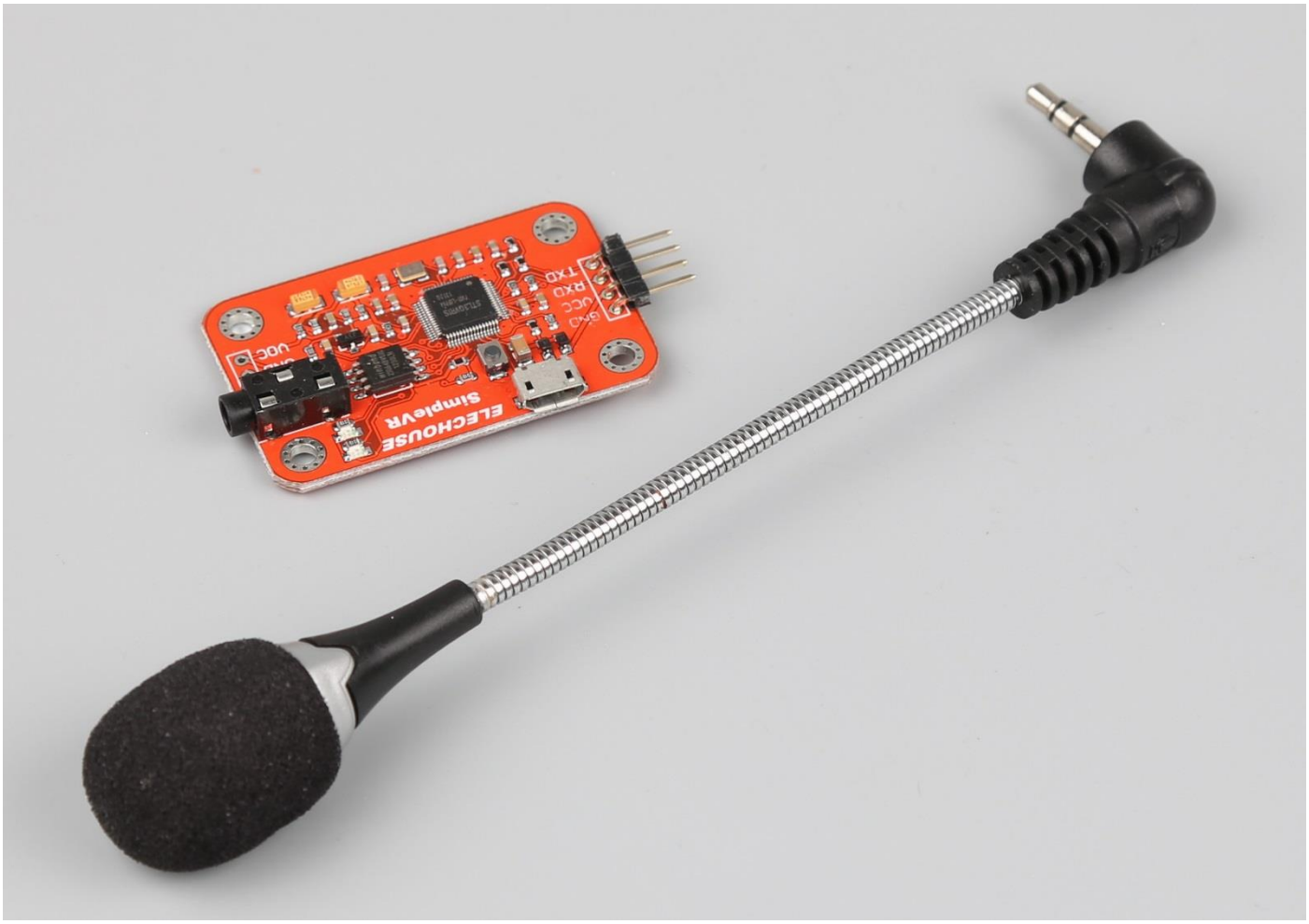
SimpleVR User Guide



Overview

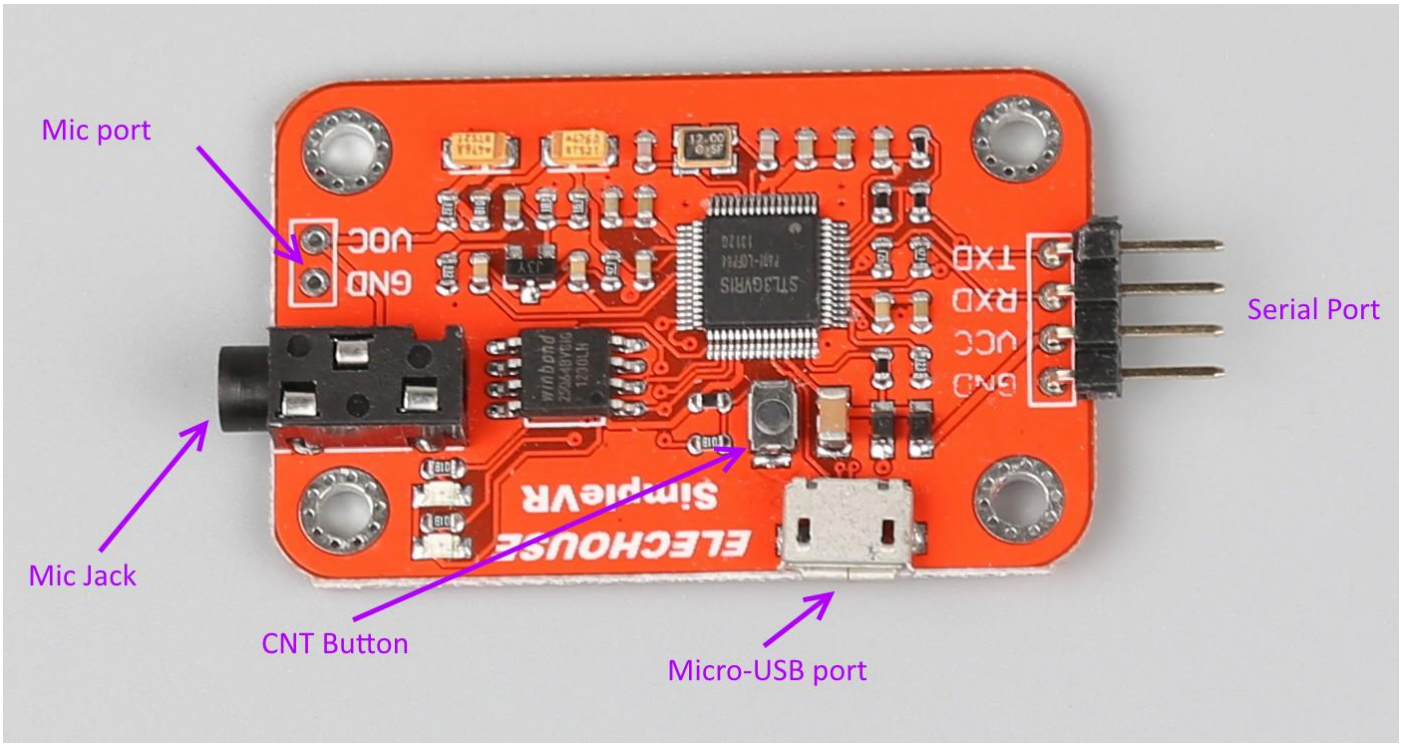
SimpleVR is a speaker-independent voice recognition module designed to add versatile, robust and cost effective speech and voice recognition capabilities to almost any application.
Different from another voice recognition module Speak Recognition, Voice Recognition Module V3, SimpleVR is speaker-independent. You don't have to train it. And it could recognition standard voice command from any speaker.

Feature

- Support maximum 64 groups, each group can contain maximum 2000 sentences.
- Support American English and Chinese (Mandarin)
- Each command could be a word or a sentence.
- 1 uart port with fixed uart baud rate 9600

Hardware

Dimension: 30.5mm*47.5mm



- MIC Jack: to connect the MIC coming with SimpleVR
- MIC Port: to connect other kind of MIC
- CNT Button: to connect SimpleVR to PC
- Micro-USB port: to connect SimpleVR to PC
- Serial Port: to connect with controller such as Arduino

Quick Start

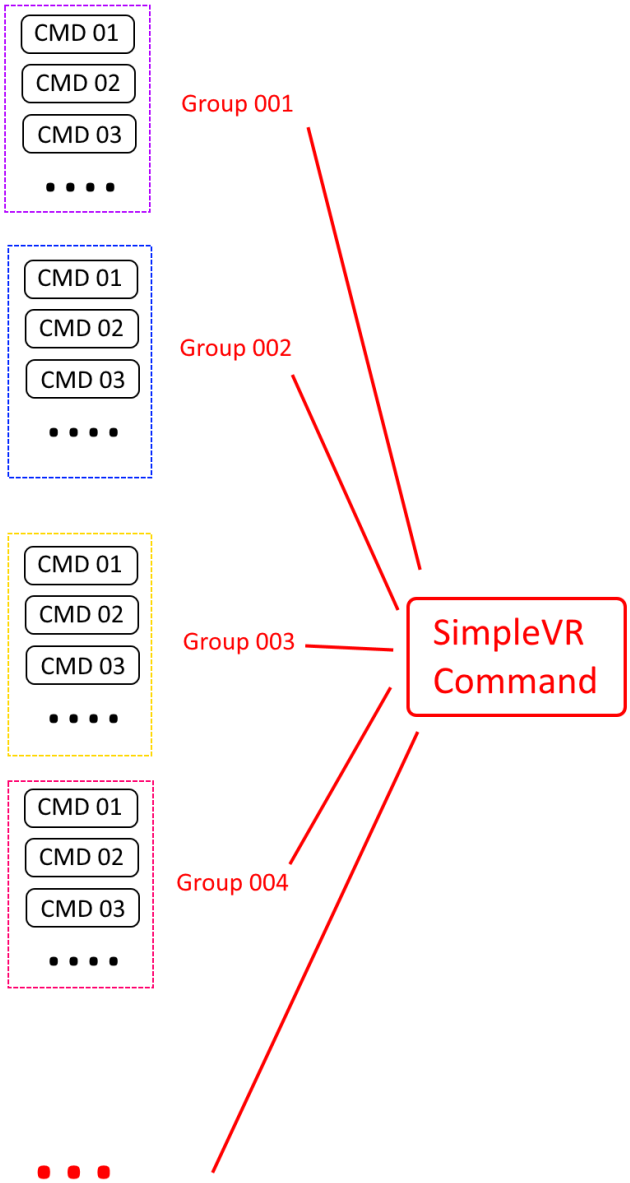
In the following example we will show you how to play this module with Arduino.

