

Customized protocol entry creation

1. Voice chip firmware creation

1.1 Notes

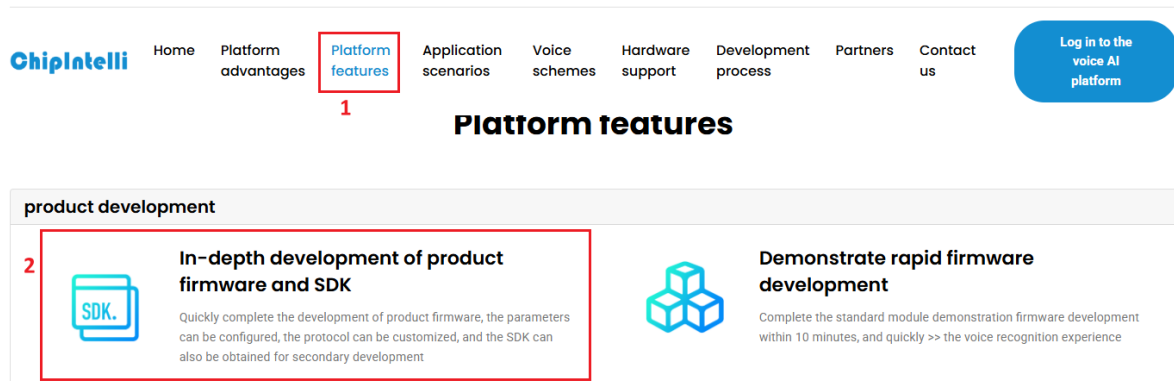
The module has already been burned with the voice recognition function firmware when it leaves the factory. The factory firmware is also provided in the data attachment. If you need to remake the firmware, you can follow the steps below to make the firmware.

1.2 Firmware creation

- First, you need to open the link "[Chiplnelli Voice AI Platform](#)" and enter the official firmware production website
- Translate this page into English



- Click "Platform Features" in the menu bar, and then click "In-depth development of product firmware and SDK" under the Product Development column



- At this time, you will be prompted to log in. Here you need to use your own information to register a platform account. The tutorial here has already been registered in advance.

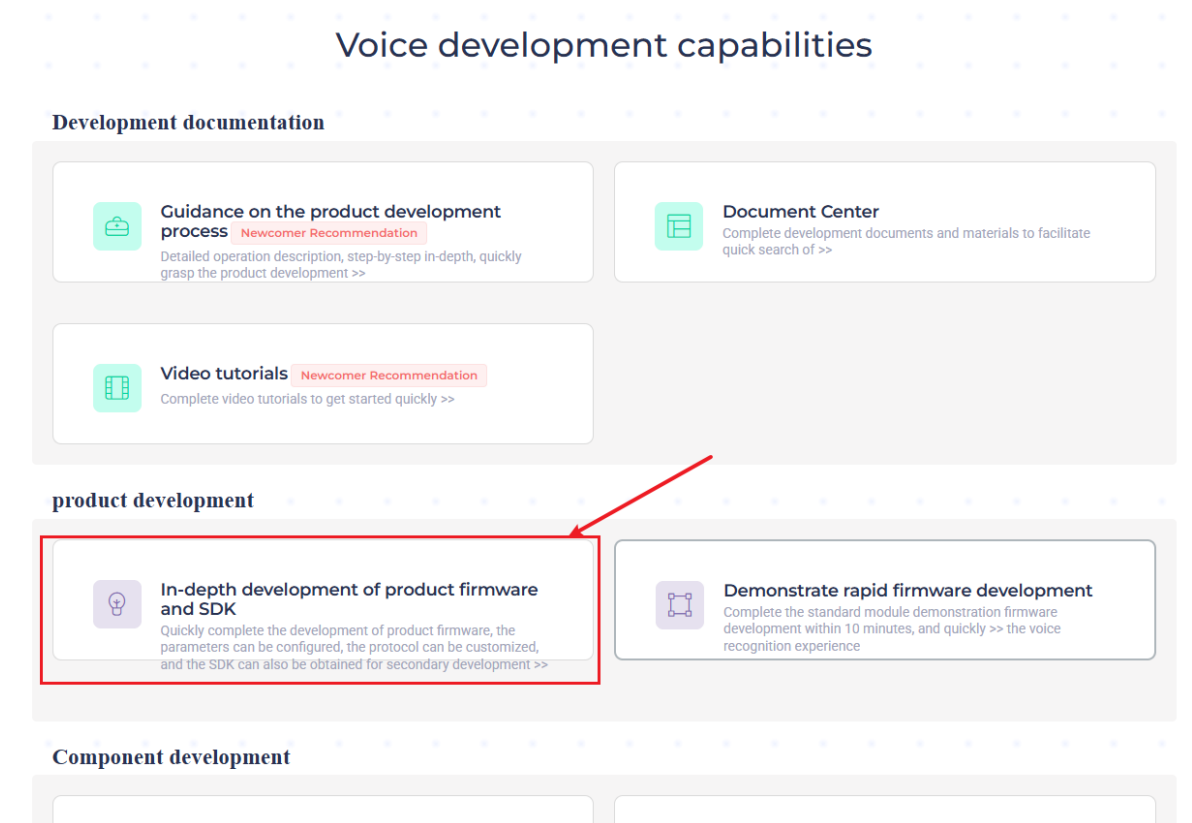
If you don't have a Chinese mobile phone number, you can use the following account:

