AudioExpert

User Manual

Version	Description	Author / Data
1.0.0	Simple draft	Ashun / 2018.5.14
2.0.0	Detailed	Ericka.Yang/2019.10.31
3.0.0	Detailed	Ericka.Yang/2020.12.01

CATALOG

1 Software Overview

AudioExpert is an audio test software platform developed by Megasig, it is a flexible audio test tool for R&D stage and it is easy to deploy to production stage.

[Software system]

The software based on NI-labview development, before using AudioExpert, need to install a version 2015 LabVIEW Run-Time.

Computer: support win7 and win10 systems.

[Hardware system]

AudioExpert support several DAQ hardware, from highest performance NI DSA Card 44xx serial to highest cost-effective sound card. It provides professional sound card driver ASIO, to realize the lowest latency of soundcard.

[Support channel for technical support]

If you need technical support, you can contact us as follows way.

Web site support: http://www.megasig.com/en/

E-mail support: support@megasig.com

Phone support: +86-0755-8950.8393

1.1 Software UI

The main interface of the software is shown in Figure 1.0. It can be divided into three parts: Setting panel, Test flow viewer and Data viewer.

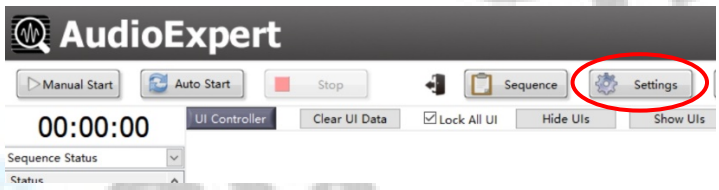
- Setting panel: Software login and operation, Software and hardware parameters setting, Sequences setting.
- Test flow viewer: Displays current test steps, test states for each step, further more, yield statistics function.
- Data viewer: Display test curve. etc.

Click “door” icon, you can login software. Initial password is “123”.

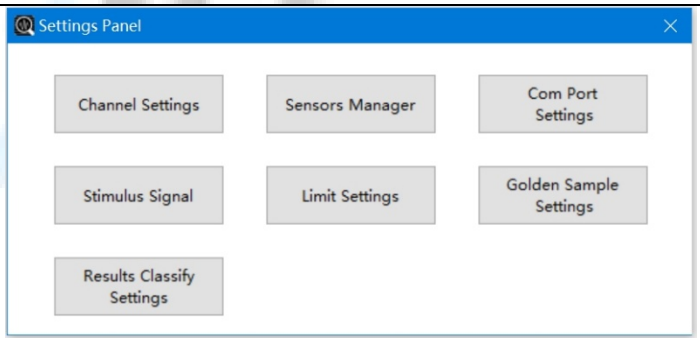
Figure 1.0 Main Interface

2 Software settings

Global setting button is shown in Figure 2.0a. Click “Settings”, will popout panel shown in Figure 2.0b.



a. Settings button



b. Settings panel

Figure 2.0 About “Settings”

2.1 Channel Settings

In the settings panel, click “Channel Settings”, entry into channel assignments. Shown in Figure 2.1.

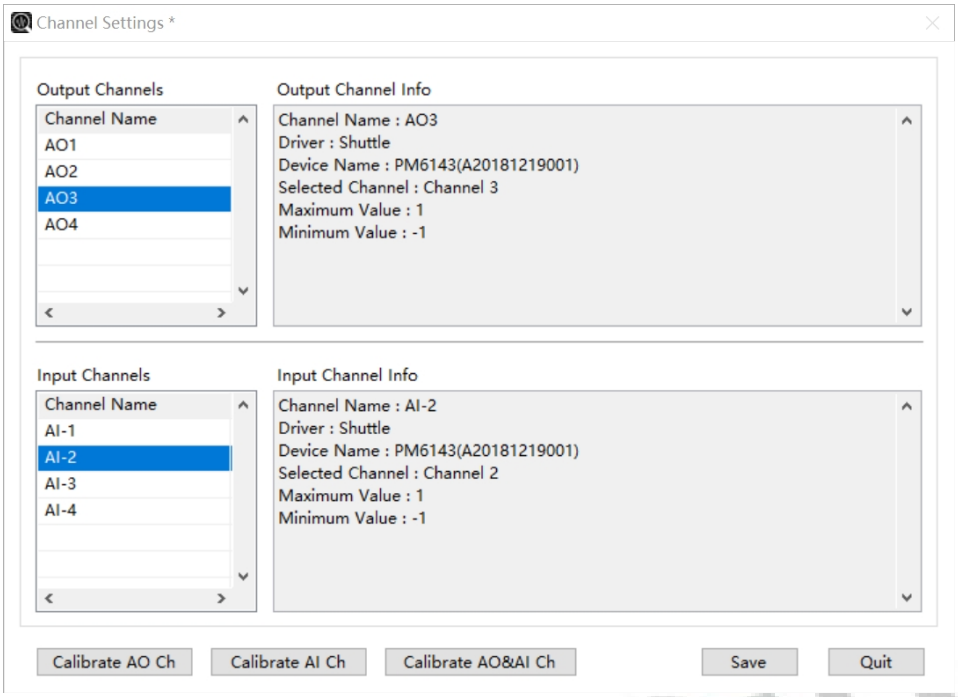


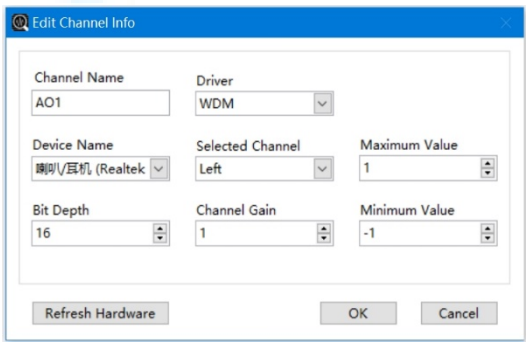
Figure 2.1 Channel Settings

2.1.1 Output Channels Setting

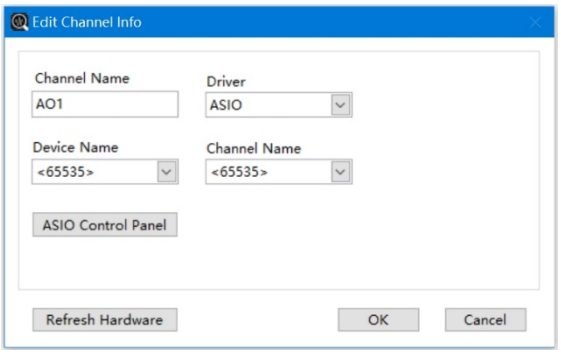
Upon the output channels list, right click, you can “Add Channel”, “Delete Channel”, “Copy Channel”, “Edit Channel”.

2.1.1.1 Edit Output Channel

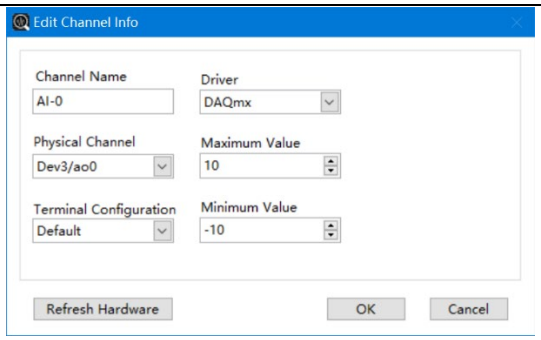
Choose the channel to edit, you can right click or double-click this channel, will popout “edit channel info”. The editing interface is shown in Figure 2.1.1.1 .



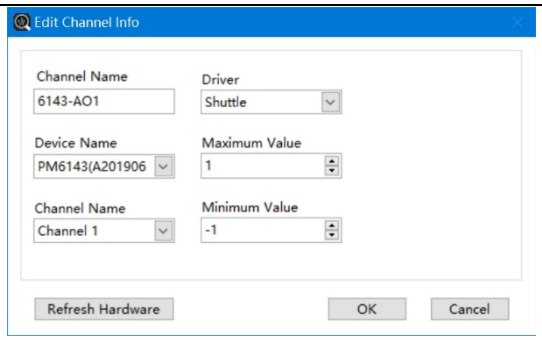
a. WDM Driver



b. ASIO Driver



c. DAQmx Driver



d. Shuttle Driver

Figure 2.1.1.1 Output channel settings

Now AudioExpert support WDM, ASIO, NI DAQmx, Megasig Shuttle driver. You can choose different driver depending on your device.

WDM (Windows Driver Model）

Channel Name：User-defined channel name

Device：A new device, need to click “Refresh Hardware” button.

Maximum Value：Output signle max value

Minimum Value：Output signle min value

ASIO（Audio Stream Input Output）

Channel Name①：User-defined channel name

Device Name：A new device, need to click “Refresh Hardware” button.

Channel Name②：ASIO physical channel

DAQmx（NI modules driver）

Channel Name：User-defined channel name

Physical Channel：NI device channel

Terminal Configuration：Mode of connection

Maximum Value：Output signle max value

Minimum Value：Output signle min value

Shuttle（MegaSig devices driver）

Channel Name①：User-defined channel name

Device Name：A new device, need to click “Refresh Hardware” button. Select device to use the channel

Channel Name②：Megasig device channel

Maximum Value：Output signle max value

Minimum Value：Output signle min value

Click “OK”, save the current setting. If not save, click “Cancel”.

2.1.1.2 Add Output Channel

Upon the output channels list, right click, select “Add Channel”. The details are consistent with those described in 2.1.1.1.

2.1.1.3 Delete Output Channel

Choose the channel to delete, you can right click this channel and then select “Delete Channel”.

2.1.1.4 Copy Output Channel

Choose the channel to copy, you can right click this channel and then select “Copy Channel”.

2.1.2 Input Channels Setting

Input channels setting are consistent with 2.1.1Output channels setting.

2.1.3 Output Channels Calibration

Click “Calibrate AO Ch”, popout the AO calibration UI as below Figure 2.1.3

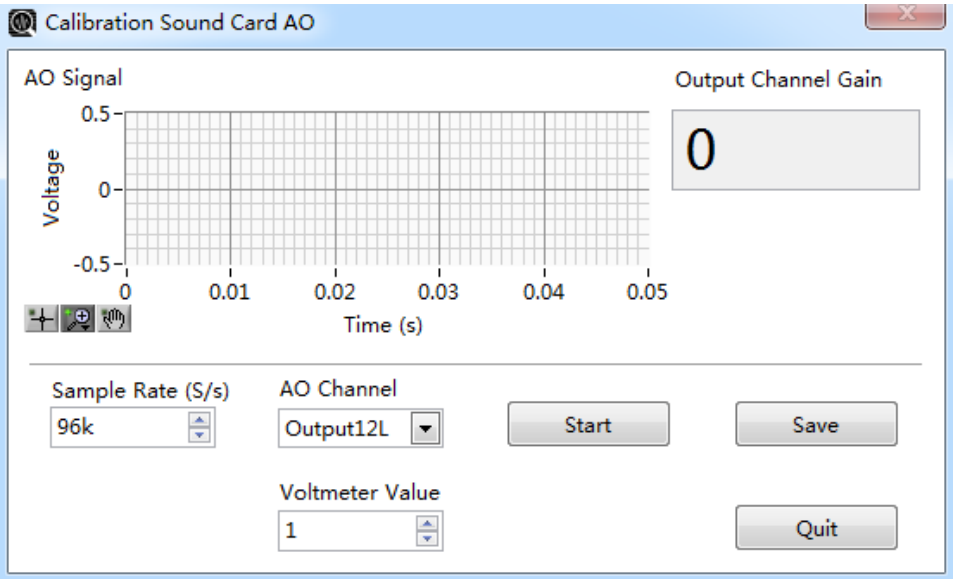


Figure 2.1.3 Calibrate AO Ch

AO Channel：Select the output channel you want to calibrate.

Voltmeter Value：Fill in measured value from the multimeter.

Calibration step：

a. Set the sample rate, select the output channel you want to calibrate.
b. Connect the selected output channel to a multimeter, set the multimeter to AC measure type, small range (such as 2Vrms).
c. Click “start” button, wait until the multimeter stable, read the measured value from the multimeter.
d. Enter the read value to “Voltmeter value”, click “stop”, and “save”.
e. Finish the calibration, click “Quit”.

2.1.4 Input channels calibration

Click “Calibrate AI Ch”, popout the AO calibration UI as below Figure 2.1.4.

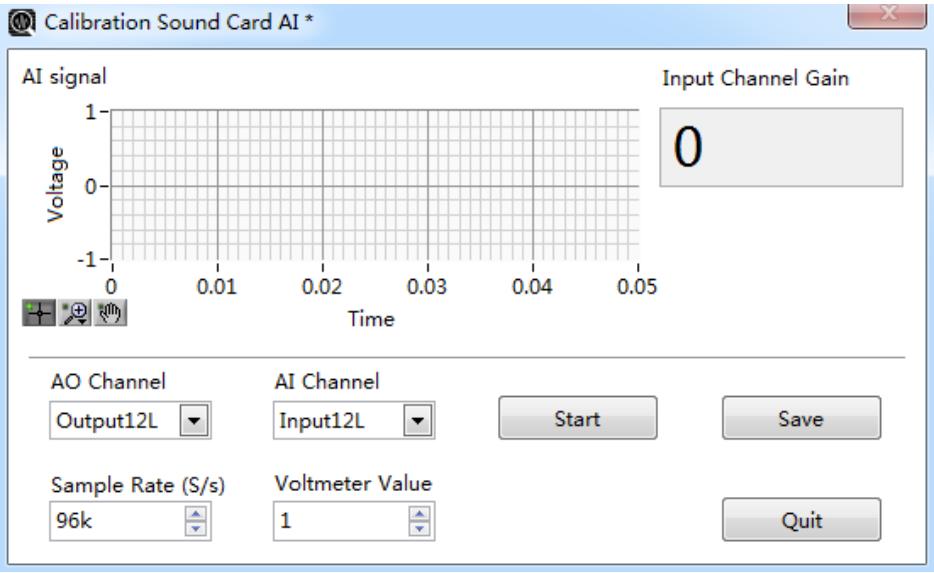


Figure 2.1.4 Calibrate AI Ch

AO Channel：Already finish calibrated output channel

AI Channel：Select the Input channel you want to calibrate.

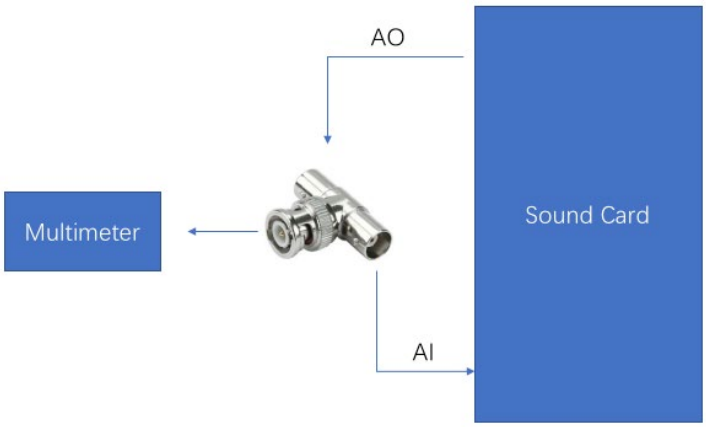
Voltmeter Value：Fill in measured value from the multimeter.

Calibration steps:

a. Make sure you already finish at least one output channel calibration.

b. “AO Channel” select a calibrated output channel, “AI Channel” select which you want to calibrate.

c. Connect the signal of AO channel to AI channel, and use a multimeter to measure this signal loop, you might need three pass connector such as below picture.



d. Click “start” button, wait until the multimeter stable, read the measured value from the multimeter.

e. Enter the read value to “Voltmeter value”, click “stop”, and “save”.

f. Finish the calibration, click “Quit”.

2.2 Sensors Manager

Sensor management have two parts, microphone manager and artificial mouth manager.

2.2.1 Microphone Manager

Microphone manager interface is shown in Figure 2.2.1.

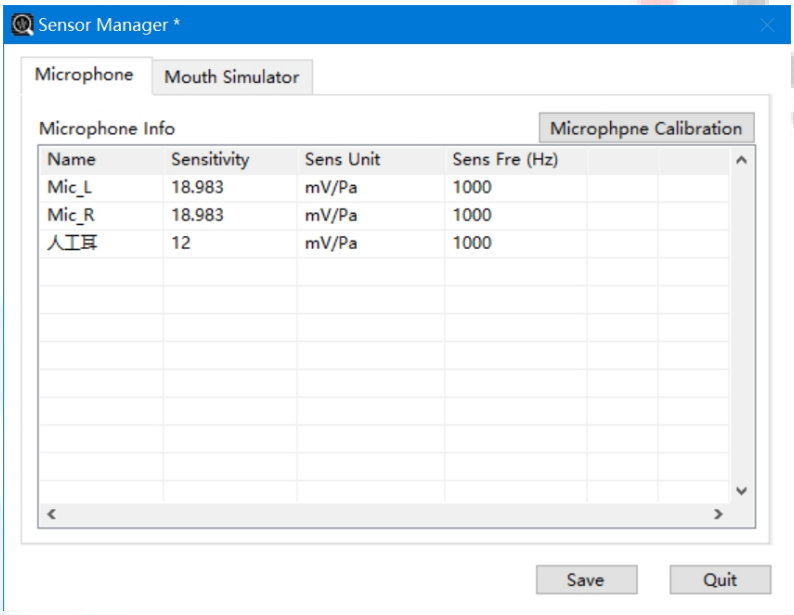


Figure 2.2.1 Microphone manager

2.2.1.1 Add Microphone

Upon the microphone info list, right click, choose “Add Microphone”. Input microphone name, click “OK”, microphone information will be added to the list.

2.2.1.2 Delete Microphone

Choose the microphone to delete, you can right click and then select “Delete Microphone”.

2.2.1.3 Edit Microphone

Double click the sensor's name, sensitivity, or frequency, you can change the value manually.

2.2.1.4 Microphone Calibration

Click "Microphone Calibration", popout interface is shown in Figure 2.2.1.4.

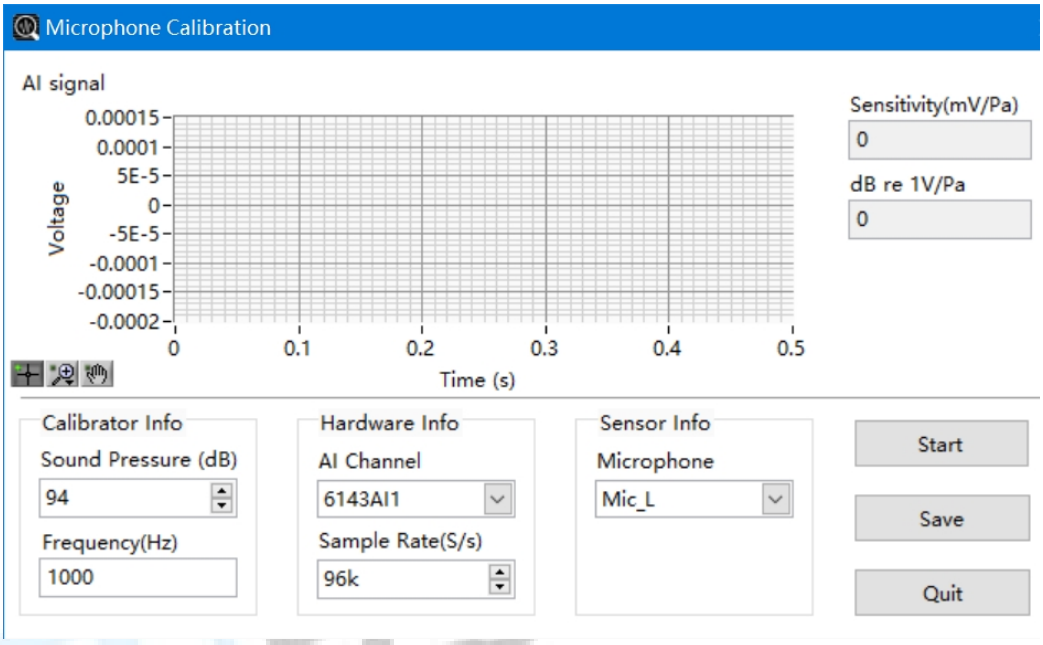


Figure 2.2.1.4 Microphone Calibration

AI Channel：Microphone channel

Microphone：Sensor calibrated save path

Calibration steps:

a. Set the parameter, including the sample rate, the sound pressure level (94dBSPL or 114dBSPL), input channel, and sensor name.

b. Insert the microphone into the calibrator, click "start", wait until the sensitivity become stable, click "Stop" and "save".

2.2.2 Artificial Mouth Manager

Artificial mouth manager interface is shown in Figure 2.2.2.

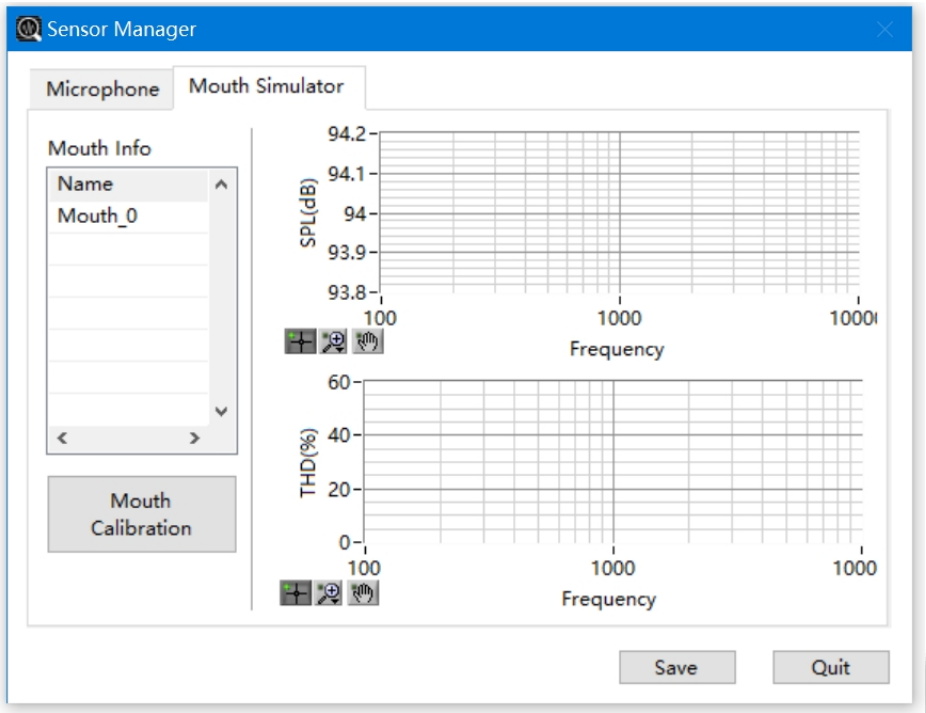


Figure 2.2.2 Artificial Mouth Manager

2.2.2.1 Add Mouth Simulator

Upon the mouth info list, right click, choose “Add Microphone”. Input mouth name, click “OK”, mouth information will be added to the list.

2.2.2.2 Delete Mouth Simulator

Choose the mouth to delete, you can right click and then select “Delete Mouth Simulator”.

2.2.2.3 Change Mouth Simulator

Double click the sensor’s name, you can change the name manually.

2.2.2.4 Mouth Calibration

Click “Mouth Calibration”, popout interface is shown in Figure 2.2.2.4.

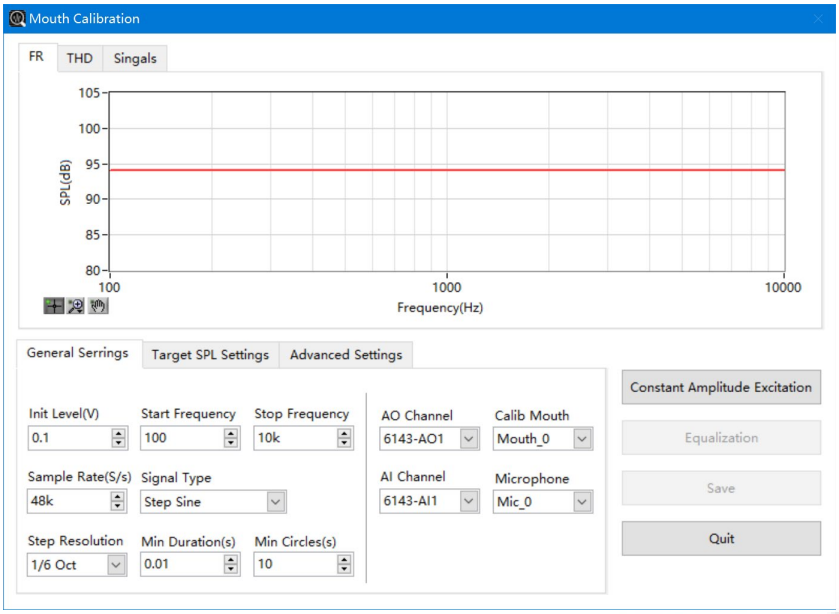


Figure 2.2.2.4 Mouth Calibration

Init Level(V): Stimulus voltage

Min Duration(s): Per frequency point min duration

Min circles: Per frequency poin min circles

AO Channel: Mouth channel

Calib Mouth: Sensor calibrated save path

AI Channel: Microphone channel

Microphone：Recall the microphone sensitivity

Constant Amplitude Excitation: Init FRF

Equalization: Automatically adjust signal, equalize the mouth to flat target SPL

Calibration steps:

a. Set all the parameter, including “Sample Rate”, “Initial level”, “Start Frequency”, “Stop Frequency”, “Min Duration(s)”, “Min circles”. Etc.

b. Click “Constant Amplitude Excitation”, to generate a Constant swept voltage signal to driver the artificial mouth, after finish, the software will get the response signal of the mouth without any EQ.

c. Click “Equalization”, this time, the software will generate a EQed swept signal which can equalize the mouth to flat 94dBSPL.

d. If the responded signal not flat enough, click “Equalization” button again.

2.3 Com Port Settings

In the settings panel, click “Com Port Settings”, entry into com port manager. Shown in Figure 2.3.

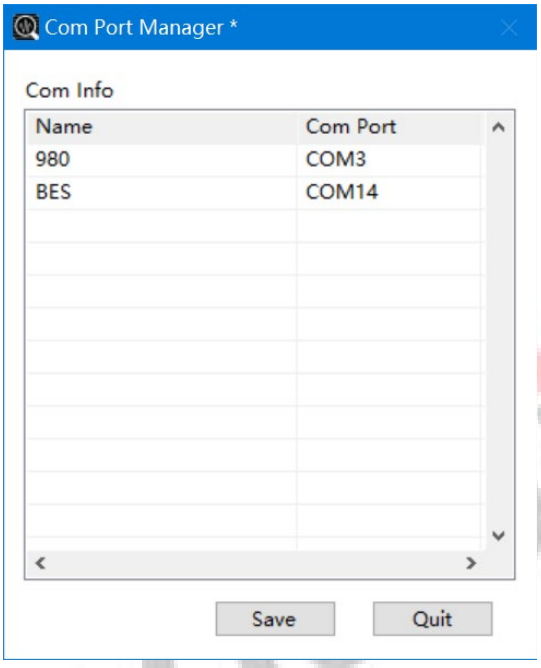


Figure 2.3 Com Port Manager

2.3.1 Add Com

Upon the com info list, right click, choose “Add Com”. Input com name, click “OK”, com information will be added to the list. And then, double click “Com Port” in this row, click “refresh” in the drop-down box, select the com port.

2.3.2 Delete Com

Choose the com to delete, you can right click and then select “Delete Com”.

2.3.3 Change Com

Double click the table info, you can change the name and com port manually.

2.4 Stimulus Signal

In the settings panel, click “Stimulus Signal”, entry into interface is shown in Figure 2.4.

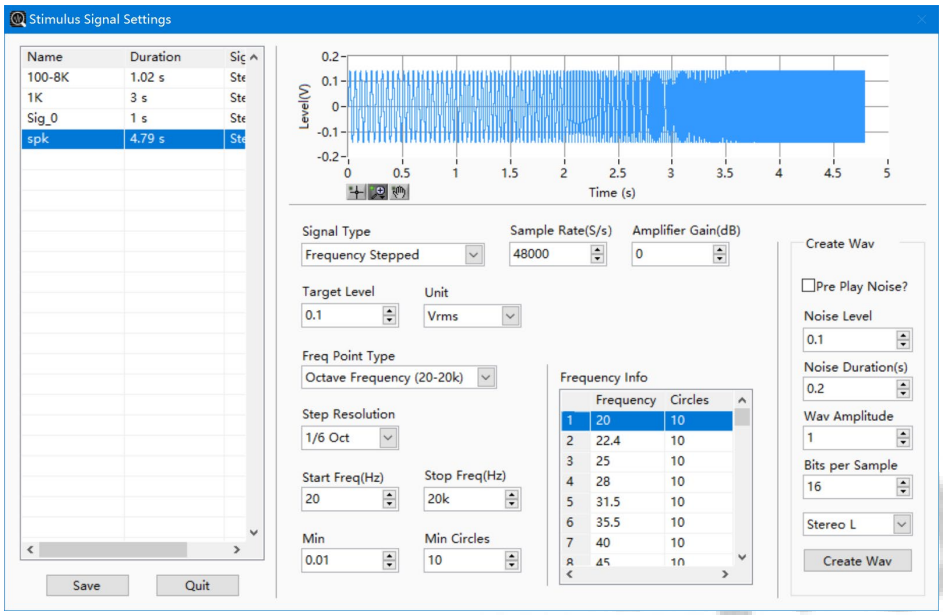


Figure 2.4 Stimulus Signal

2.4.1 Add Stimulus Signal

Upon the list, right click, choose “Add”. Input stimulus signal name, click “OK”, stimulus signal information will be added to the list.

2.4.2 Copy Stimulus Signal

Choose the stimulus signal to copy, you can right click and then select “Copy”.

2.4.3 Delete Stimulus Signal

Choose the stimulus signal to delete, you can right click and then select “Delete”.

2.4.4 Edit Stimulus Signal

Right click and then select “Edit” or double click the stimulus signal, you can change the name manually.

Min: It’s Min Duration, Per frequency point min duration

Min circles: Per frequency poin min circles

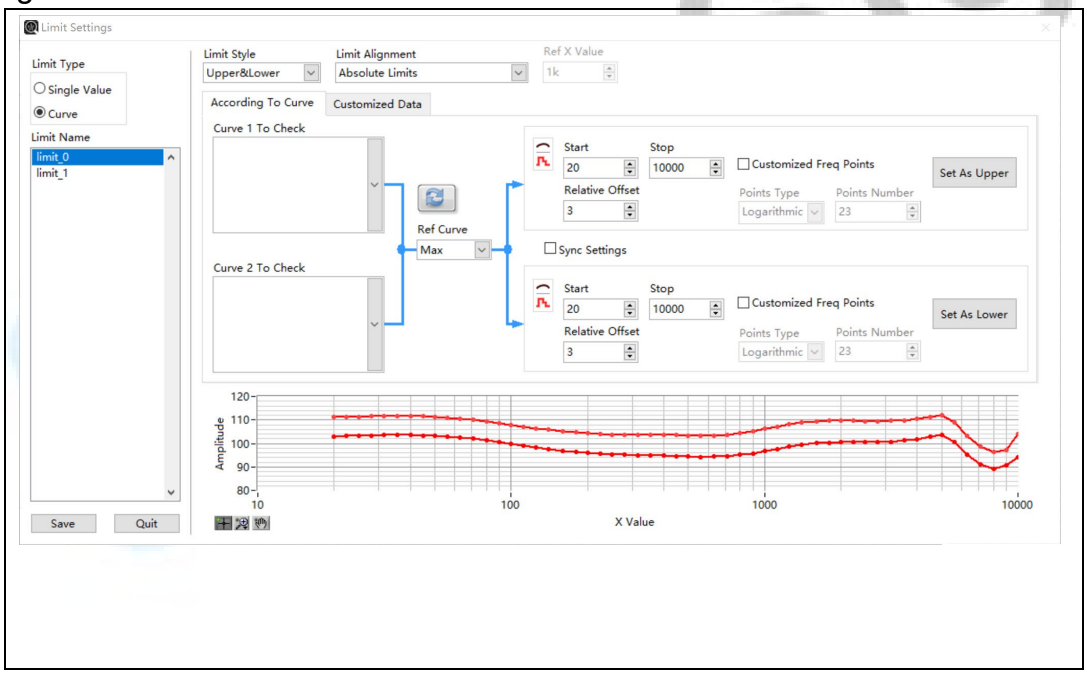
Frequency Info：Show frequency and circles of the signal. In the customized mode, you can double click table to change frequency and circles.

These signals can be called by their names during the sequence run.

Pay attention to the “Min circles” & “Min Duration”, for more stable test, we suggest Min duration not smaller than 50ms, and the Min circles not smaller than 10.

2.5 Limit Settings

In the settings panel, click “Limit Settings”, entry into interface is shown in Figure 2.5.



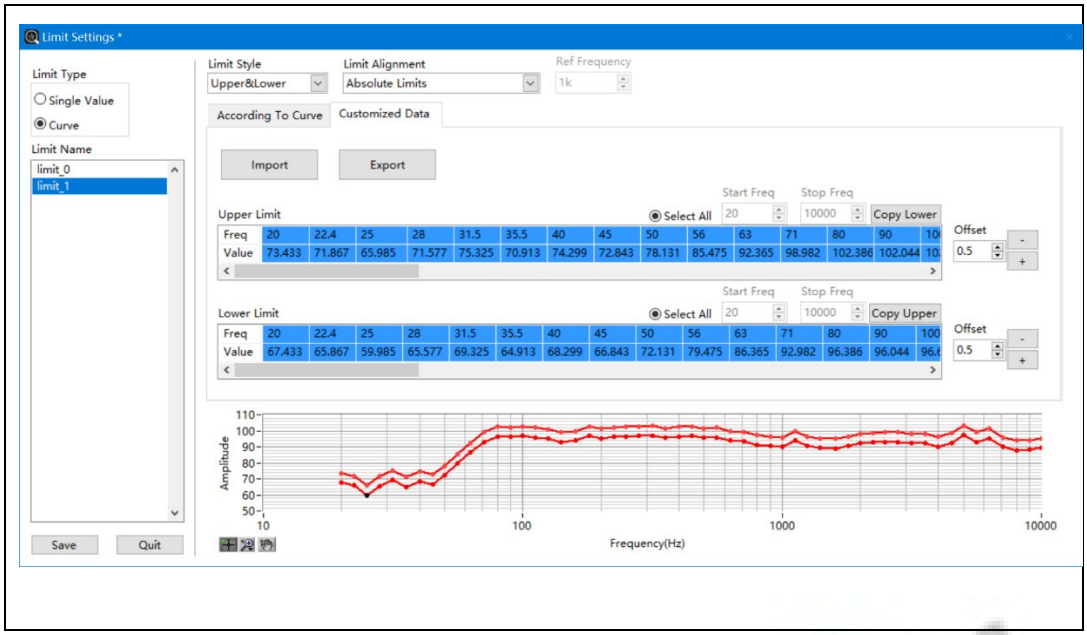


Figure 2.5 Limit Settings

Limit Name：Upon the list, right click, you can add, edit, copy or delete the limitation.

Reference Curve：Select the reference curve calculate to do limit.

Set As Upper：Click it, Set the upper limit according to the offset of the Ref curve

Set As Lower：Click it, Set the lower limit according to the offset of the Ref curve

If you want to set the limit in sections, you can use this icon ( ) in Figure 1

Upper Limit：Upper limit current frequency and value. According to curve or import. Right click table, you can “Empty Table”, “Insert Column Before”, “Delete Column” the limitation.

Lower Limit：Similar to the upper limit.

Upon the limit name list, right click, you can add, copy, edit or delete the limitation.

2.6 Golden Sample Settings

In the settings panel, click “Golden Sample Settings”, entry into interface is shown in Figure 2.6.

