

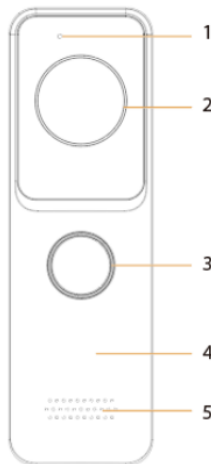
IC REALTIME IC Realtime Integration Doorbell API

This document is a work in Progress. Current to 2025.08.14 firmware build ([download here](#)).

Version/ Type	Change Log
250814 Release	Added no-auth CGI command for identification
250617 Release	Added CGI commands for identifying call group number and opening door lock
250604 Test	Changes to Card enrollment leader and Encode settings
250519 Test	Added ONVIF name for discovery, Changes to SIP, Tamper settings and GUI
250403 Test	Initial Test Build (04.11.2025)

Operational Information

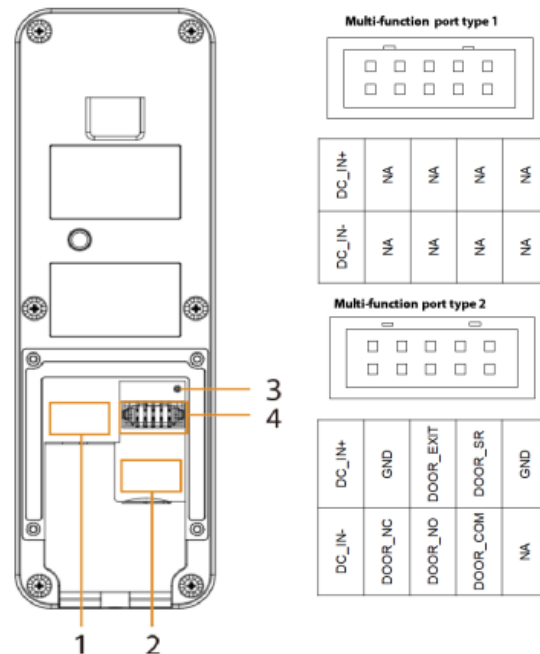
- This unit can be powered either 12~33VDC/ 1a or PoE
- The unit is 23.12 ONVIF compliant. Supports ONVIF discoverability and streaming.
- Firmware revisions will be provided by ICR when available. The latest Release version is 2025-08-14.
- The Doorbell supports unlocking via CGI, SIP or IC Card/ Keyfob (Mifare 1, 13.56MHz ISO14443A)



Number	Name	Function
1	Microphone	Audio input.
2	Camera	Captures images/ records videos
3	Call button	Initiates a call
4	Card swipe area	Swipe the registered cards or keyfobs to unlock doors.
5	Speaker	Audio output.



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Number	Name	Function
1	Network port	Connects to the network. Powers using PoE.
2	SD card slot	For storing images/ recorded videos. Supports up to 256GB.
3	Reset button	Press and hold the button for at least 30 seconds to Reset it to factory settings. Use if the password has been lost.
4	Multi-function port	See the label on the pigtail/ dongle above. Connects to electronic door locks.

Network Discovery and Identification

- The unit is 23.12 ONVIF compliant. Supports ONVIF discoverability and can be identified with ONVIF discovery with the "ICR_Doorbell" name.

```
ICR_Doorbell
Firmware
Address 192.168.1.230
Location country/USA
```

- You can use the [Configtool software here](#) to search the local network for the IP.
**Make sure that the IP address of your PC is on the same network segment as the doorbell.*
- The doorbell supports identification via CGI command without authentication.

Get Device Type	http://<ip_add>:<http_port>/cgi-bin/magicBox.cgi?action=getDeviceType
Response Example	type=IPMX-DB20-IRW1



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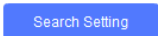
Initialization