Account number: 15338857526

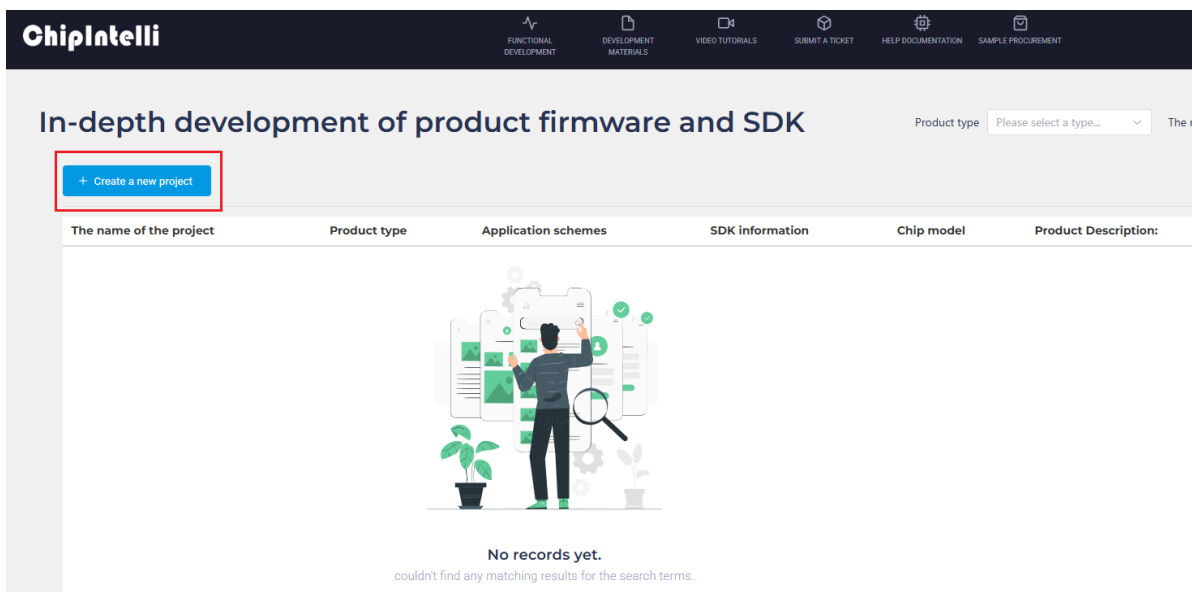
Password: Yahboom123

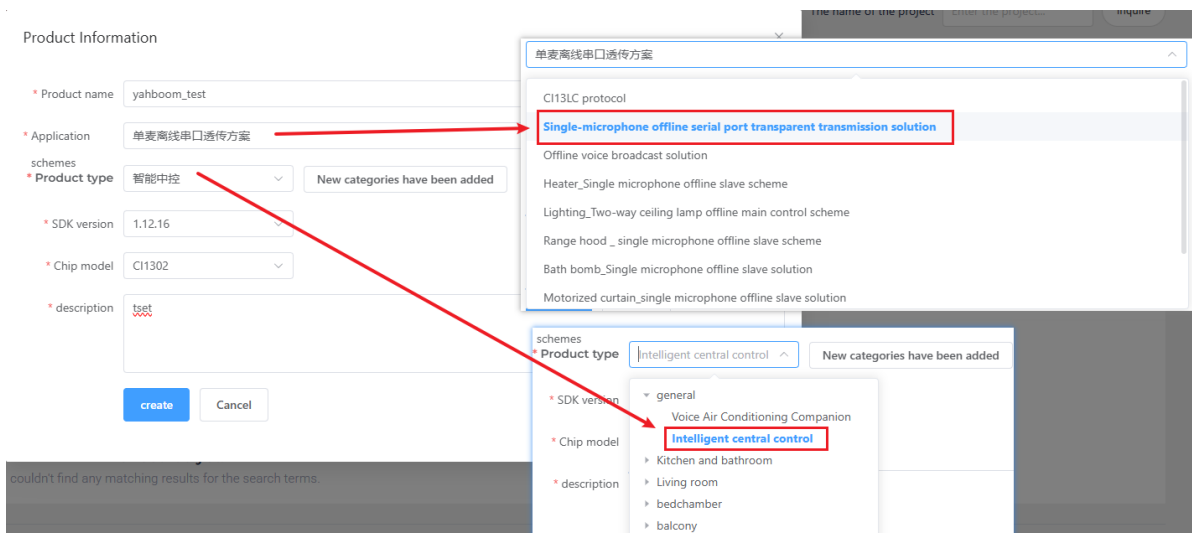
Note: Since multiple people may share one account, please be careful not to modify other people's firmware when using it.

After logging in, click **"In-depth development of product firmware and SDK"** again