Prepare

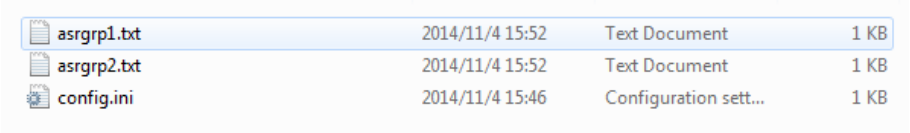
- SimpleVR module kit
- Arduino board (UNO recommended, buy here)
- Arduino Sensor Shield V08 (Optional)
- Arduino IDE
- SimpleVR Tool
- SimpleVR library(Download zip file)

Voice Command

Here shows how the SimpleVR voice command is structured:



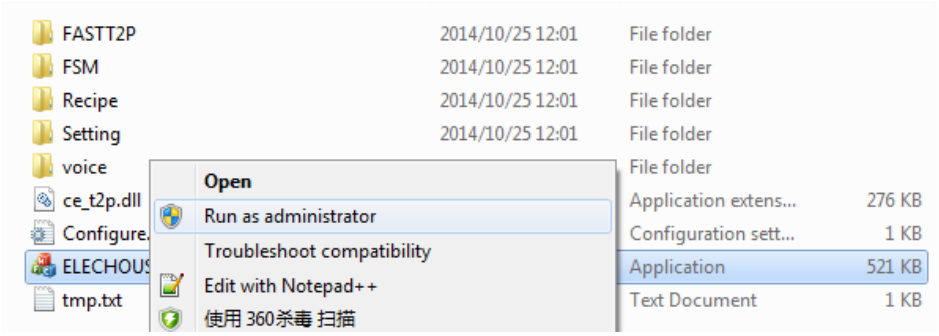
All the commands are stored in the folder "**voice**".



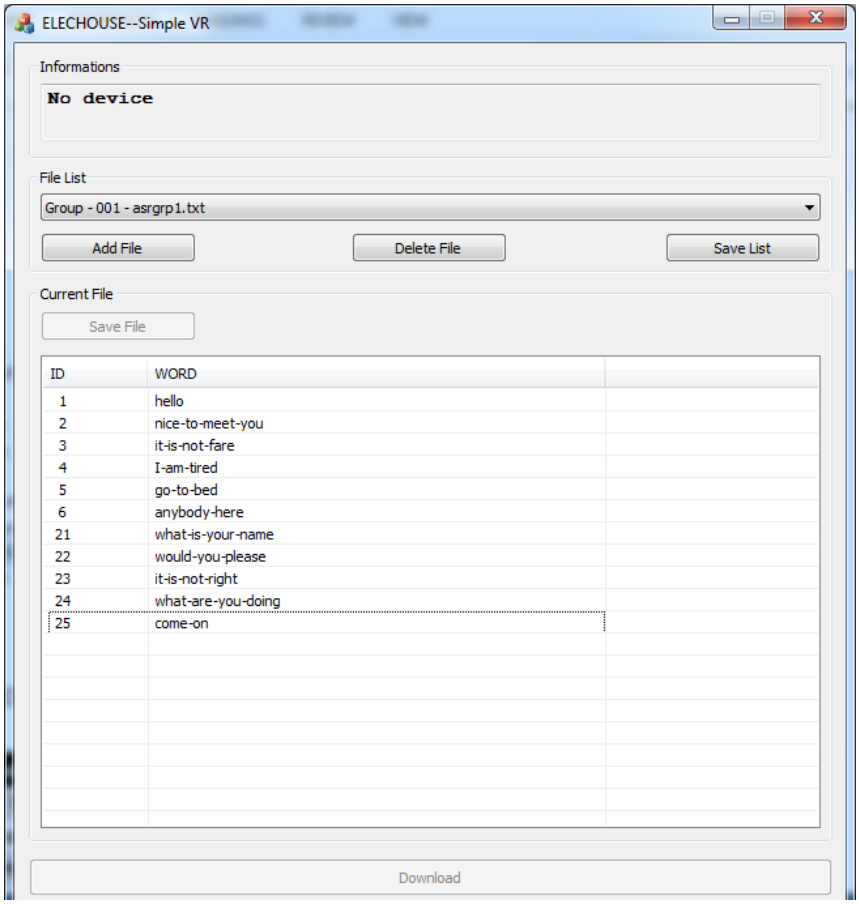
Each group is a txt file which contains all the commands in this group.
So there are 2 ways to modify the command: to modify the txt file, or change in the tool.

Change voice command in the tool

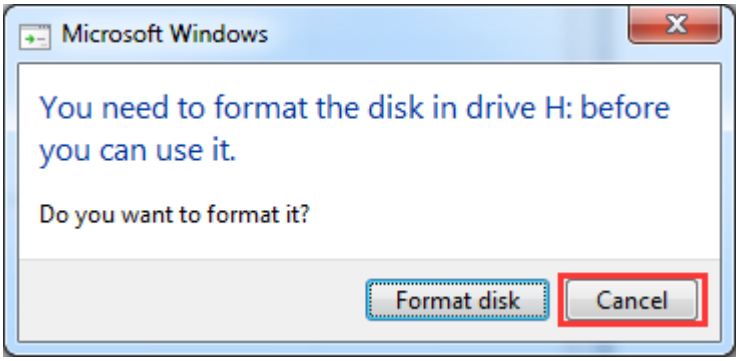
1. Download the SimpleVR Tool and unzip it. You don't need to install it.
   Note: If the software was treated as virus, please add it to white list
2. Right click the exe file and Run as administrator



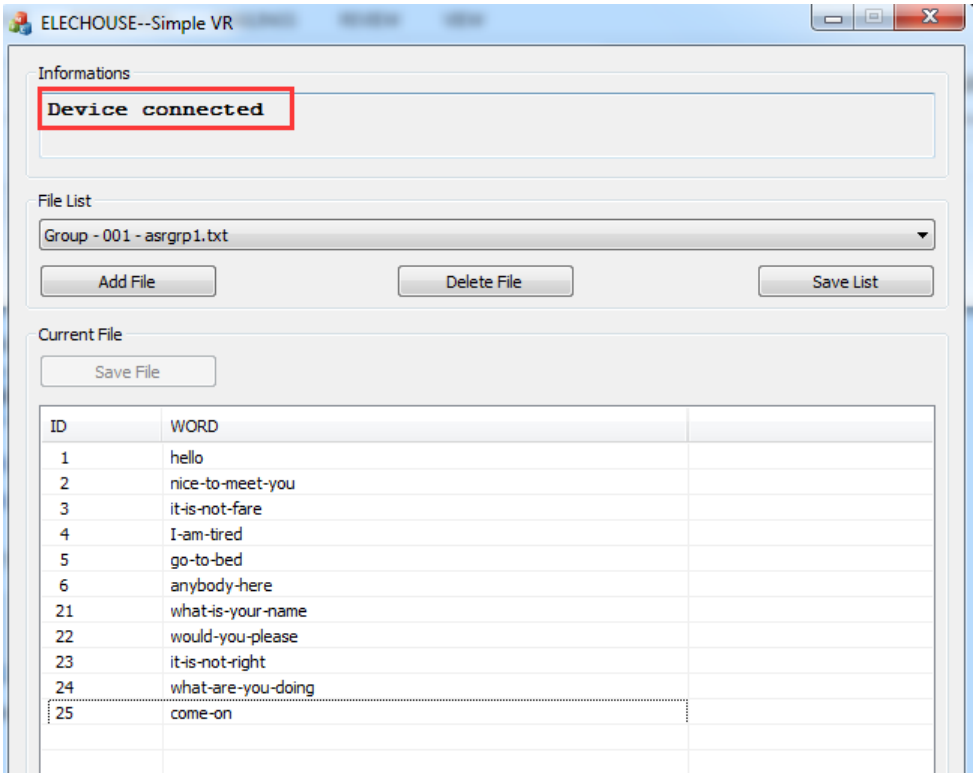
3. Now you opened the software.



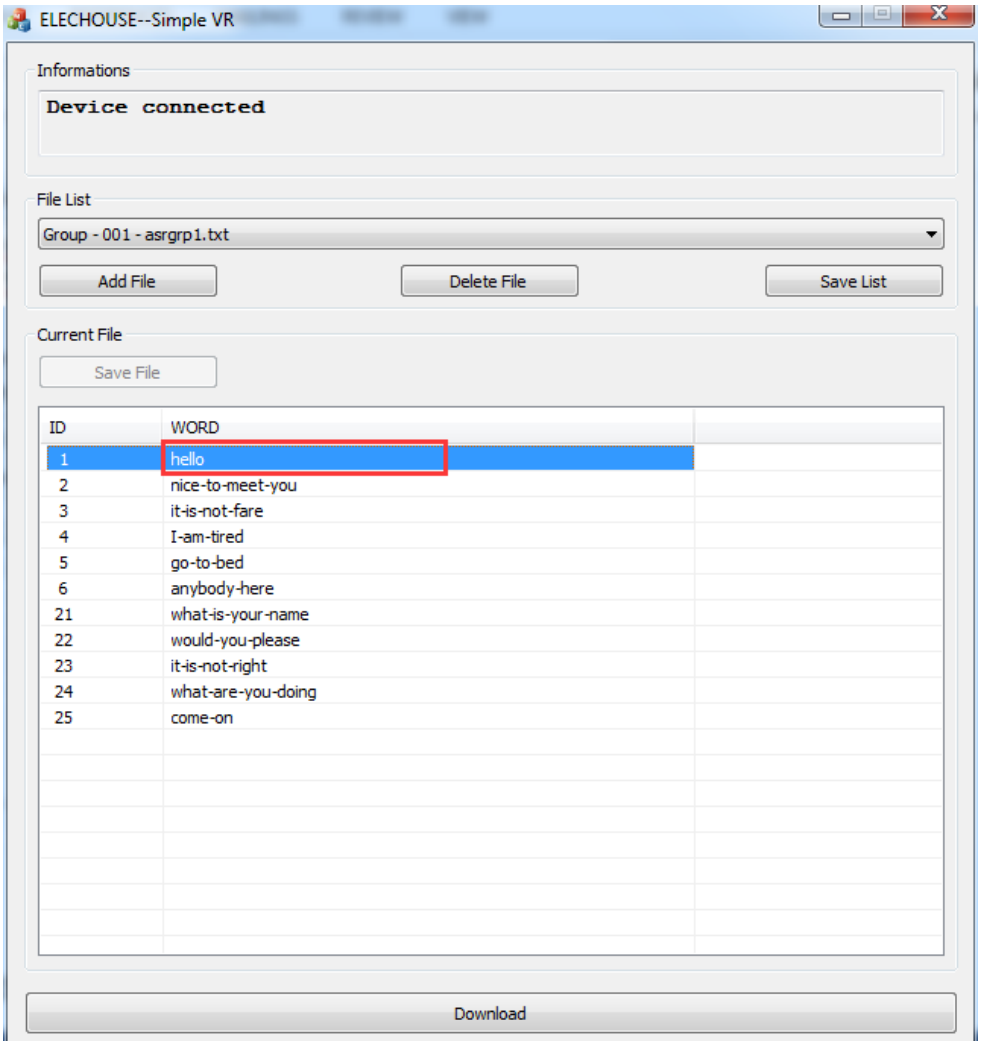
4. Press the CNT Button on the board, and hold the button. Connect SimpleVR to PC with USB button. While the device is recognized, release the CNT button. You may get the following message. Click **Cancel**.