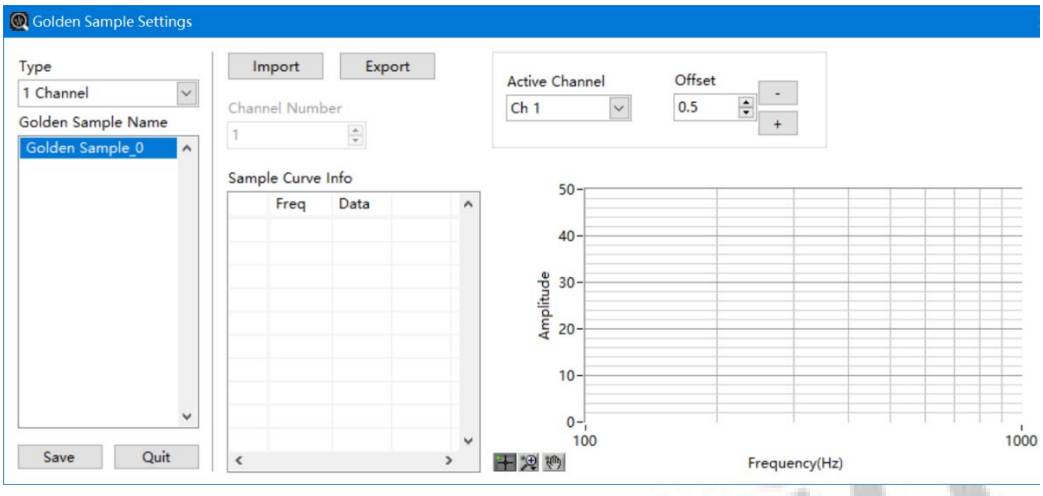


Figure 2.6 Golden Sample Settings

Type：You can choose different channel number to set golden sample

Golden Sample Name：User-defined golden sample name

Sample Curve Info：After import the data, will show info. you can edited info too

Active Channel：Currently edited channel

Upon the golden sample name list, right click, you can add, copy, edit or delete.

You can manager your golden sample data here, import the data which is gernerated by other system with higher confident level. During the sequence you can quota this data, the software will automatically study the difference between these 2 systems, and compensate the difference after the golden sample data is studied.

2.7 Results Classify Settings

In the settings panel, click “Results Classify Settings”, entry into interface is shown in Figure2.7.

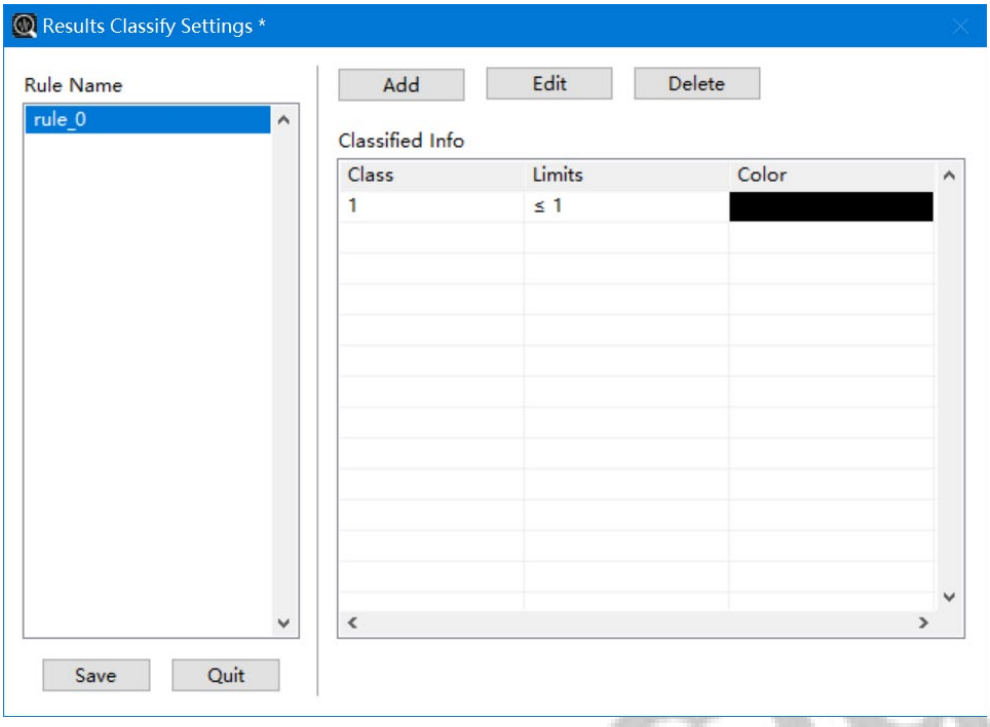


Figure2.7 Results Classify Settings

2.7.1 Add results classify rule

In the rule name list, right click, choose “Add”. Input rule name, click “OK”, information will be added to the list.

Add：In the current rule, add a new classify

Edit：In the current rule, edit the selected classify

Delete：In the current rule, delete the selected classify

2.7.2 Copy results classify rule

Choose the rule to copy, you can right click and then select “Copy”.

2.7.3 Delete results classify rule

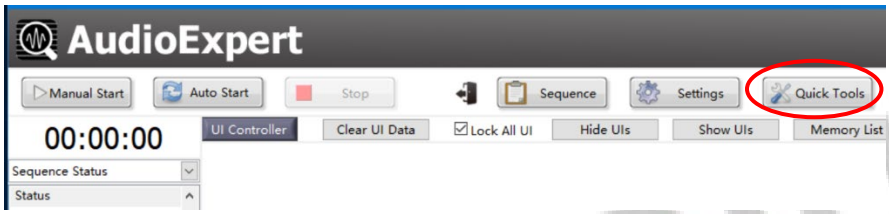
Choose the rule to delete, you can right click and then select “Delete”.

2.7.4 Edit results classify rule

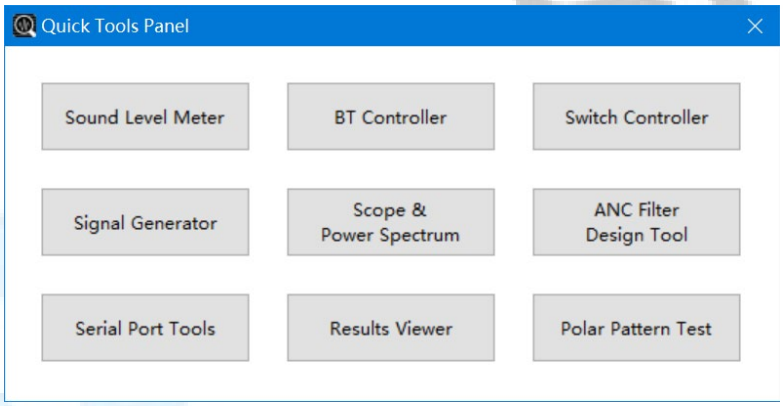
Choose the rule to delete, you can right click and then select “Edit”. Or double click this rule.

3 Quick Tools

Quick tools button is shown in Figure 3.0 a, Click “Settings”, will popout panel shown in Figure 3.0 b.



a. Location



b. Panel

Figure 3.0 Quick tools

3.1 Sound Level Meter

In the quick tools panel, click “Sound Level Meter”, entry into interface is shown in Figure 3.1.

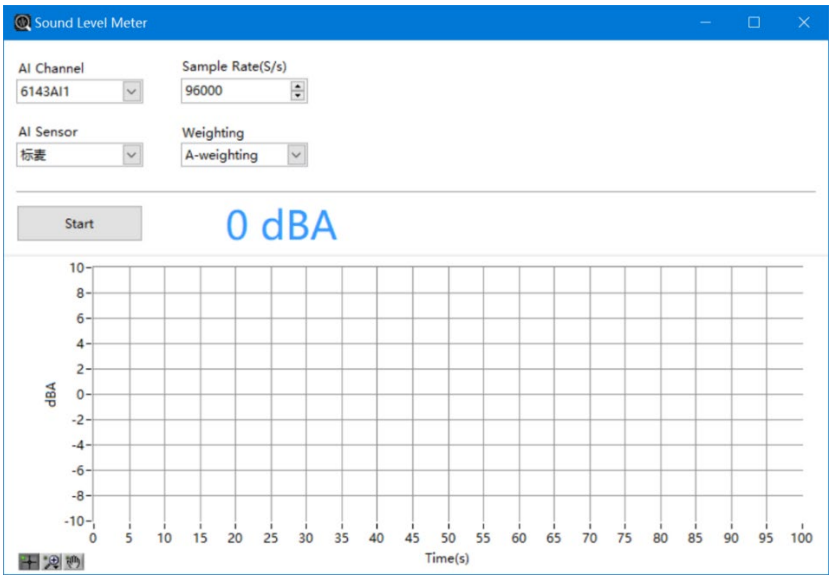


Figure 3.1 Sound Level Meter

This function can test sound level in the real time. Have 4 weighting mode to choose.

3.2 BT Controller

In the quick tools panel, click “BT Controller”, entry into interface is shown inFigure 3.2.

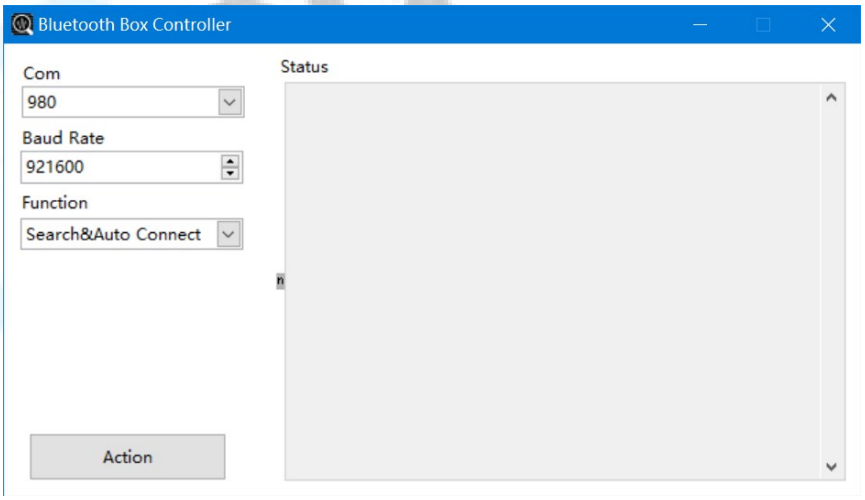


Figure 3.2 BT Controller

Com：Need to configure it ahead of time in “Settings-Com Port Manager 2.3”.

Function：Many mode, choose function to control the BT device.

3.3 Switch Controller

In the quick tools panel, click “Switch Controller”, entry into interface is shown in Figure 3.3.

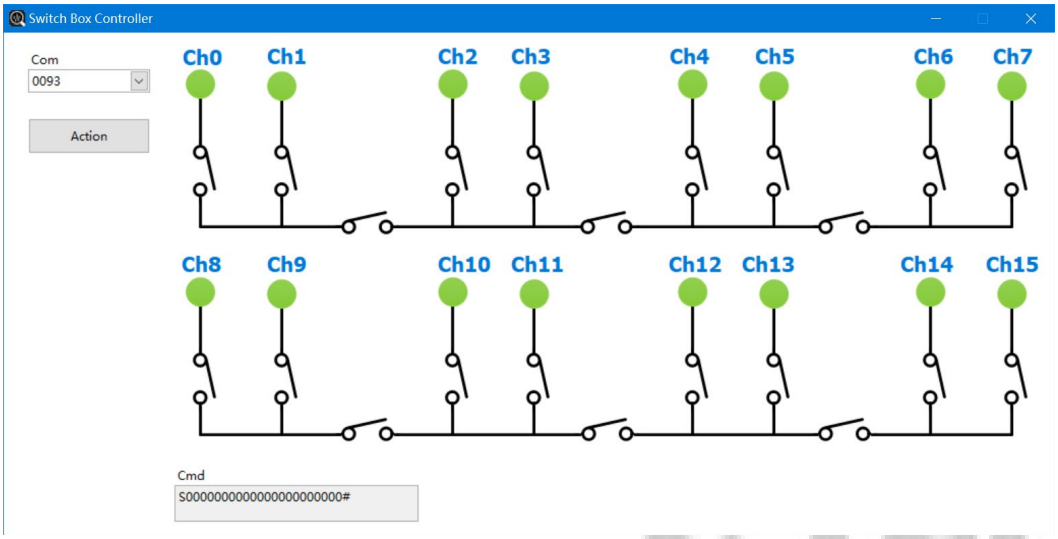


Figure 3.3 Switch Controller

Com：Need to configure it ahead of time in “Settings-Com Port Manager 错误!未找到引用源。”.

Cmd： Use 0 / 1 string to represent state of the switch.

This function is the driver for MegaSig 0093, 0093 is a Audio Switch, DUAL switch, 8x1. It provide a graphical configuration UI for this switch box.

3.4 Signal Generator

In the quick tools panel, click “Signal Generator”, entry into interface is shown in Figure 3.4.

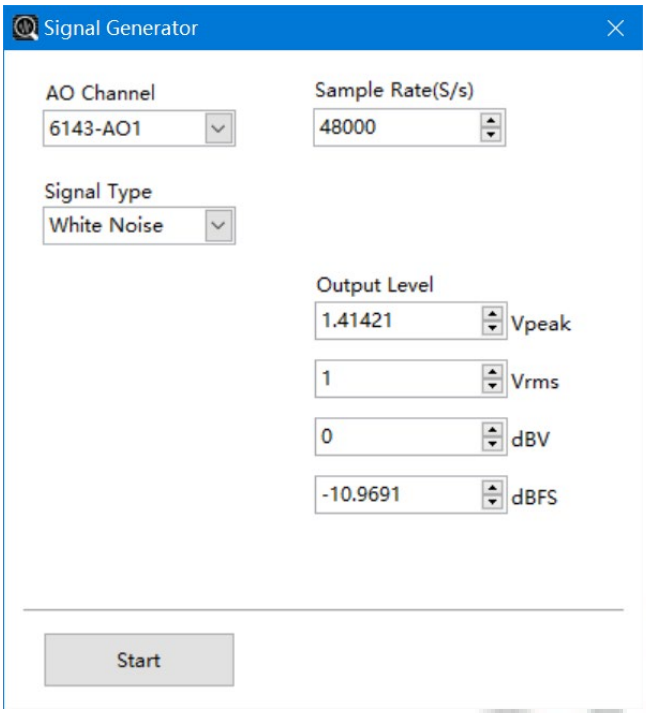


Figure 3.4 Signal Generator

AO Channel：Signal output, need to configure it ahead of time in “Settings – Channel Settings 2.1”.

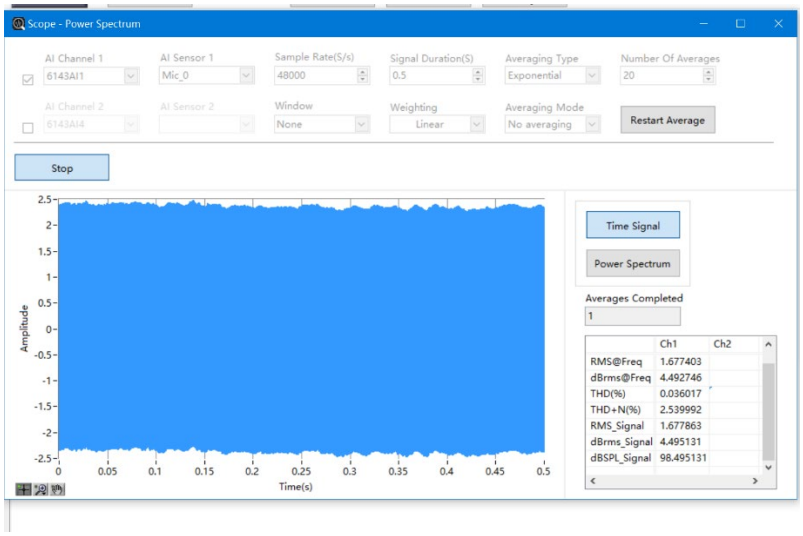
Signal Type：You can choose white noise, pink noise, sine wave or wav file.

Output Level：Four units, system can automatically convert units.

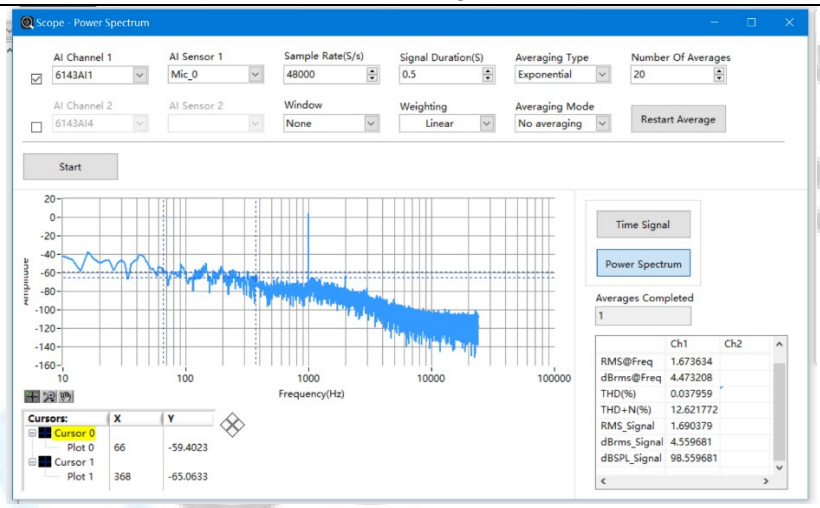
Stimulus Device：You can choose artificial mouth. Need to calibration it ahead of time in “Settings – Sensor Manager 2.2.2”.

3.5 Scope & power spectrum

In the quick tools panel, click “Scope & power spectrum”, entry into interface is shown in Figure 3.5.



a、Time signal



b、Power Spectrum

Figure 3.5 Scope & power spectrum

AI Channel：Input channel, need to configure it ahead of time in “Settings – Channel Settings 2.1”.

AI Sensor：AI sensor need to calibration in advance

Signal Duration(S)：Analyze length of the signal

Averaging Type：“Linear” or “Exponential”

Time Signal：Switch time waveform

power spectrum：Switch power spectrum

Averages Completed：“Averaging Mode” is “Vector”, “RMS” or “Peak hold” would be do multiple averaging.


：Operation button，The specific use as shown in Table 1 in 5.3.1.

3.6 ANC Filter Design Tool

In the quick tools panel, click “ANC Filter Design Tool”, entry into interface is shown in Figure 3.6.

Follow the connection diagram, choose the channel, setting stimulus signal. This tool is appropriate for ANC R&D, support test noise frequence response and phase, test PNC frequence response and phase, test ANC mic frequence response and phase, test headset speak frequence response and phase, calculate FB/FF filter curve, test ANC verification, test PCBA.

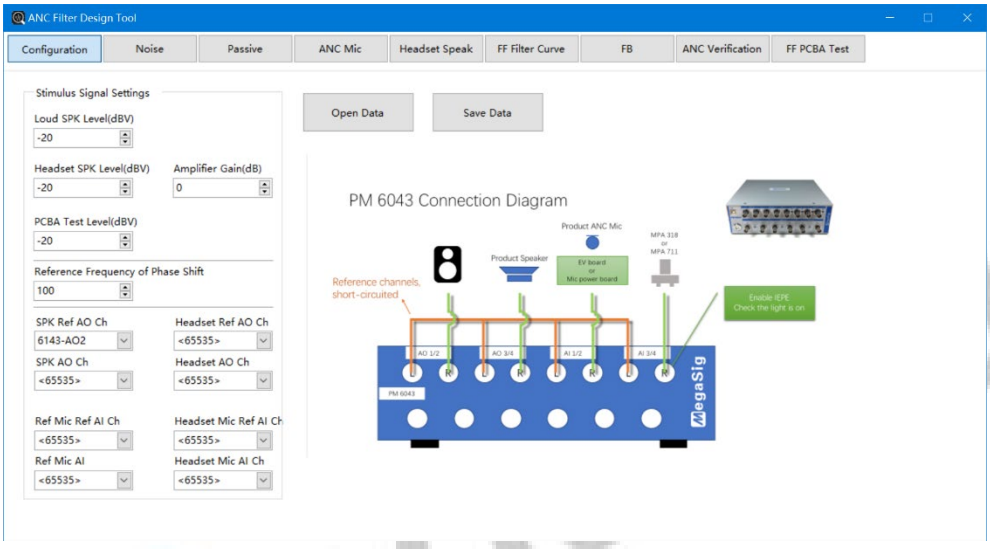


Figure 3.6 ANC Filter Design Tool

3.7 Serial Port Tools

In the quick tools panel, click “Serial Port Tools”, entry into interface is shown in Figure 3.7. This tool is often used for serial port debugging.

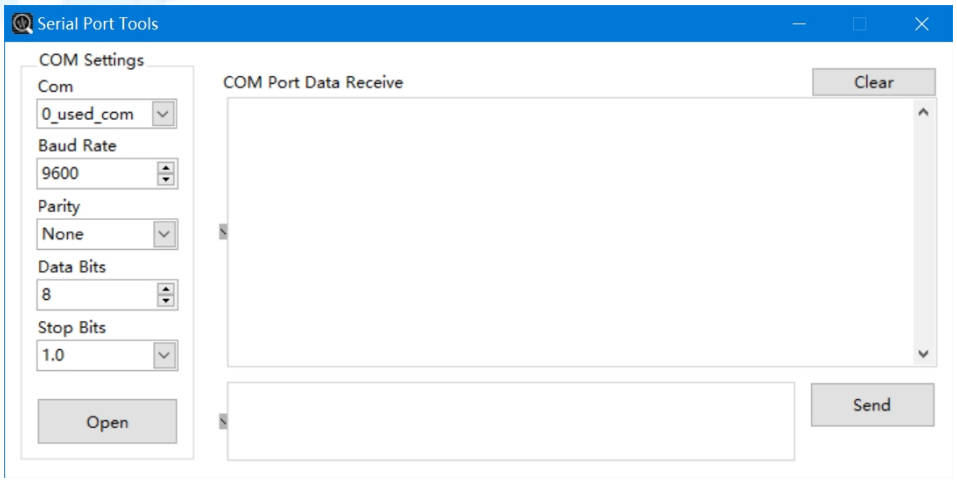


Figure 3.7 Serial Port Tools

3.8 Results Viewer

In the quick tools panel, click “Results Viewer”, entry into interface is shown in Figure 3.8. This tool is mainly used for mass production data view. Support CSV and Xlsx file from AudioExpert test data.

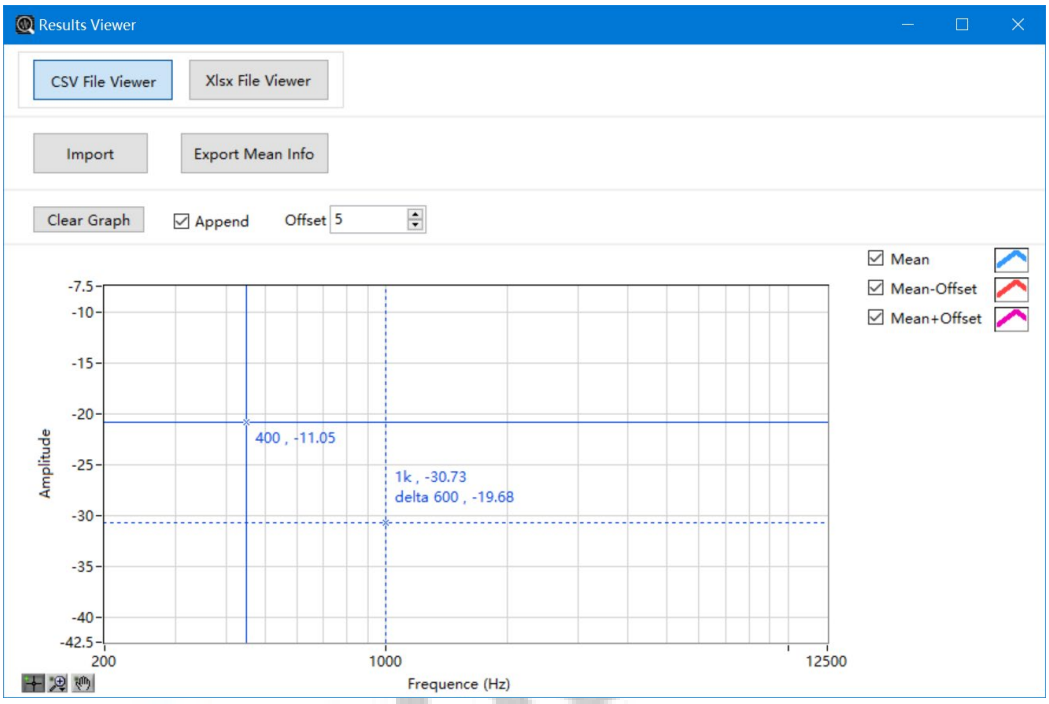


Figure 3.8 Results Viewer

3.9 Polar Pattern Test

In the quick tools panel, click “Polar Pattern Test”, entry into interface is shown in Figure 3.9. This tool works with TT625 turntable, mainly use for test ENC beanforming.

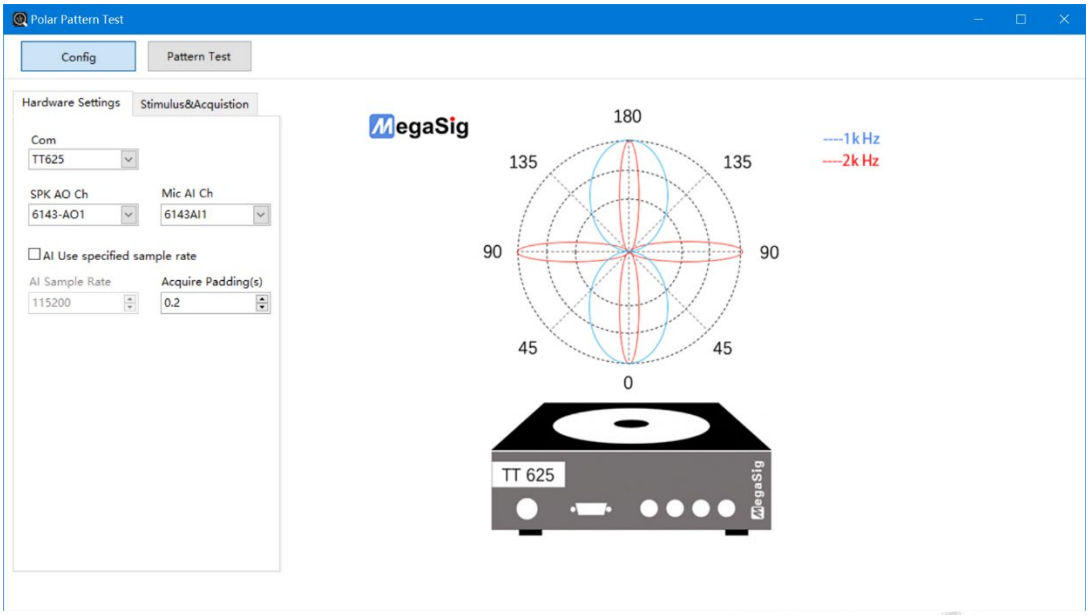


Figure 3.9 Polar Pattern Test

Need to config hardware and stimulus & acquisition before test.

Com：TT625 com. Need to configure it ahead of time in “Settings-Com Port Manager 2.3”.

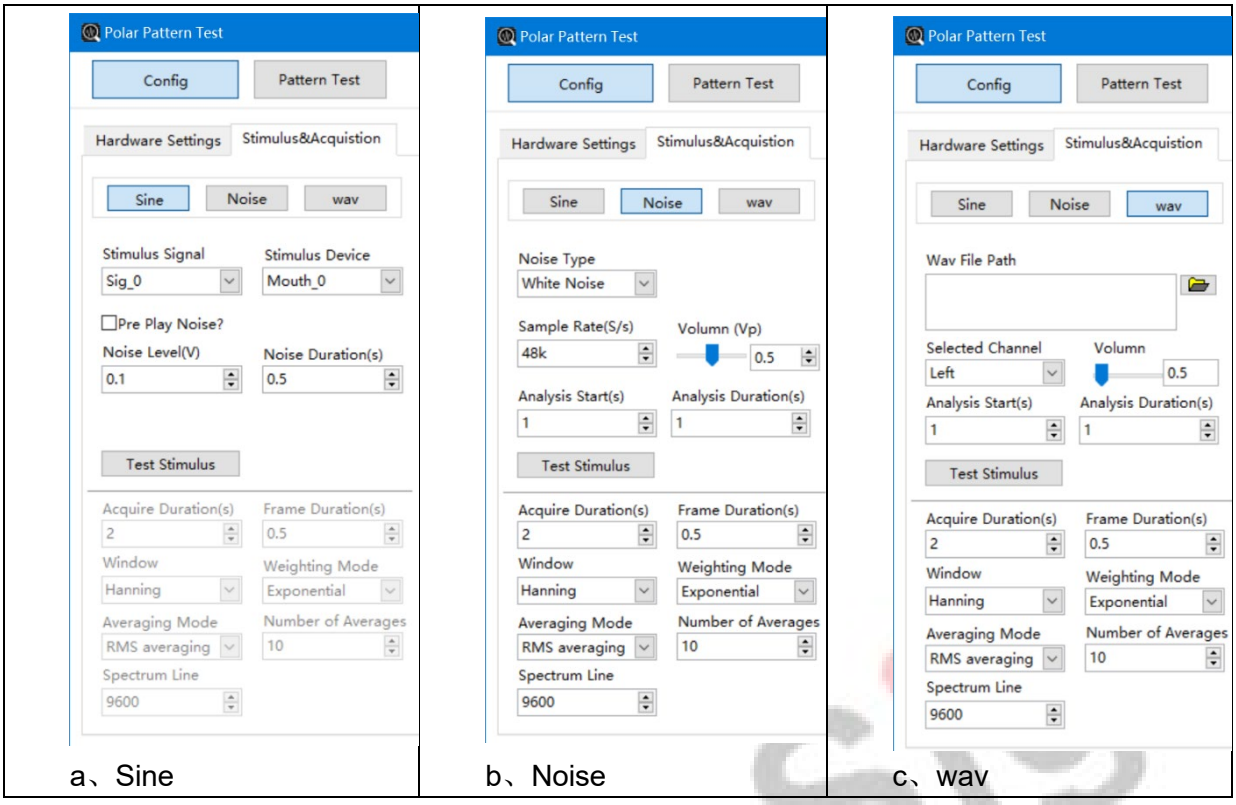
SPK AO Ch：Speaker channel. In ENC test, usually is artificial mouth or sound

Mic AI Ch：Mic channel. In ENC test, usually is earphone mic.

Acquire Padding(s)：At the end of AO play, AI will extend the acquire time.

3.9.1 Config Stimulus & Acquisition

Stimulus & Acquisition interface is shown in Figure 3.9.1. You can choose different stimulus signal to test polar pattern.



a、Sine　　b、Noise　　c、wav

Figure 3.9.1 Stimulus & Acquisition

3.9.2 Pattern Test

Pattern test is shown in Figure 3.9.2

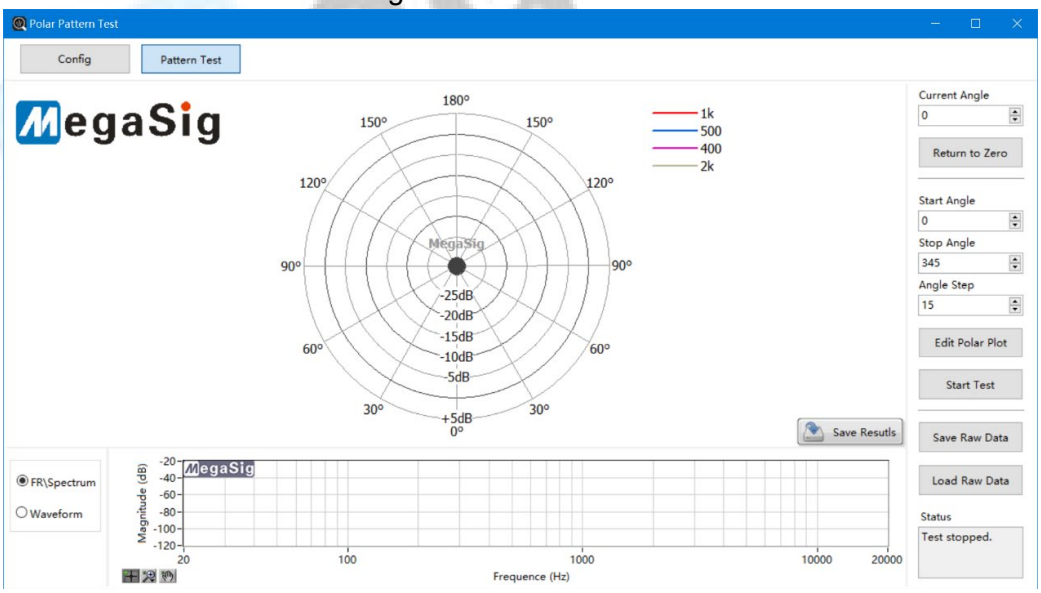


Figure 3.9.2 Pattern Test

Angle Step：Everytime test will offset angle

Edit Polar Plot：You can add, edit or delete frequency point. And choose different color to show.

4 Sequence

Sequence manager is one of the most powerful functions of AudioExpert, using sequence editor, user can easily define the sequence function.

In the main interface, click “Sequence”, entry into interface is shown inFigure 4.0. It can be divided into three parts: sequence portfolio, sequence auxiliary button and sequence edit. Choose test sequence from sequence portfolio, add to sequence edit area, you can freely combine test items.

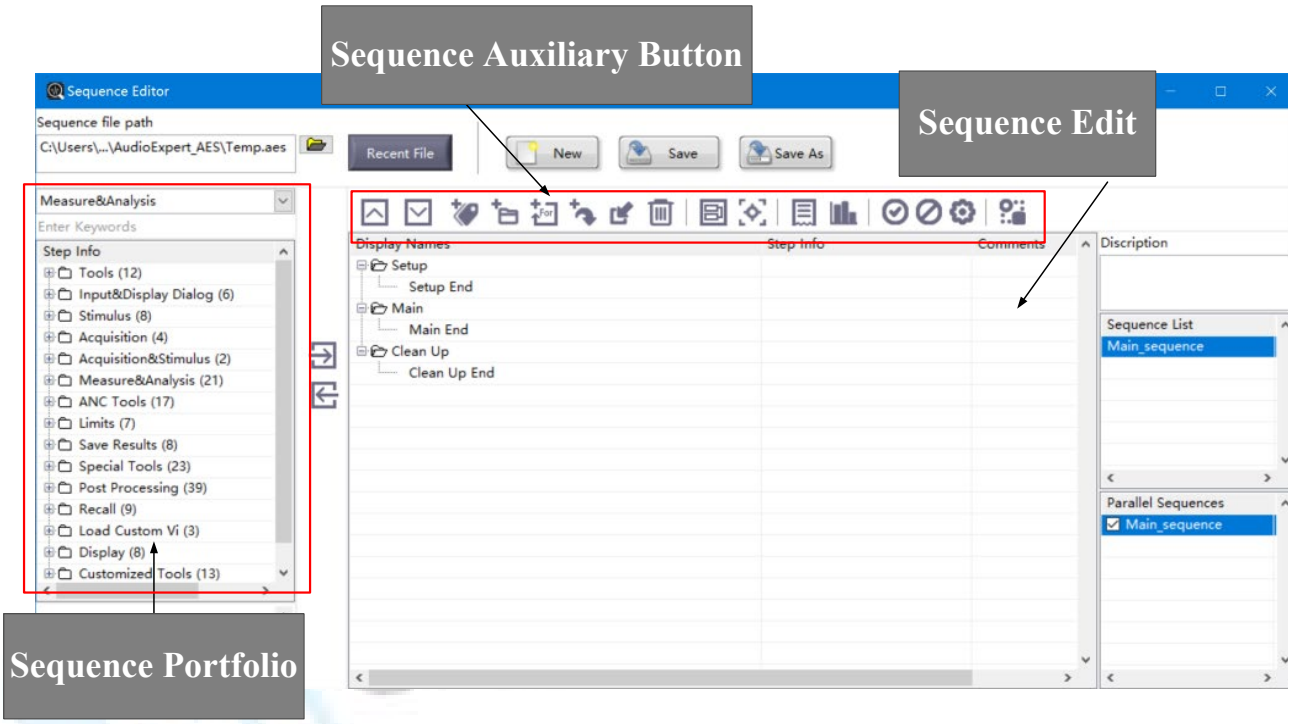


Figure 4.0 Sequence Editor

In the sequence portfolio, have 13 categories: Tools、Input & Display Dialog、Stimulus、Acquisition、Acquisition & Stimulus、Measure & Analysis、Limits、Save Results、Special Tools、Post Processing、Recall、Display、Customized Tools

→ ： Choose step from sequence portfolio, add to sequence edit area

← ： Delete step from sequence edit area

∧ ： Move up step from sequence edit area

∨ ： Move down step from sequence edit area

 ： Other sequence auxiliary button will be described in 4.3

4.1 Sequence Edit

Right click step, popout interface is shown in Figure 4.1.