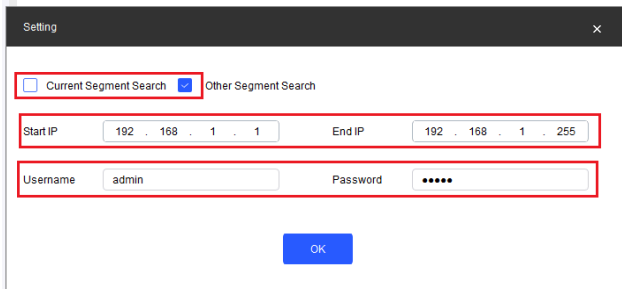
1. Power on the Doorbell and connect to the local network.
2. Using a web browser, go to the IP address of the Doorbell.
3. On the Device Initialization page, Select the Language, enter and confirm the password, and then click Next.
**The password must consist of 8–32 non-blank characters and contain at least two types of the following characters: Uppercase, lowercase, numbers, and special characters (excluding ' " ; : &).*
4. Click **OK** to go to the login page.
5. Enter the username (admin by default) and password to log in to the webpage.
6. You can change/ set a different static IP by going to **Main Menu > Network Settings> TCP/IP**.
Video/Encode Settings can be configured under **Main Menu> Device Setting > Video**.

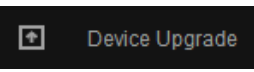
Updating Firmware

The release firmware is currently 2025.08.14 ([download here](#)). After updating the firmware, it is recommended to factory resetting by clicking  then **Factory Default**.

Method 1 (Configtool)

1. It is recommended to use a Windows OS. Download the [Configtool software here](#). Install, then run it.
2. Click on . Input the local IP range (also check the **Current/ Other Segment Search** box if necessary) that the Doorbell is on, as well as the credentials for the device. Click **OK** to begin the scan.



3. Click on . Select the Doorbell device from the list.

☒	3	DHI-VTO231...	192.168.1.230	4.800.00KL000.0.T		
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Click  to browse and select the firmware file. Click  under **Operate** to update the firmware.

Method 2 (Web UI)

Login the Web UI of the Doorbell and navigate to **Maintenance Center> Update**



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- If you have the firmware file, click **Browse**, then select the *.BIN* file. Click **Update** to begin updating.

The 'File Update' interface shows a dark-themed window with a title bar. Below the title bar is a section labeled 'File' containing a text input field, a 'Browse' button, and an 'Update' button.

- For Cloud update, click **Manual Check**. Once the new firmware version is found, click **Update Now**. Note that this will not update units that are on a T version firmware or if no newer firmware is found.

The 'Online Update' interface shows a dark-themed window with a title bar. Below the title bar is a section labeled 'Auto Check for Updates' with a red toggle switch. Below this is a 'Manual Check' button. To the right of the button, the text reads 'System Version:4.800.00KL000.0.R.20250617' and 'You are using the latest version.' Below this text is an 'Update Now' button.

Integration

The doorbell uses some of the commands shared with IC Realtime's main IP camera lineup. The [full API can be viewed here](#).

Streaming Video

Encoded video streams can be delivered via the RTSP protocol. Various video encodings are supported based on the camera device, although generally they include {H.264, H.265, MJPG}. For more information, see Section 4.1 in the Full HTTP API linked [here](#).

Streaming URL	
Main Stream	rtsp://<ip_add>:<rtsp_port>/cam/realmonitor?channel=1&subtype=0
Sub Stream	rtsp://<ip_add>:<rtsp_port>/cam/realmonitor?channel=1&subtype=1
Example:	
rtsp://192.168.1.230:554/cam/realmonitor?channel=1&subtype=1	

Video Snapshot

A JPG-encoded snapshot can be returned from the video stream. An example use case for this is as a Thumbnail preview for a Live Video stream. For more information, see Section 4.4.2 in the Full HTTP API linked [here](#).

Snapshot URL	http://<ip_add>:<http_port>/cgi-bin/snapshot.cgi
Example:	
http://<ip_add>:<http_port>/cgi-bin/snapshot.cgi	



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Configuration Management

Device settings can be *get* and *set* programmatically. The URL endpoint `/configManager.cgi` is useful for this. If a configuration table is not supported in the device, you can expect to receive a `Not Supported!` response or an HTTP 404 response code. For Get/Set Config, see Section 4.2.1 in the Full HTTP API linked [here](#).

Get/ Set Device Encoding Settings.

For more information, see Section 4.5.3 in the Full HTTP API [here](#).