5. Now you get SimpleVR connected with the tool.

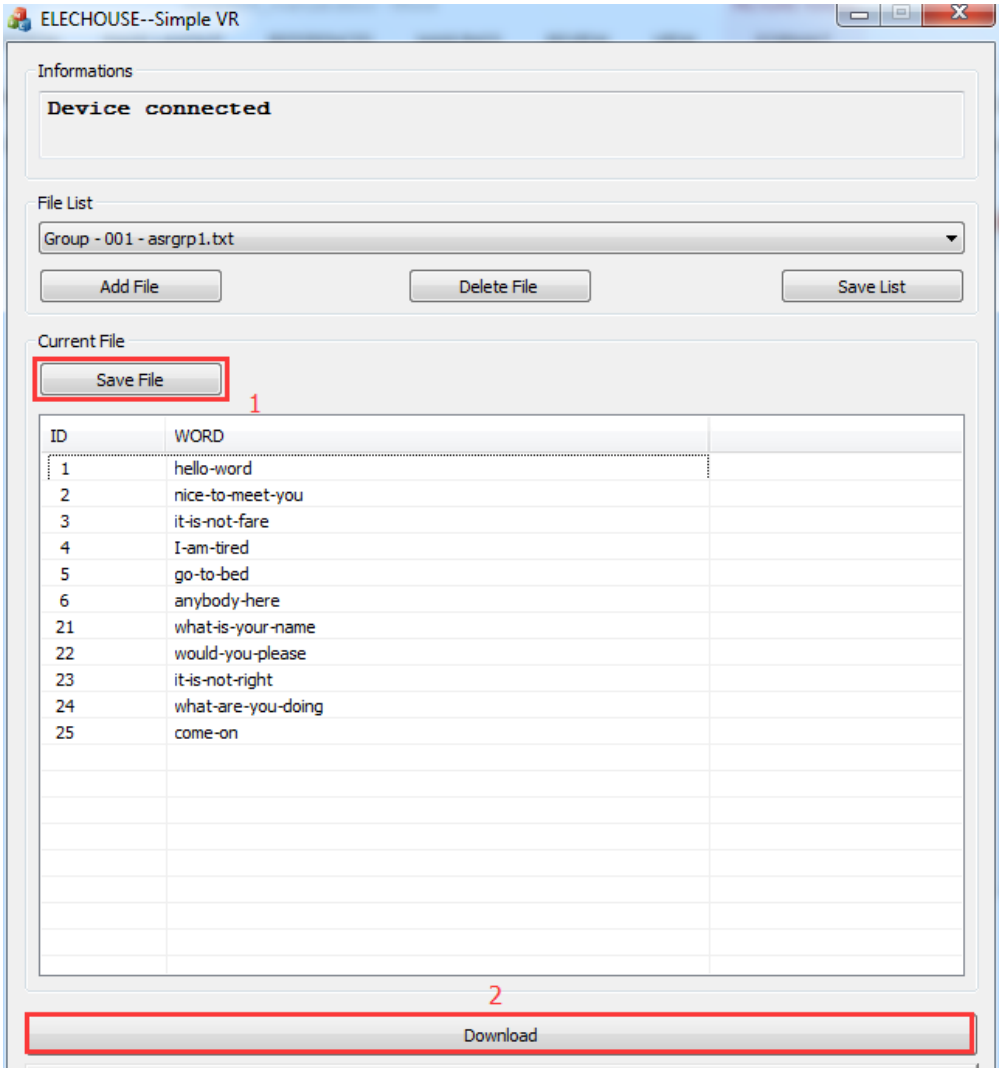


6. Double click the command to change it

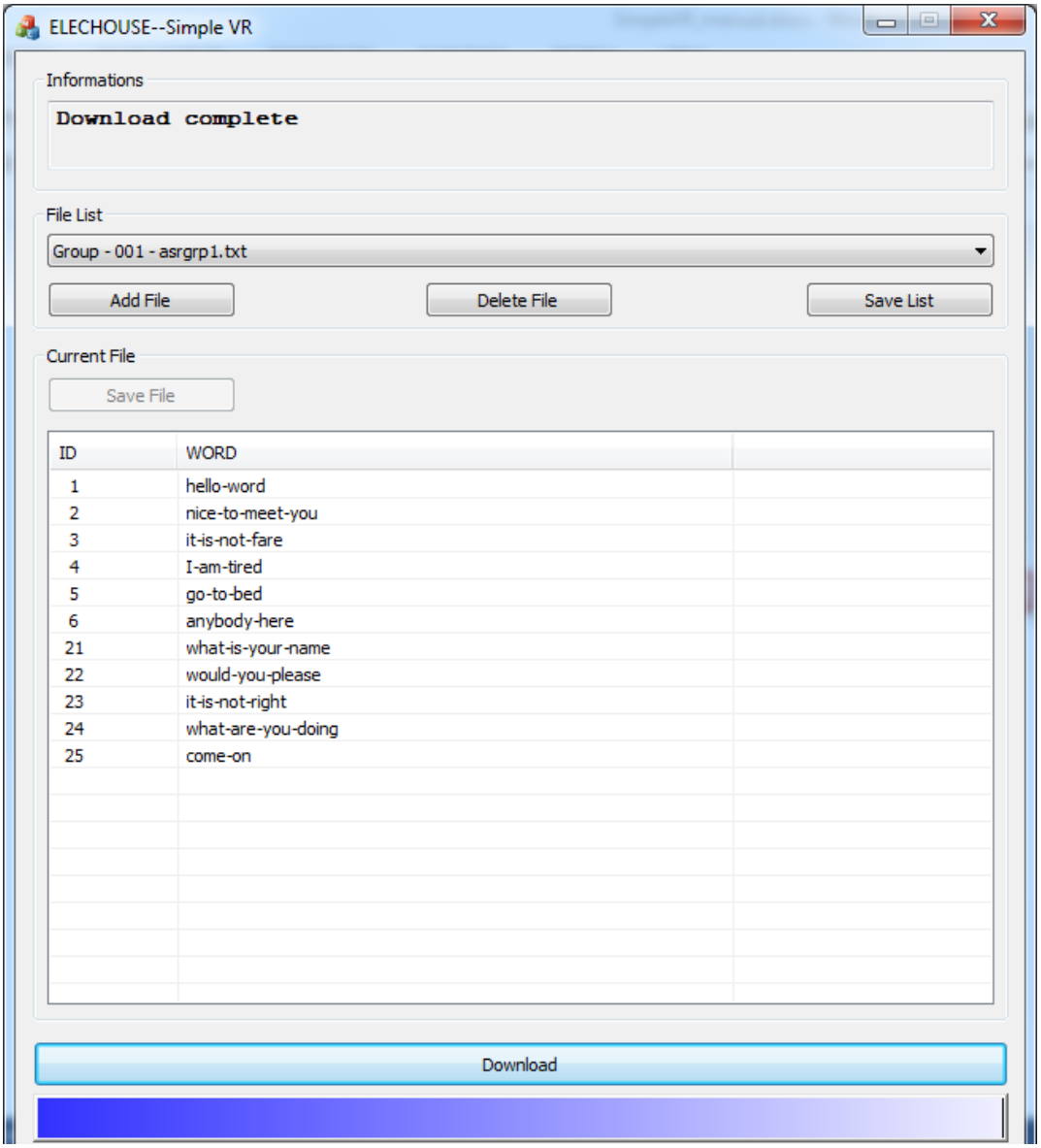


Note that you need to add hyphen "-" between words.

After the command is changed, click the button "**Save File**". And then lick the button "**Download**".



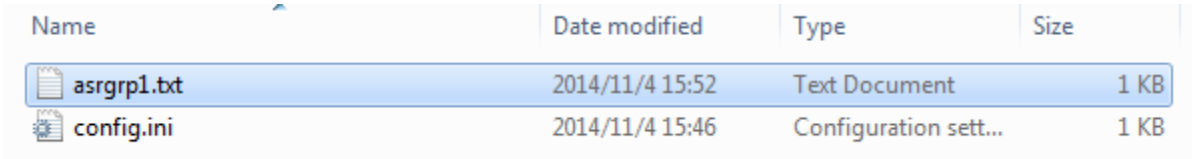
7. Downloading finished

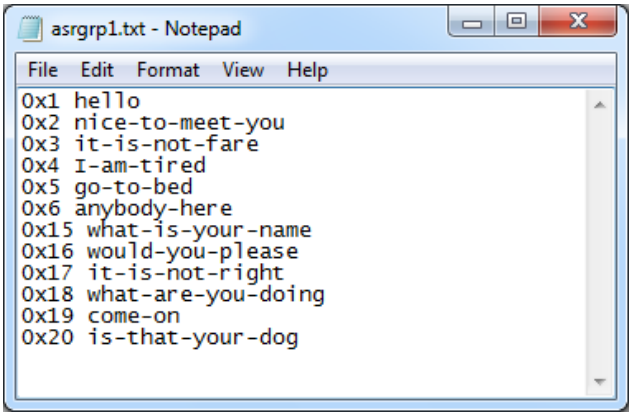


Change command by modify the txt file

Compared with the way above, you could add more commands or groups.

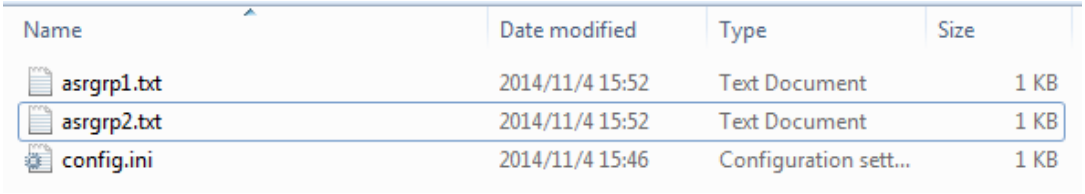
1. Edit the txt file with notepad



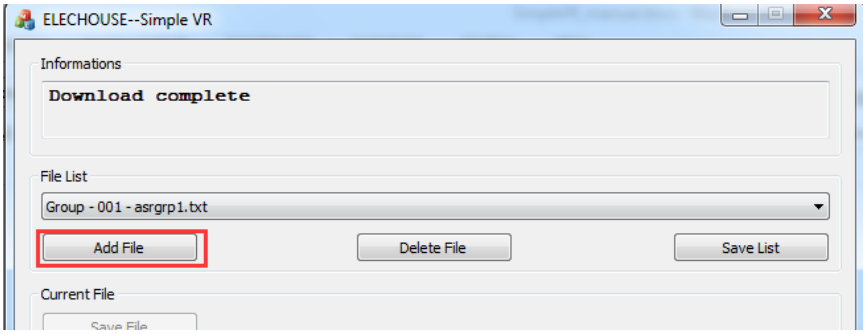


Note that the command index number could be in HEX or DEC.