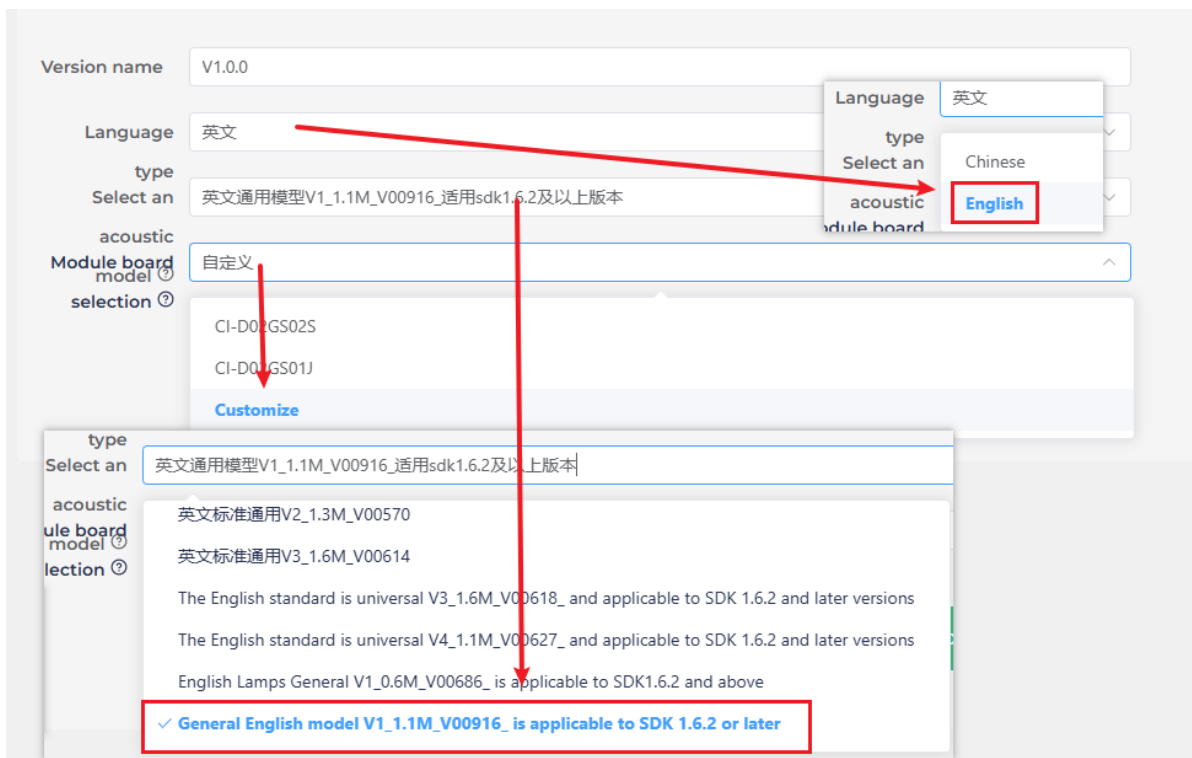


- After the page jumps, click New Project on the left and create a new product as shown below. The product name and description can be customized. The rest of the information needs to be selected according to the content in the red box. The product model needs to be selected as **"General->Intelligent central control"**. After completion, click Create

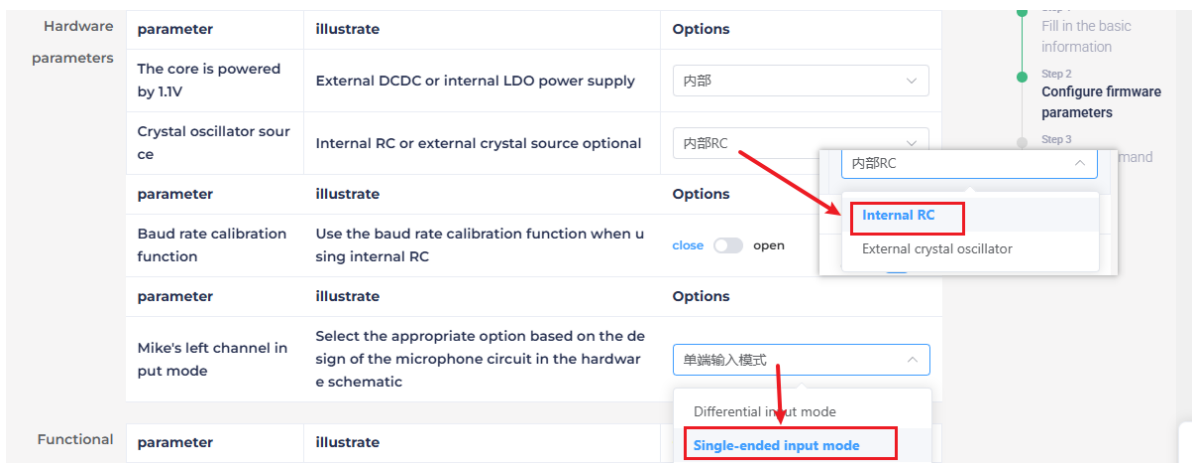




- Next, you need to fill in the basic information of the project. We need to recognize English, so select "English" as the language type. If you need to recognize Chinese, you can also make corresponding changes. For other information, select as shown below. Click Continue when you are done.



- In the hardware parameters, you need to select the crystal source as "internal RC".



- In the print serial port configuration, configure the UART0 level as open drain function, supporting external pull-up 5V.

Print the serial port configuration

parameter	illustrate	Options
Print serial port	The serial port (baud rate 921600) cannot be the same as the communication serial port	UART0
UART0 level	It is equipped with an open-drain pin function and supports external pull-up of 5V	close <input checked="" type="checkbox"/> open
RX	RX	PB6
TX	TX	PB5

- Modify the communication serial port configuration, set the baud rate to 115200, and configure the UART1 level to open drain function, support external pull-up 5V, and click "Continue" to enter the next step after the configuration is completed.