(Example below is a CGI command to display the device's current encoding settings)

Get Device Encoding Settings	<code>http://<ip_add>:<http_port>/cgi-bin/configManager.cgi?action=getConfig&name=Encode</code>
Response Example	
...	
<code>table.Encode[0].ExtraFormat[0].Video.resolution=1920x1080</code>	
<code>table.Encode[0].ExtraFormat[0].Video.BitRate=6144</code>	
<code>table.Encode[0].ExtraFormat[0].Video.BitRateControl=CBR</code>	
<code>table.Encode[0].ExtraFormat[0].Video.Compression=H.264</code>	
...	

(Example below is a CGI command to change encoding settings to H.264)

Set Device Encoding Settings	<code>http://<ip_add>:<http_port>/cgi-bin/configManager.cgi?action=setConfig&Encode[0].MainFormat[0].Video.Compression=H.264</code>
Response Example	OK

Get/Set SIP Settings. For more information, see Section 13.3.1 in the Full HTTP API linked [here](#).

(Example below is a CGI command to view current SIP settings such as ID, Password, Domain, etc)

Get SIP Settings	<code>http://<ip_add>:<http_port>/cgi-bin/configManager.cgi?action=getConfig&name=SIP</code>
Response Example	
<code>table.SIP.AuthID=8001</code>	
<code>table.SIP.AuthPassword=admin123</code>	
<code>table.SIP.IsMainVTO=0</code>	
<code>table.SIP.LocalRTPPort=15000</code>	
<code>table.SIP.LocalSIPPort=5060</code>	
<code>table.SIP.OutboundProxy=192.168.1.222</code>	
...	

(Example below is a CGI command to change SIP settings such as SIP Password and UserID)

Set SIP Settings	<code>http://<ip_add>:<http_port>/cgi-bin/configManager.cgi?action=setConfig&SIP.AuthPassword=12345&SIP.UserID=8002</code>
Response Example	OK



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Event Management

Various camera device events can be retrieved by subscribing and monitoring an HTTP session with the camera. For a comprehensive list of URL Params and Values, please see section 4.9 in the Full HTTP API [here](#).

Doorbell Push Event

You can use the command below to listen for Doorbell Push events. Firefox can be used for testing.

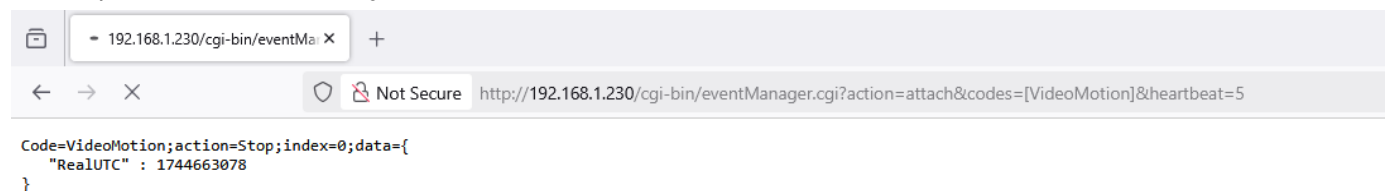
Doorbell event heartbeat	<code>http://<ip_add>:<http_port>/cgi-bin/eventManager.cgi?action=attach&codes=[Invite]&heartbeat=5</code>
Example event	<pre>Code=Invite;action=Pulse;index=0;data={ "CallID" : "4", "IsEncryptedStream" : false, "LockNum" : 1, "RealUTC" : 1744663017, "SupportPaas" : false, "TCPPort" : 37777, "UserID" : "8001" }</pre>

Motion Event

You can use the command below to listen for Motion events. Firefox can be used for testing.

Motion event heartbeat	<code>http://<ip_add>:<http_port>/cgi-bin/eventManager.cgi?action=attach&codes=[VideoMotion]&heartbeat=5</code>
Example Event	<pre>Code=VideoMotion;action=Start;index=0;data={ "RealUTC" : 1744663066 }</pre>

An example of motion event testing via Firefox is shown below:





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Door Unlock Event

Unlock event heartbeat	<code>http://<ip_add>:<http_port>/cgi-bin/eventManager.cgi?action=attach&codes=[Access Control]&heartbeat=5</code>
Example Event (Door Unlock via DTMF)	<pre>Code=AccessControl;action=Pulse;index=0;data={ "CardNo" : "92787D0E", "CardType" : null, "ErrorCode" : 0, "Method" : 1, "Name" : "OpenDoor", "Password" : "", "ReaderID" : "1", "RealUTC" : 1747076020, "RecNo" : 27, "SnapURL" : "", "Status" : 0, "Type" : "Entry", "UserID" : "70" }</pre>
Example Event (Door Unlock via Card)	<pre>Code=AccessControl;action=Pulse;index=0;data={ "CardNo" : "92787D0E", "CardType" : null, "ErrorCode" : 0, "Method" : 1, "Name" : "OpenDoor", "Password" : "", "ReaderID" : "1", "RealUTC" : 1747076020, "RecNo" : 27, "SnapURL" : "", "Status" : 0, "Type" : "Entry", "UserID" : "70" }</pre>



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Two-Way Audio

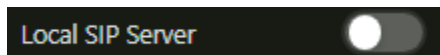
The unit utilizes standard **SIP protocol** for Audio Communication. The Doorbell can connect to a third-party SIP server or function as the local SIP server to which other SIP devices connect.

The SIP devices must be registered to communicate, and the SIP Client should have provisions for a Username, separate from the SIP login, otherwise, the *doorbell will not be able to reach the SIP client* when a call from the doorbell is placed.

Third-Party SIP Server Connection to the Doorbell

The instructions will cover registering the Doorbell to a user-provided SIP server.

1. Login to the Doorbell web UI. Go to: **Main Menu> Network Settings >SIP Server**.
Uncheck/ disable Local SIP server toggle. Under **Server Type**, select *Third-party Server*.



2. Input SIP information under **Server Address/ port**. Input the SIP password under the Registration Password Field if required by the third-party SIP server. Click **Apply** to Save.

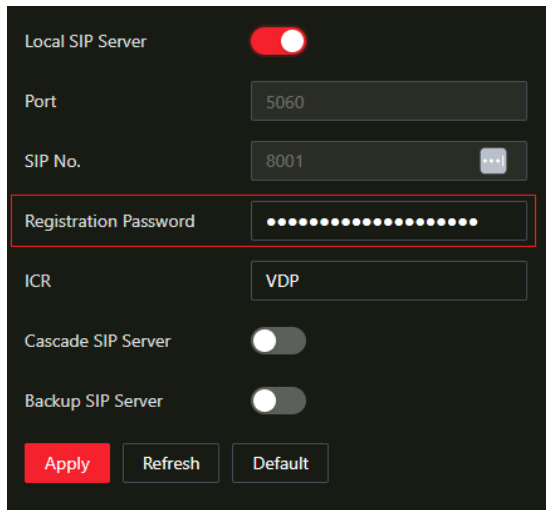
Connecting to the Doorbell as the SIP server

The instructions will cover registering a user-provided SIP client to the Doorbell's SIP server.

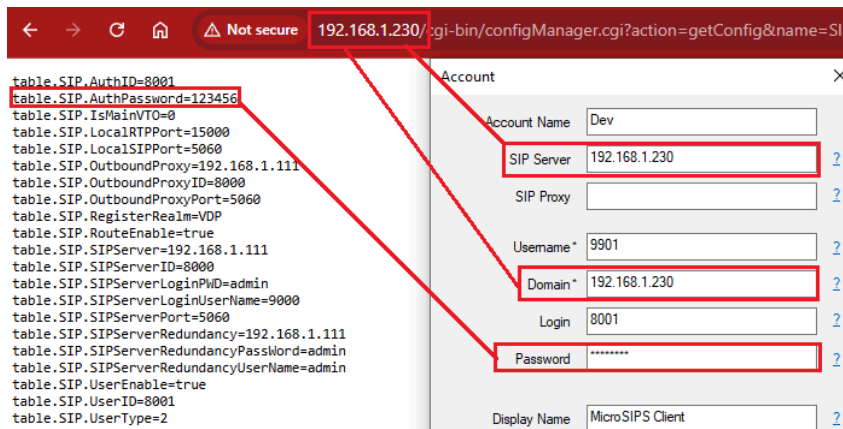
1. Login to the Doorbell web UI. Go to: **Main Menu> Network Settings >SIP Server**. By default, the SIP server will be enabled. If it is disabled, click the toggle to enable. You can then set a SIP password. Click **Apply** to save.