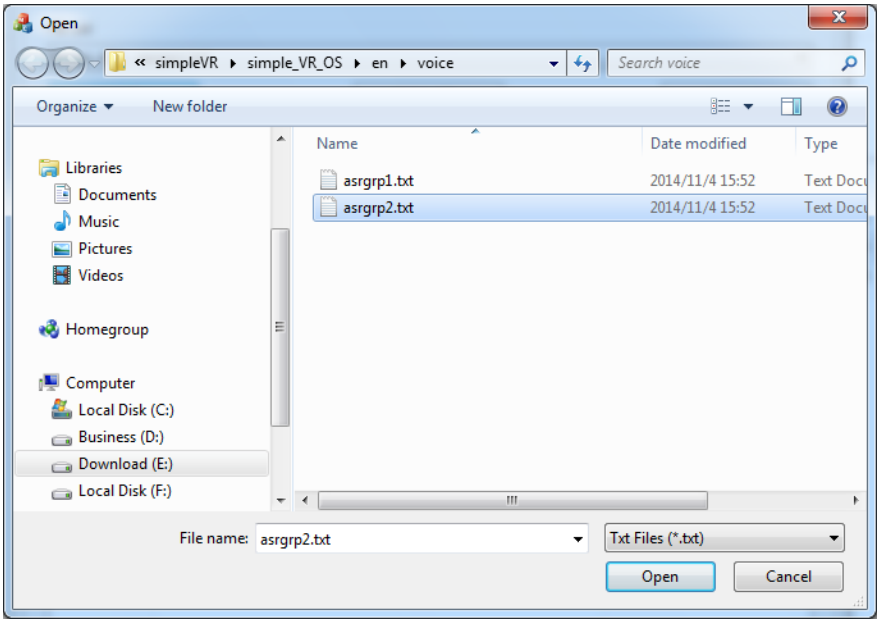
2. You could add more groups



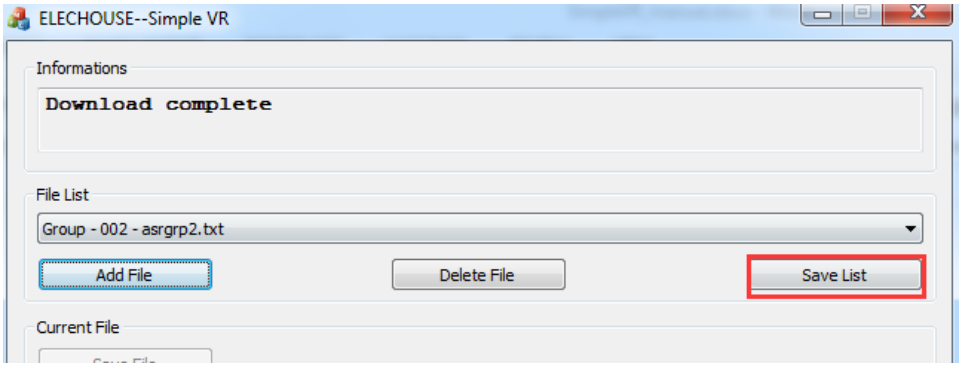
Now open the SimpleVR tool and add the new group in the list:



Choose the new group file



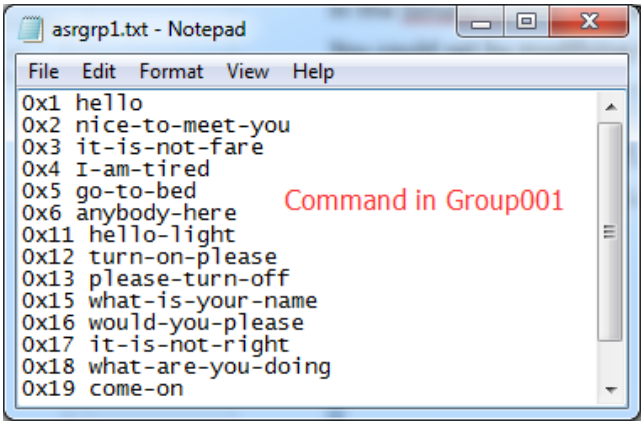
Click Save list

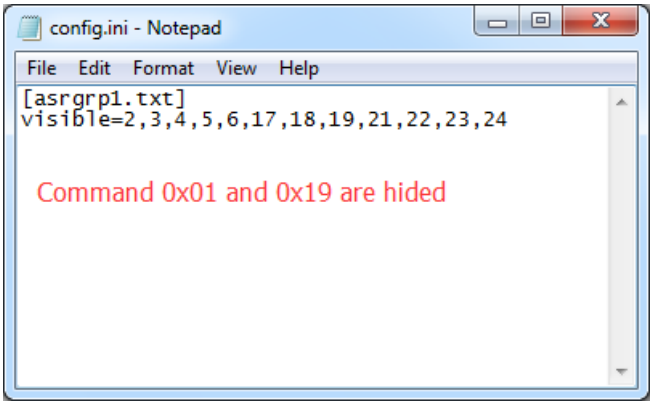


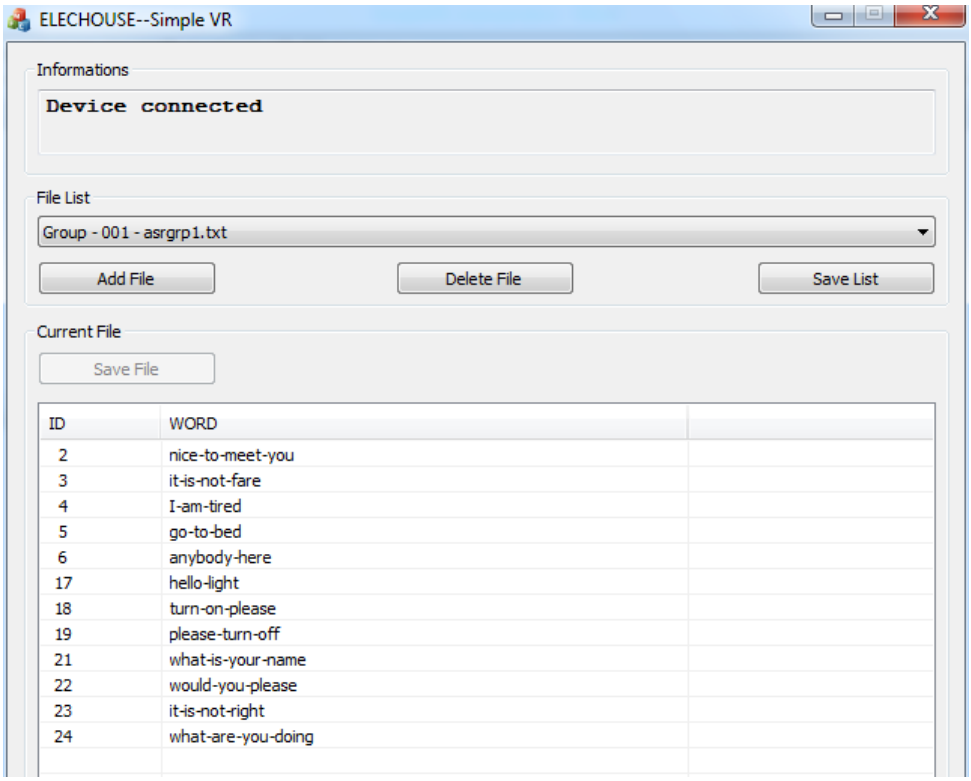
Visibility of command

In the SimpleVR tool, you could hide or display commands.

You could set by modifying the **config.ini** in the **voice** folder.







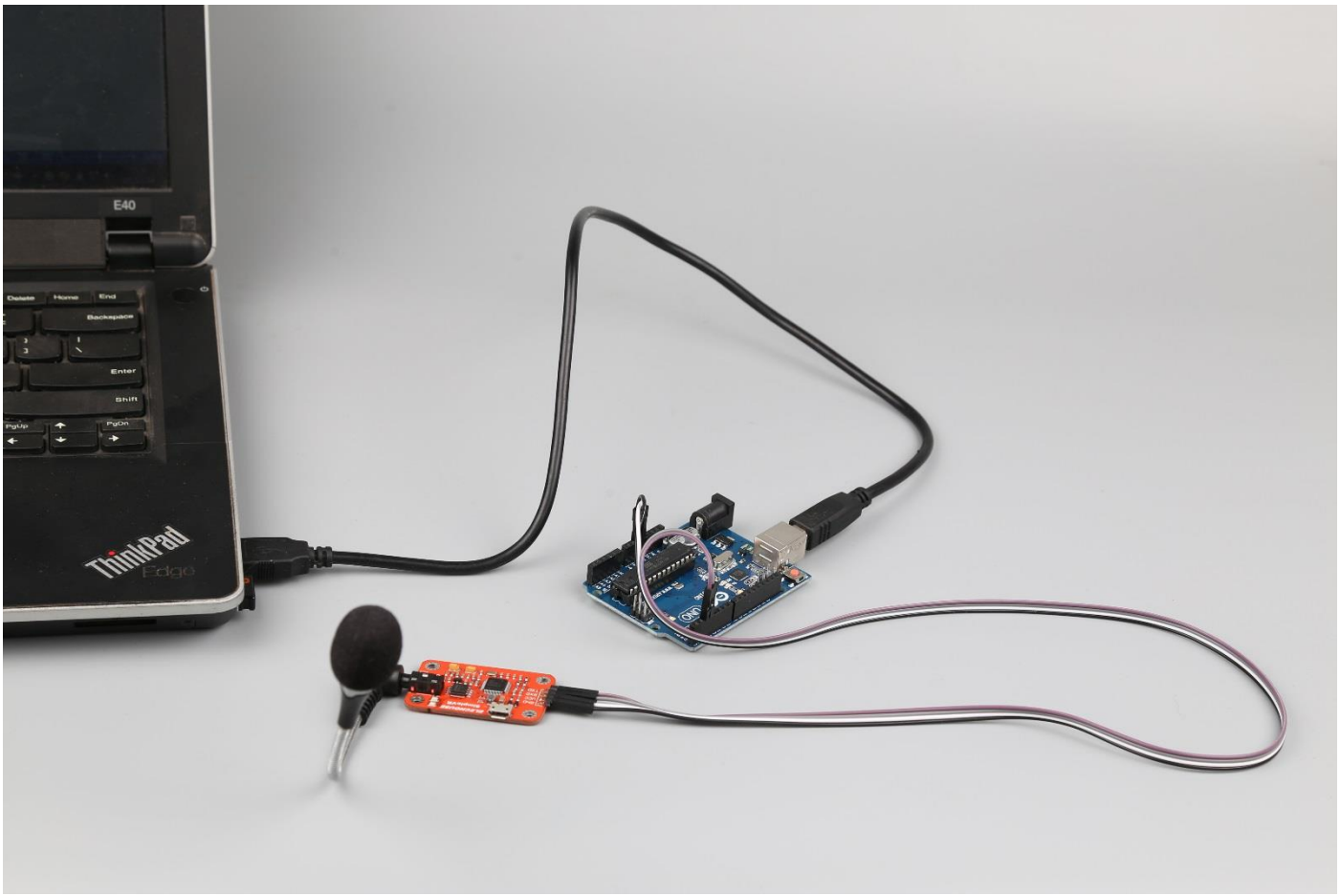
Connection

The following example is for Arduino Uno. As this library is based on Softserial library, if you use Mega, please change the TX and RX pins.

Arduino	SimpleVR
5V	VCC
GND	GND

Pin 3	RXD
Pin 2	TXD

Connect Arduino to PC. Insert MIC into SimpleVR module.