Serial port configuration

Serial communication	When enabled, the voice module can communicate with the host CPU through the serial port, but cannot communicate with the host CPU after it is turned off	close <input checked="" type="checkbox"/> open
Communication serial port	The name of the serial port of the communication	UART1
Communication serial baud rate	The baud rate of the UART used for communication	115200
Serial protocol version	Custom serial port protocol, any protocol can be customized, and the length of each protocol is less than 20 bytes. When the voice chip receives the protocol packet, it determines that the packet has been received by receiving the timeout period (0.34ms), so the master controller needs to ensure that the time interval between the packets is more than 0.34ms when sending the protocol packets to ensure that the communication is normal.	自定义协议
UART1 level	It is equipped with an open-drain pin function and supports external pull-up of 5V	close <input checked="" type="checkbox"/> open
RX	RX	PA3
TX	TX	PA2

- Next, enter the edit command word function. First, you need to select the sound to be played.

Tone selection

English - Adult female voiceEnglish - Adult male voiceEnglish - Girl's voice

Ana-英语女声 Ver.3

Olivia-英语女声 Ver.3

Sophia-英语女声 Ver.3

Mia-英语女声 Ver.3

Harper-英语女声 Ver.3

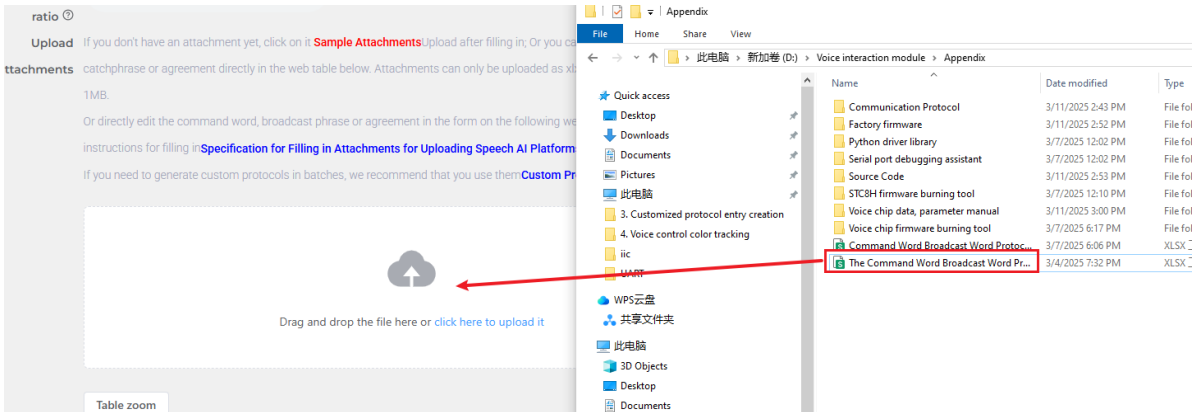
Linda-英语女声 Ver.3

Dora-英语女声 Ver.2

Rebecca-英语女声 Ver.2

Dora-英语女声 Ver.1

- Then we upload the command word attachment, find the "Command Word Broadcast Word Protocol List V3_EN" table in the same path as this document, and drag it directly into the web page to upload.



- After uploading the file, you can see our command word data in the table below.

Add a new row Delete the selection Format Check:

*The sending protocol, receiving protocol, and confidence level can be modified according to the actual application

<input type="checkbox"/>	* <input checked="" type="checkbox"/> Semantic tags	* <input checked="" type="checkbox"/> Command words	* <input checked="" type="checkbox"/> Type of feature	* <input checked="" type="checkbox"/> Broadcast state	* <input checked="" type="checkbox"/> Broadcast mode	* <input checked="" type="checkbox"/> Send the agreement	* <input checked="" type="checkbox"/> Receiving Agreements	<input checked="" type="checkbox"/> Confidence threshold
<input type="checkbox"/>	1	WELCOME	Welcome	welcome	by	AA 55 01 0 0 FB	AA 55 01 0 0 FB	35
<input type="checkbox"/>	2	BYE	Break words	bye	host	AA 55 02 0 0 FB	AA 55 02 0 0 FB	42
<input type="checkbox"/>	3	HI-YAHBOM	Wake words	I am here	host	AA 55 03 0 0 FB	AA 55 03 0 0 FB	35
<input type="checkbox"/>	4	VOLUME-UP	Increase the volume	Volume Up	host	AA 55 04 0 0 FB	AA 55 04 0 0 FB	35
<input type="checkbox"/>	5	VOLUME-DOWN	Reduce the volume	Volume down	host	AA 55 05 0 0 FB	AA 55 05 0 0 FB	35
<input type="checkbox"/>	6	MAX-VOLUME	Maximum volume	Maximum volume	host	AA 55 06 0 0 FB	AA 55 06 0 0 FB	35
<input type="checkbox"/>	7	MID-VOLUME	Medium volume	Medium volume	host	AA 55 07 0 0 FB	AA 55 07 0 0 FB	35