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The settings should appear as below:



2. Register the doorbell to the third-party SIP client using the SIP information of the Doorbell (send the [/cgi-bin/configManager.cgi?action=getConfig&name=SIP](#) command to view your actual device settings):



Username: 9901 by default. This can be changed under **Access Config > Basic Settings > "Call Group No."**

You can also send the [<ip_address>/cgi-bin/configManager.cgi?action=getConfig&name=VTOCall](#) command to the doorbell to find this value under **"table.VTOCall.VillaCallVTHNum"**.

***This is important so that the Doorbell can contact the SIPS client when the Doorbell button is pressed.**

***Do not set the Username to 8001 or whatever the SIP.AuthID is set to.**

SIP Server IP/ Domain: <IP address of the Doorbell>

SIP Login/ ID: The default value is 8001. This cannot be changed

Authentication Password: 123456 by default. This can be changed under **Network Settings > SIP Server > Registration Password**.

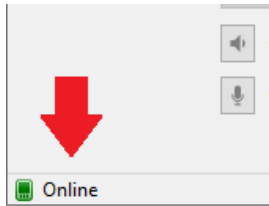
SIP Port: 5060 by default

SIP Server: <IP Address of Doorbell>



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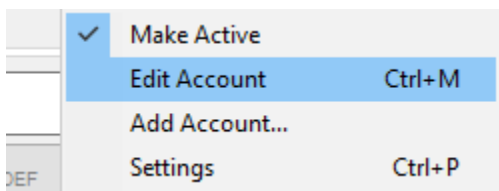
3. If the information is valid, there should be an indication on the third-party SIP client indicating the register/connection status.



Placing and Receiving Calls to the Doorbell

This section demonstrates how to register a third-party SIP client with the Doorbell's SIP server and initiate a call. Note that unless the third-party client has a SIP username separate from the SIP login username, the Doorbell will not be able to call the SIP client (the SIP Client will not receive the doorbell push call to answer).

1. Install a SIP-enabled device or install a SIP Client on a PC. In this example, I am using [MicroSIP](#).
2. On MicroSIP, click  then Add Account.



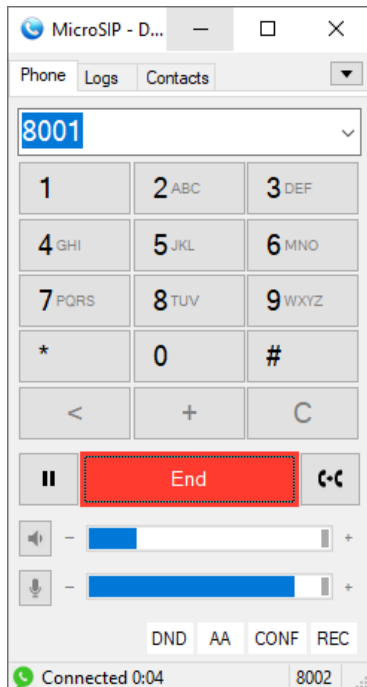
3. Input the Doorbell SIP information into the client and save. (send the </cgi-bin/configManager.cgi?action=getConfig&name=SIP> command to view your device settings.) See the [Connecting to the Doorbell as the SIP server](#) section for more information.

Account ×

Account Name	Test	
SIP Server	192.168.1.230	?
SIP Proxy		?
Username *	9901	?
Domain *	192.168.1.230	?
Login	8001	?
Password	*****	?

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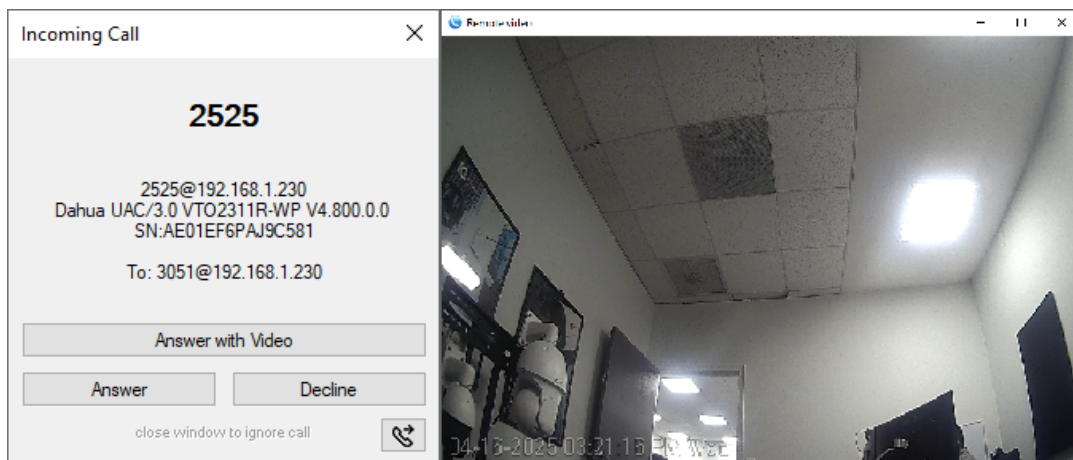
4. To call the doorbell from the client, Dial and call "8001".