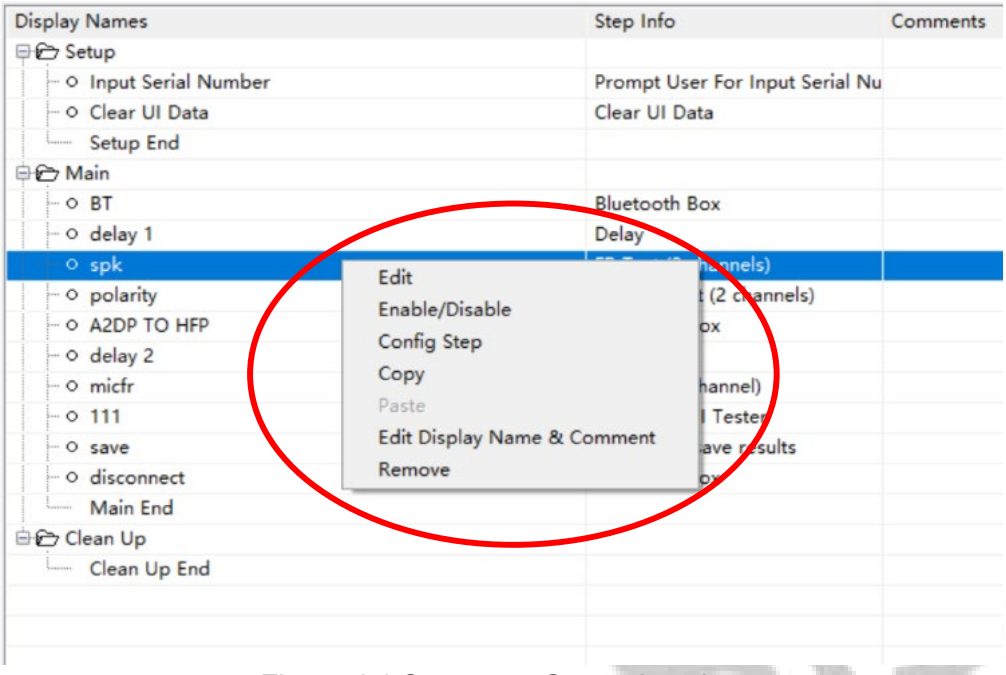
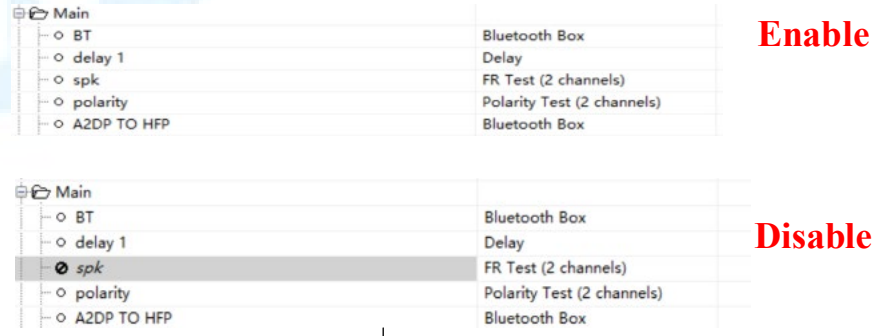


Figure 4.1 Sequence General setting

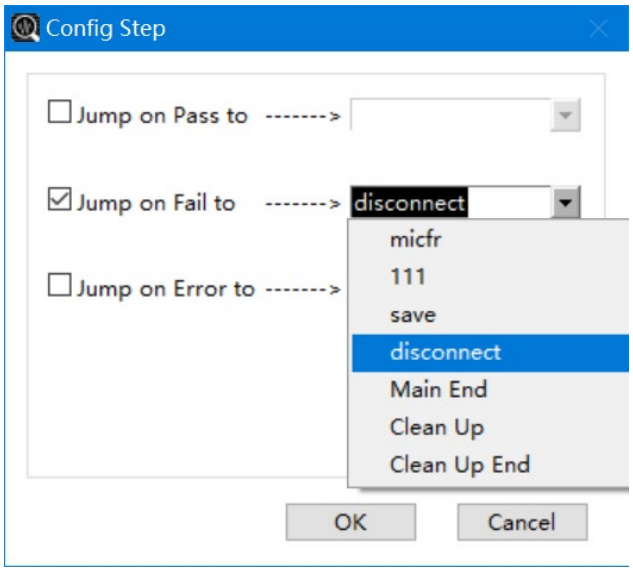
Edit：config detailed parameter of this step. (Double click this step is same function)

Enable/Disable：enable and disable status is shown inFigure 4.1.1a

Config Step：this function can be jump to specified step. Detailed interface is shown in Figure 4.1.1b



a、 Step Enable/Disable



b、 Jump step

Figure 4.1.1 4.1 Sequence Edit

4.2 Sequence Portfolio

4.2.1 Tools instructions

Tools include such steps shown inFigure 4.2.1

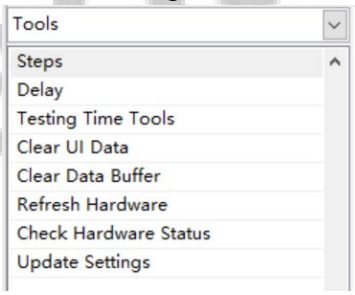
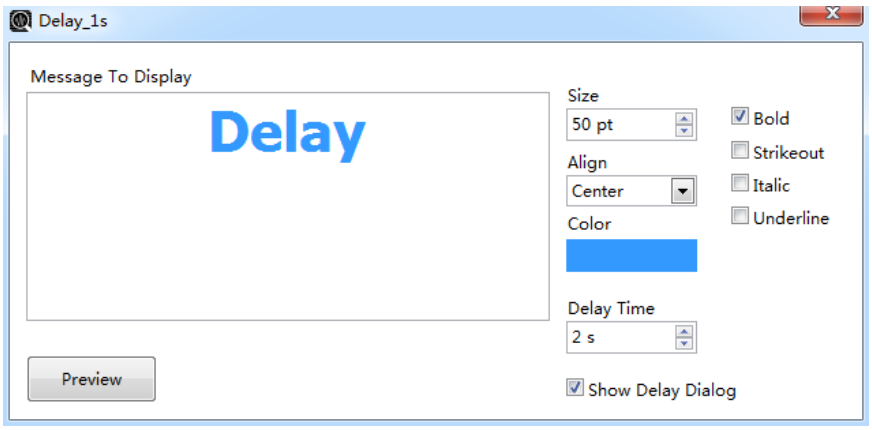


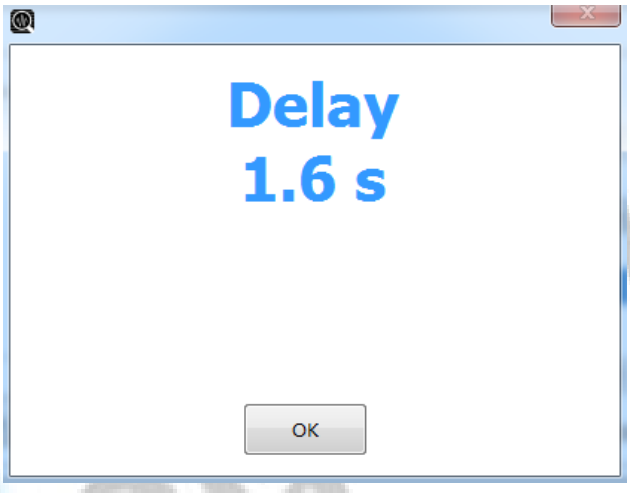
Figure 4.2.1 Tools

4.2.1.1 Delay

Insert delay step, can be setting delay time and message display. Pay attention, show the message display need to check “Show Delay Dialog”.



a. Setting interface



b. Show interface

Figure 4.2.1.1 Delay interface

4.2.1.2 Testing Time Tools

Insert “Testing Time Tools” step, have reset, pause and continue function, can be count test time of a certain test.

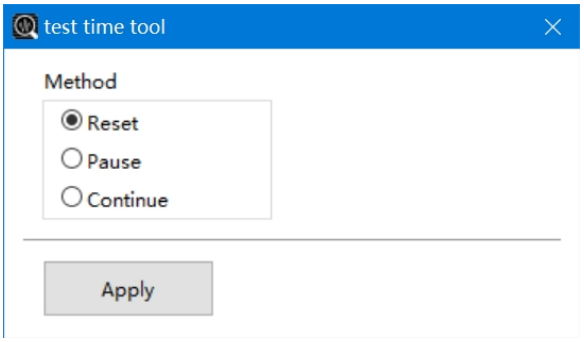


Figure 4.2.1.2 Testing Time Tools interface

4.2.1.3 Clear UI Data

Insert “Clear UI Data” step, double click step will show interface in Figure 4.2.1.3

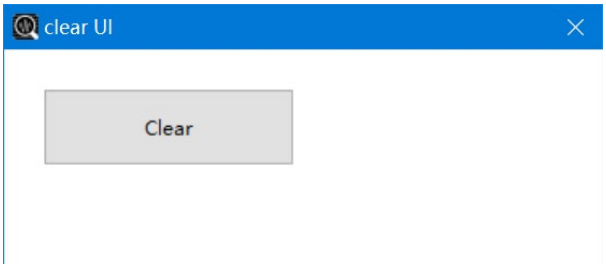


Figure 4.2.1.3 Clear UI Data

4.2.1.4 Clear Data Buffer

This step is similar to 4.2.1.3 Clear UI Data.

4.2.1.5 Refresh Hardware

Insert “Refresh Hardware” step, double click step will show interface in Figure 4.2.1.5. Check the hardware driver to refresh.

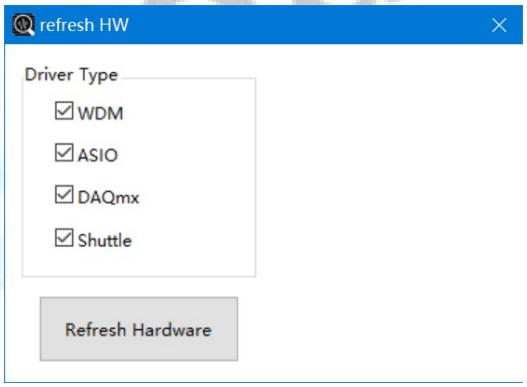
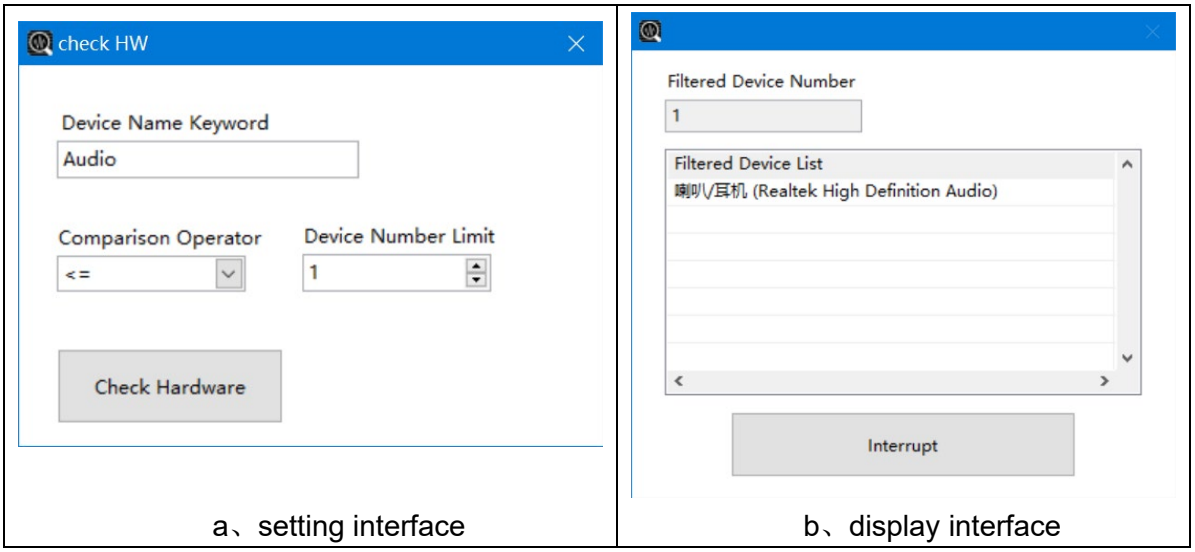


Figure 4.2.1.5 Refresh Hardware

4.2.1.6 Check Hardware Status

Insert “Check Hardware Status” step, double click step can enter setting interface. This step is use to check devices status and if the number of connected devices meets the require.



a、setting interface　　b、display interface

Figure 4.2.1.6 Check Hardware Status

4.2.1.7 Update Settings

Insert “Update Settings” step, double click step will show interface in Figure 4.2.1.7

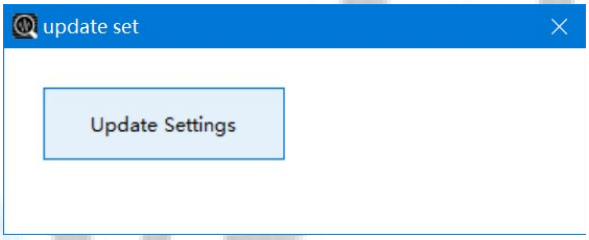


Figure 4.2.1.7 Update Settings interface

4.2.2 Input & Display Dialog instructions

Input & Display Dialog include such steps shown in Figure 4.2.2

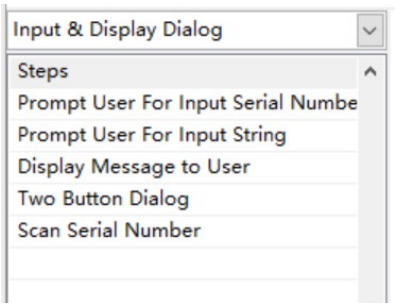
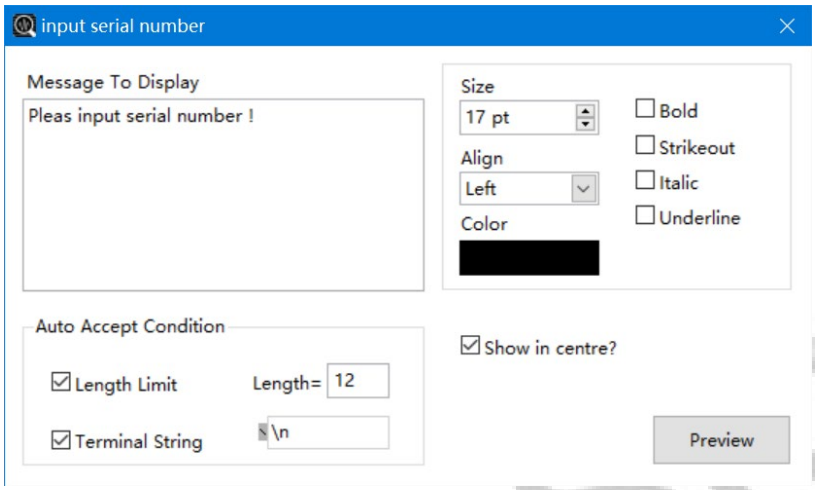


Figure 4.2.2 Input & Display Dialog

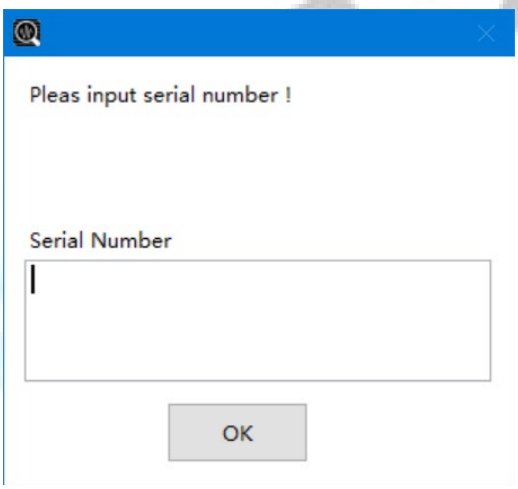
4.2.2.1 Prompt User For Input Serial Number

Insert “Prompt User For Input Serial Number” step, double click step will show interface in Figure 4.2.2.1a.

You can input custom message to display, and check limit condition to make this step auto run.



a. Setting interface



b. Display interface

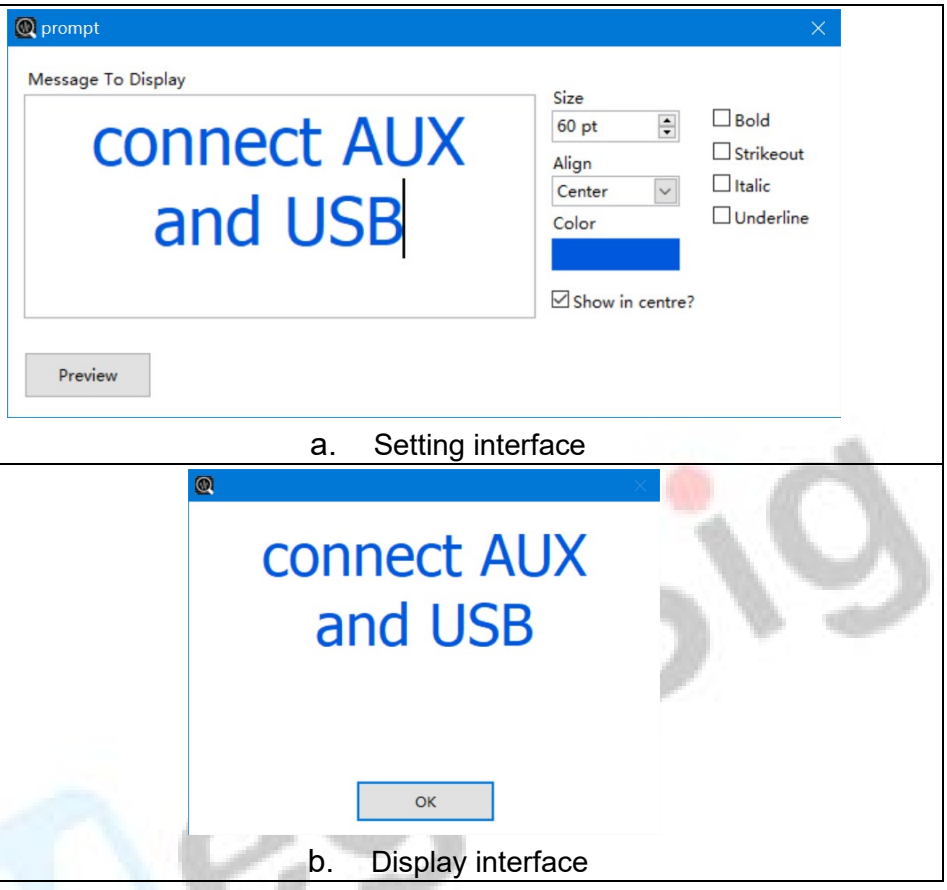
Figure 4.2.2.1 Prompt User For Input Serial Number

4.2.2.2 Prompt user for input sting

The “Prompt user for input sting” step is similar to 4.2.2.1 Prompt User For Input Serial Number.

4.2.2.3 Display Message to User

Insert “Display Message to User” step, double click step will show interface in Figure 4.2.2.3a



a. Setting interface

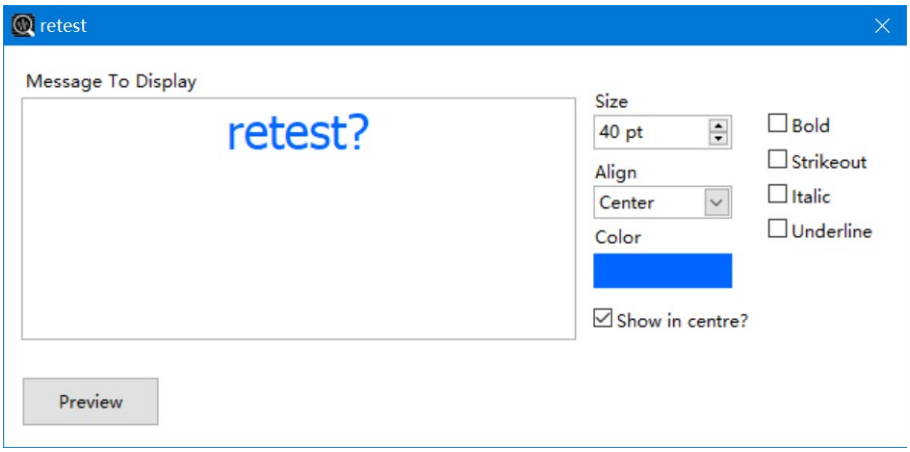
b. Display interface

Figure 4.2.2.3 Display Message to User

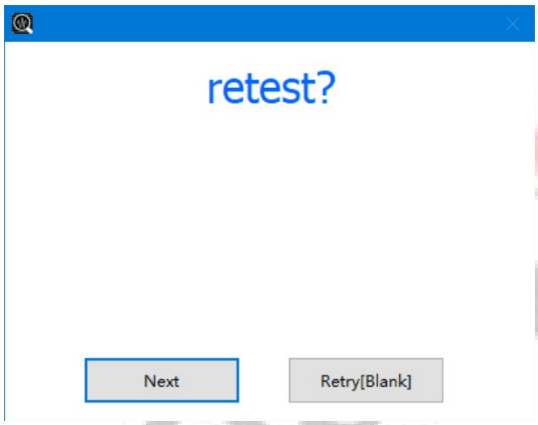
4.2.2.4 Two Button Dialog

Insert “Two Button Dialog” step, double click step will show interface in Figure 4.2.2.4 a

In the display interface, click “Next” button, enter the next test step; click “Retry” button, software judge this step is fail, use “Config Step” jump function in 4.1 described, can be jump to specified step and then retest this step.



a、Setting interface

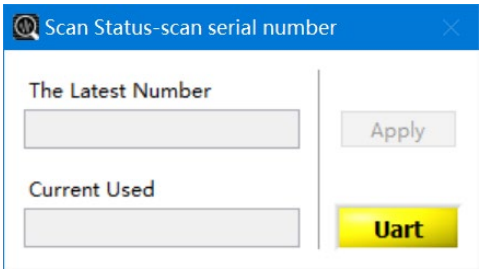


b、display interface

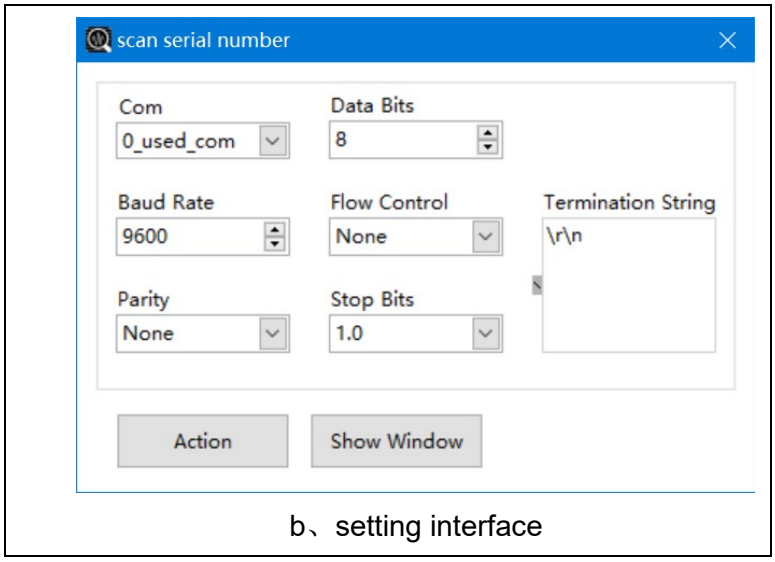
Figure 4.2.2.4 Two Button Dialog

4.2.2.5 Scan Serial Number

Insert “Scan Serial Number” step, popout display interface show in Figure 4.2.2.5a. Double click step, enter setting interface show in Figure 4.2.2.5b.



a、display interface



b、setting interface

Figure 4.2.2.5 Scan Serial Number

4.2.3 Stimulus instructions

Stimulus include such steps shown in Figure 4.2.3

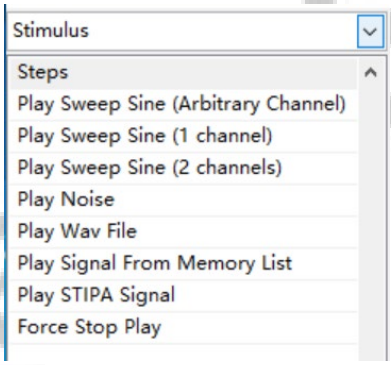


Figure 4.2.3 Stimulus

4.2.3.1 Play Sweep Sine (Arbitrary Channel)

Insert “Play Sweep Sine (Arbitrary Channel)” step, double click step will show interface in Figure 4.2.3.1

This step can use arbitrary channel to play sweep sine. Channel need to configure it ahead of time in “Settings – Channel Settings 2.1”. Stimulus signal need to configure it ahead of time in “Settings – Stimulus Signal 2.4”.

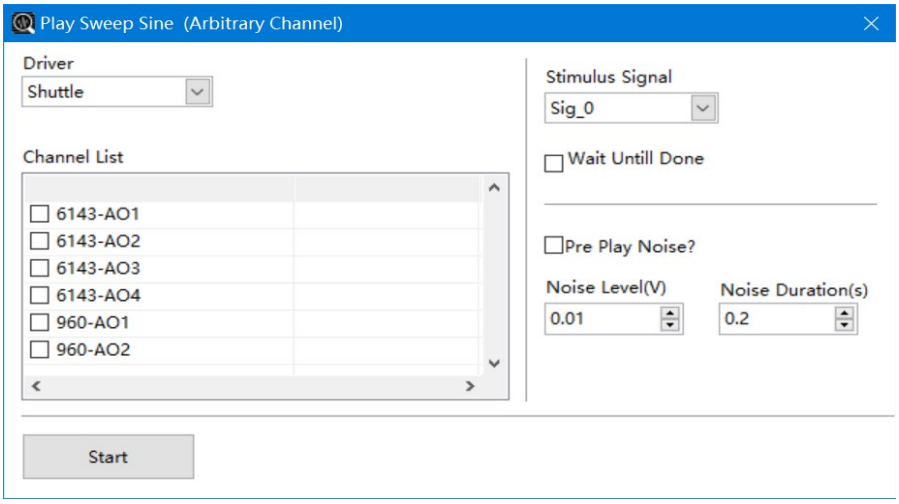


Figure 4.2.3.1 Play Sweep Sine (Arbitrary Channel)

4.2.3.2 Play Sweep Sine (1 channel)

Insert “Play Sweep Sine (1 Channel)” step, double click step will show interface in Figure 4.2.3.2. This step only used one channel to play sweep sine.

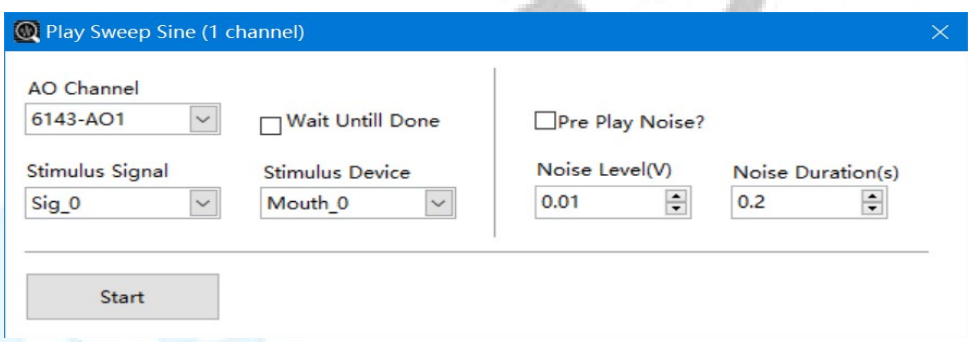


Figure 4.2.3.2 Play Sweep Sine (1 Channel)

4.2.3.3 Play Sweep Sine (2 channels)

Insert “Play Sweep Sine (2 Channel)” step can used two channels to play sweep sine.

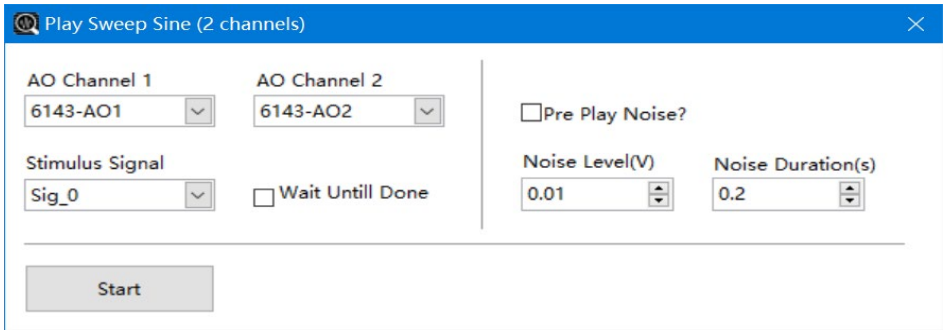


Figure 4.2.3.3 Play Sweep Sine (2 Channel)

4.2.3.4 Play Noise

Insert “Play Noise” step, double click step will show interface in Figure 4.2.3.4. This step use to play noise. Noise type have white noise and pink noise.

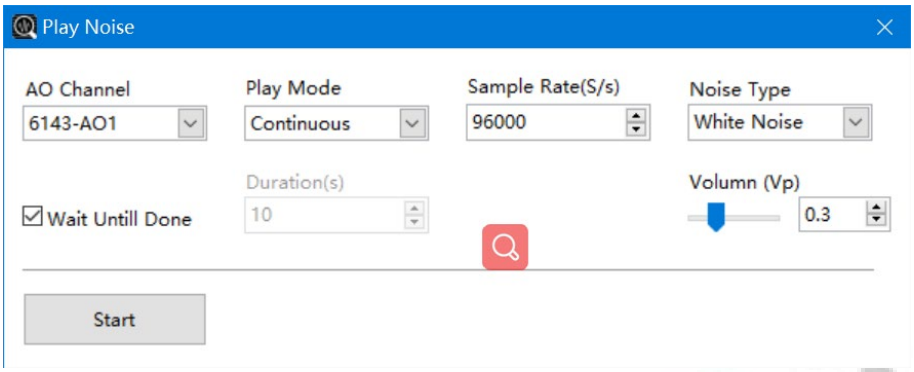


Figure 4.2.3.4 Play Noise

4.2.3.5 Play Wav File

Insert “Play Wav File” step, double click step will show interface in Figure 4.2.3.5. Channel select based on the Wav file.

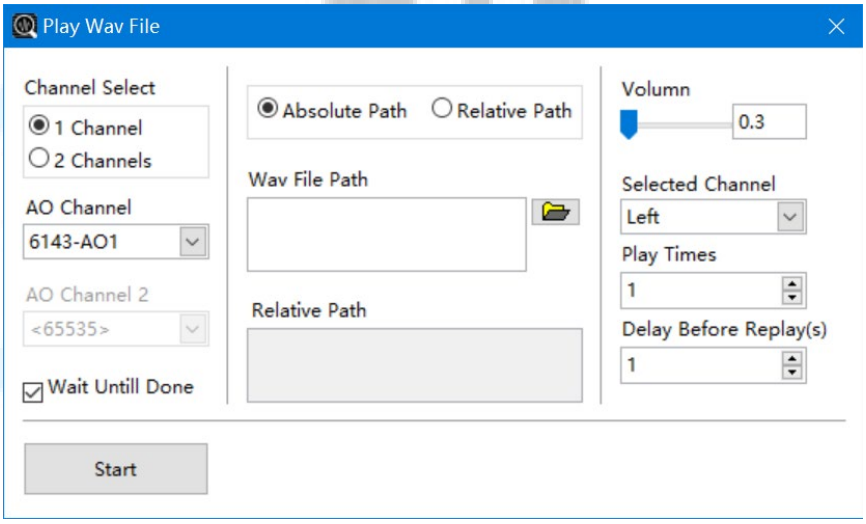


Figure 4.2.3.5 Play Wav File

4.2.3.6 Play Signal From Memory List

Insert “Play Signal From Memory List” step, double click step will show interface in Figure 4.2.3.6

This step can play waveform signal from memory list. In the sequence, all the results of the test step are stored in the memory list.

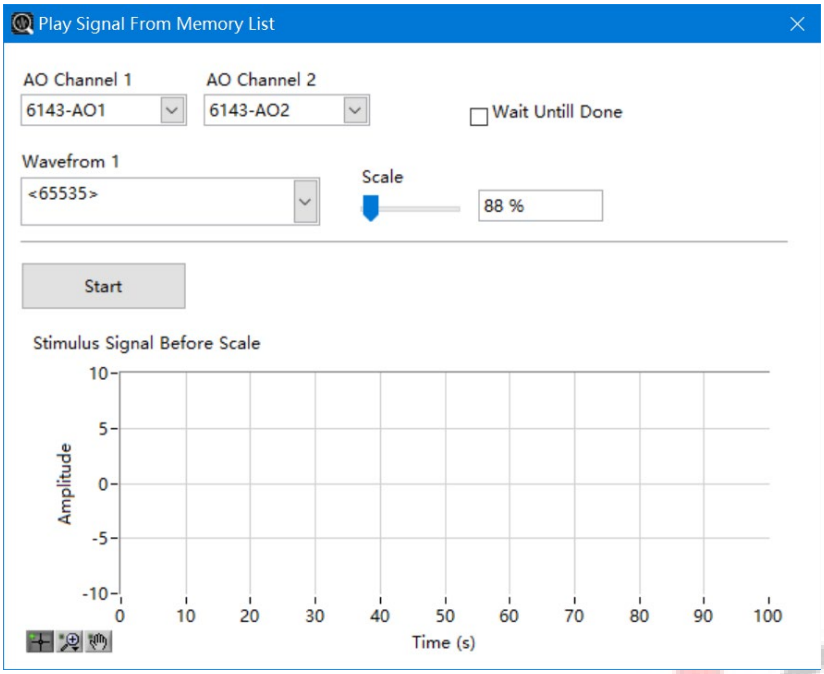


Figure 4.2.3.6 Play Signal From Memory List

4.2.3.7 Play STIPA Signal

This step can play STIPA signal, after insert show interface in Figure 4.2.3.7

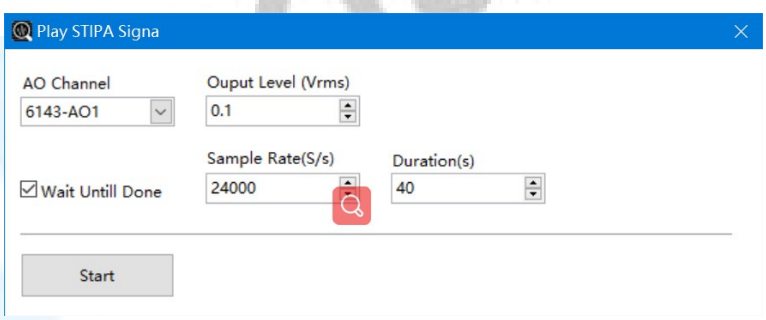


Figure 4.2.3.7 Play STIPA Signal

4.2.3.8 Force Stop Play

Insert “Force Stop Play” step, double click step will show interface in Figure 4.2.3.8. This step use with previous play stimulus signal.