- Turn on the self-learning function and select designated learning. At this time, the system will automatically generate 4 self-learning instructions, and we will not modify them here.

Download the ☐ SDK options

SDK

Wake word

switching

Self-learning

feature

Self-learning ☐ Continuous learning ☒ Specify learning

approach

	<input type="button" value="Add a new row"/>	<input type="button" value="Delete the selection"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/> Semantic tags	<input checked="" type="checkbox"/> Learn the instructions
<input type="checkbox"/>	<input checked="" type="checkbox"/> Study tips	<input checked="" type="checkbox"/> Delete the instruction
<input type="checkbox"/>	3	STUDY-WAKE
<input type="checkbox"/>	11	STUDY-ROBOT-STOP
<input type="checkbox"/>	12	STUDY-STOP
<input type="checkbox"/>	13	STUDY-ROBOT-SLEEP

- After submitting, wait for a few minutes to complete the firmware production. After completion, click Download Firmware to obtain the produced firmware.

Version name	Version number	Chip model	Language models	Creation time	Current process	Feedback description	operate
V1.0.0	sfw2025031116260364098685	C11302	V00627	March 11, 2025 4:26:03 PM	Done	OK	<input type="button" value="Delete"/> <input type="button" value="Inherit"/> <input type="button" value="View"/> <input checked="" type="button" value="Download the file"/>

- For the steps of burning firmware, please refer to 《2. Firmware burning》

2. Modify functional terms

- Open the **Command Word Broadcast Word Protocol List V3_EN** file in the attachment

Voice interaction module > Appendix		
Name	Date modified	Type
Communication Protocol	3/11/2025 2:43 PM	File folder
Factory firmware	3/11/2025 2:52 PM	File folder
Python driver library	3/7/2025 12:02 PM	File folder
Serial port debugging assistant	3/7/2025 12:02 PM	File folder
Source Code	3/11/2025 2:53 PM	File folder
STC8H firmware burning tool	3/7/2025 12:10 PM	File folder
Voice chip data, parameter manual	3/11/2025 3:00 PM	File folder
Voice chip firmware burning tool	3/7/2025 6:17 PM	File folder
Command Word Broadcast Word Protoc...	3/7/2025 6:06 PM	XLSX 工作表

- Find the functional terms in the table, that is, the first 10 items in the table. It should be noted that the first 10 functional terms here are fixed terms and cannot be added, but can only be modified.

语义标签 Semantic Tags	命令词 Command word	功能类型 Function Type	播报语句 Broadcast sentence	播报模式 Broadcast mode	发送协议 Sending Agreement	接收协议 Receiving Agreement
1	WELCOME	Welcome	welcome	被 passive	AA 55 01 00 FB	AA 55 01 00 FB
2	BYE	Break time	bye	主	AA 55 02 00 FB	AA 55 02 00 FB
3	HI-YAHBOOM	Wake-up word	I am here	主	AA 55 03 00 FB	AA 55 03 00 FB
4	VOLUME-UP	Increase volume	Volume Up	主	AA 55 04 00 FB	AA 55 04 00 FB
5	VOLUME-DOWN	Decrease volume	Volume down	主	AA 55 05 00 FB	AA 55 05 00 FB
6	MAX-VOLUME	Maximum volume	Maximum volume	主	AA 55 06 00 FB	AA 55 06 00 FB
7	MID-VOLUME	Medium volume	Medium volume	主	AA 55 07 00 FB	AA 55 07 00 FB
8	MINI-VOLUME	Minimum volume	Minimum Volume	主	AA 55 08 00 FB	AA 55 08 00 FB
9	START-REPORT	On broadcast	Start broadcasting	主	AA 55 09 00 FB	AA 55 09 00 FB
10	STOPT-REPORT	Off broadcast	Stop Broadcast	主	AA 55 0A 00 FB	AA 55 0A 00 FB

- Here we take the modification of the wake-up word announcement as an example, and change the original announcement of "Hi Yahboom" after recognizing "I am here" to

"Yahboom is here".