Note: This call dial number will coincide with the Doorbell's **SIP.UserID**. You can use the command below to change this call number.

Set SIP.UserID	
<code>http://<ip_add>:<http_port>/cgi-bin/configManager.cgi?action=setConfig&SIP.UserID=<number_value></code>	
Example	<code>http://192.168.1.230/cgi-bin/configManager.cgi?action=setConfig&SIP.UserID=2525</code>
Result	OK

5. You can receive calls from the Doorbell to a SIP Client via doorbell push, which initiates a call that can be answered or declined. You can also answer the call with a video.





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Unlocking Function

The Doorbell can be wired to an electronic door lock, which can be operated via registered IC Card/ Keyfob, CGI command, or via SIP-INFO DTMF method. Unlock settings, such as unlock duration and unlock code configuration, can be found under **Main Menu > Access Config > Access Control > Access**.

Door unlock via DTMF

Once a call has been answered, you can dial a code on the SIP client's dial pad to unlock the door/ lock connected to the Doorbell's back wiring. The DTMF Method used is SIP-INFO.

1. To enable this, set the SIP Client DTMF Method to SIP-INFO.
2. The default unlock code is 123.

DTMF Method SIP-INFO

To change the unlock code, log in to the web UI > **Main menu > Access Config > Access Control > Config**. Set a numerical value under "Unlock Code."

Unlock Code 123

3. During a call, you can dial the unlock code from the Client Dial Pad to open the lock. The Doorbell will audibly notify of the unlock action.

Door unlock via CGI command

Door Unlock	
	http://<ip_add>:<http_port>/cgi-bin/accessControl.cgi?action=openDoor&channel=1
Example	http://192.168.1.230/cgi-bin/accessControl.cgi?action=openDoor&channel=1
Result	OK



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Doorbell/ SIP Troubleshooting

Issue	Solutions
The Doorbell makes constant alarm noises	The mount/ backplate is not installed. This can be disabled under Main Menu > Device Setting> Tamper Settings>Tamper Alert .
Unable to find the Doorbell on the network	Use the Configtool software to scan for the device. Ensure the Doorbell is powered properly (12-33 VDC, 1 A ; Standard PoE).
A third-party SIP client cannot connect to Doorbell's SIP server	Make sure the client device is in the same network segment as the Doorbell.
	Check client SIP settings and make sure the it matches SIP Server settings of the Doorbell. (View your device settings using /cgi-bin/configManager.cgi?action=getConfig&name=SIP)
Doorbell push gives "Number does not exist" error	Client's username does not match the Call Group No/ Villa Room No value
	Group call is disabled. Re-enable under Local Device Config > Basic Settings
Doorbell Push does not Reach SIP client to answer/ Unable to answer calls placed from Doorbell	The SIP client may not have SIP username provisions (separate from SIP login). This value should match the Call Group No/ Villa Room No
Cannot call from Client to Doorbell (Number does not exist/ Incorrect Dialing)	The SIP client needs to place a call to "8001" or "SIP.UserID" has changed from 8001.
How do I register an IC Card/ Keyfob?	Go to Main Menu> Person management > Add. From this section, create a user and under Verification Mode, click Card, then click "Issue Card".
The unlock function does not work after inputting the unlock code during a call	The unlock code is incorrect. The unlock code is <u>123</u> by default. This property can be set under Main menu > Local Device Config > Access Control > Config > Unlock Code.
	On the SIP client, make sure the DTMF method is set to SIP-INFO