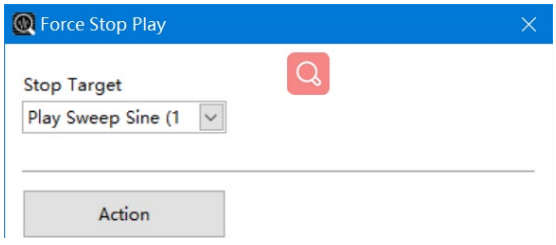


Figure 4.2.3.8 Force Stop Play

4.2.4 Acquisition instructions

Acquisition include such steps shown in figure 4.2.4

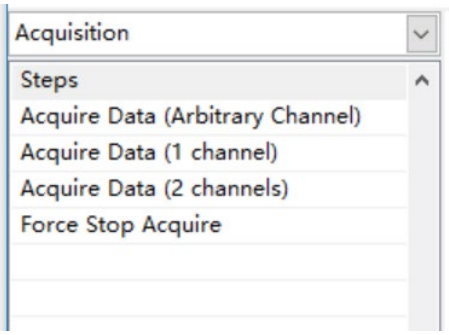


Figure 4.2.4 Acquisition

4.2.4.1 Acquire Data (Arbitrary Channel)

Insert “Acquire Data (Arbitrary Channel)” step, double click step will show interface in Figure 4.2.4.4

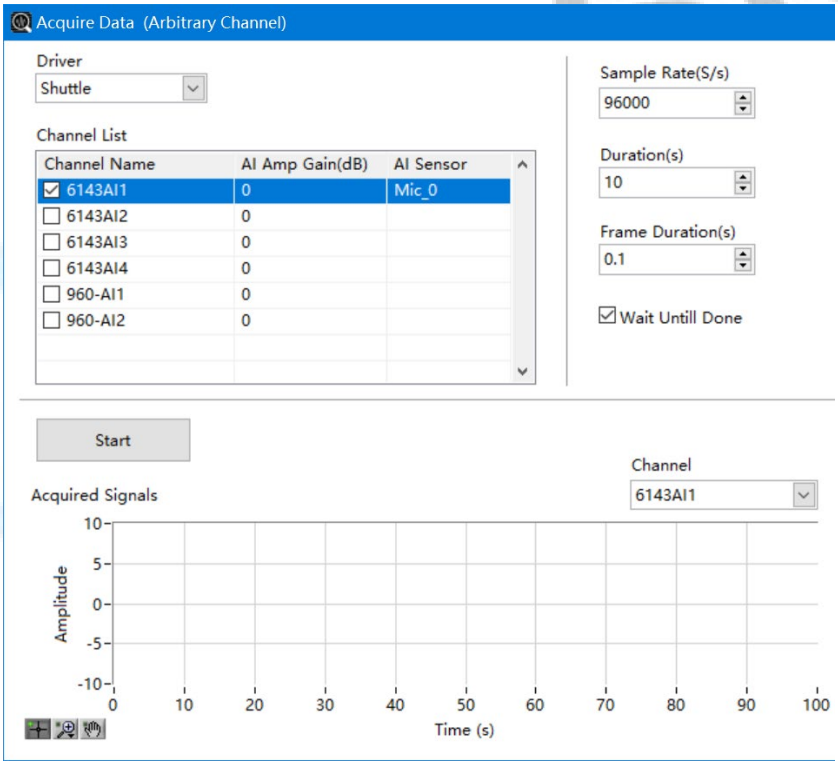


Figure 4.2.4.1 Acquire Data (Arbitrary Channel)

Channel List：Channel need to configure it ahead of time in “Settings – Channel Settings 2.1”

AI Sensor：Need to configure it ahead of time in “Settings – Sensors Manager 2.2.1”

Duration(s)：acquire time

Frame Duration(s)：analysis precision

4.2.4.2 Acquire Data (1 channel)

Insert “Acquire Data (1 Channel)” step, double click step will show interface in Figure 4.2.4.2 .

This step only use 1 channel to acquire, the detail is similar to 4.2.4.1Acquire Data (Arbitrary Channel).

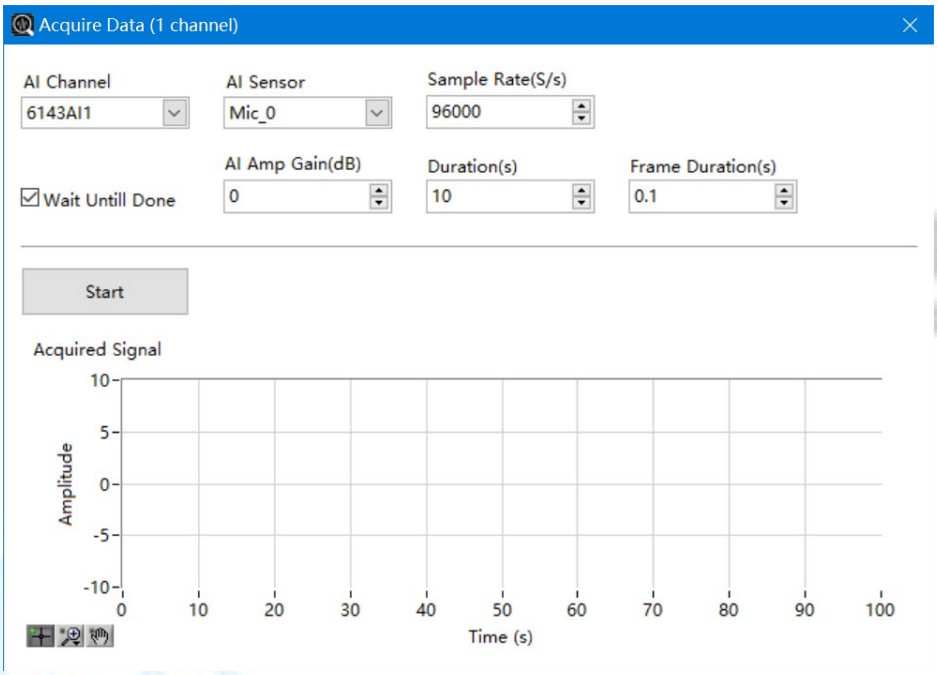


Figure 4.2.4.2 Acquire Data (1 Channel)

4.2.4.3 Acquire Data (2 channels)

This step have 2 channels to acquire, the detail is similar to 4.2.4.1Acquire Data (Arbitrary Channel).

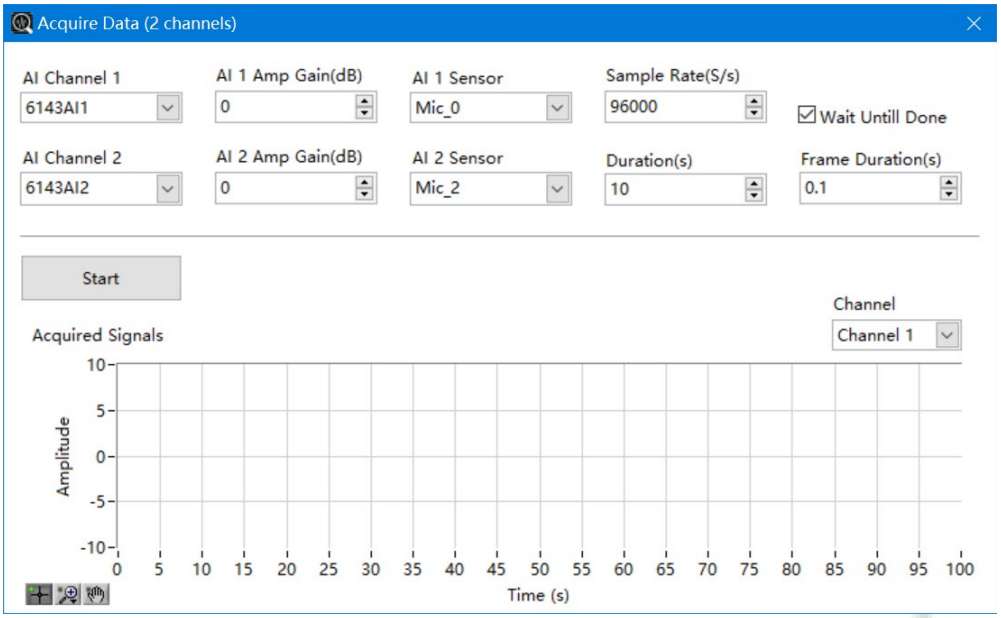


Figure 4.2.4.3 Acquire Data (2 Channel)

4.2.4.4 Force Stop Acquire

Insert “Force Stop Play” step, double click step will show interface in figure 4.2.4.4. This step use with previous acquisition step.

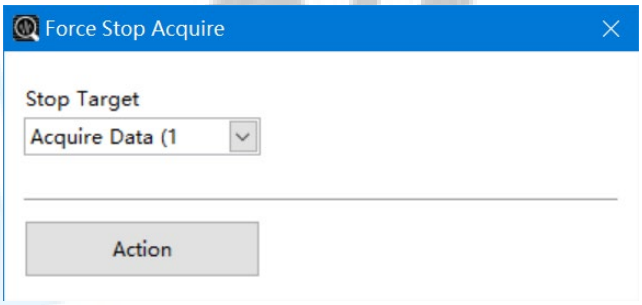


Figure 4.2.4.4 Force Stop Acquire

4.2.5 Acquisition & Stimulus instructions

Acquisition & Stimulus include such steps shown in Figure 4.2.5

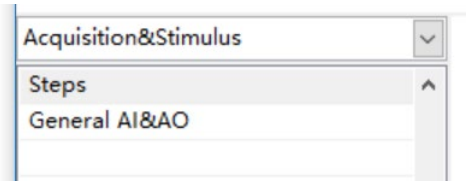
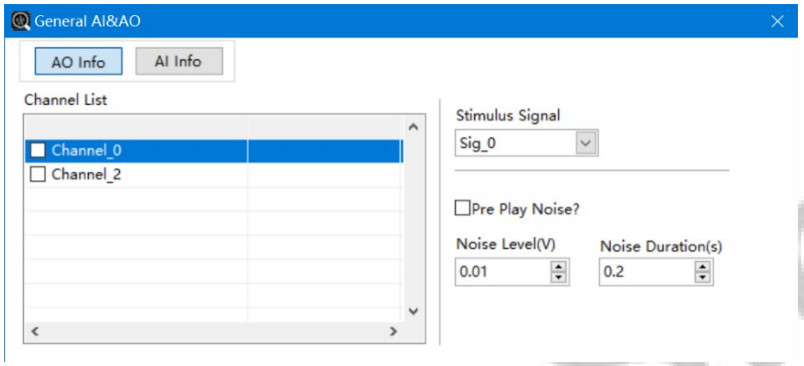


Figure 4.2.5 Acquisition & Stimulus

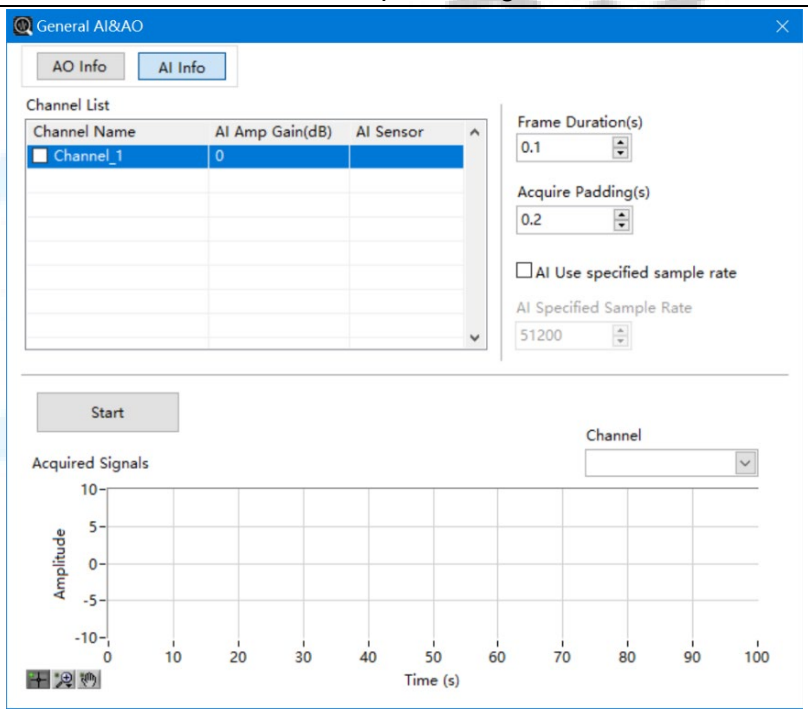
4.2.5.1 General AI&AO

Insert “General AI&AO” step, double click step will show interface in figure 4.2.5.1

Channel need to configure it ahead of time in “Settings – Channel Settings 2.1”. Stimulus signal need to configure it ahead of time in “Settings – Stimulus Signal 2.4”. AI Sensor need to configure it ahead of time in “Settings – Sensors Manager 2.2.1”



a、output setting



b、input setting

Figure 4.2.5.1 General AI&AO

Frame Duration(s)：analysis precision

Acquire Padding(s)：At the end of output, input will be extended collection time.

4.2.6 Measure & Analysis instructions

Measure & Analysis include such steps shown in Figure 4.2.6

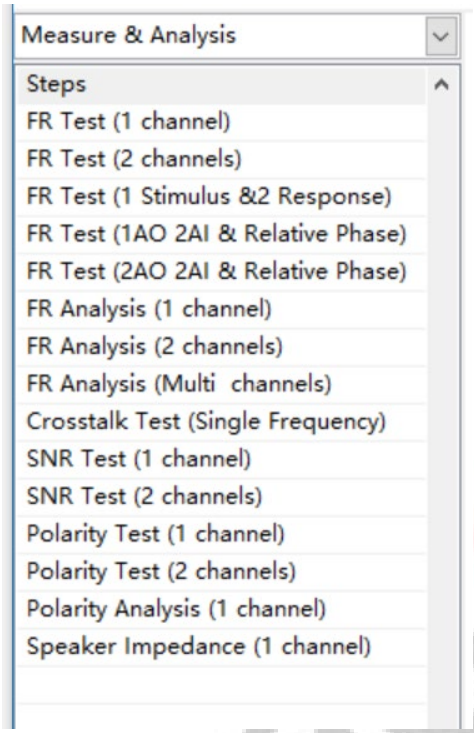
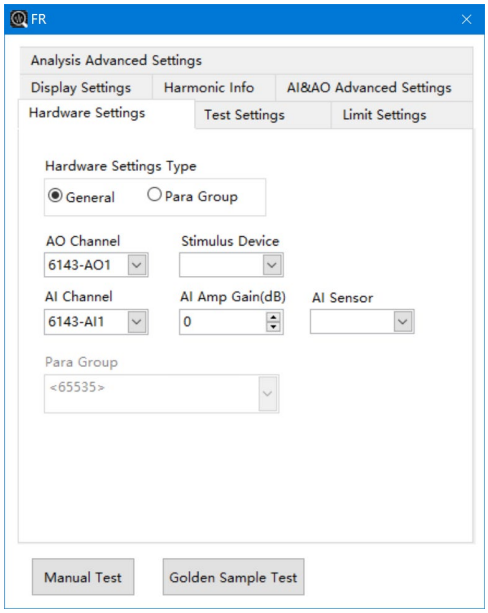


Figure 4.2.6 Measure & Analysis

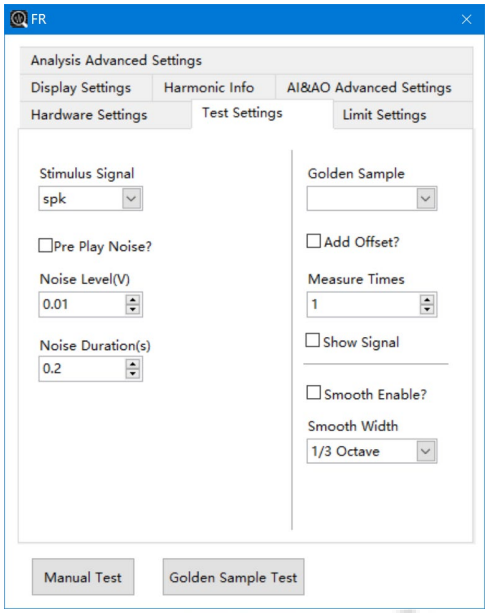
4.2.6.1 FR Test（1 channel）

Insert “FR Test（1 channel）” step, double click step will show interface in Figure 4.2.6.1

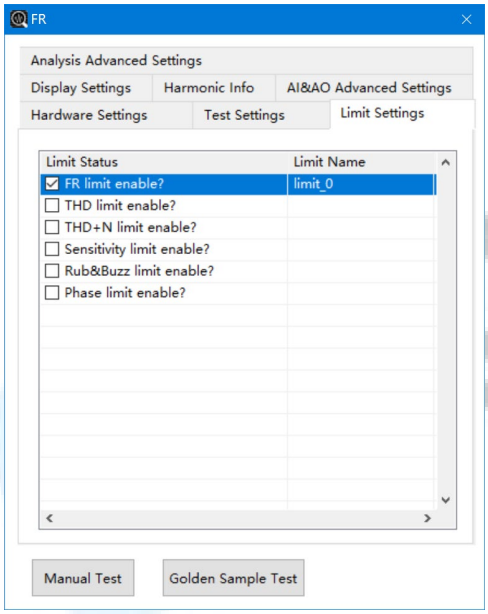
This step can test single channel frequency response, parameters setting have four parts: test setting, limit setting, display setting and harmonic info.



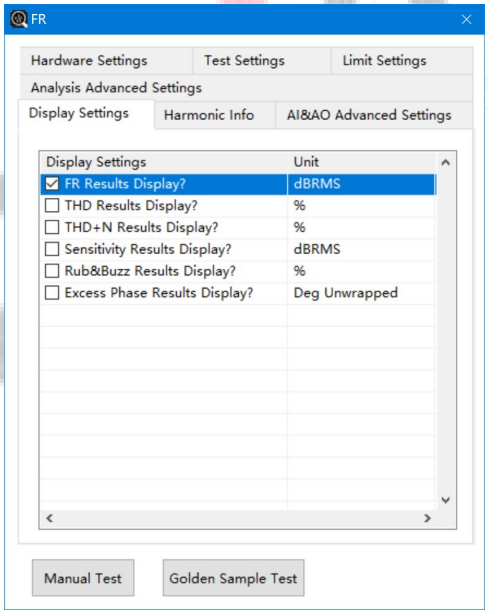
a. Hardware Setting



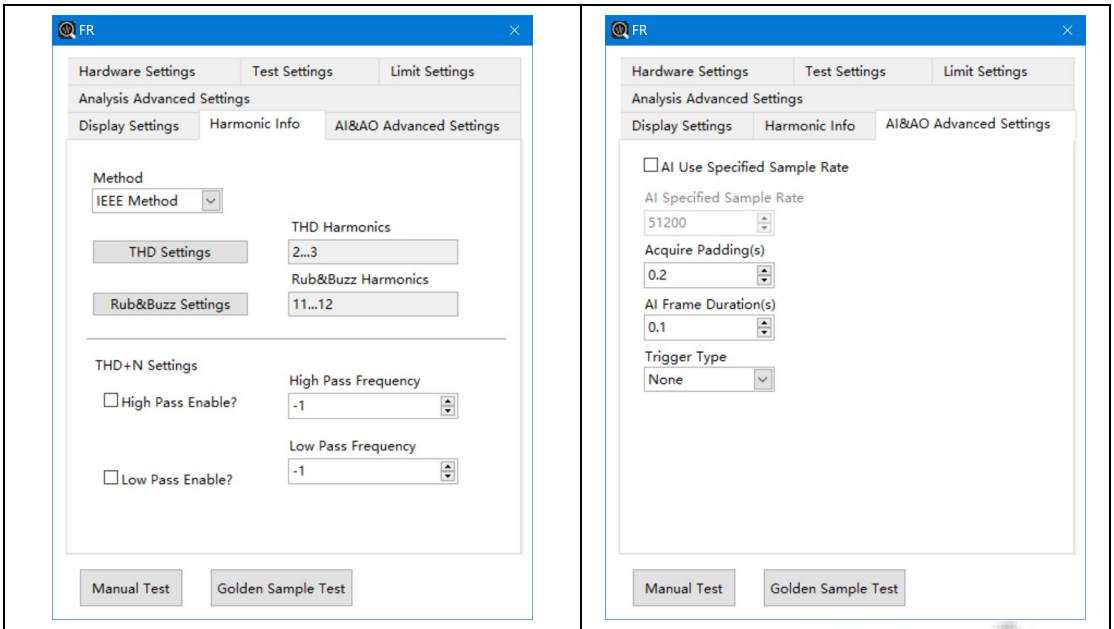
b. Test Setting



c. Limit Setting



d. Display Setting



e. Harmonic Info　　d、AI&AO Advanced Settings

Figure 4.2.6.1 FR Test（1 channel）

Hardware Setting

AO Channel：Channel need to configure it ahead of time in “Settings – Channel Settings 2.1”

Stimulus Device：If you leave it empty, the signal generated will not be apply EQ.

AI Channel：Channel need to configure it ahead of time in “Settings – Channel Settings 2.1”

AI Sensor：If you leave it empty, the valid value is dBrms, if your channels have been calibrated, then dBrms=dBV; If you want to measure dBSPL, then make sure you finish the calibration of channels, and select the right sensor sensitivity under “AI Sensor”.

Test Setting

Stimulus Signal：need to configure it ahead of time in “Settings – Stimulus Signal 2.4”.

Golden Sample: need to configure it ahead of time in “Settings – Golden Sample 2.6”. The software will auto add compensation after the Golden Sample is check.

Limit Setting

Limit Status：Tick which items you want to control;

Limit Name：□ Double click the “Limit Name” column, you can choose which limit to apply. Limit need to configure it ahead of time in “Settings –Limit Setting 2.5”

Display Setting

Display Settings：Select which data to view, the item ticked will be displayed at data viewer.

Unit： You can change the unit by double-click the Unit column.

AI&AO Advanced Settings

Acquire Padding(s)：At the end of AO play, AI will extend the acquire time.

4.2.6.2 FR Test（2 channels）

Insert “FR Test（2 channel）” step, this step can test double channel frequency response. The detail is similar to single channel (4.2.6.1)

4.2.6.3 FR Test (1 Stimulus & 2 Response)

This step has one output channel and two input channels, other detail is similar to single channel (4.2.6.1)

4.2.6.4 FR Test (1AO 2AI & Relative Phase)

This step can test relative, other detail is similar to single channel (4.2.6.1)

4.2.6.5 FR Test (2AO 2AI & Relative Phase)

This step detail is similar to single channel (4.2.6.1)

4.2.6.6 FR Analysis (1 channels)

Insert “FR Analysis（1 channel）” step, double click step will show interface in Figure 4.2.6.6.

This step can analysis single channel frequency response, parameters setting have four parts: test setting, limit setting, display setting and harmonic info.

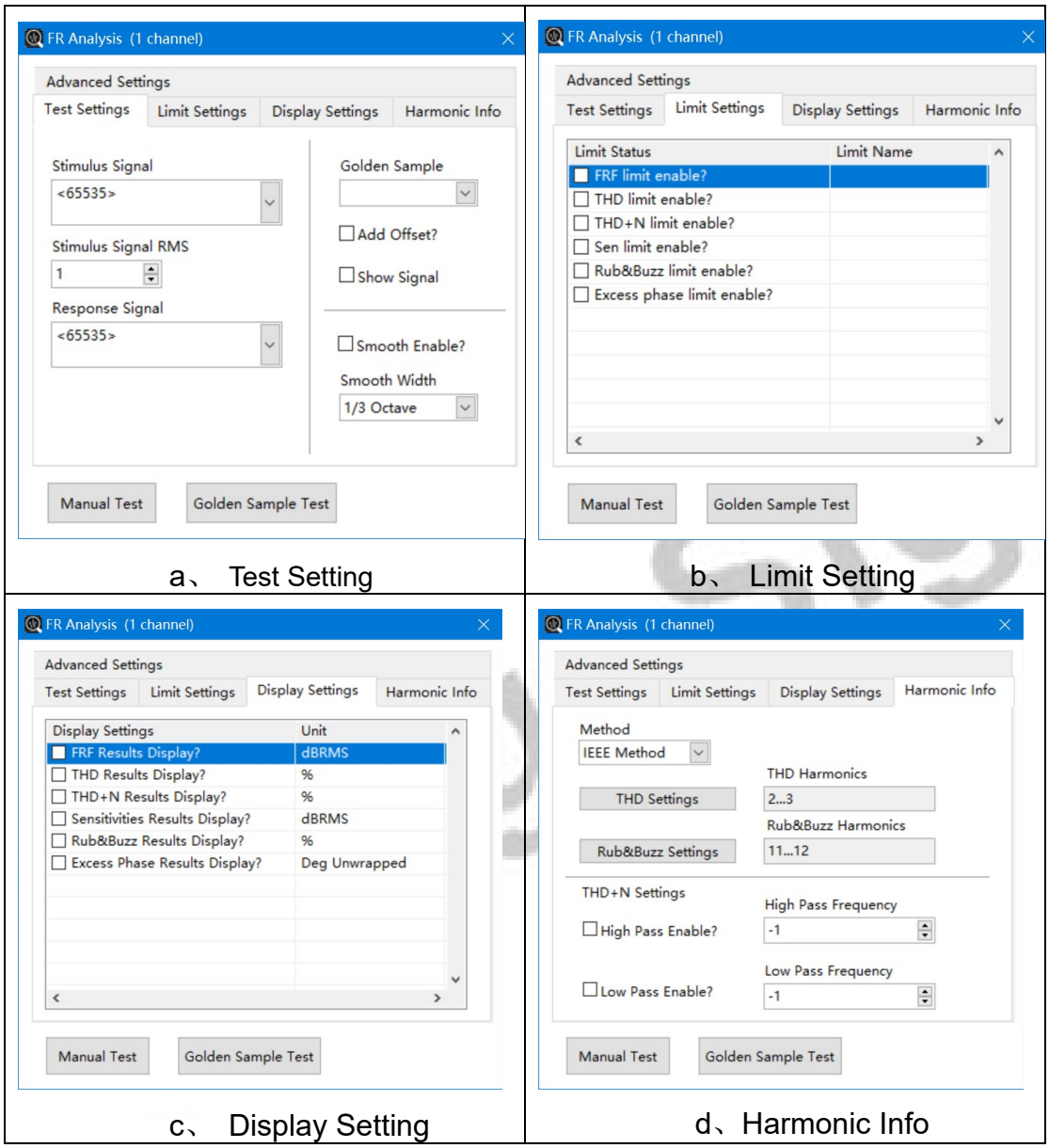


Figure 4.2.6.6 FR Analysis（1 channel）

Test Setting

Stimulus Signal：the stimulus signal to correspond to the analysis signal.

Response Signal：the analysis target time domain data comes from the pre-step, such as “Acquisition” step.

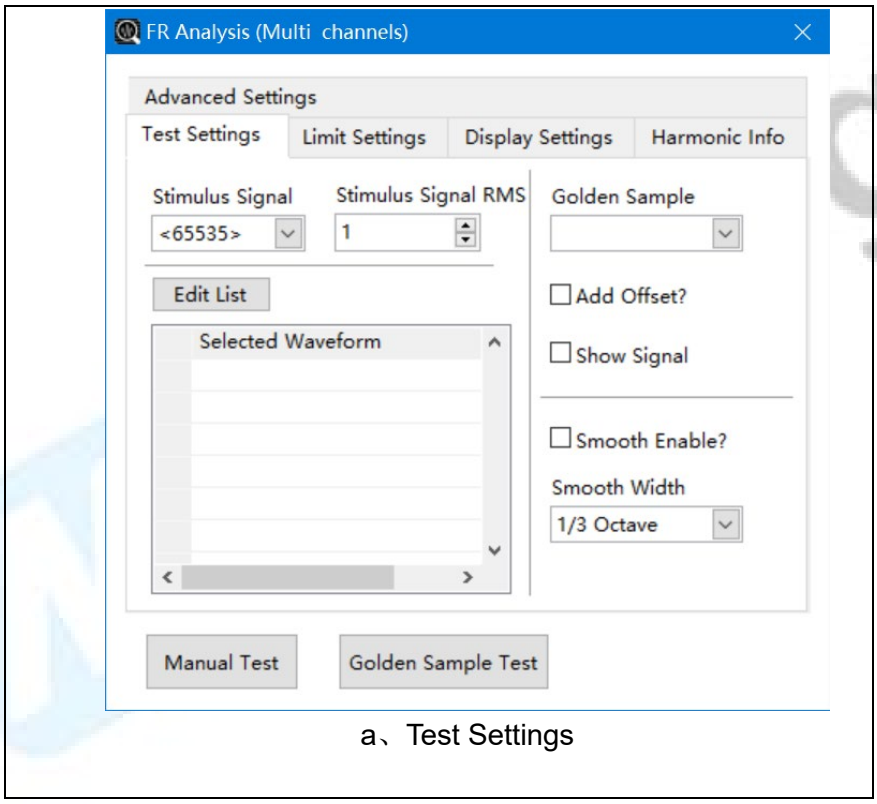
The other parameters setting detail are similar to 4.2.6.1

4.2.6.7 FR Analysis (2 channels)

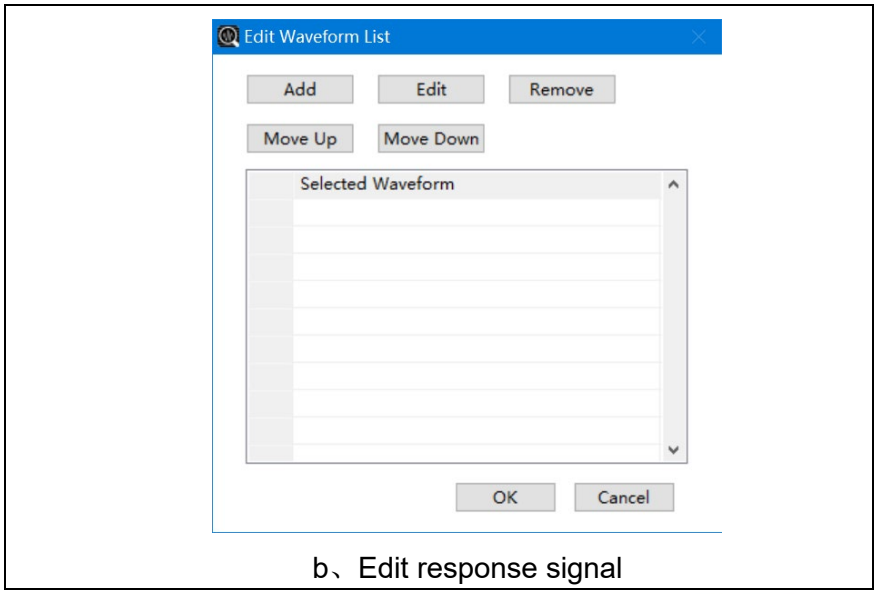
This step can analysis double channels frequency response, the parameters setting detail are similar to single channel analysis 4.2.6.6

4.2.6.8 FR Analysis (Multi channels)

This step can analysis multi channels frequency response, add the response signal by edit list. The other parameters setting detail are similar to single channel analysis 4.2.6.6.



a、Test Settings



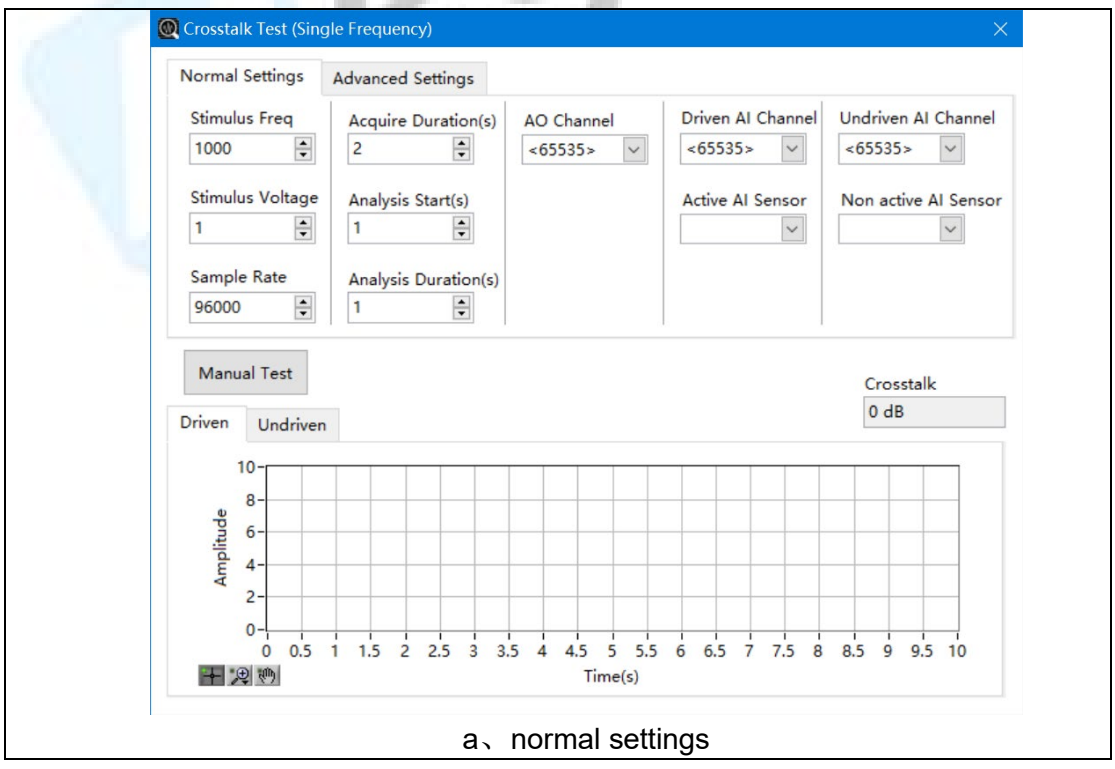
b、Edit response signal

Figure 4.2.6.8 FR Analysis（Multi channel）

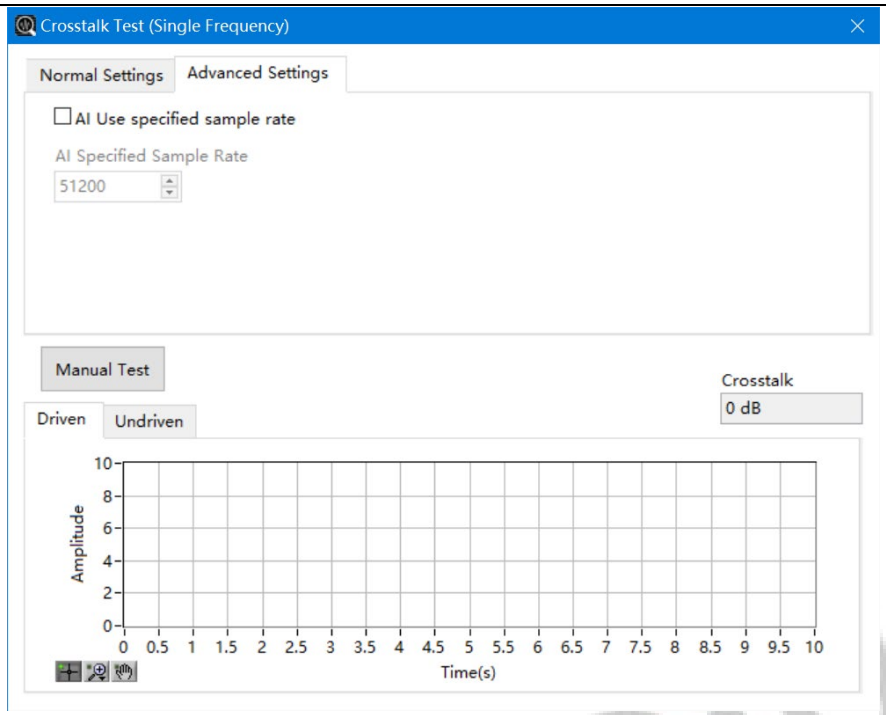
4.2.6.9 Crosstalk Test (Single Frequency)

Insert “Crosstalk Test (Single Frequency)” step, double click step will show interface in Figure 4.2.6.9.

