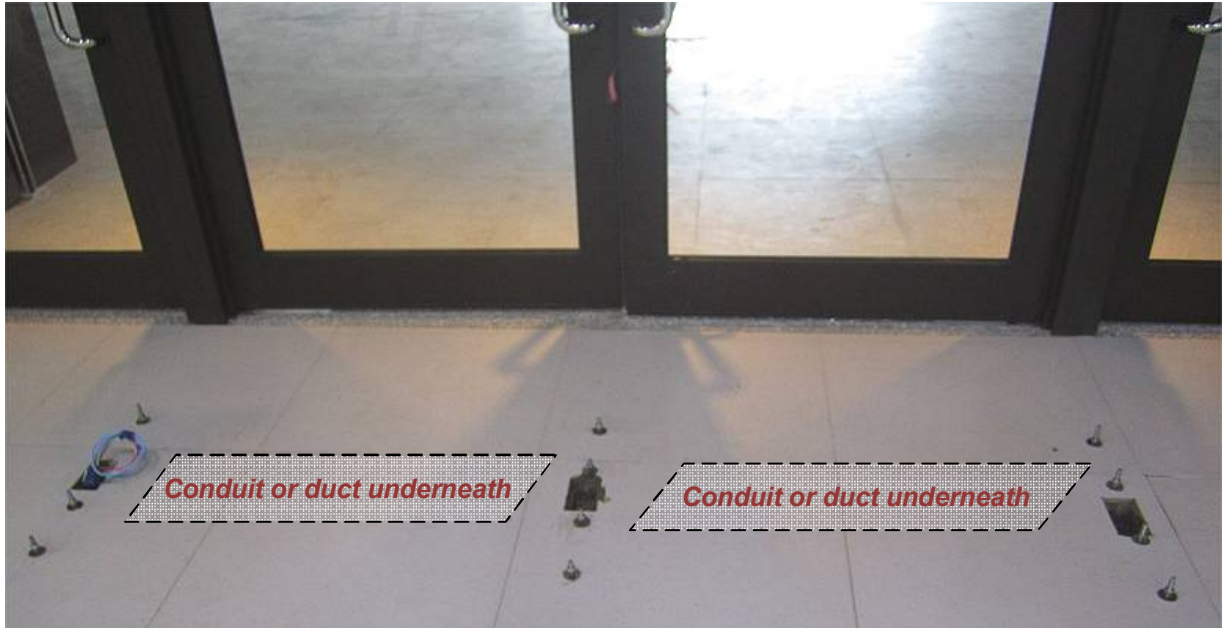
Always check the networking configuration and Ethernet cable when attempting to find the UHF RFID Reader. If the tool cannot connect to the reader after a period of time, user could try to switch API level manually by clicking on the "Set API" button on the search reader dialog. The set API level can only be performed when a reader has been successfully searched. Select "Set High Level API" button to switch the reader to high level API mode.