语义标签 Semantic Tags	命令词 Command word	功能类型 Function Type	播报语句 Broadcast sentence	播报模式 Broadcast mode	发送协议 Sending Agreement	接收协议 Receiving Agreement
1	WELCOME	欢迎语	welcome	被	AA 55 01 00 FB	AA 55 01 00 FB
2	BYE	休息语	bye	主	AA 55 02 00 FB	AA 55 02 00 FB
3	HI-YAHBOOM	Wake-up word 唤醒词	Yahboom is here	active 主	AA 55 03 00 FB	AA 55 03 00 FB
4	VOLUME-UP	增大音量	Volume Up	主	AA 55 04 00 FB	AA 55 04 00 FB
5	VOLUME-DOWN	减小音量	Volume down	主	AA 55 05 00 FB	AA 55 05 00 FB

- After the repair is completed, save it, and then follow the steps in "1.2 Firmware creation" to import the table into the website. If you have already made the firmware once, you can click the "inherit" button in the previous project to save the parameter configuration steps

Version name	Version number	Chip model	Language models	Creation time	Current process	Feedback description	operate
V1.0.0	sfw2025031118140064097910	CI1302	V00627	March 11, 2025 18:14:00	Done	OK	Delete inherit View Download the file

- After remaking the firmware, you also need to burn the firmware into the voice interaction module, so that you can modify the functional terms.

3. Add command terms

- Open the **Command Word Broadcast Word Protocol List V3_EN** file in the attachment

Voice interaction module > Appendix		
Name	Date modified	Type
Communication Protocol	3/11/2025 2:43 PM	File folder
Factory firmware	3/11/2025 2:52 PM	File folder
Python driver library	3/7/2025 12:02 PM	File folder
Serial port debugging assistant	3/7/2025 12:02 PM	File folder
Source Code	3/11/2025 2:53 PM	File folder
STC8H firmware burning tool	3/7/2025 12:10 PM	File folder
Voice chip data, parameter manual	3/11/2025 3:00 PM	File folder
Voice chip firmware burning tool	3/7/2025 6:17 PM	File folder
Command Word Broadcast Word Protoc...	3/7/2025 6:06 PM	XLSX 工作表

- At the bottom of the table, add a new command term. Here, we take the command word "Don't come over" as an example.

116	113	DO-NOT-COME-OVER	command word 命令词	ok	active 主	AA 55 00 8B FB	AA 55 00 8B FB
-----	-----	------------------	------------------	----	----------	----------------	----------------

- Here you need to select the function type as "Command word (命令词)", and the broadcast mode needs to be set to "active (主)", so that it can actively broadcast "ok" after recognizing "Do not come over"

113	DO-NOT-COME-OVER	Command word 命令词	ok	active 主
-----	------------------	------------------	----	----------

- Let's take a look at the sending protocol. The first and second bits in the data are the data frame header and do not need to be modified. When we select the function type as command word, then according to the sending protocol, the third bit of data must be "00", which is to distinguish whether the command is "Command word (命令词)" or "Broadcast words (播报语)".

113	DO-NOT-COME-OVER	Command word 命令词	ok	active 主	AA 55 00 8B FB	AA 55 00 8B FB
-----	------------------	------------------	----	----------	----------------	----------------

- The 4th bit is the data ID of the command word, which is a hexadecimal data. Because the ID of the previous command word is "8A", we need to set this bit to "8B". In special cases, the data ID can be the same, for example, when the results returned by two command words need to be consistent.