Software

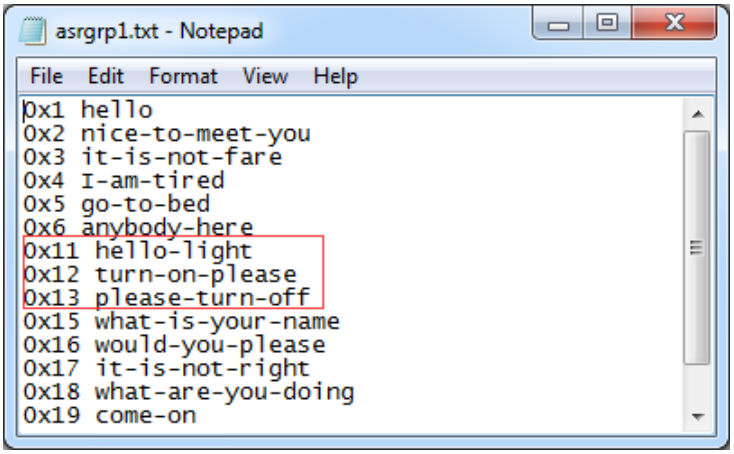
simplevr_sample_control_led

For this example **simplevr_sample_control_led.ino**, make sure the following command is in group001.

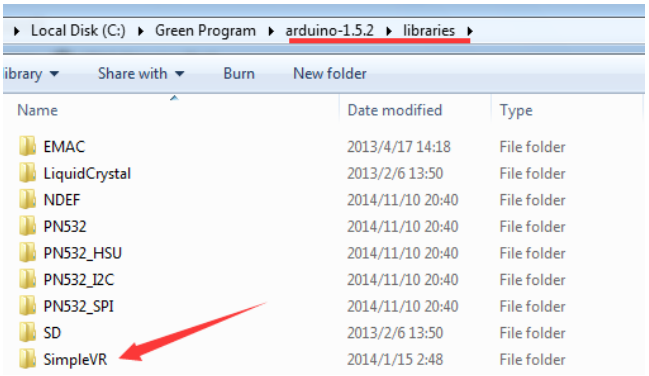
0x11 hello-light

0x12 turn-on-please

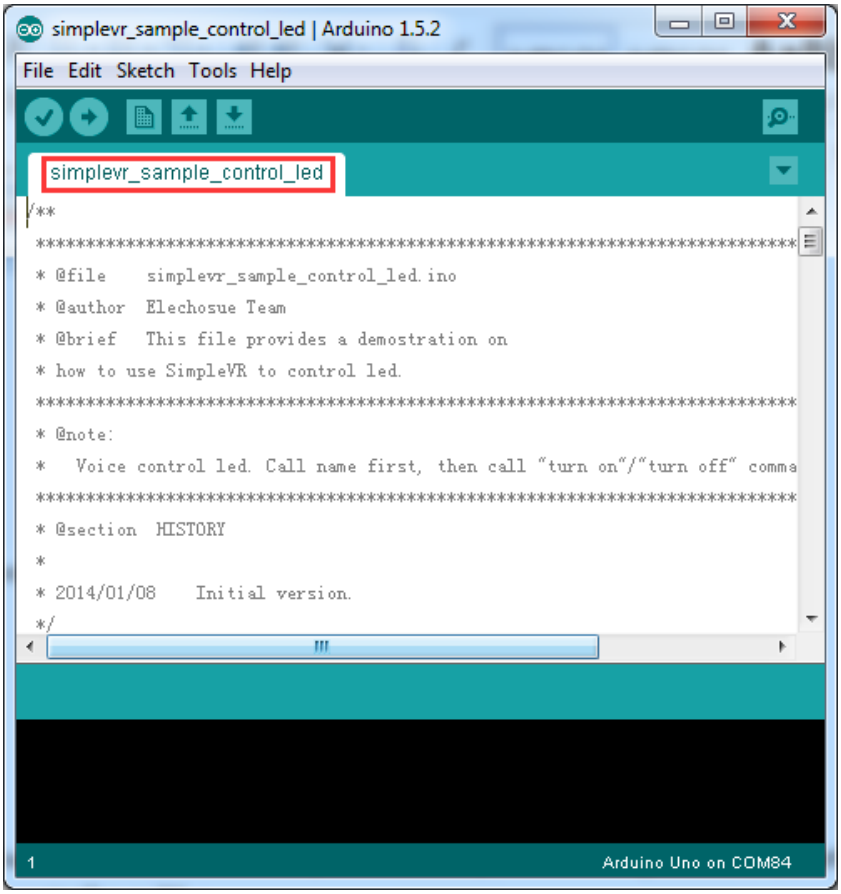
0x13 please-turn-off



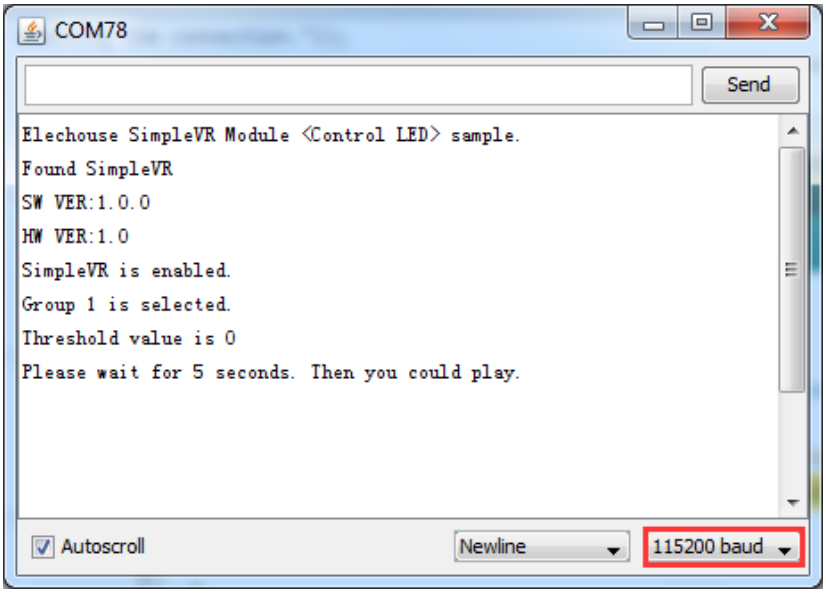
Please download the library in our github page. Extract it into the folder of library of Arduino IDE



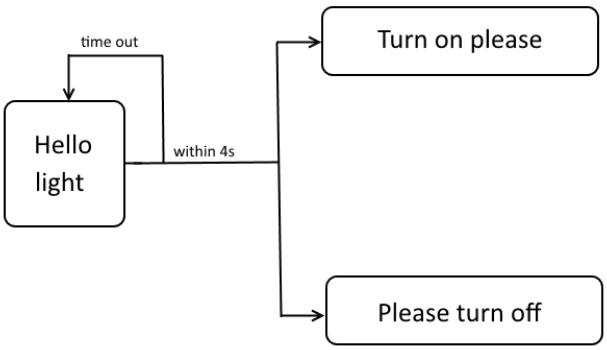
Upload the example into Arduino



Open the serial monitor. Note that the baudrate is 115200.



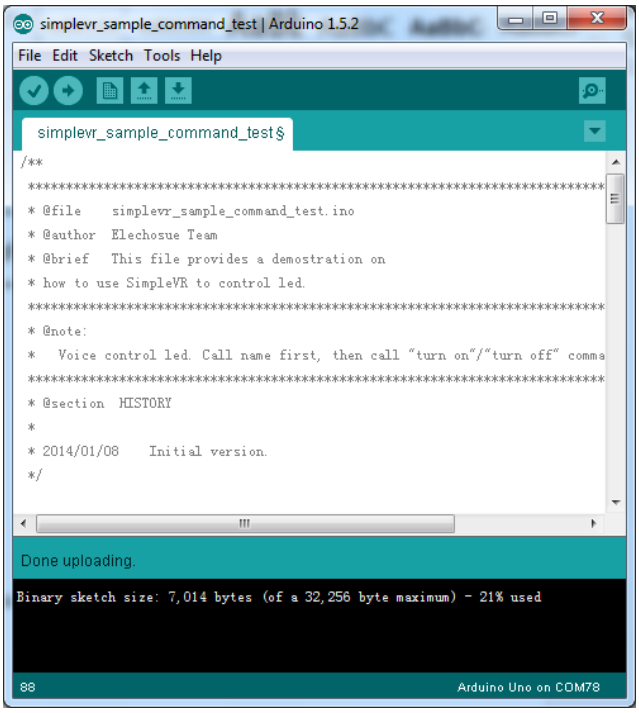
Speak "**Hello light**", within 4 seconds, speak "**Turn on please**" or "**Turn off please**".



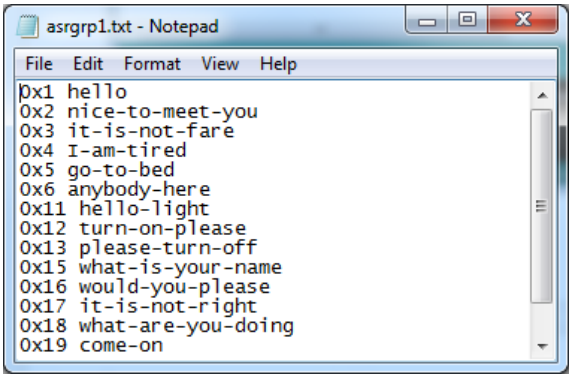
The LED on Arduino was controlled by voice command.

simplevr_sample_command_test

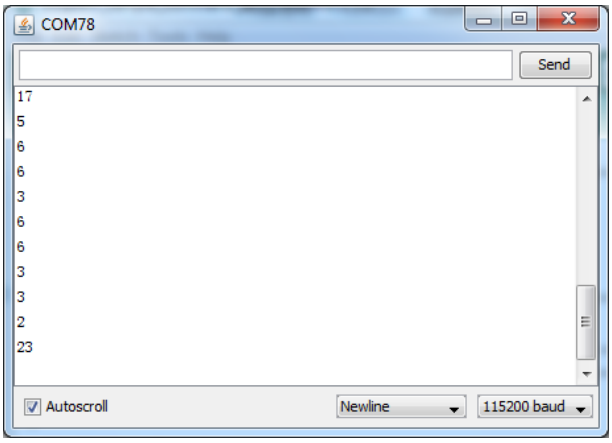
Upload simplevr_sample_command_test.ino to Arduino.



Open Serial monitor. And you could speak the command in group001.