This step can test crosstalk, parameters setting have normal settings and advanced settings.



a、normal settings



b、advanced settings

Figure 4.2.6.9 Crosstalk Test (Single Frequency)

Normal Settings

Acquire Duration(s)：total acquire duration

Analysis Duration(s)：intercepting duration to analysis

AO Channel：output channel

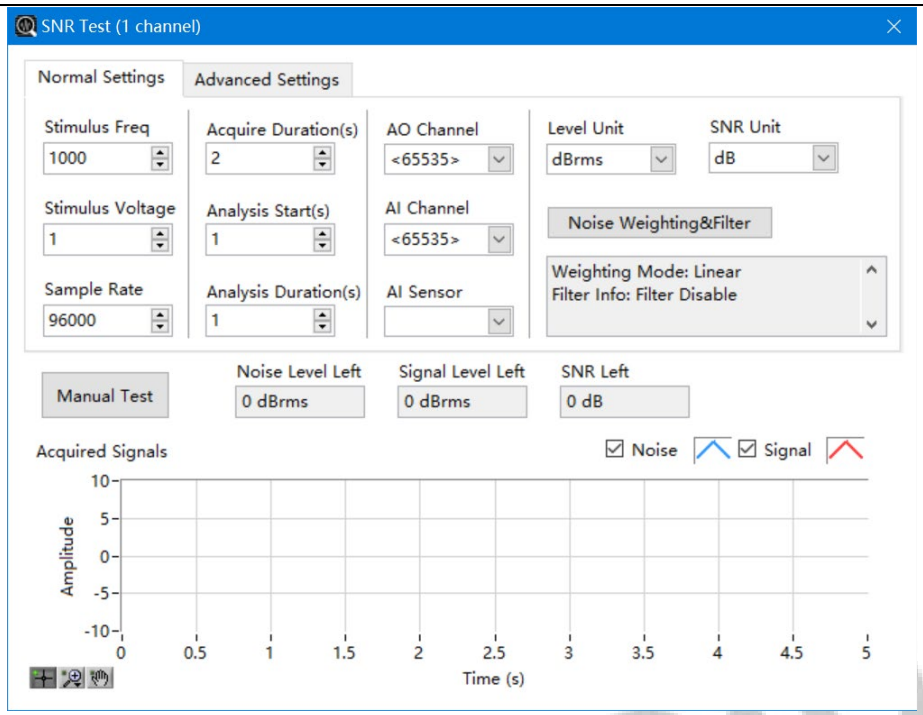
Driven AI Channel：stimulus input channel

Active AI Sensor：AI sensor need to calibration in advance

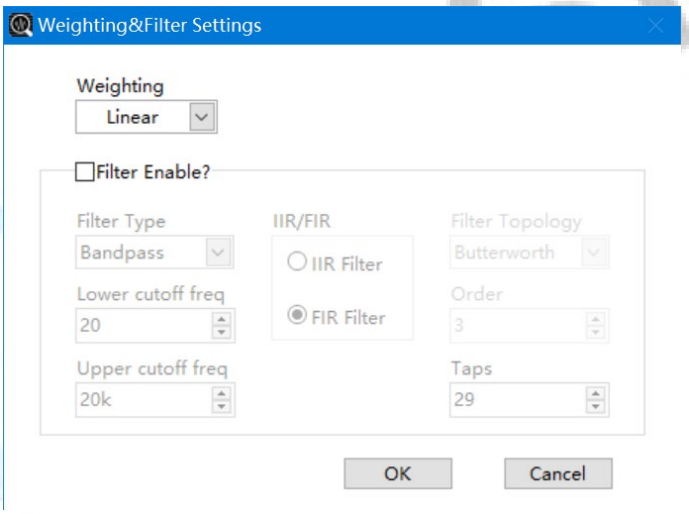
4.2.6.10 SNR Test (1 channel)

Insert “SNR Test (1 channel)” step, double click step will show interface in Figure 4.2.6.10.

This step can test SNR, parameters setting have normal settings and advanced settings.



a、Normal Setting



b、Noise Weighting & Filter

Figure 4.2.6.10 SNR Test (1 channel)

4.2.6.11 SNR Test (2 channels)

This step is similar to SNR Test (1 channel) .

4.2.6.12 Polarity Test (1 channels)

Insert “Polarity Test (1 channels)” step, double click step will show interface in Figure 4.2.6.12.

This step usually tests for positive and negative polarity.

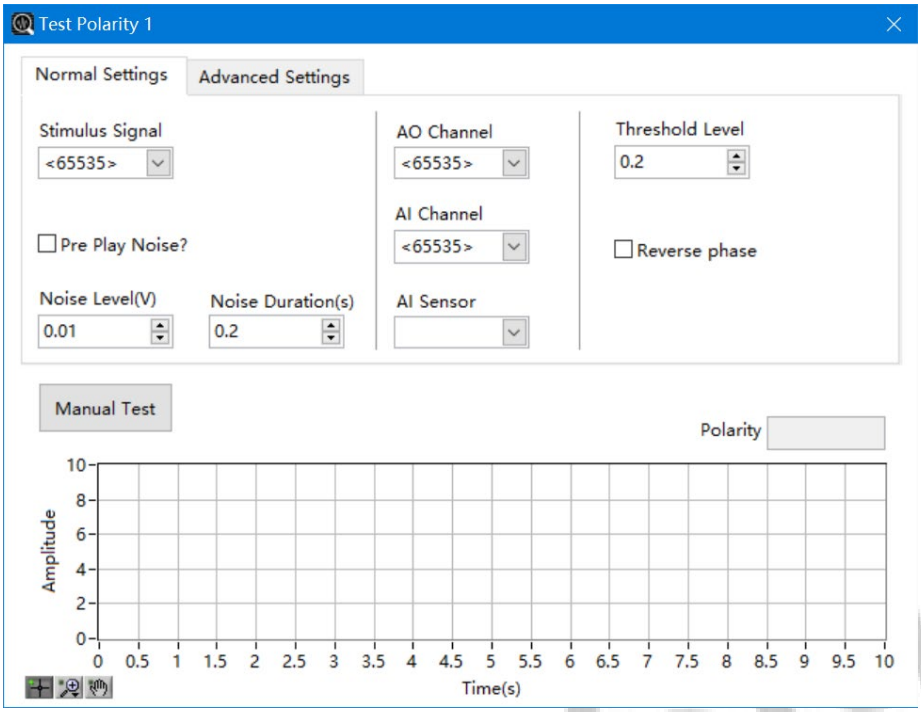


Figure 4.2.6.12 Polarity Test (1 channels)

Threshold Level：Setting threshold level, the first sine wave over the threshold determines polarity

Reverse phase：If first sine wave is down, need to reverse phase.

4.2.6.13 Polarity Test (2 channels)

This step is similar to Polarity Test (1 channels) 4.2.6.12. Usually used to test earphone polarity.

4.2.6.14 Polarity Analysis (1 channel)

Insert “Polarity Analysis (1 channels)” step, double click step will show interface in Figure 4.2.6.14.

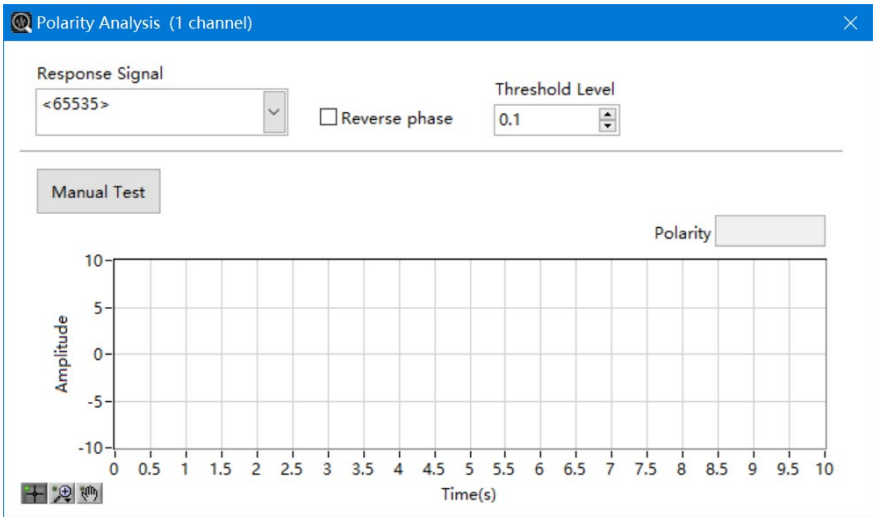


Figure 4.2.6.14 Polarity Analysis (1 channels)

Response Signal：choose signal in memory list.

Threshold Level：Setting threshold level, the first sine wave over the threshold determines polarity

Reverse phase：If first sine wave is down, need to reverse phase.

4.2.6.15 Speaker Impedance (1 channel)

Insert “Speaker Impedance (1 channels)” step, double click step will show interface in Figure 4.2.6.15.

This step needs to use with Megasig impedance box.

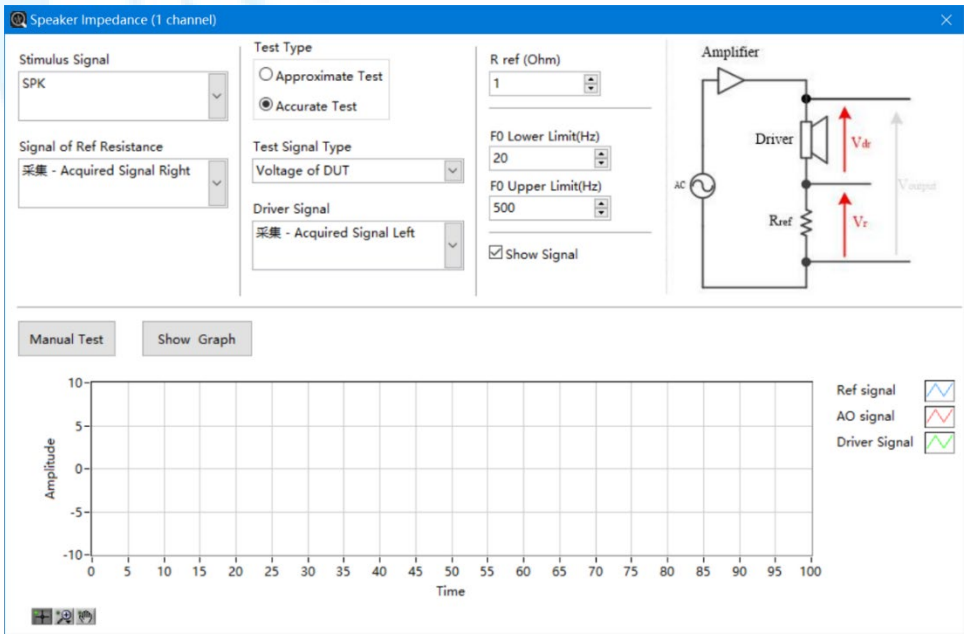


Figure 4.2.6.15 Speaker Impedance (1 channel)

Stimulus Signal：need to configure it ahead of time in “Settings – Stimulus Signal 2.4

Signal of Ref Resistance：choose in memory list

Test Signal Type：Select different circuit voltages for calculation

R ref(Ohm)：impedance value of the impedance box

4.2.7 Limits instructions

Limits include such steps shown in Figure 4.2.7

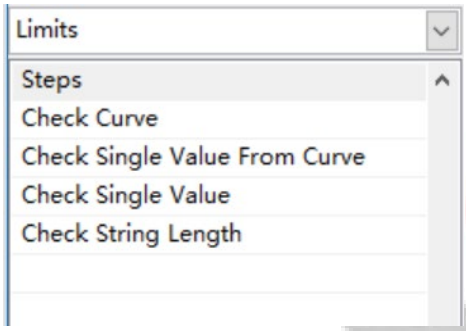
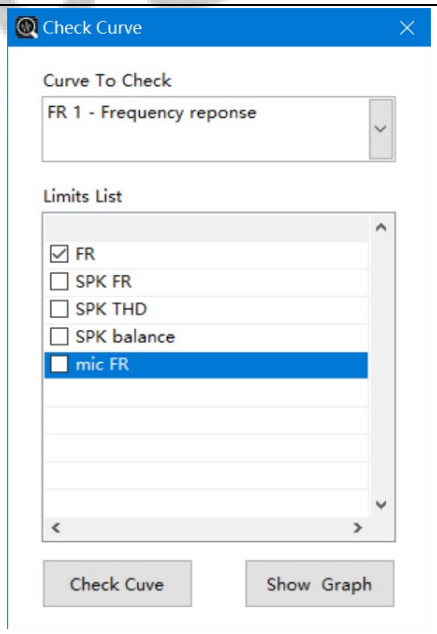


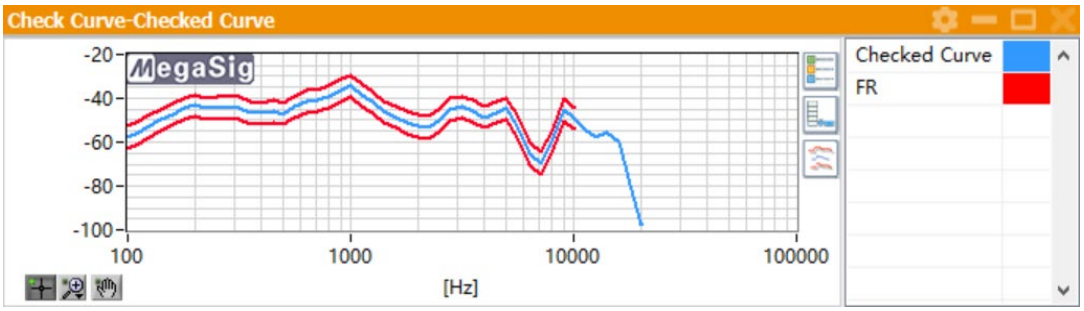
Figure 4.2.7 Limits

4.2.7.1 Check Curve

Insert “Check Curve” step, double click step will show interface in Figure 4.2.7.1



a、edit interface



b、display interface

Figure 4.2.7.1 Check Curve

Curve To Check：choose curve to check from memory list

Limits List：need to configure it ahead of time in “Settings – Limit Settings 2.5”

4.2.7.2 Check Single Value From Curve

Insert “Check Single Value From Curve” step, double click step will show interface in Figure 4.2.7.2

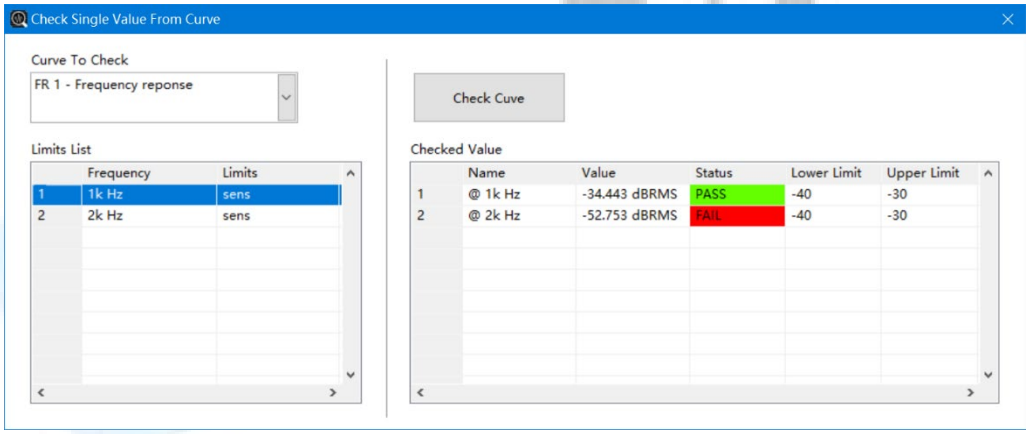


Figure 4.2.7.2 Check Single Value From Curve

Curve To Check：Select the test curve to extract single value

Limits List：right click table, you can “Add”, “Edit”, “Delete” limits list. Limits need to configure it ahead of time in “Settings – Limit Settings 2.5”

Check Curve：Check value limit according to selected frequency point

Lower Limit：according with selected limits

Upper Limit：according with selected limits

4.2.7.3 Check Single Value

Insert “Check Single Value” step, double click step will show interface in Figure 4.2.7.3

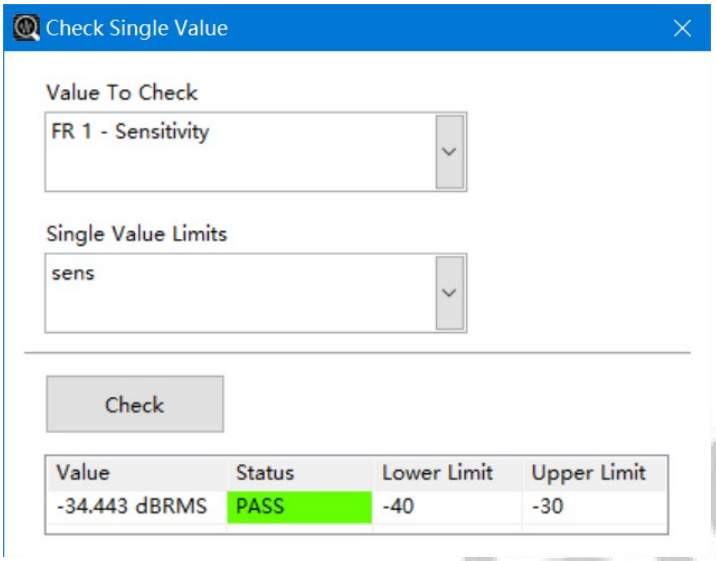


Figure 4.2.7.3 Check Single Value

Value To Check：Select the test value from memory list

Single Value Limits：need to configure it ahead of time in “Settings – Limit Settings 2.5”

4.2.7.4 Check String Length

This step is used to check string length, usage is similar to check single value.

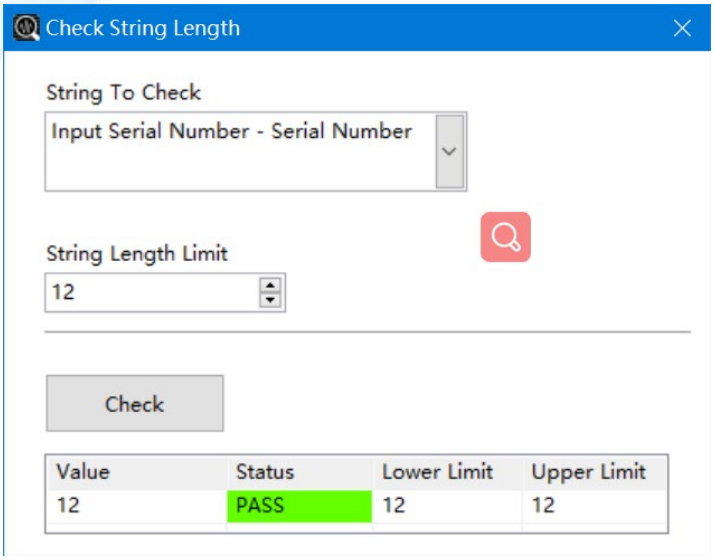


Figure 4.2.7.4 Check String Length

4.2.8 Save Results instructions

Save Result include such steps shown inFigure 4.2.8

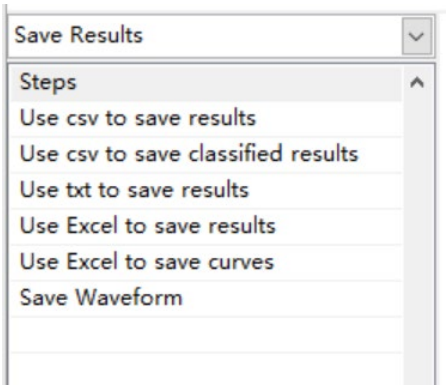
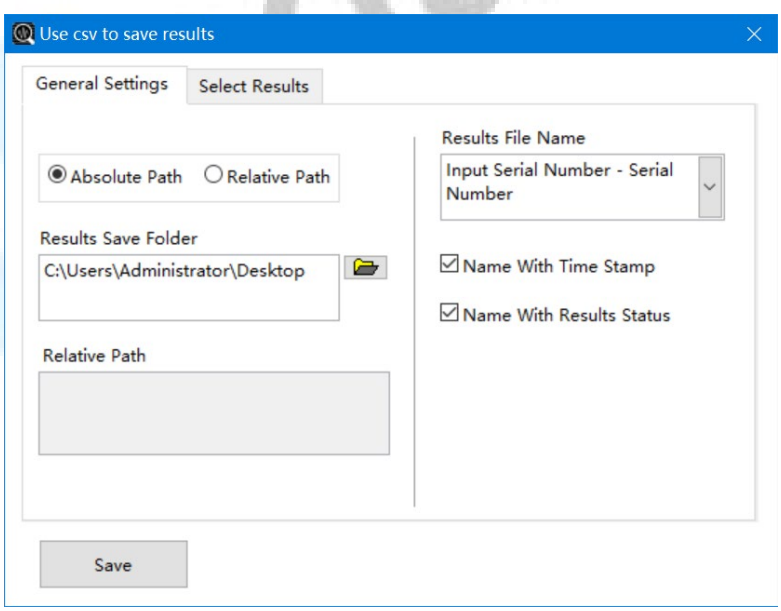


Figure 4.2.8 Save Results

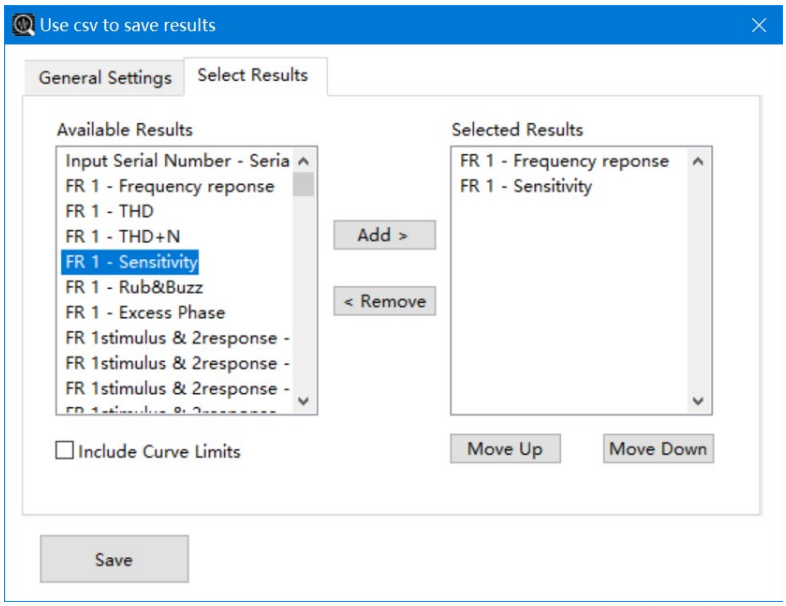
4.2.8.1 Use csv to save results

Insert “Use csv to save results” step, double click step will show interface in Figure 4.2.8.1

This step will generate a new file after each execution. Before save, need to select results data.



a. General Settings



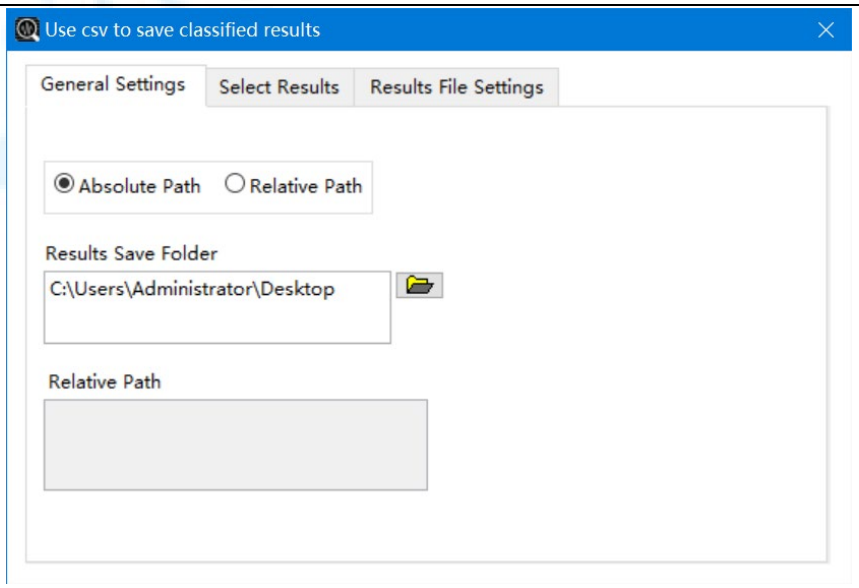
b. Sleect Results

Figure 4.2.8.1 Use csv to save results

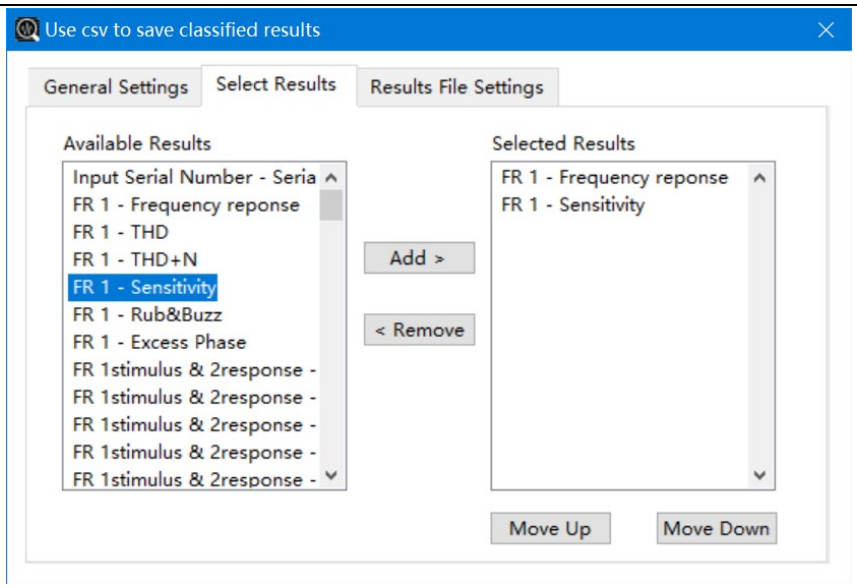
4.2.8.2 Use csv to save classified results

Insert “Use csv to save classified results” step, double click step will show interface in Figure 4.2.8.2

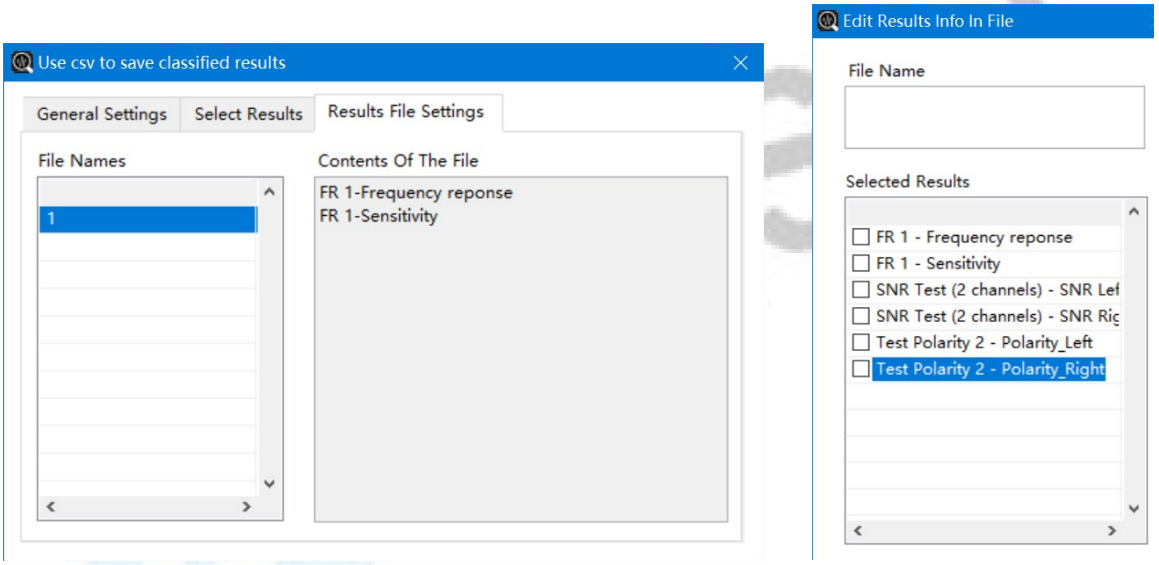
This step will append the test data to the same file after each execution. Before save, need to select results data. General settings and select results are similar to “Use csv to save results”.



a、General Settings



b、Sleect Results



c、classified settings　　d、classified edit

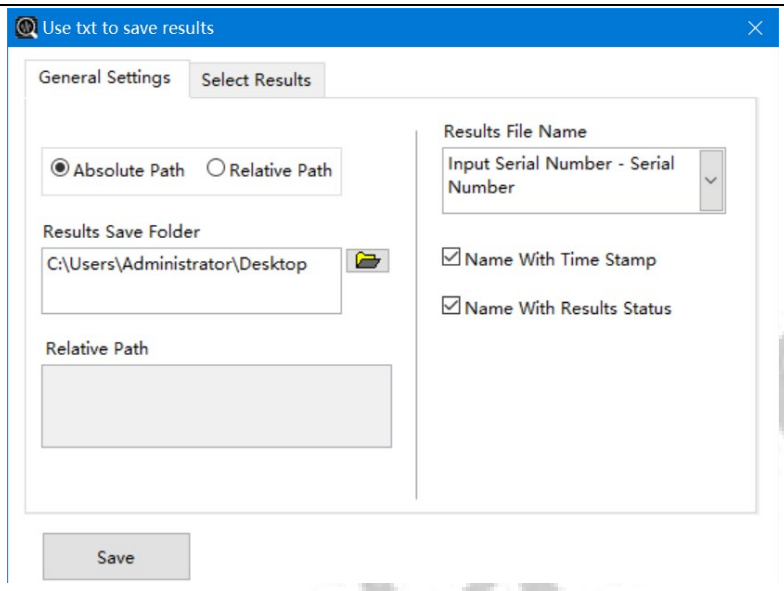
Figure 4.2.8.2 Use csv to save classified results

In the results file settings interface, you can right click file names table to “Add”, “Edit”, “Delete” classified results.

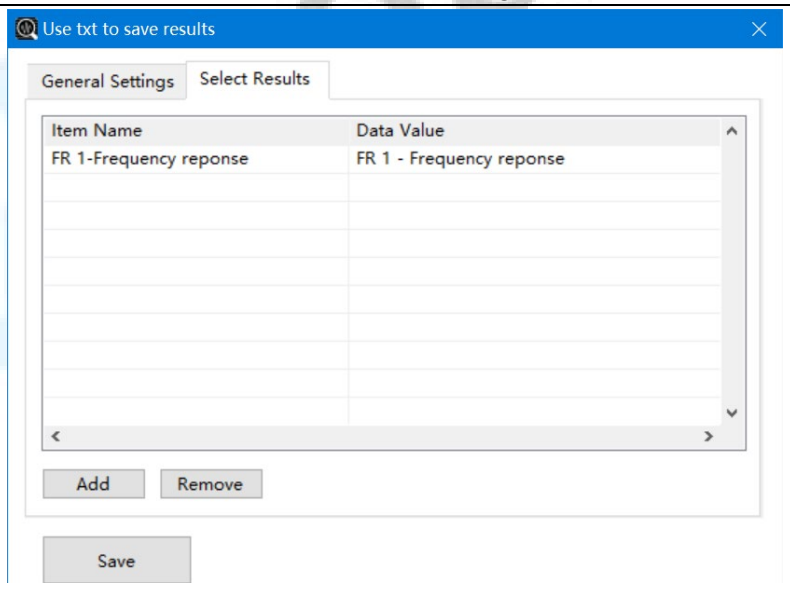
4.2.8.3 Use txt to save results

Insert “Use txt to save results” step, double click step will show interface in Figure 4.2.8.3.

This step will save data as txt format. In select results interface, click “Add”, “Remove” button, can select data results to save.



a、General Settings



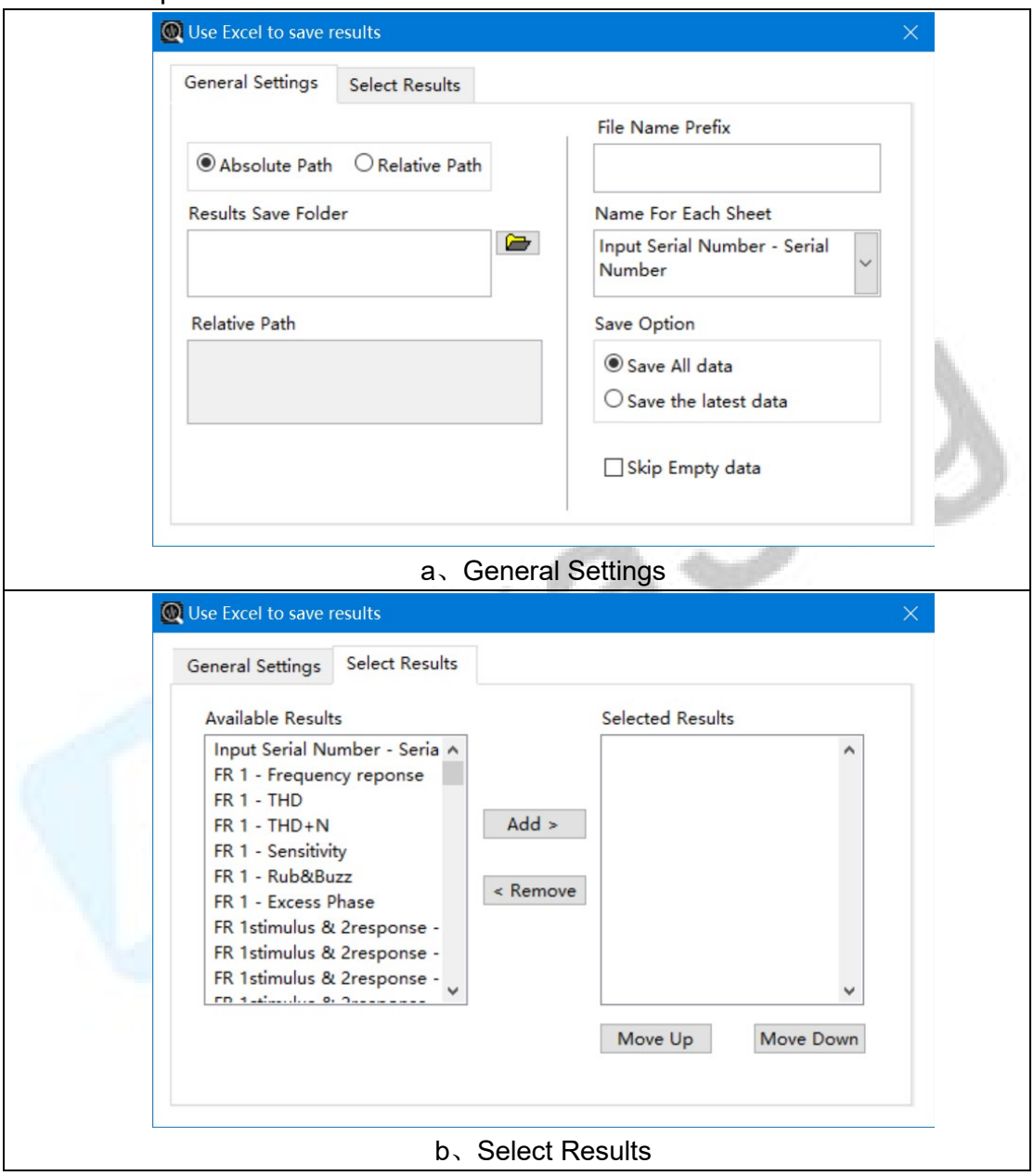
b、Sleect Results

Figure 4.2.8.3 Use txt to save results

4.2.8.4 Use Excel to save results

Insert “Use Excel to save results” step, double click step will show interface in Figure 4.2.8.4

This step will save data as excel format.



a、General Settings

b、Select Results

Figure 4.2.8.4 Use Excel to save results

4.2.8.5 Use Excel to save curves

This step will save curves as excel format. Other settings are similar to save results.

4.2.8.6 Save Waveform

Insert “Save Waveform” step, double click step will show interface in Figure 4.2.8.4Figure 4.2.8.6.

This step will save time-domain data as .wav file.