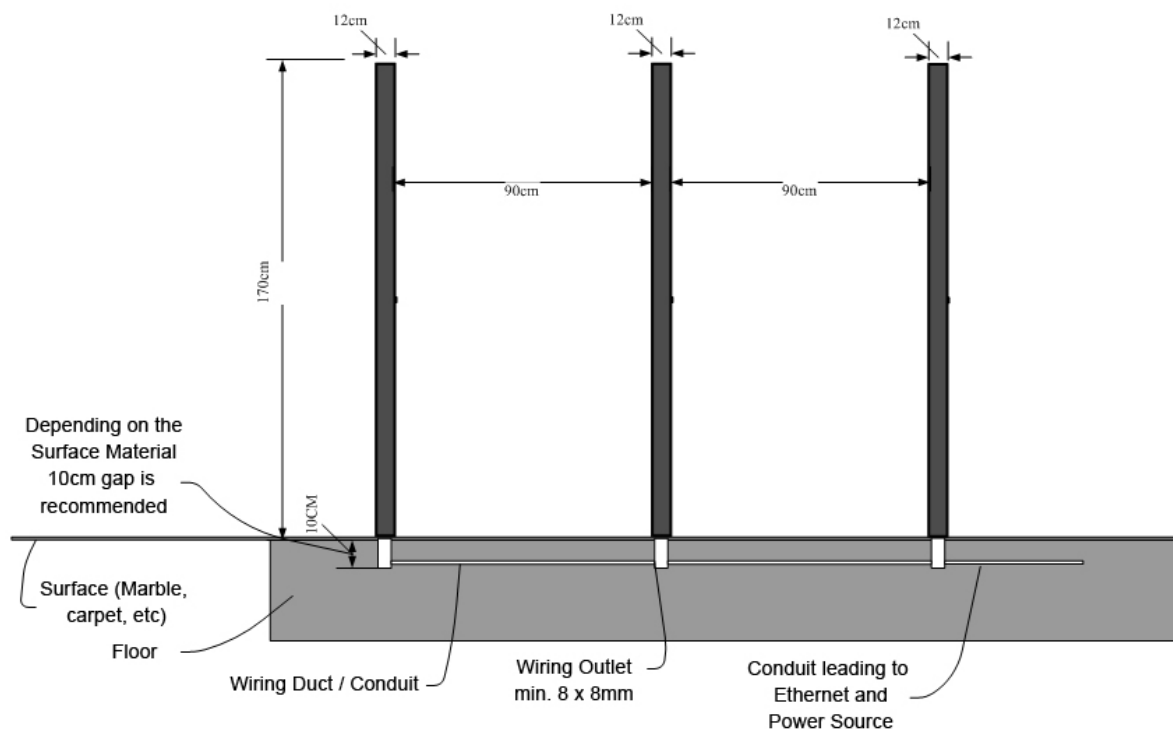


## 7. Appendix - Security Gate Mounting

In general, the security gate is best mounted to the floor for robustness and aesthetic. If base plate or mounting plate approach is desired, installers are responsible for designing the base plate or mounting plate according to the site survey. Consult Claridy technical personnel for customizing the base plate or mounting plate. The following picture illustrates the mounting point for the gate which ensure the panel of the security gate is correctly aligned. Wiring conduit or duct is located underneath the floor surface.

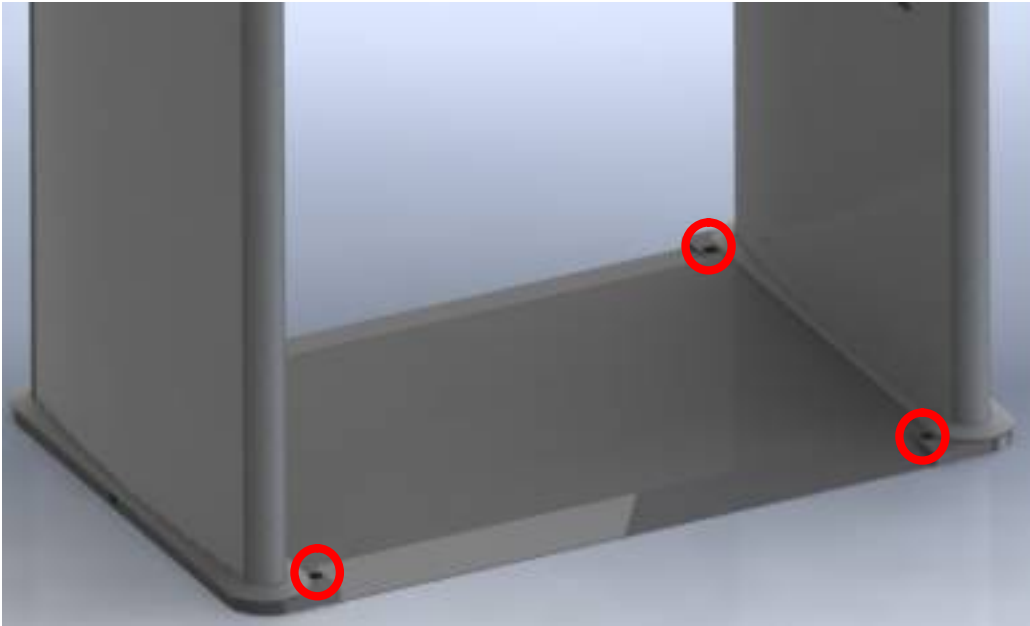


The diagram below illustrates three panels of a double lane security gate mounted to the floor.



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The following base plate or mounting plate is one of many types available for shipping. There are 4 holes (3 visible and shown below) designed for mounting the security gate with the base plate to the floor.



Rotary hammer/hammer drill with 12.7mm (0.5 inch) masonry/concrete drill bit is recommended for drilling the floor.



Both mounting approaches need anchor bolt or expansion bolt to attach the security gate structure to floor.





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**FCC Warning**

**FEDERAL COMMUNICATIONS COMMISSION  
INTERFERENCE STATEMENT**

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

**CAUTION:**

To assure continued FCC compliance:

1. Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.
2. This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

**BATTERY CAUTION:**

- Risk of explosion if Battery is replaced by an incorrect type.**
- Dispose of used batteries according to the instructions.**

IDSmart UHF Security Gate User Manual



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