12	11	ROBOT-STOP	Command word 命令词	ok I am stop	active 主	AA 55 00 01 FB	AA 55 00 01 FB
13	12	STOP	命令词	ok I am stop	主	AA 55 00 02 FB	AA 55 00 02 FB

- The 5th bit in the protocol is fixed to "FB" and does not need to be modified. In the table, the sending protocol and the receiving protocol need to be consistent.

113	DO-NOT-COME-OVER	Command word 命令词	ok	active 主	AA 55 00 8B FB	AA 55 00 8B FB
-----	------------------	------------------	----	----------	----------------	----------------

- After repairing, save it and then follow the steps in "**1.2 Firmware creation**" to import the table into the website. If you have already made the firmware once, you can click the "**inherit**" button in the previous project to save the parameter configuration steps

Version name	Version number	Chip model	Language models	Creation time	Current process	Feedback description	operate
V1.0.0	sfw2025031118140064097910	CI1302	V00627	March 11, 2025 18:14:00	Done	OK	Delete inherit View Download the file

- After remaking the firmware, you also need to burn the firmware into the voice interaction module, so that you can realize the function of adding new command entries.

4. Add new broadcast words

- Open the **Command Word Broadcast Word Protocol List V3_EN** file in the attachment

Voice interaction module > Appendix		
Name	Date modified	Type
Communication Protocol	3/11/2025 2:43 PM	File folder
Factory firmware	3/11/2025 2:52 PM	File folder
Python driver library	3/7/2025 12:02 PM	File folder
Serial port debugging assistant	3/7/2025 12:02 PM	File folder
Source Code	3/11/2025 2:53 PM	File folder
STC8H firmware burning tool	3/7/2025 12:10 PM	File folder
Voice chip data, parameter manual	3/11/2025 3:00 PM	File folder
Voice chip firmware burning tool	3/7/2025 6:17 PM	File folder
Command Word Broadcast Word Protoc...	3/7/2025 6:06 PM	XLSX 工作表

- At the bottom of the table, add a new command entry. Here, we take the example of adding a new broadcast word "**It's night**".

114	IT-IS-NIGHT	Broadcast word 播报语	It's night	passive 被	AA 55 FF 8C FB	AA 55 FF 8C FB
-----	-------------	--------------------	------------	-----------	----------------	----------------

- Here, you need to select the function type as "**Broadcast words (播报语)**", and the broadcast mode needs to be set to "**passive (被)**".

114	IT-IS-NIGHT	Broadcast words 播报语	It's night	passive 被	AA 55 FF 8C FB	AA 55 FF 8C FB
-----	-------------	---------------------	------------	-----------	----------------	----------------

- Let's take a look at the sending protocol. The first and second bits in the data are the data frame header and do not need to be modified. When we select the function type as broadcast words, then according to the sending protocol, the third bit of data must be "**FF**", which is to distinguish the command as "**Broadcast words (播报语)**".

114	IT-IS-NIGHT	播报语	It's night	被	AA 55 FF 8C FB	AA 55 FF 8C FB
-----	-------------	-----	------------	---	----------------	----------------

- The fourth bit of data is the data ID of the command word, which is a hexadecimal data. Because the ID of the previous broadcast word is "**8A**", we need to set this bit to "**8C**".
- The fifth bit in the protocol is fixed to "**FB**", which also does not need to be modified. In the table, the sending protocol and the receiving protocol need to be consistent.

114	IT-IS-NIGHT	播报语	It's night	被	AA 55 FF 8C FB	AA 55 FF 8C FB
-----	-------------	-----	------------	---	----------------	----------------

- After the repair is completed, save it, and then follow the steps in "**1.2 Firmware creation**" to import the table into the website. If the firmware has been produced once, you can click the "**inherit**" button in the previous project, which can save the parameter configuration step

Version name	Version number	Chip model	Language models	Creation time	Current process	Feedback description	operate			
V1.0.0	sfw2025031118140064097910	CI1302	V00627	March 11, 2025 18:14:00	<div>Done</div>	OK	<div>Delete</div>	<div>Inherit</div>	<div>View</div>	<div>Download the file</div>

- After reproducing the firmware, you also need to burn the firmware into the voice interaction module, so that the function of adding new command entries can be realized.