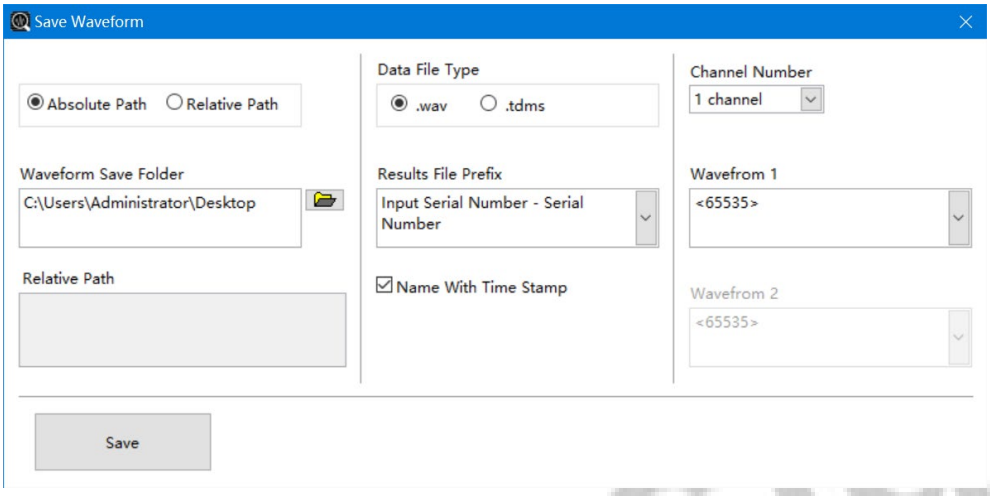


Figure 4.2.8.6 Save Waveform

4.2.9 Special Tools instructions

Special Tools include such steps shown in Figure 4.2.9

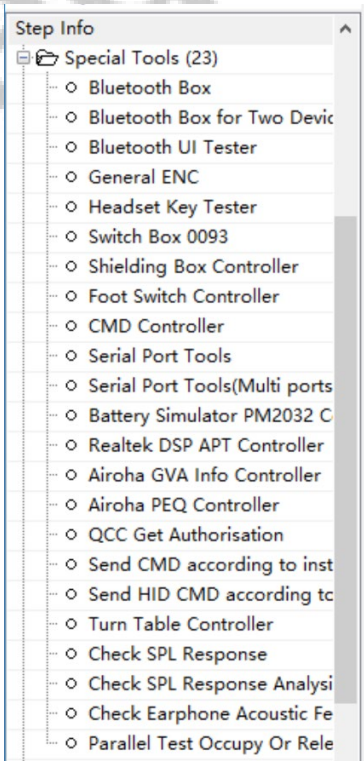


Figure 4.2.9 Special Tools

4.2.9.1 Bluetooth Box

Insert “Bluetooth Box” step, double click step will show interface in Figure 4.2.9.1. This function is the driver for MegaSig bluetooth dongle, can control the dongle to connect the Bluetooth DUT, to perform A2DP / HFP protocol data transfer, realize Bluetooth DUT audio test, including speaker/mic FR / THD. Etc.

The details are similar to 3.2 BT Controller.

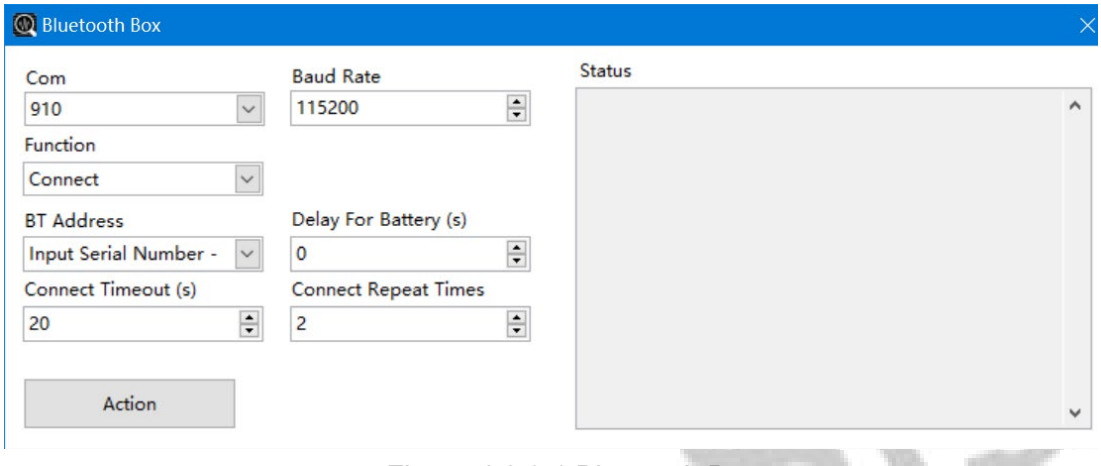


Figure 4.2.9.1 Bluetooth Box

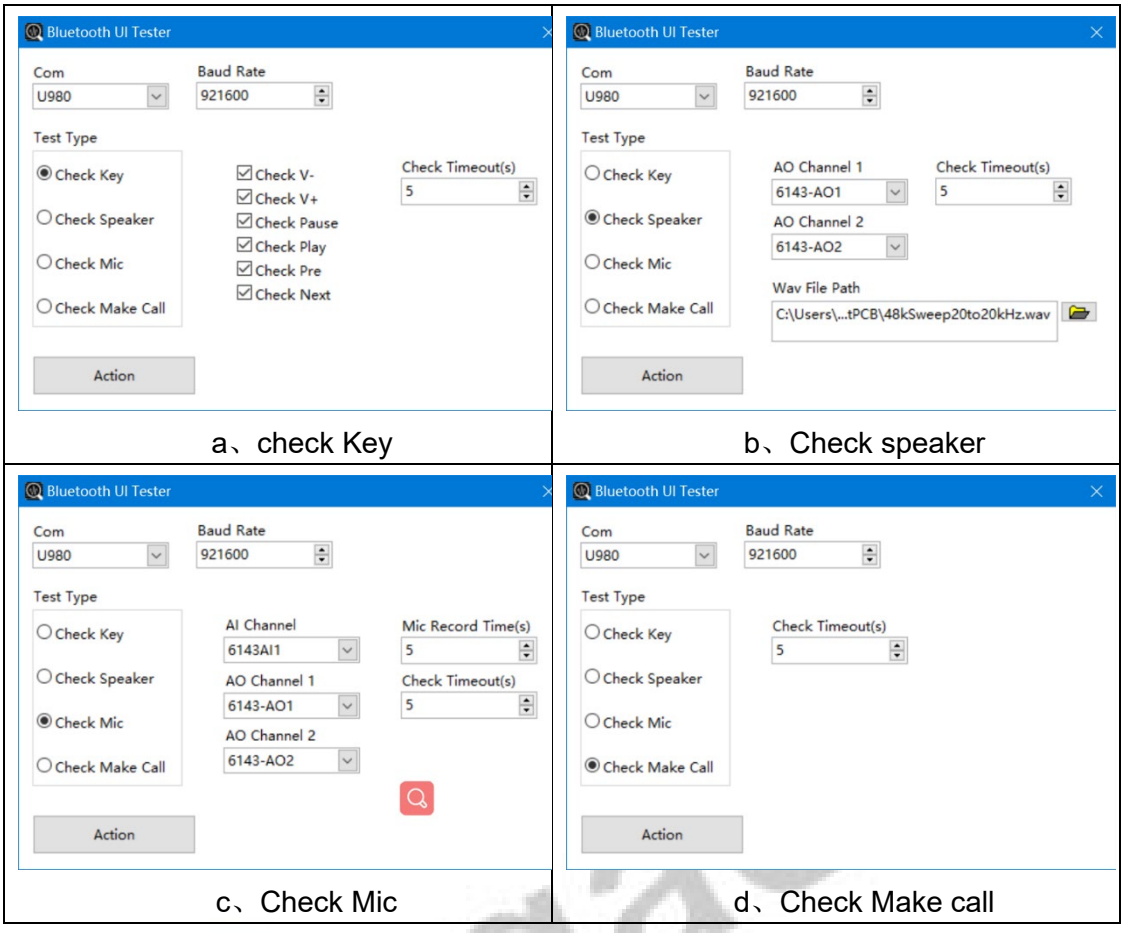
4.2.9.2 Bluetooth Box for Two Device

“Bluetooth Box for Two Device” is use two bluetooth dongle, the details are similar to 3.2 BT Controller.

4.2.9.3 Bluetooth UI Tester

Insert “Bluetooth UI Tester” step, double click step will show interface in Figure 4.2.9.3.

After Bluetooth connection established, this function can detect which button is pressed; test whether the speaker, mic, make call function is normal; and provide user a approach to test the DUT button.



a、check Key　　b、Check speaker

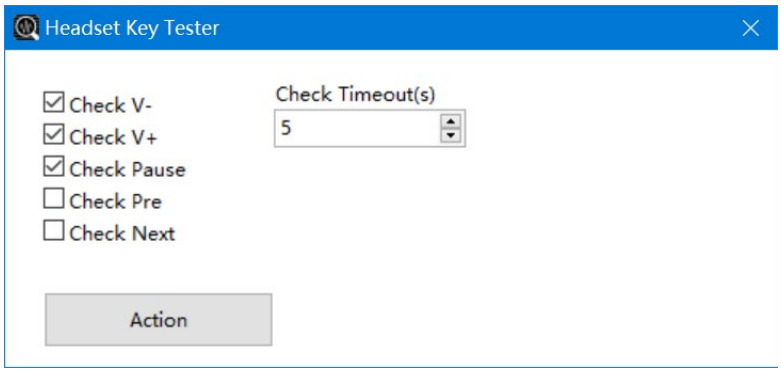
c、Check Mic　　d、Check Make call

Figure 4.2.9.3 Bluetooth UI Tester

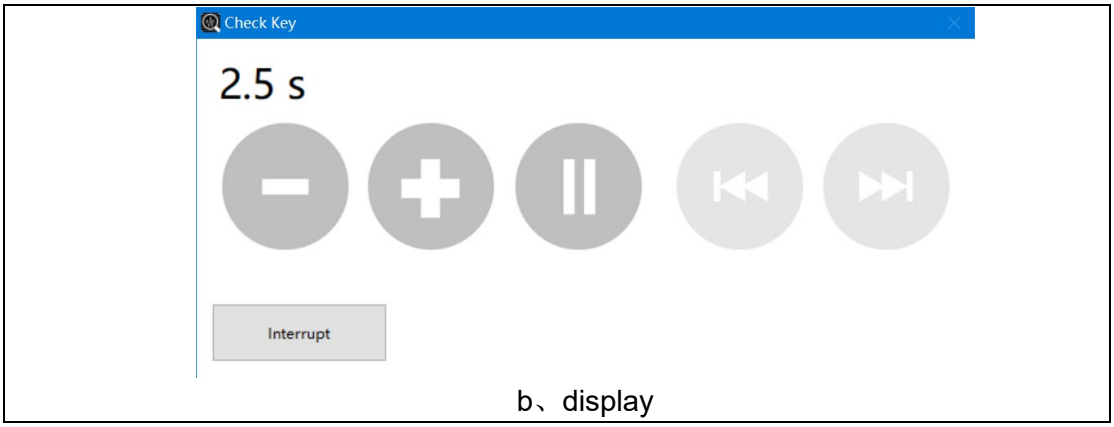
4.2.9.4 Headset Key Tester

Insert “Headset Key Tester” step, double click step will show interface in Figure 4.2.9.4

After USB headset connection established, this function can detect which button is pressed, and provide user a approach to test the DUT button.



a、Settings



b、display

Figure 4.2.9.4 Headset Key Tester

4.2.9.5 Switch Box 0093

This step is similar to quick tools 3.3 Switch Controller.

4.2.9.6 Shielding Box Controller

Insert “Shielding Box Controller” step, double click step will show interface in Figure 4.2.9.6

This function provide user a easy access to control a shielding box, the command can be customized.

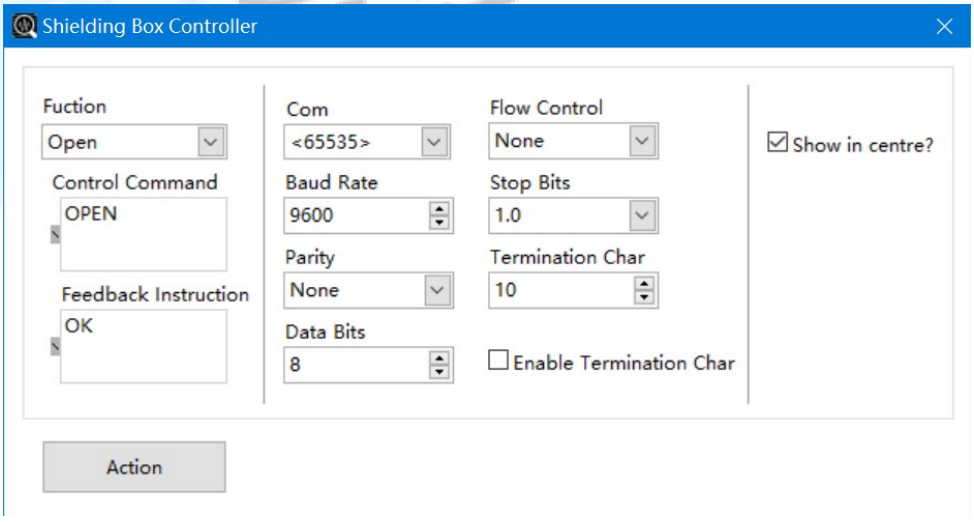


Figure 4.2.9.6 Shielding Box Controller

4.2.9.7 CMD Controller

Insert “CMD Controller” step, double click step will show interface in Figure 4.2.9.7.

This function provide user a interface use CMD to control product.

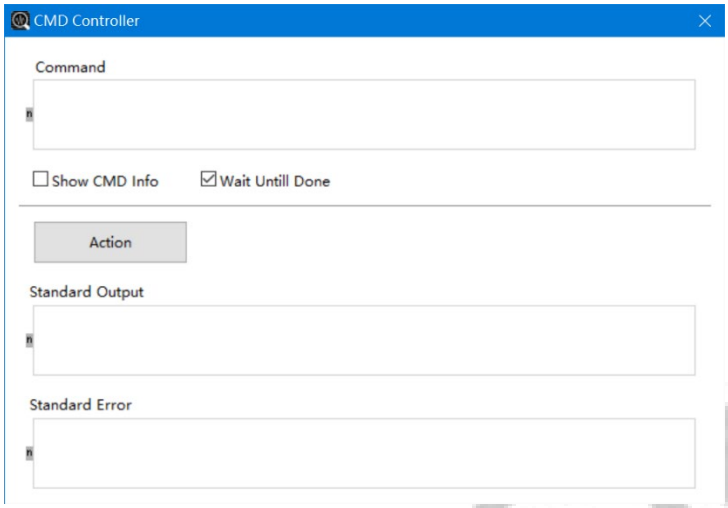


Figure 4.2.9.7 CMD Controller

4.2.9.8 Serial Port Tools

Insert “Serial Port Tools” step, double click step will show interface in Figure 4.2.9.8

This function provide user a interface use COM command to control devices.

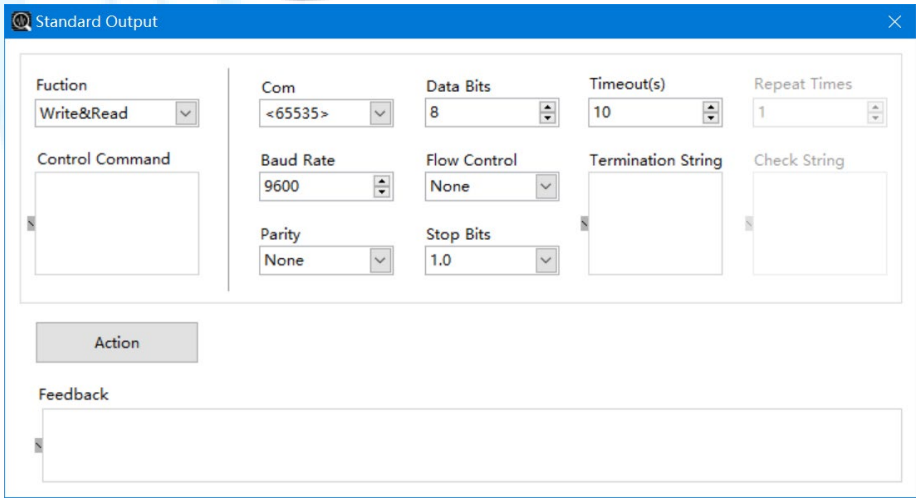
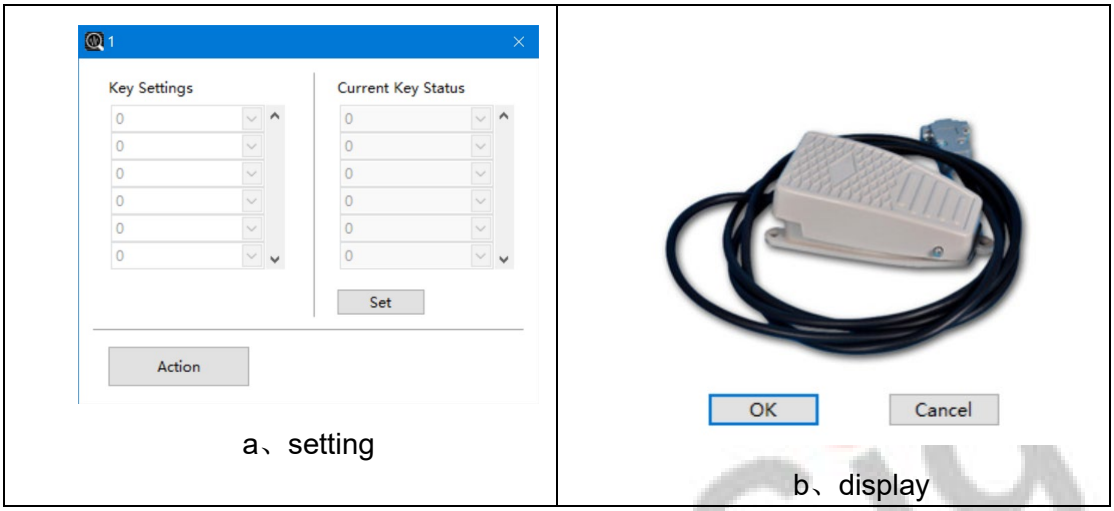


Figure 4.2.9.8 Serial Port Tools

4.2.9.9 Foot Switch Controller

Insert “Foot Switch Controller” step, double click step will show interface in Figure 4.2.9.9

This function provide user a easy access to control the foot switch, the command can be customized.



a、setting

b、display

Figure 4.2.9.9 Foot Switch Controller

4.2.9.10 Check SPL Response

Insert “Check SPL Response” step, double click step will show interface in Figure 4.2.9.10. This function is designed for test sound pressure.

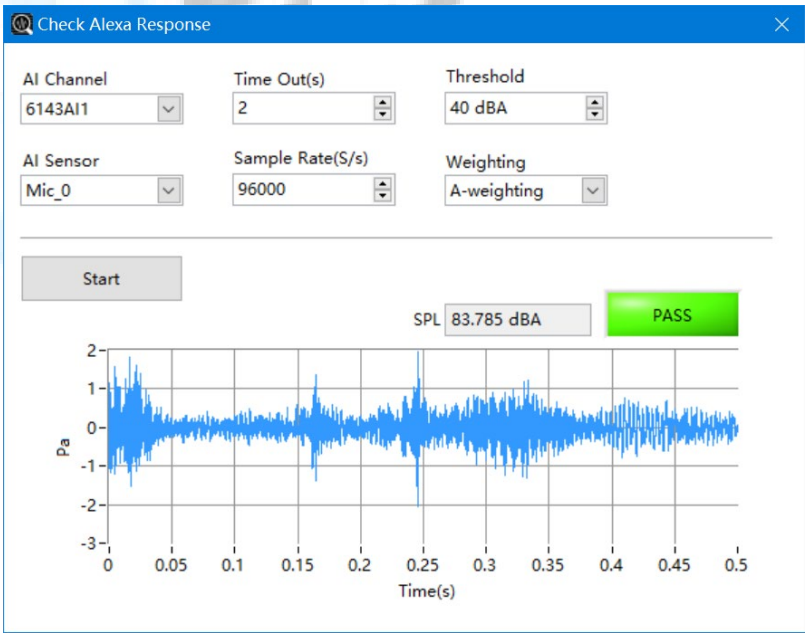


Figure 4.2.9.10 Check Alexa Response

4.2.9.11 Check Earphone Acoustic Feedback status.

This step is designed for test acoustic feedback status, the interface is similar to 4.2.9.10.

4.2.9.12 Check SPL Response Analysis Only

Insert “Check SPL Response Analysis Only” step, double click step will show interface in Figure 4.2.9.12

This function is designed for analysis sound pressure. Analysis wavefrom choose in the test memory.

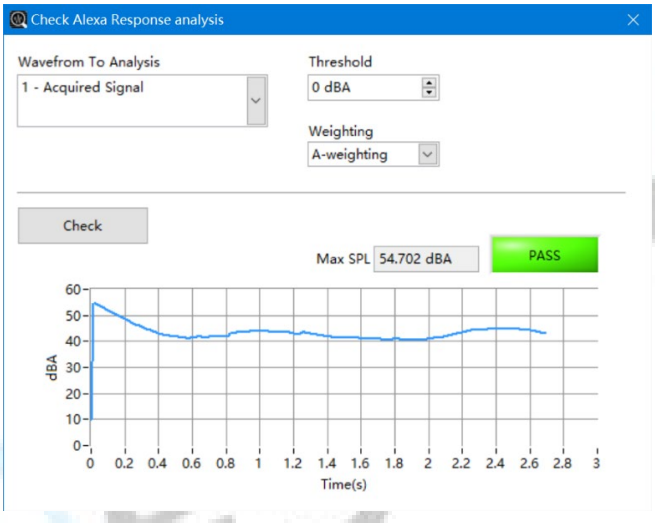


Figure 4.2.9.12 Check SPL Response Analysis Only

4.2.9.13 Parallel Test Occupy Or Release Resource

Insert “Parallel Test Occupy Or Release Resource” step, double click step will show interface in Figure 4.2.9.13.

This function is designed for parallel test resource control.

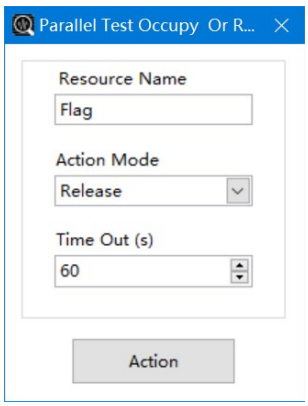


Figure 4.2.9.13 Parallel Test Occupy Or Release Resource

When 2 or more sequences run parallelly, but only have one instrument, then we need to use this function to new a flag, and before we use the instrument, we will add a flag occupy step to reserve this instrument, so other sequence cannot access this instrument until the flag is released.

4.2.10 Post Processing instructions

Post Processing include such steps shown in Figure 4.2.10

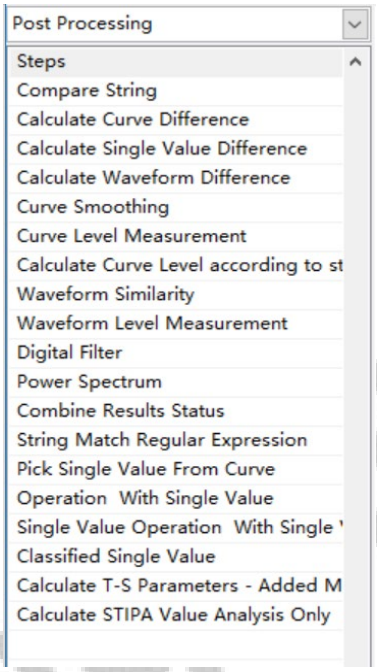


Figure 4.2.10 Post Processing

4.2.10.1 Compare String

Insert “Compare String” step, double click step will show interface in Figure 4.2.10.1

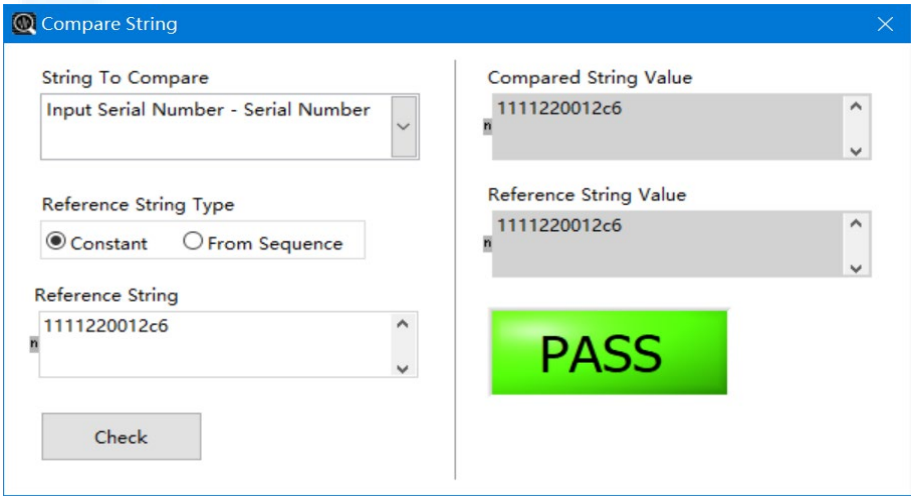


Figure 4.2.10.1 Compare String

4.2.10.2 Calculate Curve Difference

Insert “Calculate Curve Difference” step, double click step will show interface inFigure 4.2.10.2. With the use of 4.2.13.3 Display Curves, can be show indifference curve.

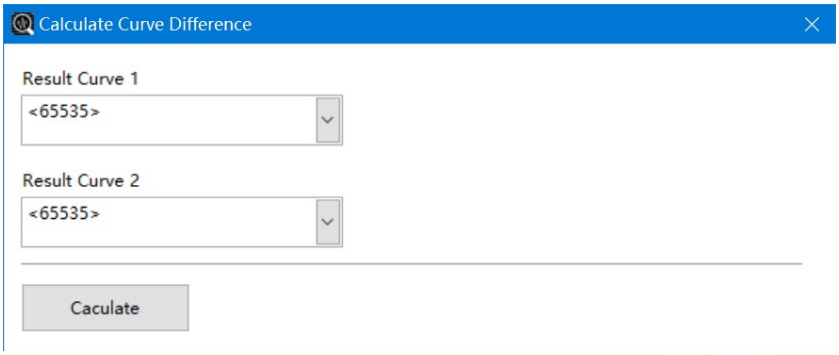


Figure 4.2.10.2 Calculate Curve Difference

4.2.10.3 Calculate Single Value Difference

Insert “Calculate Single Value Difference” step, double click step will show interface in Figure 4.2.10.3. With the use of 4.2.13.1 Single Value Display Table can be show indifference value.

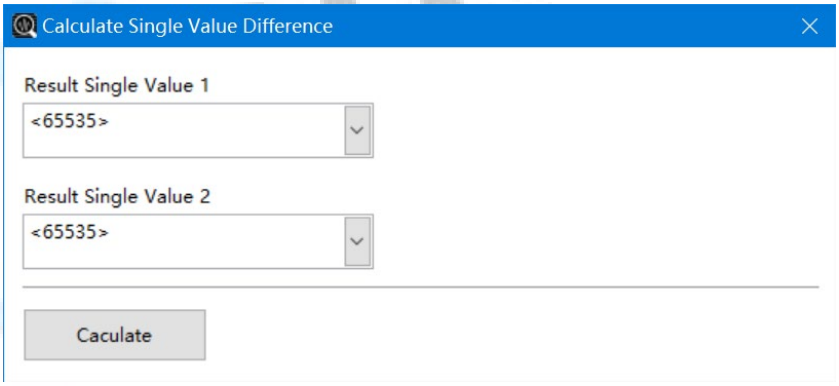


Figure 4.2.10.3 Calculate Single Value Difference

4.2.10.4 Calculate Waveform Difference

Insert “Calculate Waveform Difference” step, double click step will show interface in Figure 4.2.10.4. With the use of 4.2.13.5 Display Waveform can be show indifference waveform.

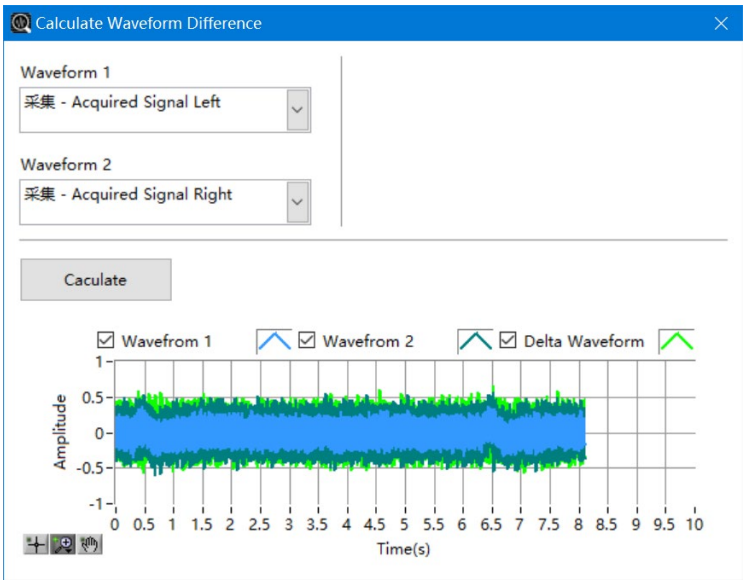


Figure 4.2.10.4 Calculate Waveform Difference

4.2.10.5 Curve Smoothing

Insert “Curve Smoothing” step, double click step will show interface in Figure 4.2.10.5. Choose curve to smooth from memory list, with the use of 4.2.13.3 Display Curves, can be show the smooth curve.

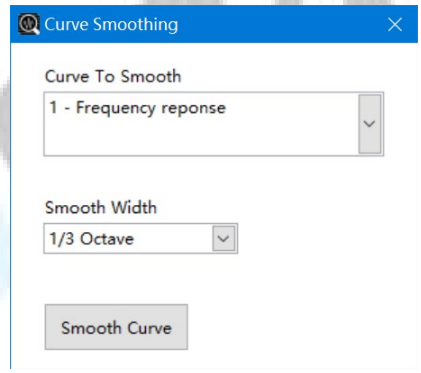


Figure 4.2.10.5 Curve Smoothing

4.2.10.6 Curve Level Measurement

Insert “Curve Level Measurement” step, double click step will show interface in Figure 4.2.10.6.

This function is designed for measure curve level.

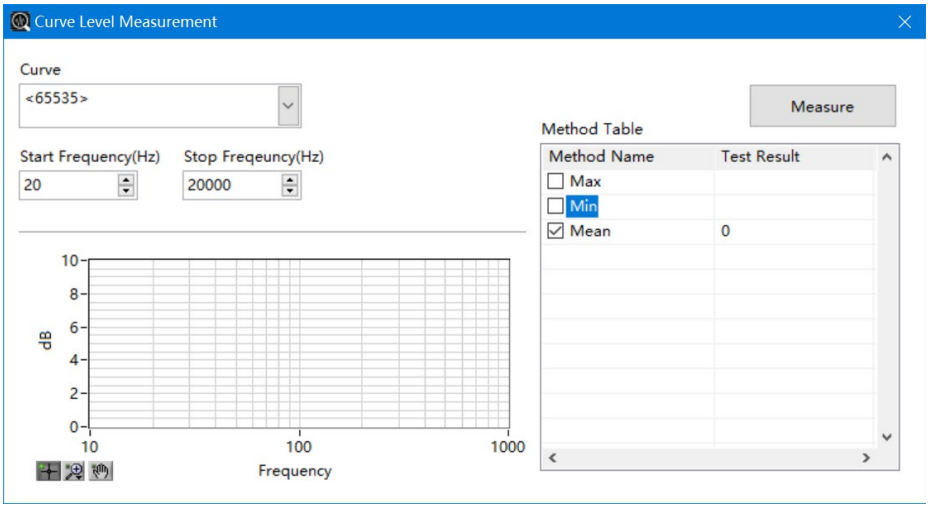


Figure 4.2.10.6 Curve Level Measurement

4.2.10.7 Calculate Curve Level according to standard

Insert “Calculate Curve Level according to standard” step, double click step will show interface in Figure 4.2.10.7.

This function is designed for calculate curve SLR and RLR.

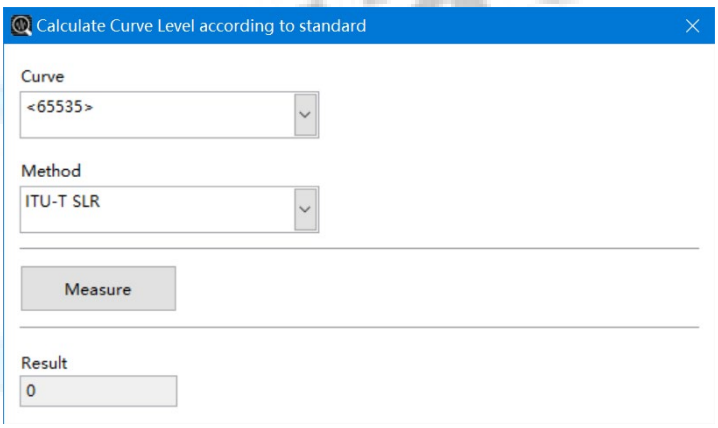


Figure 4.2.10.7 Calculate Curve Level according to standard

4.2.10.8 Waveform Similarity

Insert “Waveform Similarity” step, double click step will show interface in Figure 4.2.10.8 .

This function is designed for compared waveform similarity, determine the result by setting a threshold.

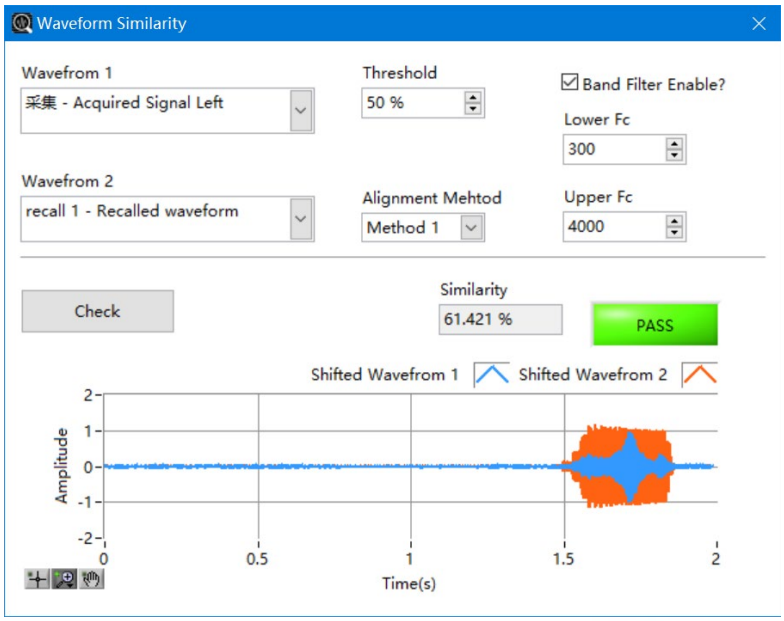


Figure 4.2.10.8 Waveform Similarity

4.2.10.9 Waveform Level Measurement

Insert “Waveform Level Measurement” step, double click step will show interface in Figure 4.2.10.9

This function is designed for measure waveform level.

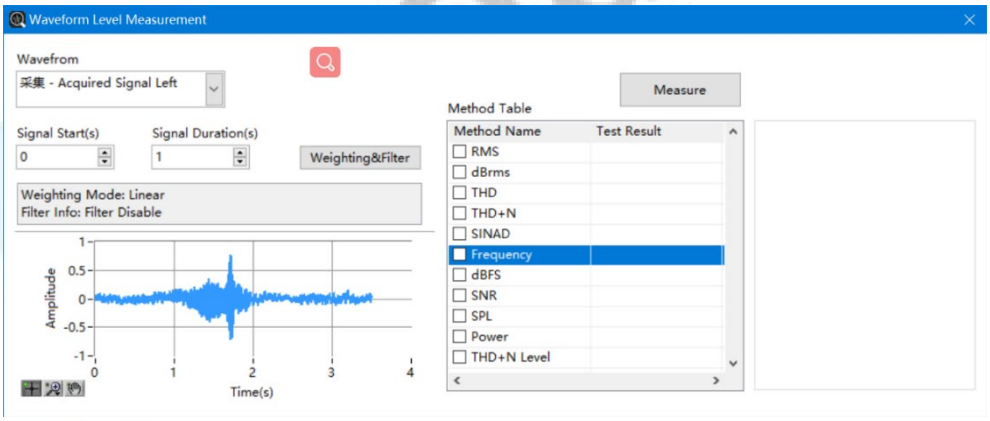


Figure 4.2.10.9 Waveform Level Measurement

4.2.10.10 Digital Filter

Insert “Digital Filter” step, double click step will show interface in Figure 4.2.10.10.

This function is designed for processing waveform filter.