The command index would be displayed:

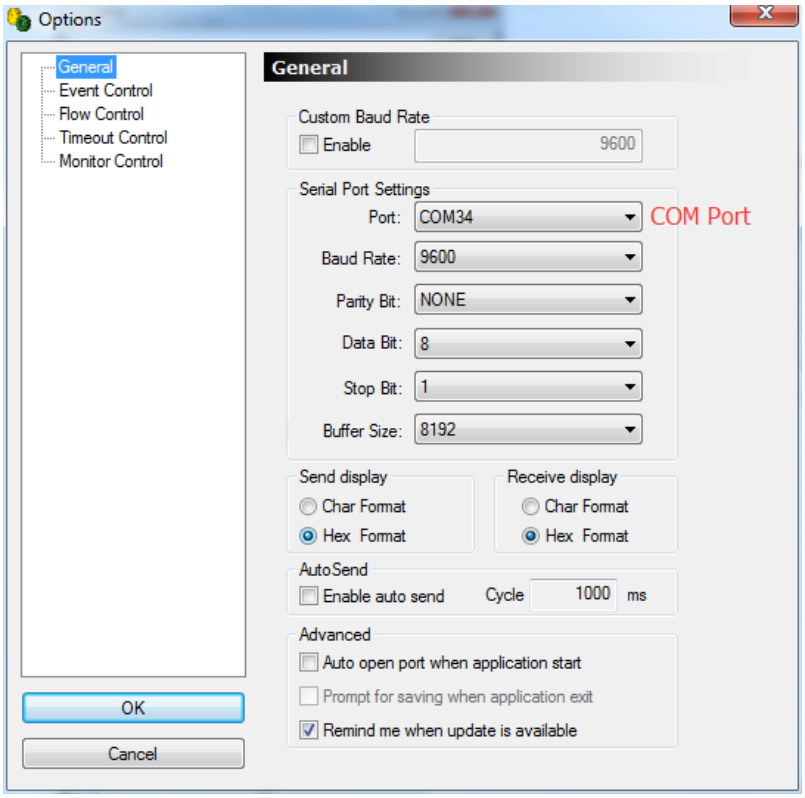


Protocol

SimpleVR supports more than Arduino. Here we will explain the basic protocol through which any platform with UART could control it, such as PIC microcontroller or PC.
Here we will explain the protocol with examples.

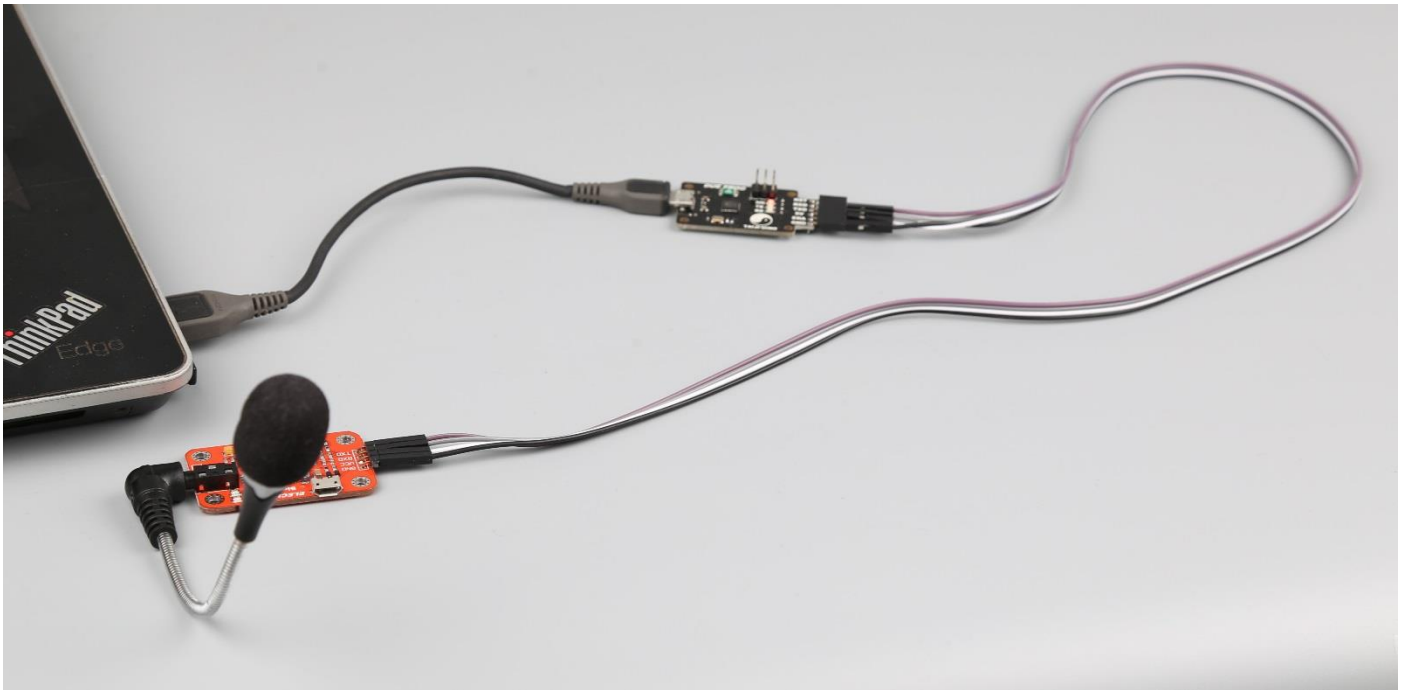
Tool

The following item will be needed:
CP2102 USB-TTL module (PL2303 is not recommended for compatibility reason)
The following tool is needed:
Accesport
Accessport setting:



Connection

USB-TTL Module	SimpleVR
VCC	VCC
GND	GND
TX/TXD	RXD
RX/RXD	TXD



Base Format

HEAD	Length	CMD Code	Data	END
AA	L(Length + Command + Data)	Code	Data	0A

Both command and return message have the same format as above.

Note: all the data in the command are in HEX format

CMD code

Code (HEX)	Information	Note
00	Restore system settings	"Set" CMD code
01	Enable recognition	
02	Disable recognition	
03	Group select	
04	Enable/Disable startup information	
05	Set threshold value	
10	Check System State	"Check" CMD code
11	Check Version Info	
0A	[Prompt][id0a]	Only used in returned message
0D	Voice Recognized	
FF	Error	

Restore System Settings (00)

Use "Restore System Settings" command to reset SimpleVR to default (Enabled/Startup Info/Group 1).

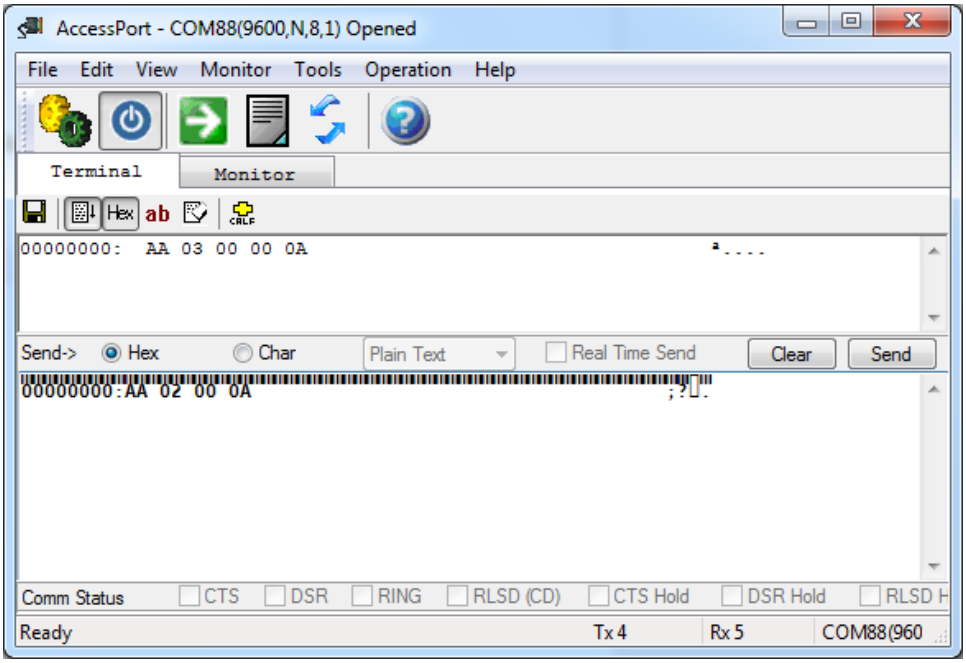
Format:

| AA | 02 | 00 | 0A |

Return:

| AA | 03 | 00 | 00 | 0A |

If an error occurs, error info is returned.



Enable recognition (01)

Enable voice recognition, LED REC would be turned on.

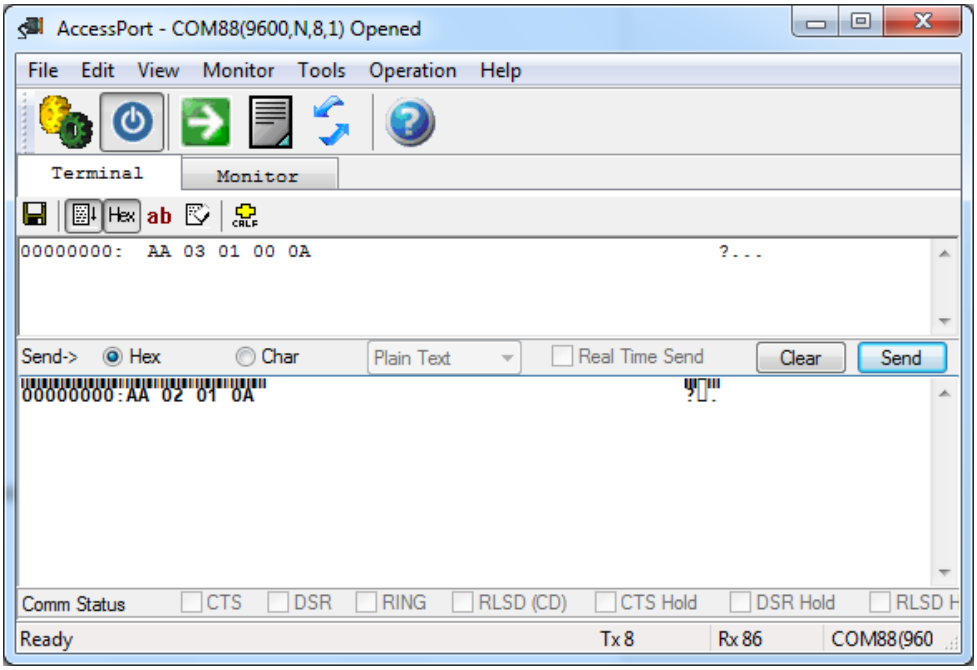
Format:

| AA | 02 | 01 | 0A |

Return:

| AA | 03 | 01 | 00 | 0A |

If an error occurs, error info is returned.



Disable recognition (02)

Disable voice recognition, LED REC would turn off.

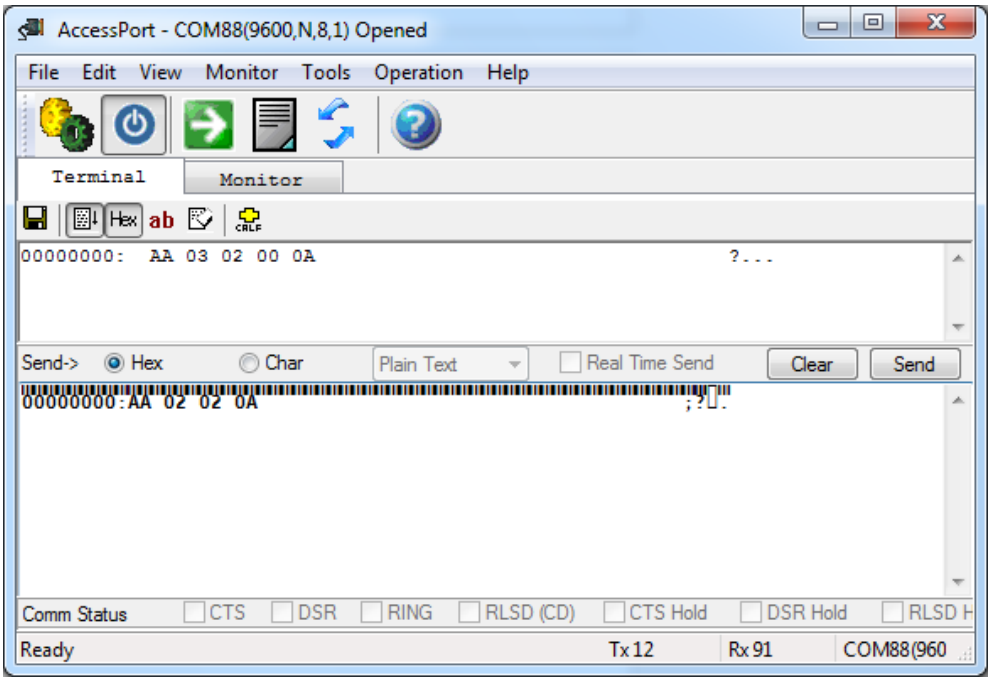
Format:

| AA | 02 | 02 | 0A |

Return:

| AA | 03 | 02 | 00 | 0A |

If an error occurs, error info is returned.