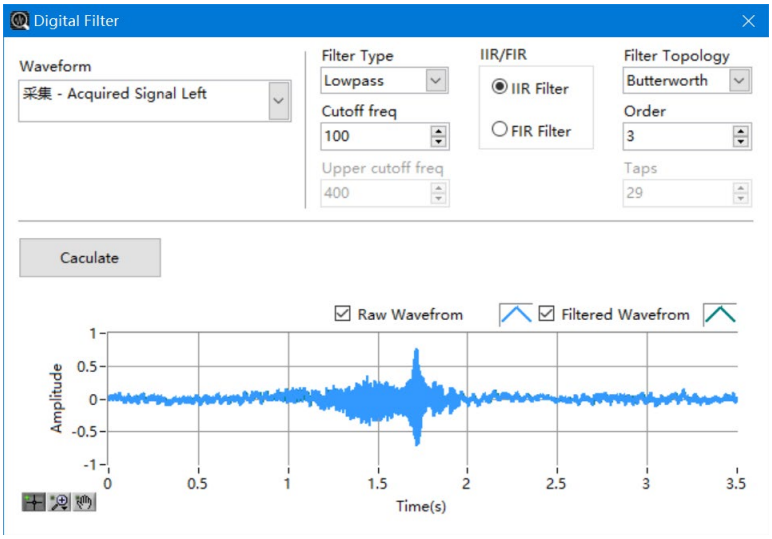


Figure 4.2.10.10 Digital Filter

4.2.10.11 Power Spectrum

Insert “Power Spectrum” step, double click step will show interface in Figure 4.2.10.11.

This function is designed for switch time waveform to power spectrum, with the use of 4.2.13.3 Display Curves, can be show the smooth curve.

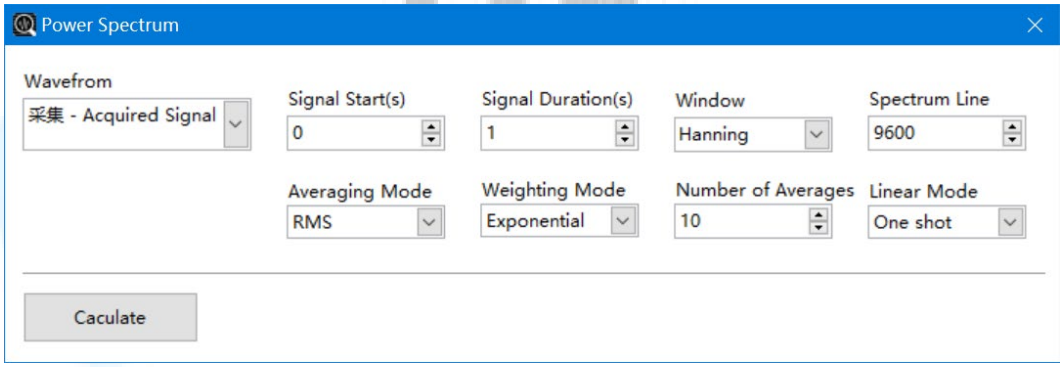
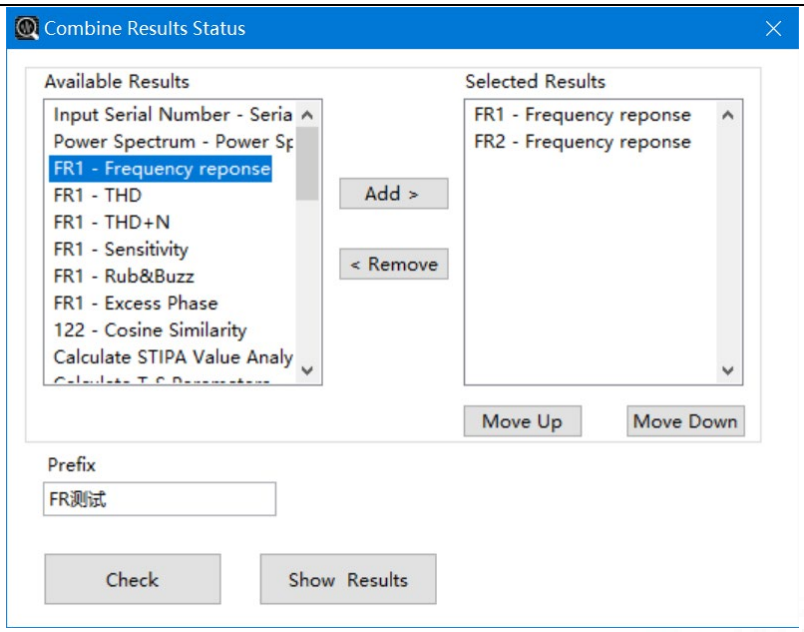


Figure 4.2.10.11 Power Spectrum

4.2.10.12 Combine Results Status

Insert “Combine Results Status” step, double click step will show interface in Figure 4.2.10.12

Choose the results from available results to add to selected results.



a、setting

b、display

Figure 4.2.10.12 Combine Results Status

4.2.10.13String Match Regular Expression

Insert “String Match Regular Expression” step, double click step will show interface in Figure 4.2.10.13

This function is designed for check feedback value, input regular string to matching analysis.

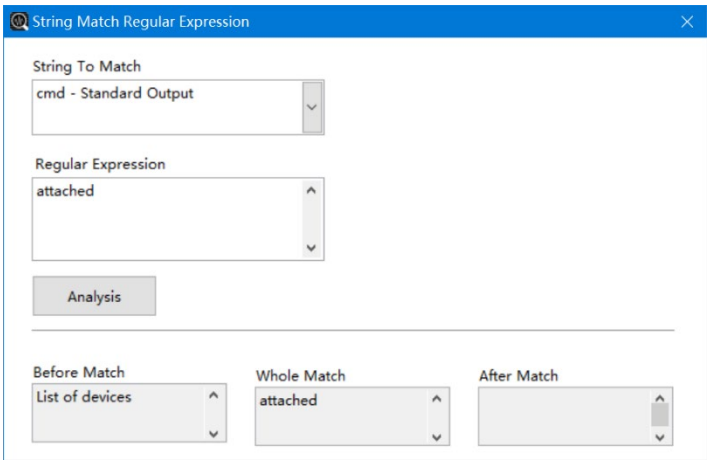


Figure 4.2.10.13 String Match Regular Expression

4.2.10.14 Pick Single Value From Curve

Insert “Pick Single Value From Curve” step, double click step will show interface in Figure 4.2.10.14.

This function is designed for pick a frequency point from curve to check value.

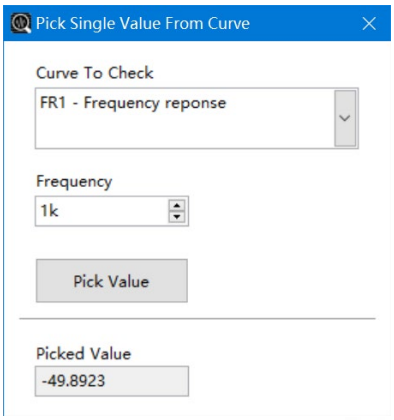


Figure 4.2.10.14 Pick Single Value From Curve

4.2.10.15Operation With Single Value

Insert “Operation With Single Value” step, double click step will show interface in Figure 4.2.10.15

This function is designed for use Add, subtract, multiply and divide to process the resulting curve.

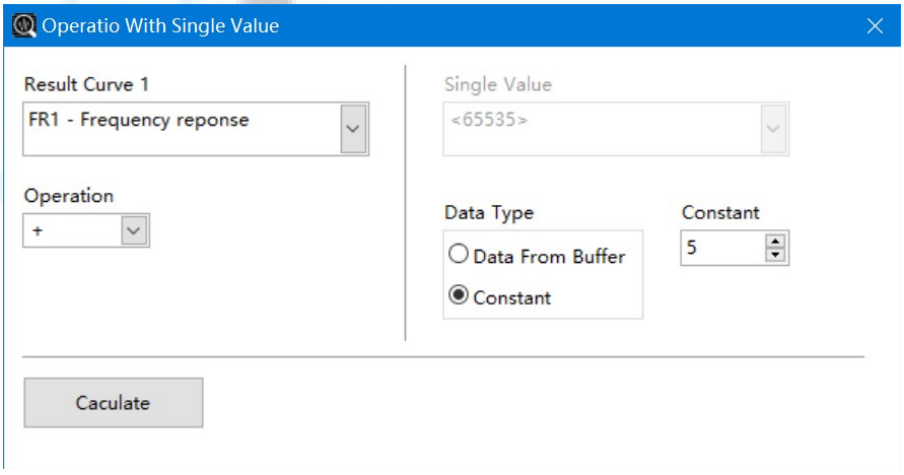


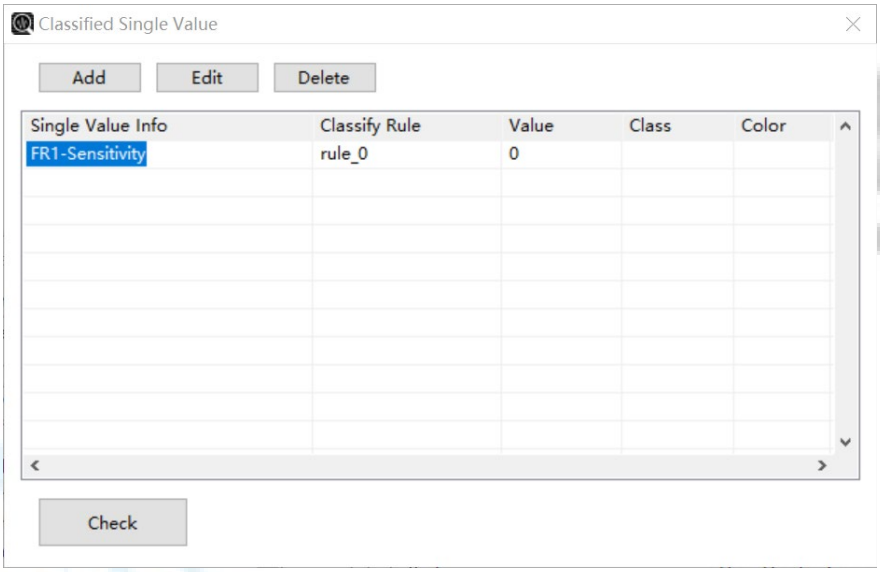
Figure 4.2.10.15 Operation With Single Value

4.2.10.16 Single Value Operation With Single Value

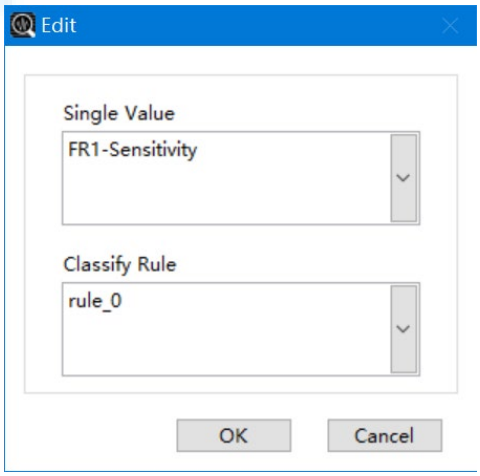
This step is processing the value, other set is similar to 4.2.10.15 Operation With Single Value.

4.2.10.17Classified Single Value

Insert “Classified Single Value” step, double click step will show interface in Figure 4.2.10.17a. You can add, edit and delete classified single value. In the step, classify rule need to configure it ahead of time in “Settings – Results Classify Settings 2.7”.



a、setting



b、edit / add

Figure 4.2.10.17 Classified Single Value

4.2.11 Recall instructions

Recall include such steps shown in Figure 4.2.11

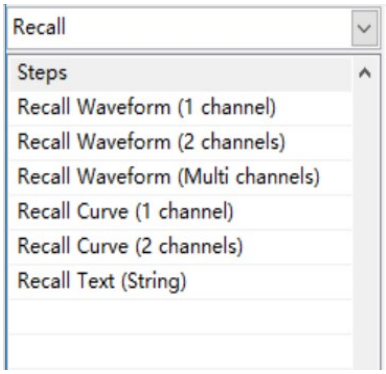


Figure 4.2.11 Recall

4.2.11.1 Recall Waveform (1 channel)

Insert “Recall Waveform (1 channel)” step, double click step will show interface inFigure 4.2.11.1. This step can recall the mono waveform file.

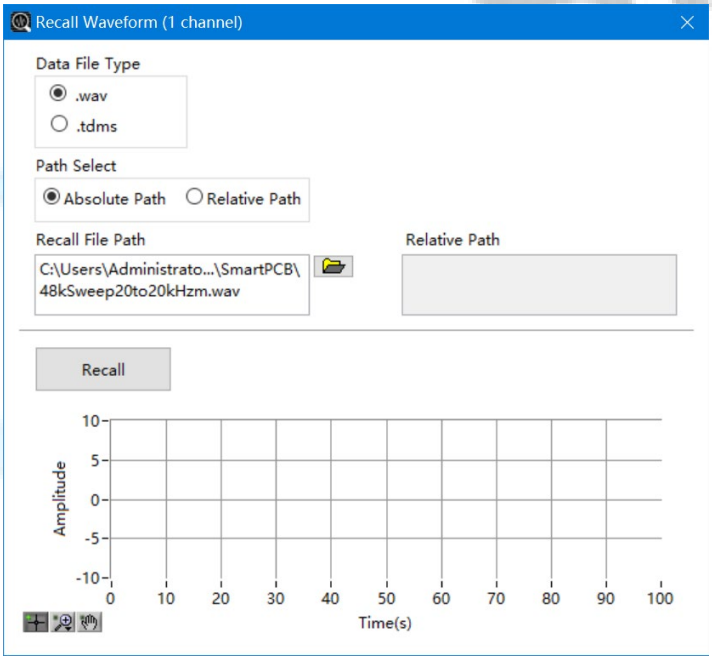


Figure 4.2.11.1 Recall Waveform (1 channel)

4.2.11.2 Recall Waveform (2 channel)

This step is recall two-channel stereo waveform file, other set is similar to 4.2.11.1Recall Waveform (1 channel).

4.2.11.3 Recall Waveform (Multi channels)

This step is recall multi channels waveform file, other set is similar to 4.2.11.1Recall Waveform (1 channel).

4.2.11.4 Recall Curve (1 channel)

Insert “Recall Curve (1 channel)” step, double click step will show interface in Figure 4.2.11.4 . This step can recall the single channel curve file.

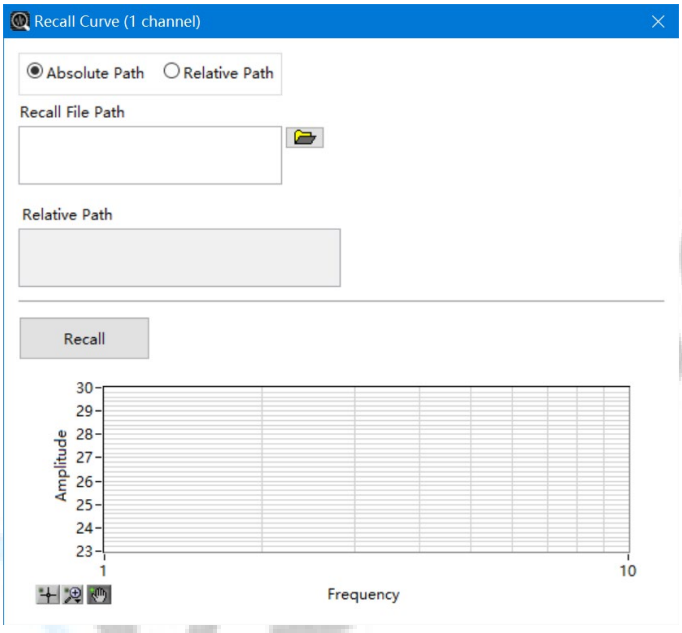


Figure 4.2.11.4 Recall Curve (1 channel)

4.2.11.5 Recall Curve (2 channels)

This step is recall two channels curve file, other set is similar to 4.2.11.4 Recall Curve (1 channel).

4.2.11.6 Recall Text (String)

Insert “Recall Text (String)” step, double click step will show interface in Figure 4.2.11.6. This step is designed for recall the string file.

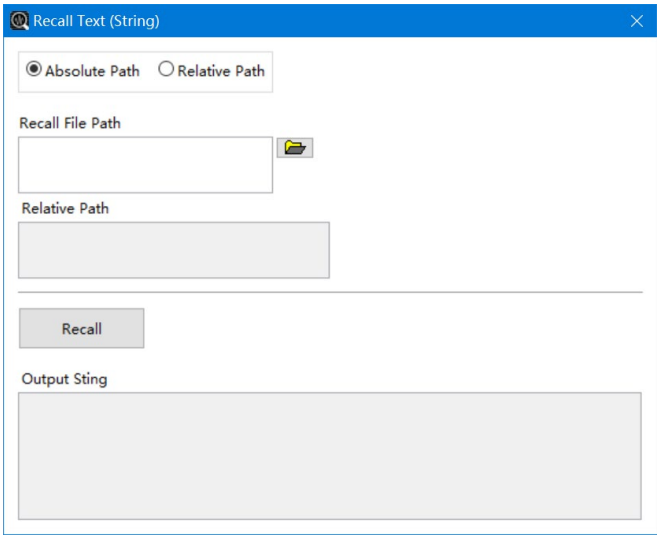


Figure 4.2.11.6 Recall Text (String)

4.2.12 Load Custom Vi instructions

Load Custom Vi include such steps shown in Figure 4.2.12

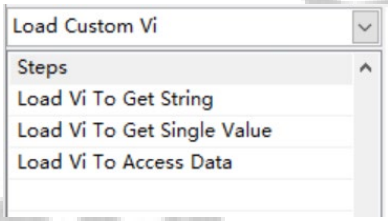


Figure 4.2.12 Load Custom Vi

4.2.12.1 Load Vi To Get String

Insert this step, double click step will show interface in Figure 4.2.12.1

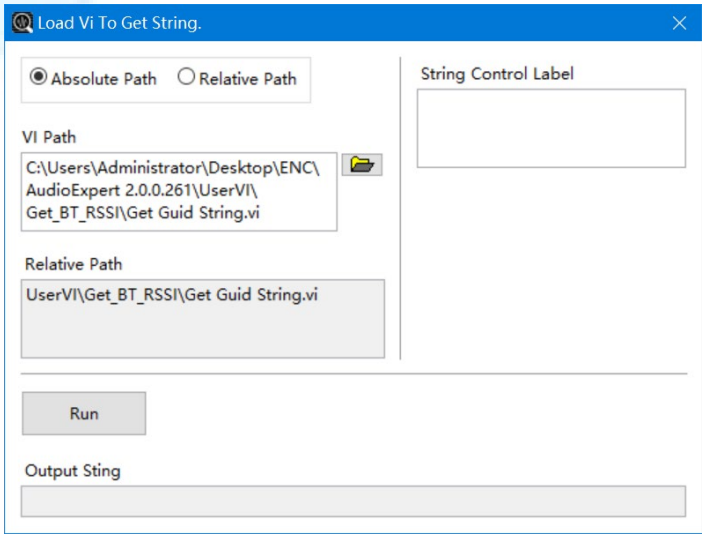


Figure 4.2.12.1 Load Vi To Get String

4.2.12.2 Load Vi To Get Single Value

This funciton is designed for load Vi to get single value, the interface is similar to 4.2.12.1.

4.2.12.3 Load Vi To Access Data

Insert “Load Vi To Access Data” step, double click step will show interface inFigure 4.2.12.3.

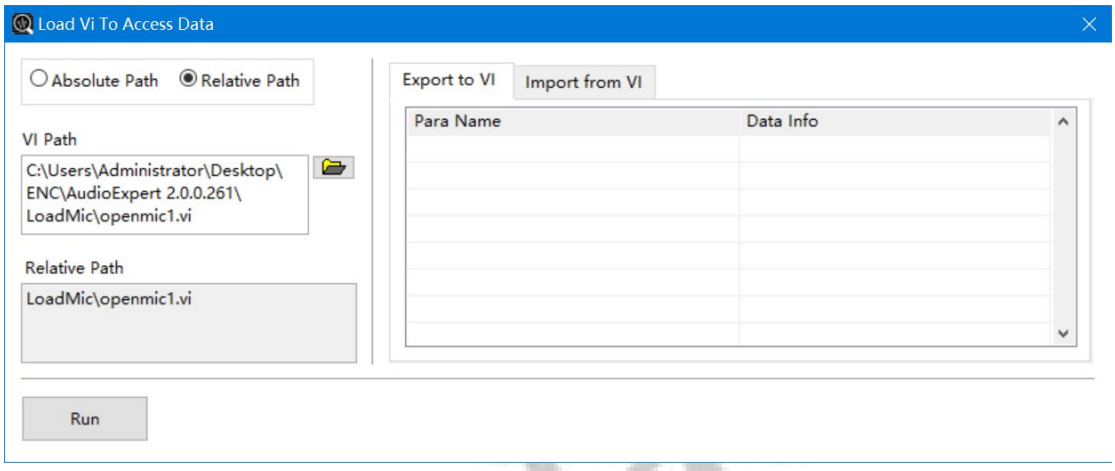


Figure 4.2.12.3 Load Vi To Access Data

4.2.13 Display instructions

Display include such steps shown inFigure 4.2.13

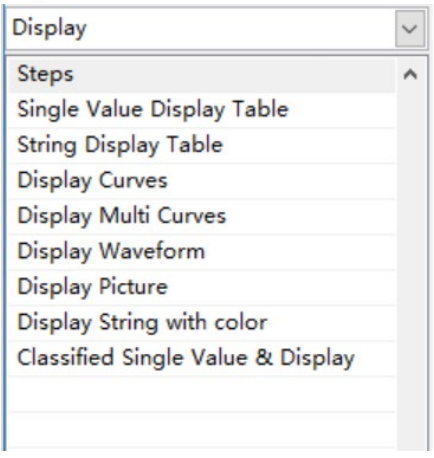
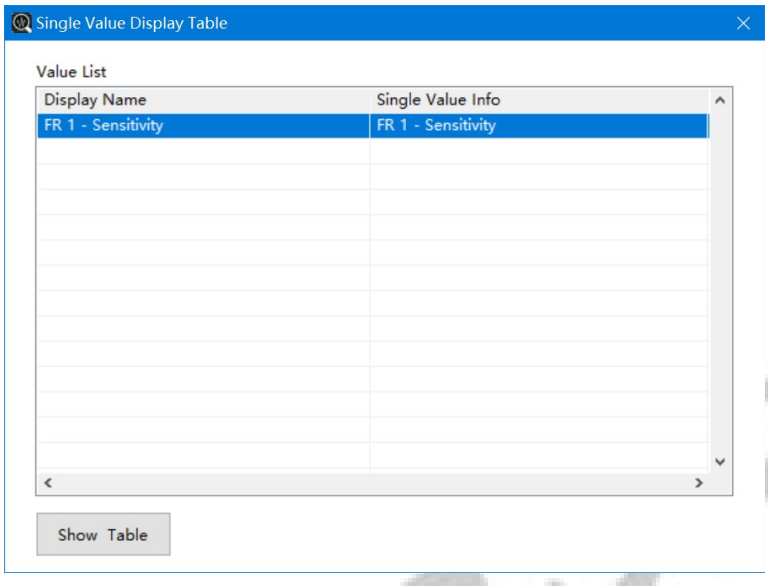


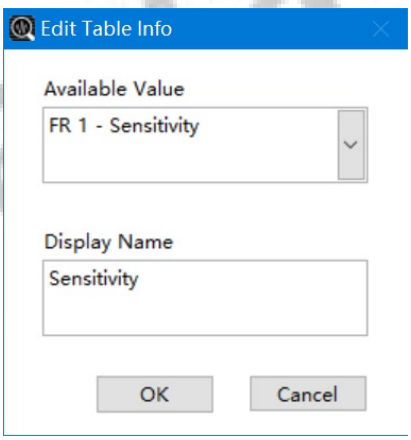
Figure 4.2.13 Display

4.2.13.1 Single Value Display Table

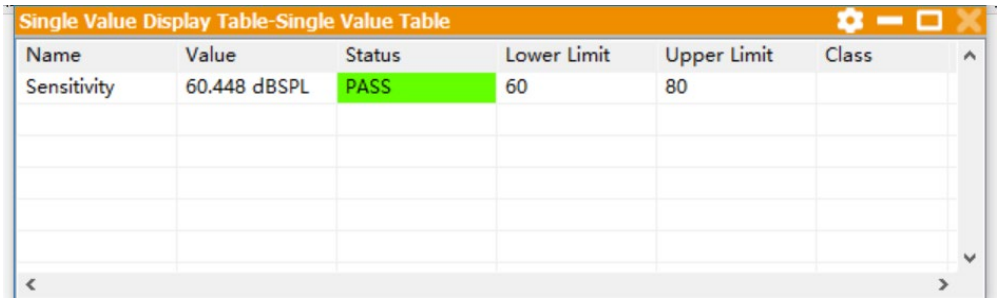
Insert “Single Value Display Table” step, double click step will show interface in Figure 4.2.13.1. You can add, edit and delete single value to show in table.



a、setting



b、edit / add



c、display

Figure 4.2.13.1 Single Value Display Table

4.2.13.2 String Display Table

This step is show string in the table, detail is similar to 4.2.13.1Single Value Display Table.

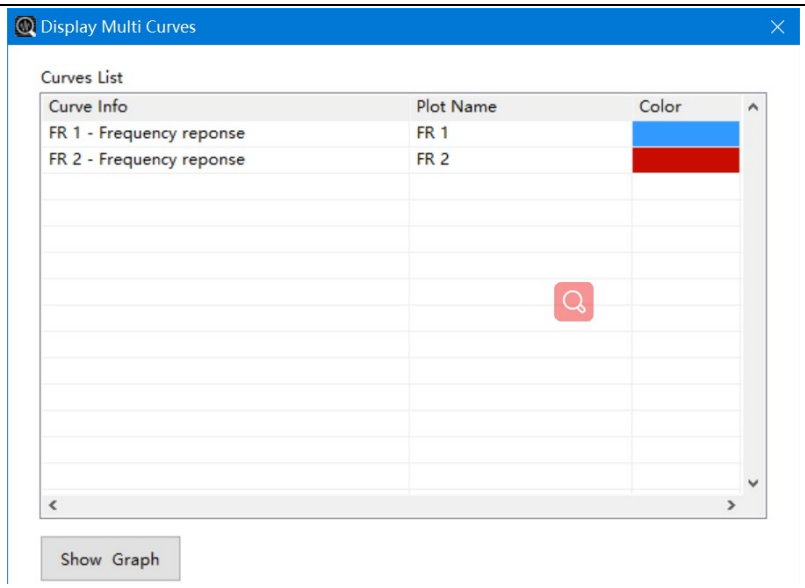
4.2.13.3 Display Curves

Insert “Display Curves” step, double click step will show interface in 4.2.13.3

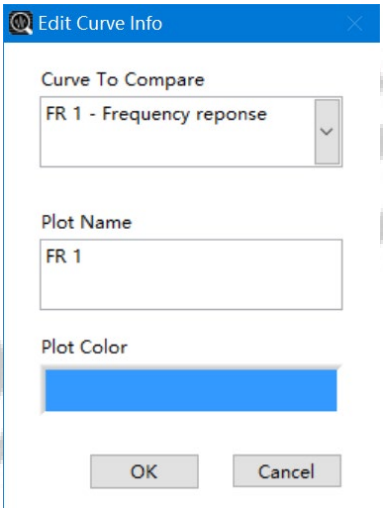
4.2.13.3 Display Curves

4.2.13.4 Display Multi Curves

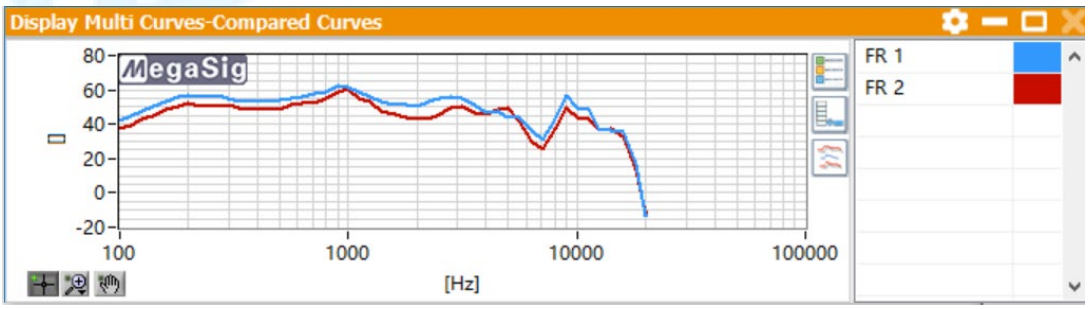
Insert “Display Multi Curve” step, double click step will show interface in Figure 4.2.13.4. You can add, edit and delete curves to show, at the same time, you can also customize the curves color.



a、setting



b、edit / add



c、display

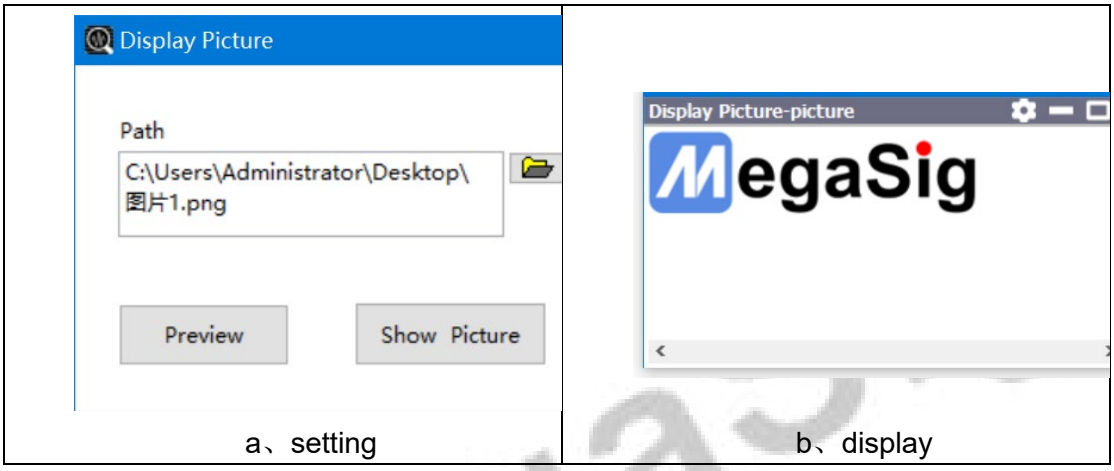
Figure 4.2.13.4 Display Multi Curves

4.2.13.5 Display Waveform

This function is designed for show waveform, the detail is similar to 4.2.13.3Display Curves.

4.2.13.6 Display Picture

Insert “Display Picture” step, double click step will show interface in Figure 4.2.13.6. You can add picture to show in UI.

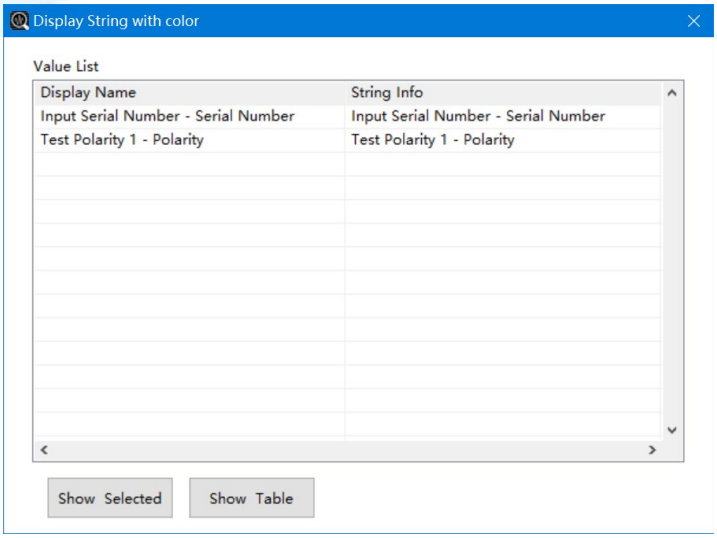


a、setting b、display

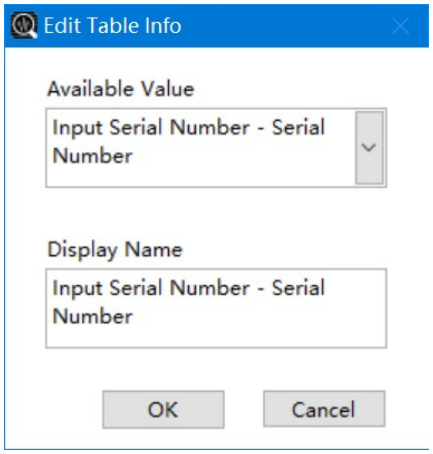
Figure 4.2.13.6 Display Picture

4.2.13.7 Display String with color

Insert “Display String with color” step, double click step will show interface inFigure 4.2.13.7. You can add, edit and delete string to show in table, at the same time, you can also customize the display color.



a、setting



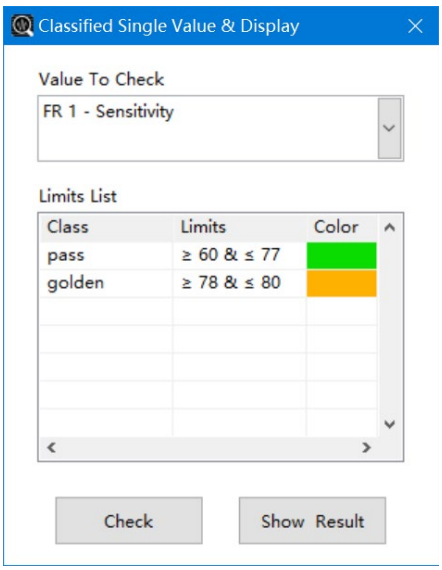
b、edit / add

c、display

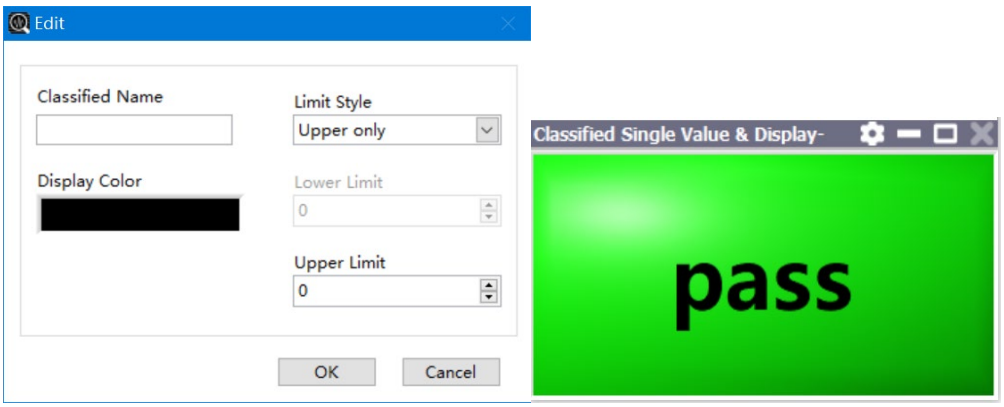
Figure 4.2.13.7 Display String with color

4.2.13.8 Classified Single Value & Display

Insert “Classified Single Value & Display” step, double click step will show interface in Figure 4.2.13.8. This step is designed for classified single, you can add, edit and delete class, test single value result will auto classify.



a、 setting



b、edit / add　　c、display

Figure 4.2.13.8 Classified Single Value & Display

4.2.14 ANC Tool

When selecting the ANC Tool, the general ANC chip supported by the software is shown in Figure 4.2.14.