Group Select (03)

Use to select and enable a group.

Format:

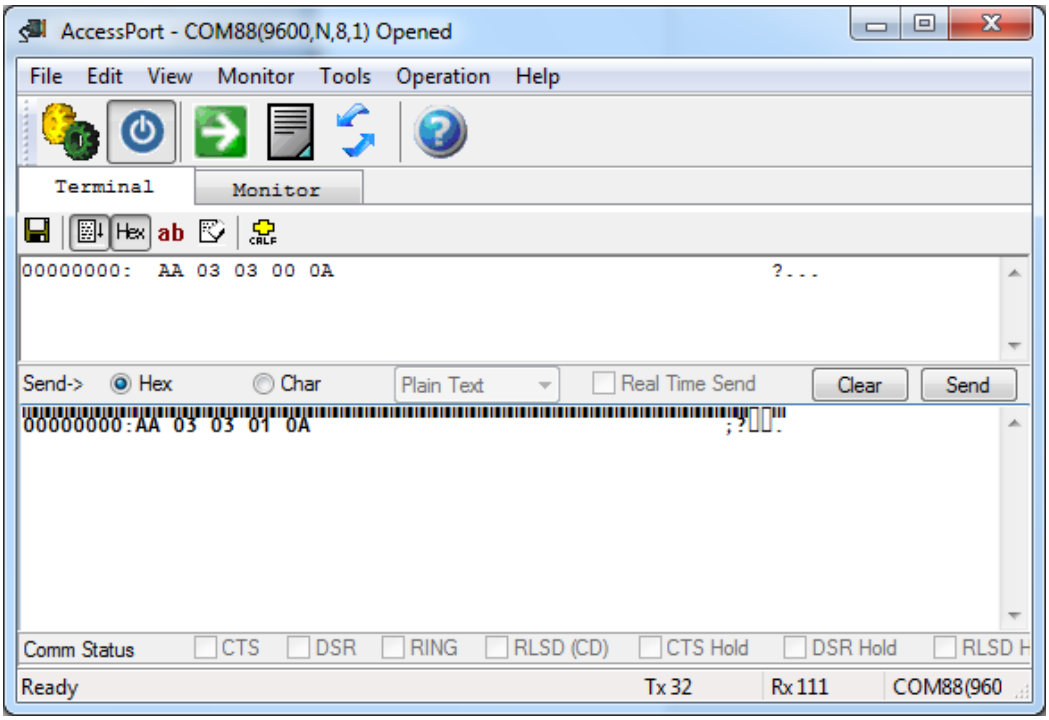
| AA | 03 | 03 | GRP| 0A |

Return:

| AA | 03 | 03 | 00 | 0A |

If an error occurs, error info is returned.

GRP: Group number to select, range from 1 to 64.



Disable or enable startup info (04)

Disable/enable the startup information.

Format:

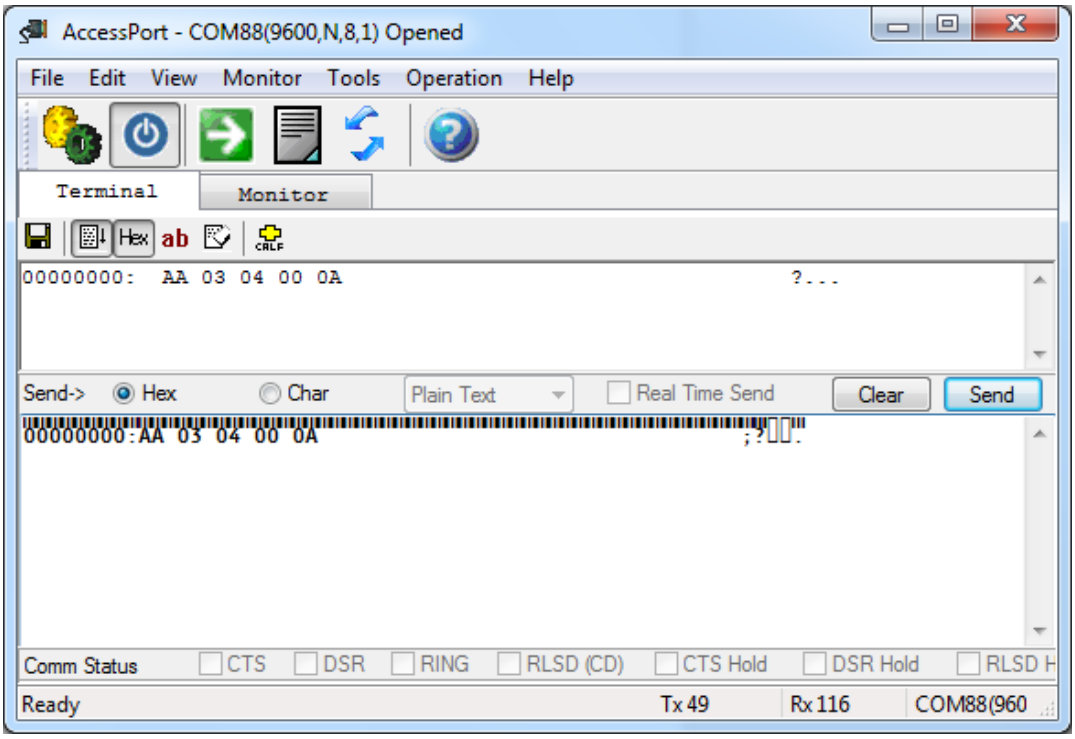
| AA | 03 | 04 | STA | 0A |

Return:

| AA | 03 | 04 | 00 | 0A |

If an error occurs, error info is returned.

STA: 0 -- disable, others -- enable.



Set Threshold Value (05)

Set the voice recognition threshold, only valid for Chinese language.

Format:

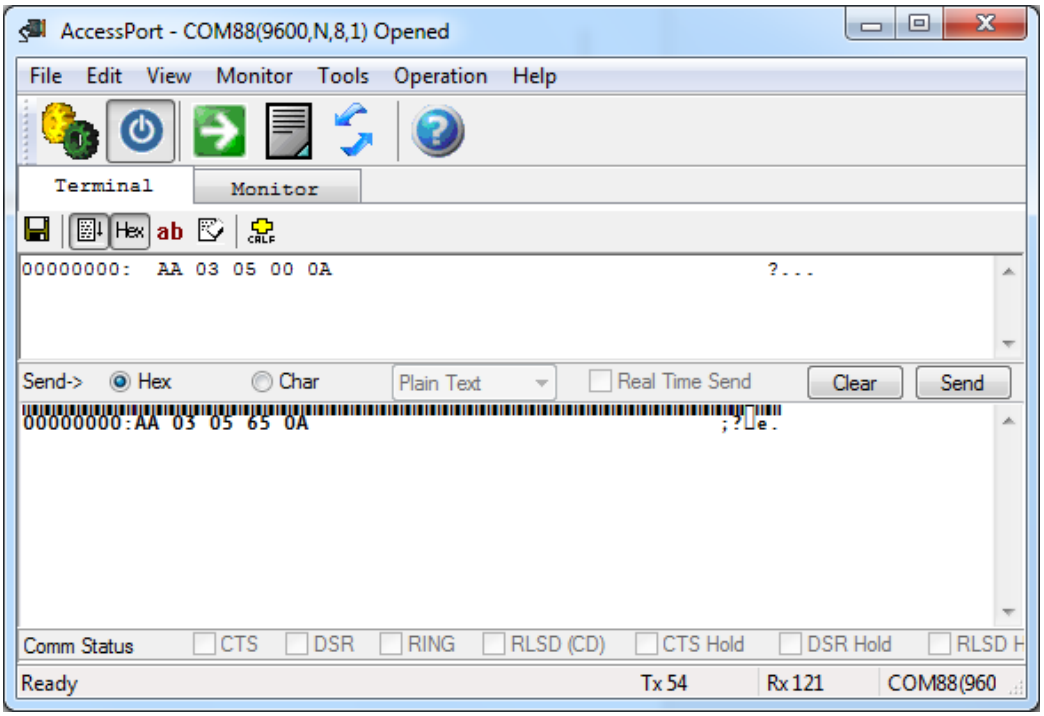
| AA | 03 | 05 | VAL | 0A |

Return:

| AA | 03 | 05 | 00 | 0A |

If an error occurs, error info is returned.

VAL: Threshold value, recommended value is (0x45-0x65).



Check System State (10)

Format:

| AA | 02 | 10 | 0A |

Return:

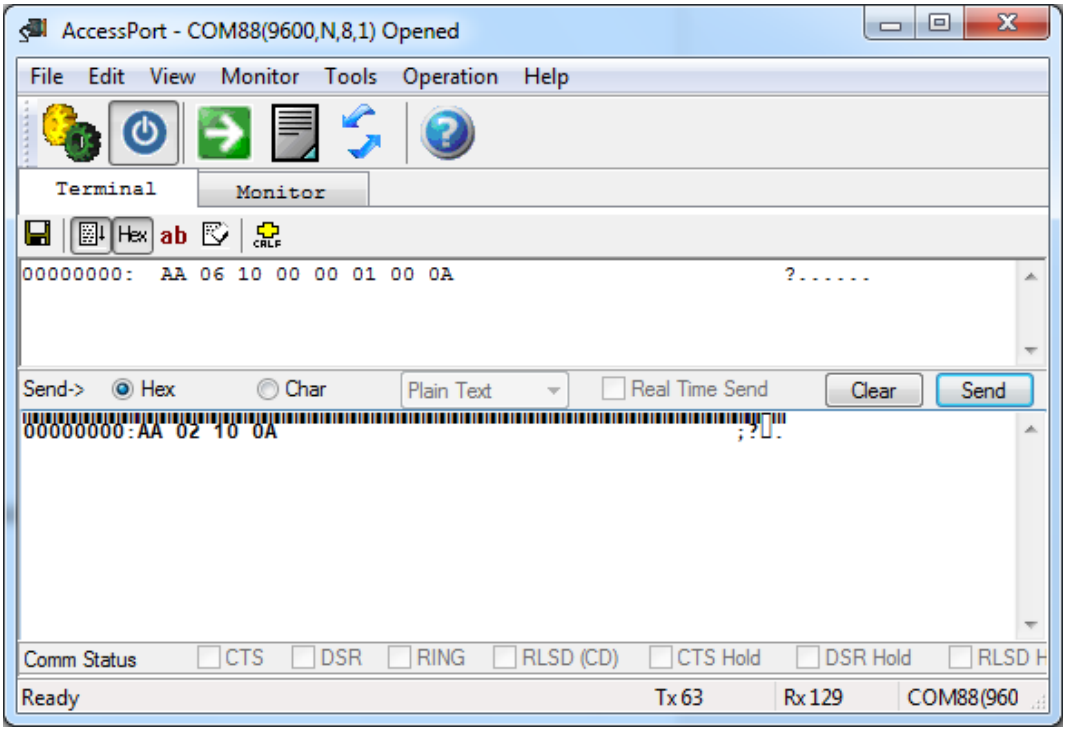
| AA | 06 | 10 | 00 | STA | GRP | VAL | 0A |

If an error occurs, error info is returned.

STA: Recognition State (00 -- disabled, others -- enabled)

GRP: Current group

VAL: Current threshold value, valid for Chinese, 0 for Enaglish.



Check Version (11)

Format:

| AA | 02 | 11 | 0A |

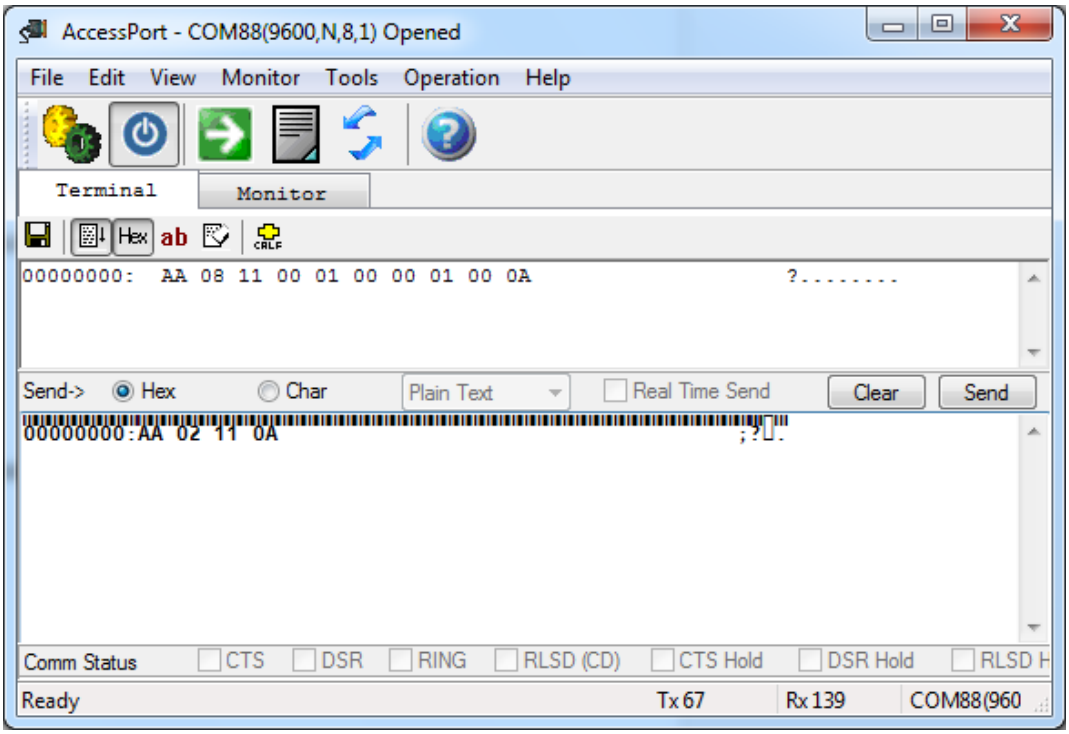
Return:

| AA | 08 | 11 | 00 | SWMAJOR | SWMINOR | SWPATCH | HWMAJOR | HWMINOR | 0A |

If an error occurs, error info is returned.

Software version: **MAJOR.MINOR.PATCH**

Hardware version: **MAJOR.MINOR**



Voice Recognized (0D)

This command code is only in returned message while voice command is recognized.

Format:

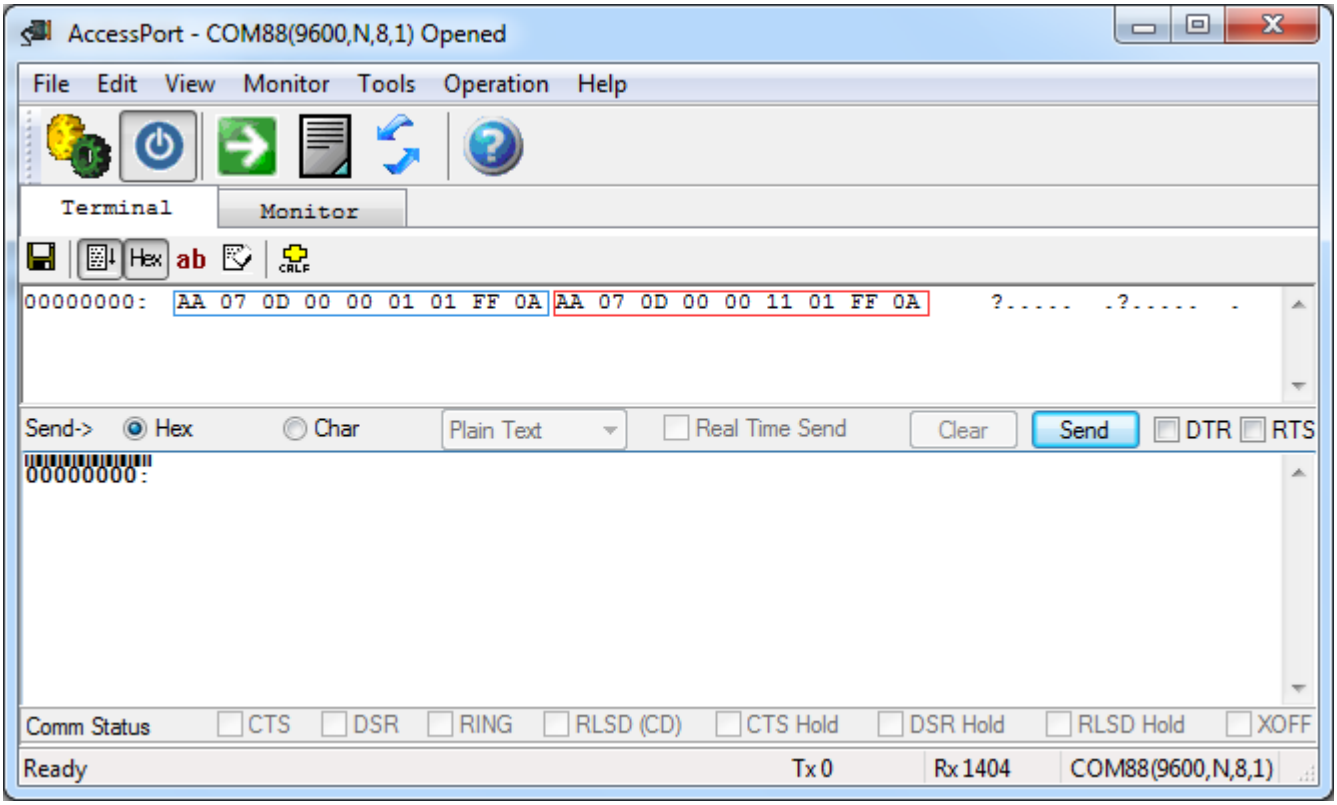
| AA | 07 | 0D | 00 | INDEXH | INDEXL | GRP | SCORE | 0A |

INDEXH: High byte of sentence index value.

INDEXL: Low byte of sentence index value.

GRP: Current group.

SCORE: Score of recognition. The higher the score to recognize the more accurate.



Error (FF)

Only used in returned error message.

Format:

| AA | 03 | FF | ECODE | 0A |

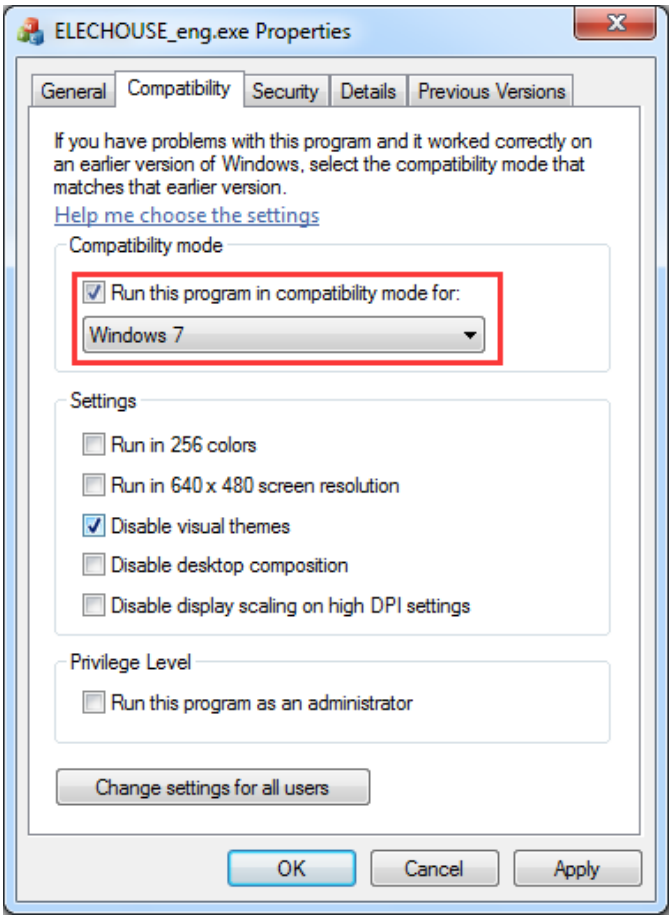
ECODE: error code (FF-command undefined FE-command length error FD-data error FC-subcommand error FB-command usage error)

FAQ

SimpleVR Tool could not find device.

SimpleVR is well compatible with Windows 7. However, sometimes it could not release the driver in Windows XP/8. If you have problems, please do the following check:

1. Make sure you run it as administrator.
2. Make sure you were pressing down the CNT button while connecting it with PC.
3. On Windows 8, try to run it in Windows 7 compatible mode.



SimpleVR picks up wrong voice command

Sometimes SimpleVR would take other voice as command. Please check the following:

1. There are bad voice commands which could not be recognized easily, such as “come on”. Change your command to get

better performance if necessary.

2. Make sure your command list doesn't contain simple-pronunciation command, such as "Hi", "Hey". The longer, the better.
3. Make your command pronunciation different each other. The following two are not good if they are all in the same group: "There you are" "Here you are"
4. Add commands used frequently in daily life as anti-interference commands. You may only need several valid commands for your application. For example, you are building a robot car. You need "go ahead", "turn right", "turn left", "stop", etc. You might only need those commands. But your command list should contains more than those words. Other voice commands could serve as "anti-interference commands", such as "that's right".