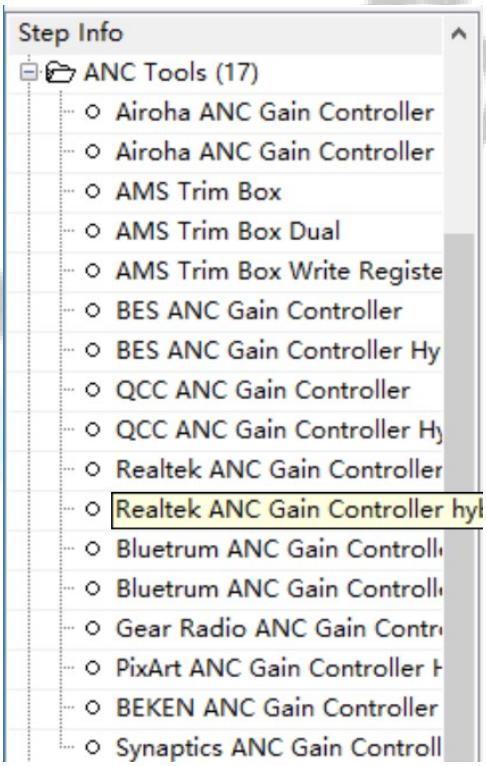


Figure 4.2.14 ANC Tool

4.2.14.1 Airoha ANC Gain Controller

Insert “Airoha ANC Gain Controller” step, double click step will show interface in Figure 4.2.14.1. This function is designed for auto-trimming FF/FB or monitor ANC earphone’s gain, based on Airoha chip-set, Airoha is an MTK brand which can provide ANC chip-set.

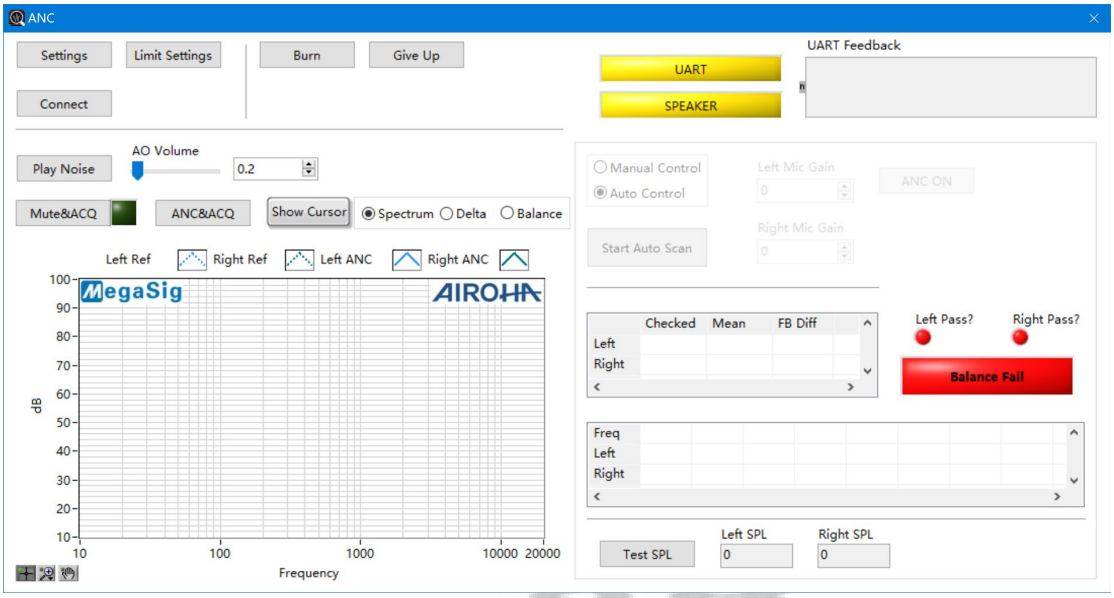


Figure 4.2.14.1 Airoha ANC Gain Controller

Left side of interface

Settings：It consists of ten parts, described in the following documentation

Limit Settings：this button can be settings reference limit, ANC limit and monitor limit.

Dump：Read the value in the chip register

Connect：connect earphone. For earphones that require SPP communication, the bluetooth dongle is required to SPP connect before "connecting" here.

Play Noise：noise can be set in “settings”

Mute&ACQ：PNC(passive noise cancellation) test, turn off ANC function and acquisition data

ANC&ACQ：ANC test, open ANC function and acquisition data

Spectrum：show ANC and PNC curve.

Delta：show ANC add PNC noise cancellation capability curve

Right side of interface

UART：Headset connection status display. After the headset is successfully connected, the panel turns green.

Manual Control：Manual input gain to debugging

Auto Control：Auto search gain through software Settings

Checked：show the max noise cancellation at the current gain

Mean：show the mean noise cancellation at the current gain

4.2.14.1.1Settings - Parameters

Parameters is shown in Figure 4.2.14.1.1

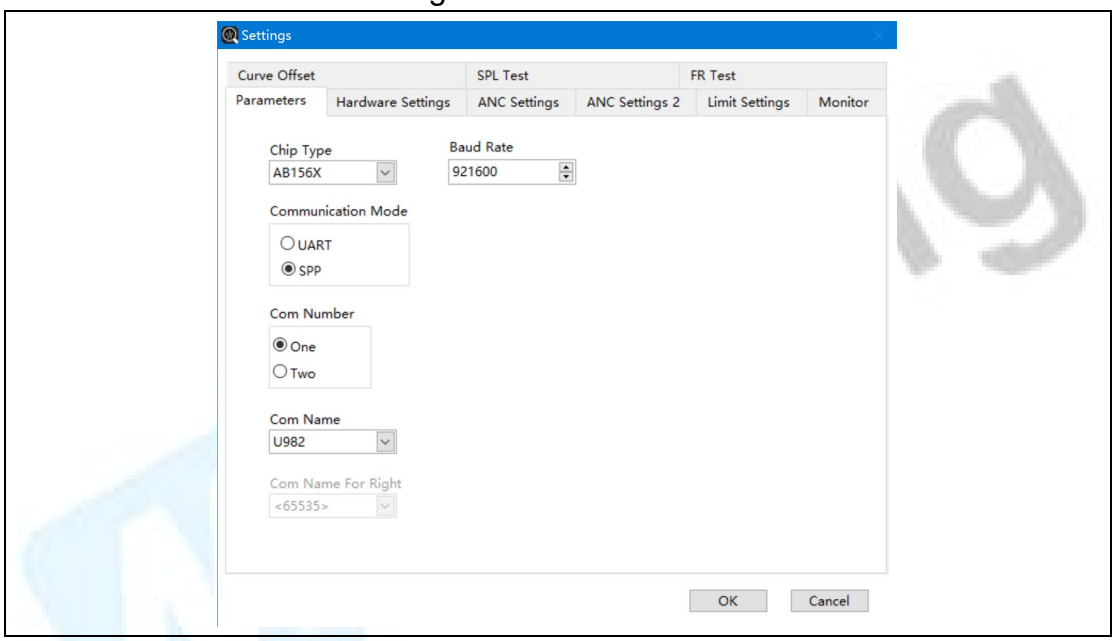


Figure 4.2.14.1.1 Parameters

Chip：Choose according to the chip of earphone

Baud Rate：According to the baud rate of the communication serial port, if using Bluetooth communication, according to the Baud rate of the Bluetooth dongle to fill in

Communication Mode: according to the transmission mode of the filter to choose."UART" general mode;"SPP" Bluetooth wireless data transmission mode

Com Name: to invoke communication serial port, it needs to be configured in advance in "Settings - Com Port Settings". The configuration method is referred to as “2.3Com Port Settings”

Com Number：The corresponding number is selected according to whether the earphones are paired. Unpaired earphones should have two serial ports.

4.2.14.1.2Settings - Hardware Settings

Hardware settings is shown in figure

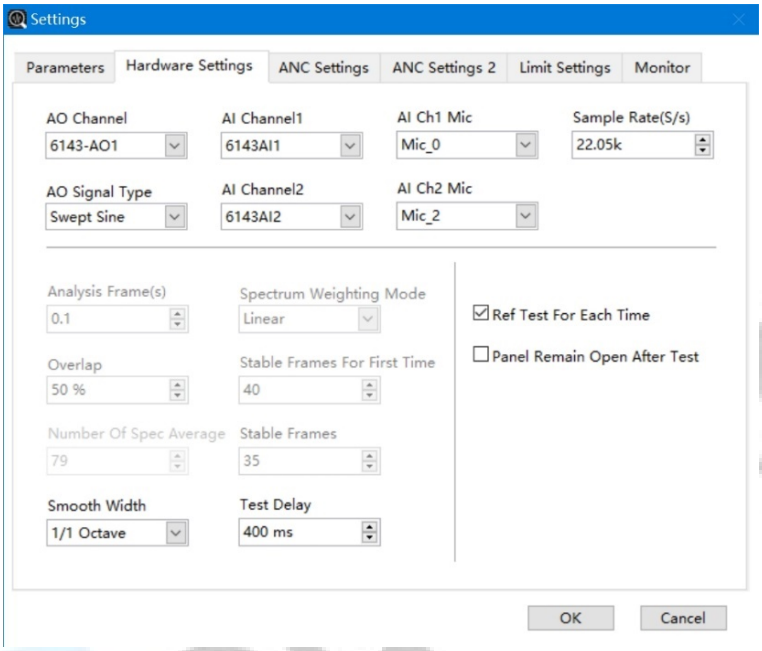


Figure 4.2.14.1.2 Hardware Settings

This interface is used to setting output and input information. “AI Ch1 Mic” is sensitivity of the corresponding channel sensor.

4.2.14.1.3Settings – ANC Settings

ANC Settings 1 is shown in figure

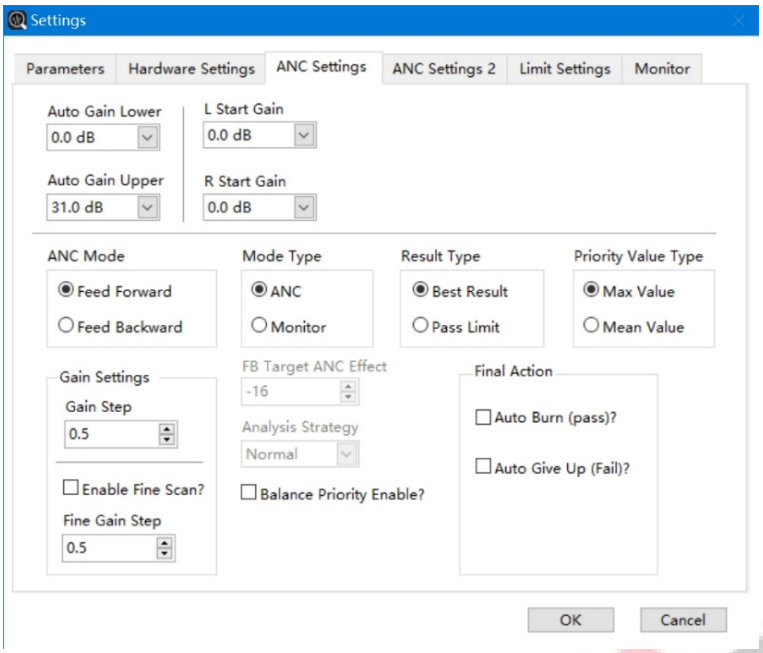


Figure 4.2.14.1.3 ANC Settings 1

This interface is used to setting required of auto search gain. You can settings auto search gain range, ANC mode, mode type and result best, etc.

Result Type：the “best result” is search best gain within the setting range; the “pass limit” is end the test as soon as pass the set limit.

Priority Value Type：noise cancellation max or mean width priority.

Gain settings: here can setting step width of the search gain.

Auto Burn (pass)? ：end the test pass will be auto burn

Auto Give Up (Fail)? ：end the test fail will be auto give up burn

4.2.14.1.4Settings – ANC Settings2

ANC Settings 2 is shown in figure

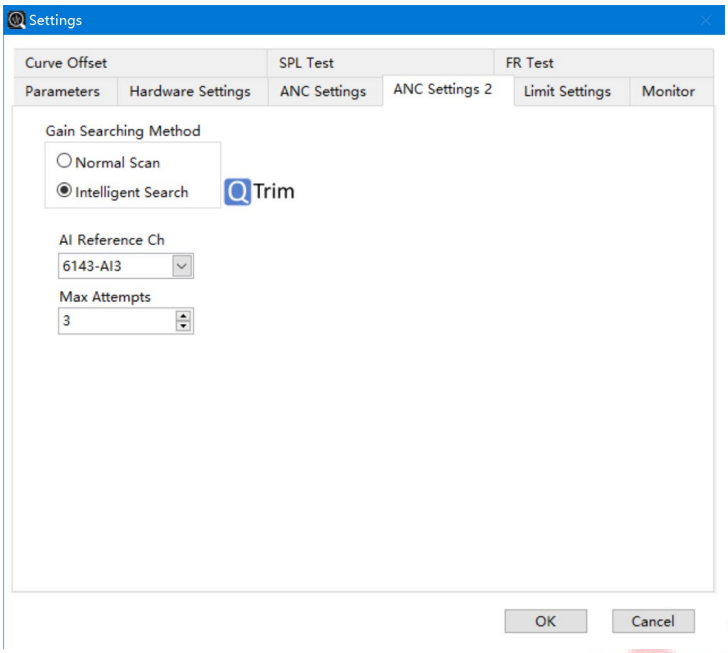
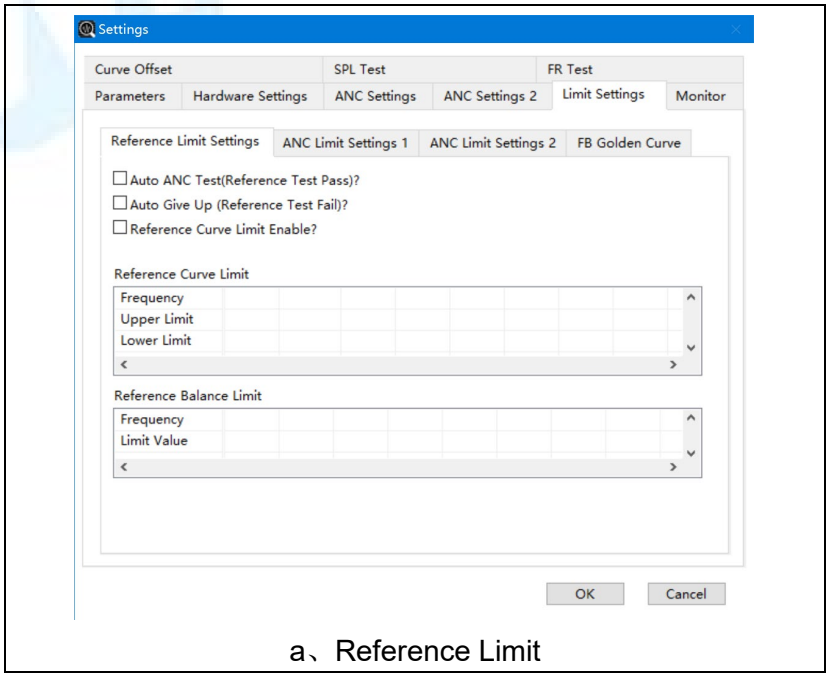


Figure 4.2.9.1.4 ANC Settings 2

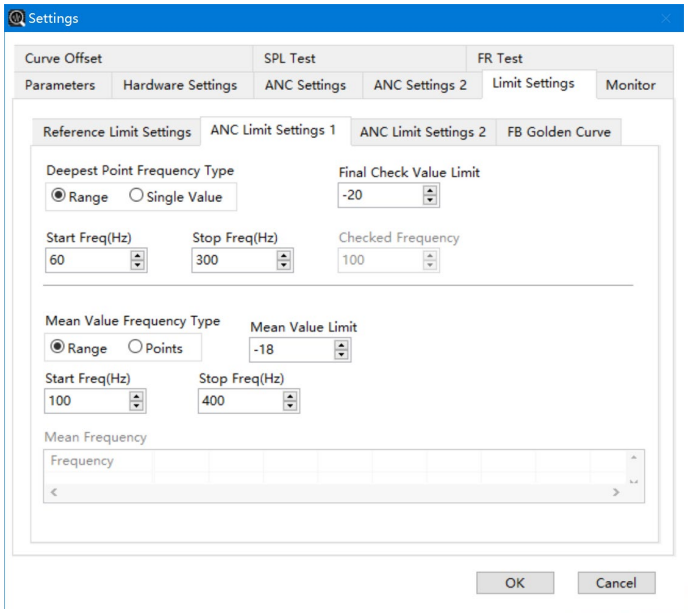
Here have two method to search gain, the first “Normal” method is use “ANC Settings”; “Intelligent Search” method uses the Megasig exclusive algorithm: QTrim algorithm, can fast search gain value. Use “Intelligent Search”, the FF/FB max calibration speed 3 sec; Hybrid max calibration speed 6 sec.

4.2.14.1.5Settings – Limit Settings

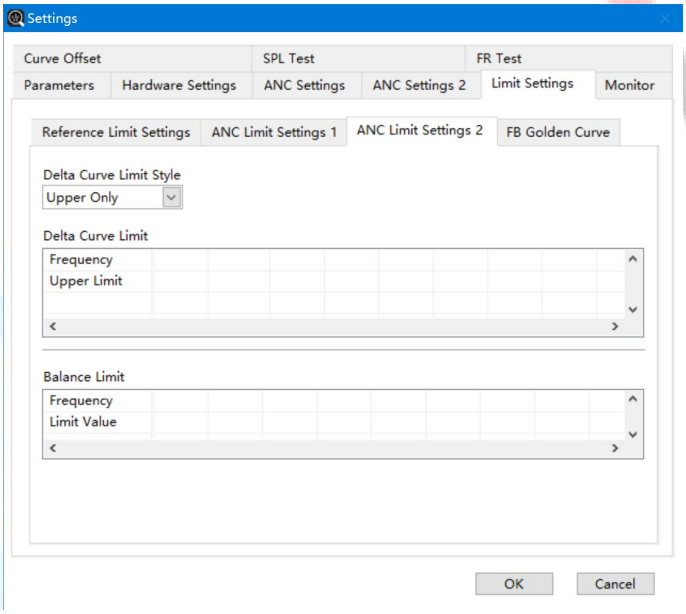
Limit Settings is shown in figure



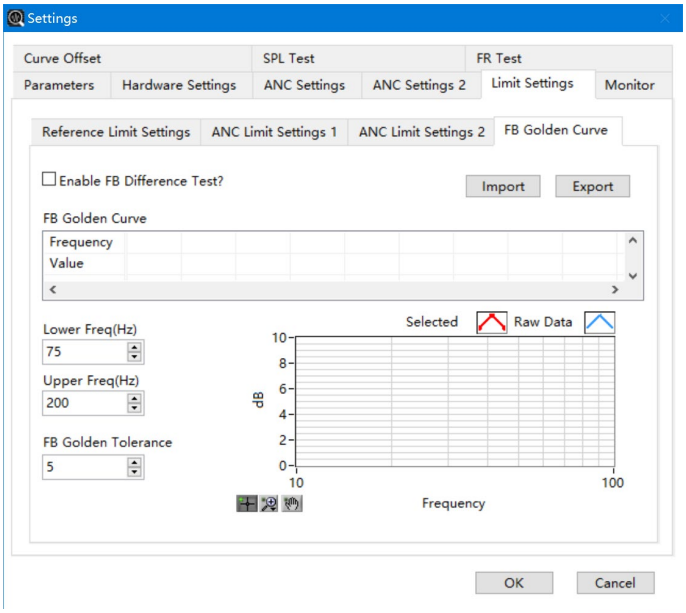
a、Reference Limit



b、ANC Limit 1



c、ANC Limit 2



d、FB Golden Curve

Figure 4.2.14.1.5 settings-limit

Reference Limit

Here is add PNC test limit, you can settings relevant parameter.

Reference Curve Limit：here recall 4.2.14.1.10 “Limit Settings-Reference Curve”, you can enter it manually in the form.

Reference Balance Limit：you can enter it manually in the form.

ANC limit Value

Checked Frequency Type：here is set deepest noise cancellation limit. In the range, a frequency reach the set value will be pass; or specify a single frequency reach the set value.

Mean Frequency Type： here is set mean noise cancellation limit. In the range, frequency all reach the set value will be pass; or specify some frequency reach the set value will be pass.

ANC limit Curve

Delta Curve Limit：here recall 4.2.14.1.10 “Limit Settings-ANC limit”

Balance Limit：ANC Balance, you can enter it manually in the form.

FB Golden Curve

This is to control the curve shape of the FB ANC earphones. With the imported samples, the software automatically searches for the test results that are most similar to the sample curve.

This is required when the earphones have FB ANC and is a Airoha chip solution.

4.2.14.1.6 Settings - Monitor

Monitor module, now only AMS chip open adjustable.

4.2.14.1.7 Settings - Curve Offset

Curve Offset is shown in figure

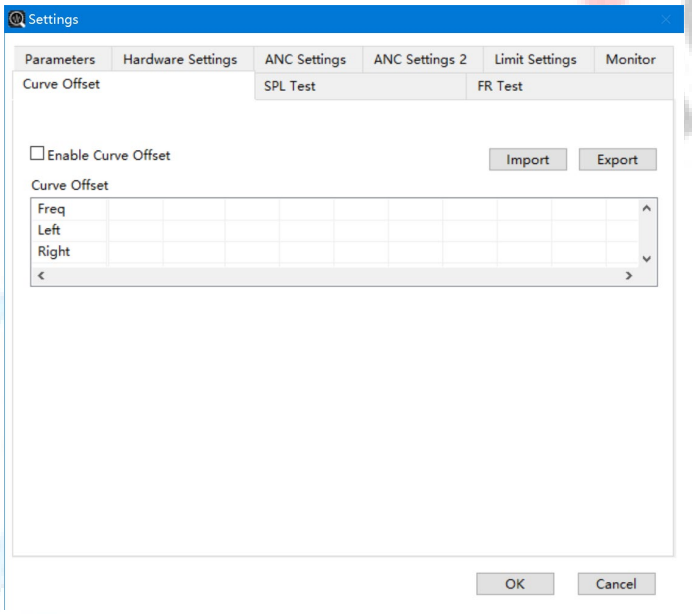


Figure 4.2.14.1.7 Curve Offset

Curve Offset: the compensation of the noise sound. Called by import.

4.2.14.1.8 Settings – SPL Test

SPL Test is shown in figure

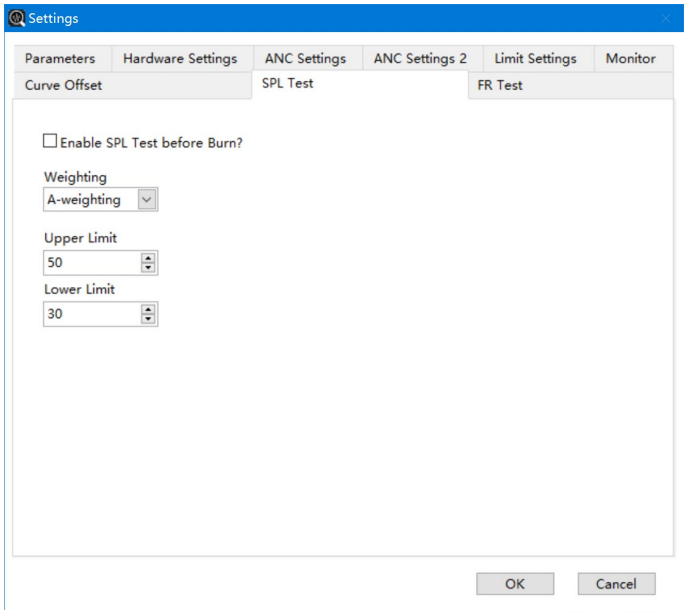


Figure 4.2.14.1.8 SPL Test

After the check is enabled, the ANC pressure level test will be conducted before gain burning.

4.2.14.1.9 Settings – FR Test

FR Test is shown in figure

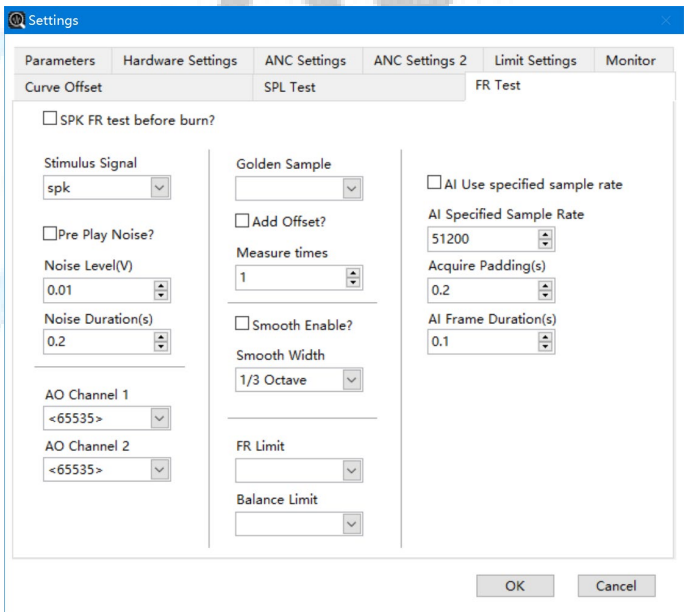


Figure 4.2.14.1.9 FR Test

After the check is enabled, the ANC FR test will be conducted before gain burning. The content of this interface is similar to the 4.2.6.2 frequency response test sequence module.

4.2.14.1.10 Limit Settings

In the ANC edit interface（as shown in Figure 4.2.14.1），Click "Limit Setting", and the interface as shown in Figure 4.2.9.1.7

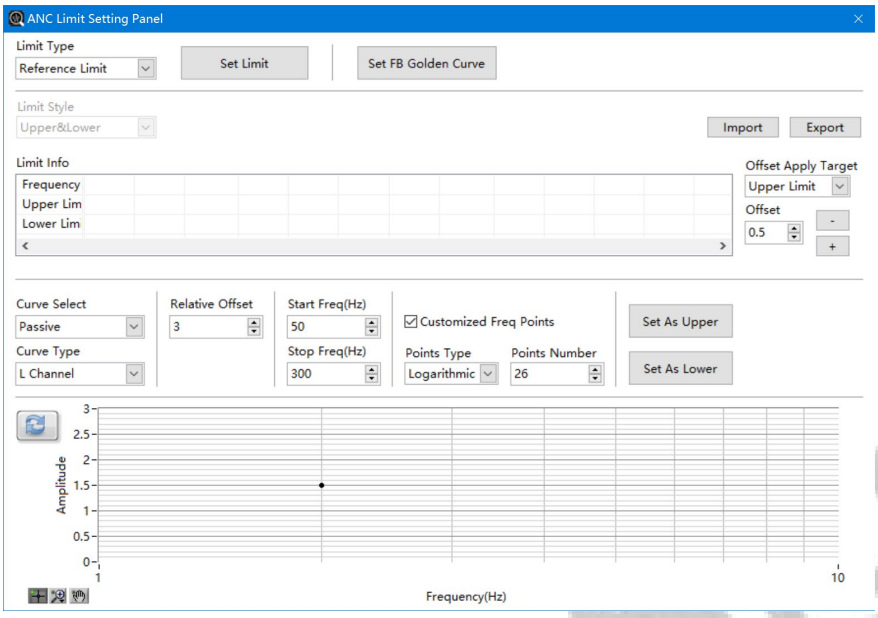


Figure 4.2.14.1.10 Limit Setting

This function can be setting limit curve, choose limit style, you can recall the curve to setting limit or manually entering. The setting method is basically the same as 2.5 "limit setting".

Customized Freq Points：if don't check, The limit is the number of frequency points given by the system.

Limit Type：choose limit save path, click "Set Limit" will save limit.

4.2.14.2 Airoha ANC Gain Controller Hybrid

This function is designed for auto-trimming Hybrid mode ANC earphone's gain, based on Airoha chip-set. The other Settings are consistent with the previous sequence (as above 4.2.14.1).

4.2.14.3 AMS Trim Box

Insert step, double click step will show interface in Figure 4.2.14.3

This function is designed for ANC earphone (based on AMS chip-set, AMS is an Austria company which can provide ANC chip-set) auto gain-trim in production test. This step is special for Feed forward, Feed back mode earphone.

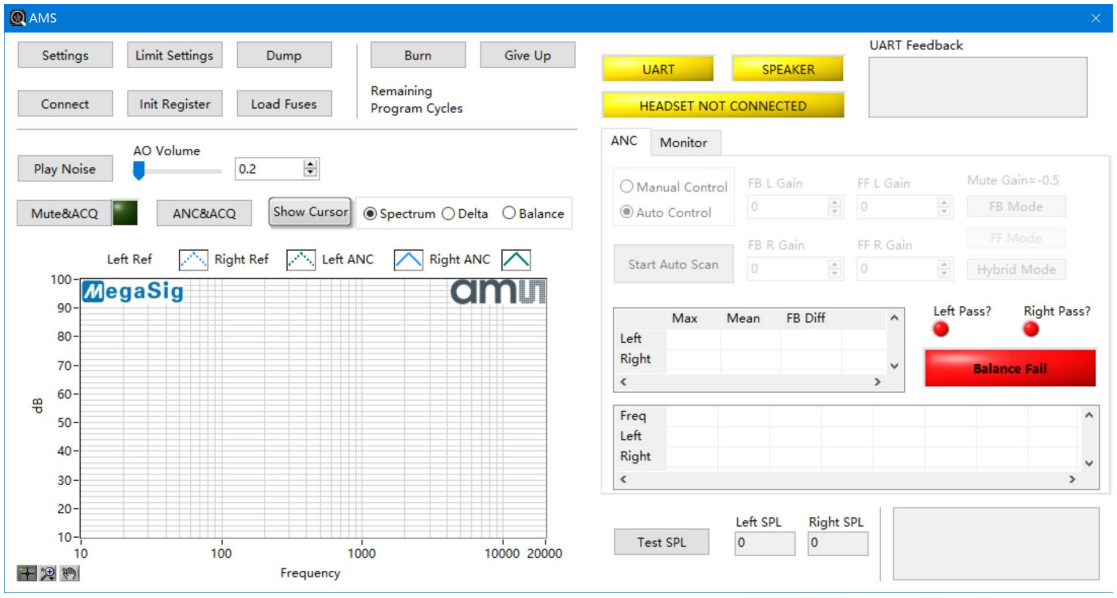


Figure 4.2.14.3 AMS Trim Box

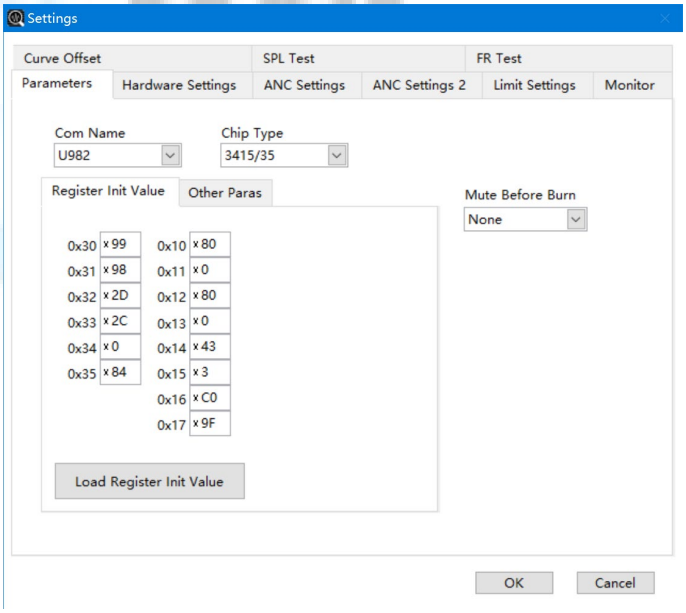
Dump：Read the value in the chip register

Load Fuses：Gets the current burn value from the earphone

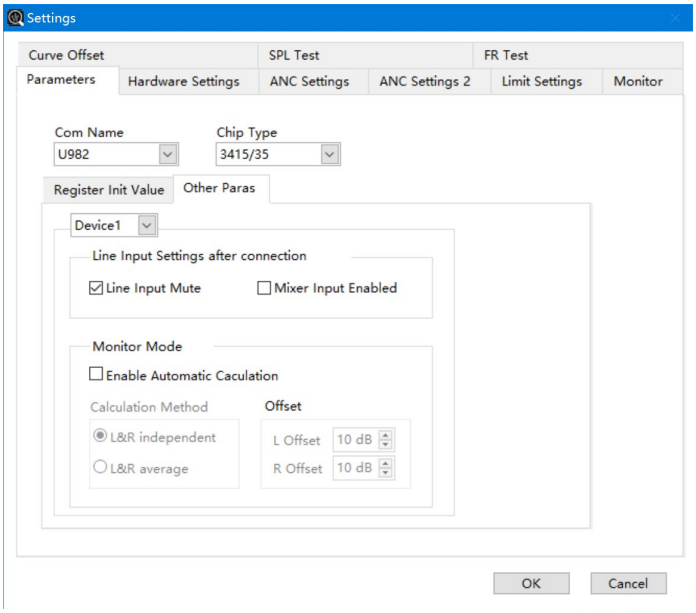
Remaining Program Cycles：AMS chip remaining burn time

The most details are similar to 4.2.14.1

4.2.14.3.1Settings - Parameters



a、Parameters



b、Other

Figure 4.2.14.3.1 Parameters

Before test, need to load or write register init value.

4.2.14.3.2Settings -Monitor

“settings”- “Monitor” is shown in figure

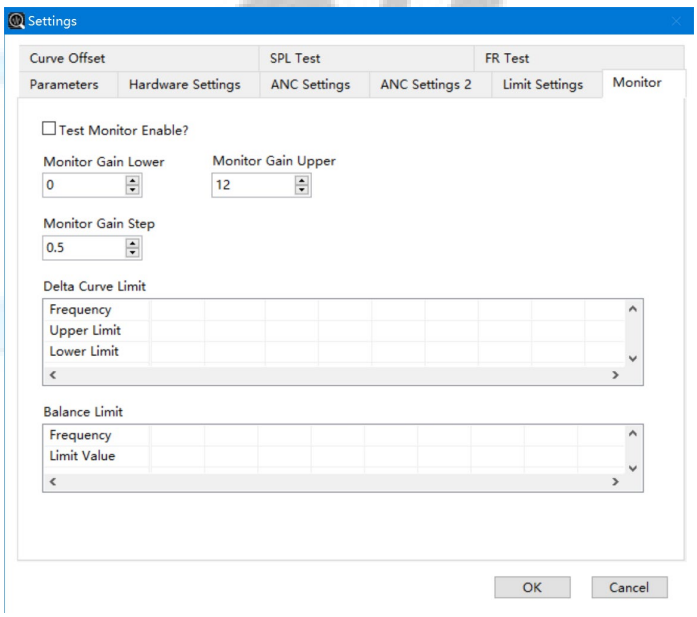


Figure 4.2.14.3.6 Monito

Delta Curve Limit：here recall “Limit Settings-Monitor limit”

Balance Limit：you can enter it manually in the form.

The other Settings are consistent with the previous sequence (as above 4.2.14.1).

4.2.14.4 AMS Trim Box Dual

This function is designed for auto-trimming Hybrid mode ANC earphone's gain, based on AMS chip-set. The most details are similar to 4.2.14.3, note the difference in parameters settings.

4.2.14.4.1 Parameters settings

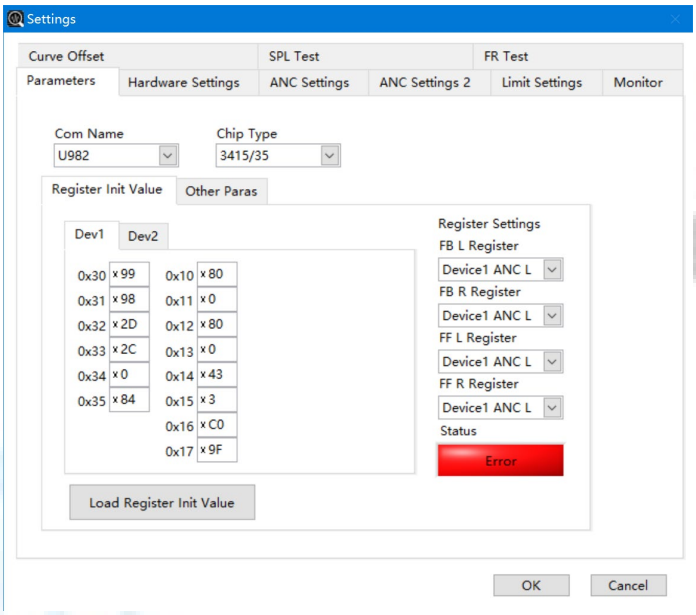


Figure 4.2.14.4.1 parameters settings

Register Settings：AMS hybrid have two chips, so need to differentiated FF/FB register.

The other Settings are consistent with the previous sequence (as above 4.2.14.1).

4.2.14.5 AMS Trim Box Write Register Only

Insert "AMS Trim Box Write Register Only" step, double click step will show interface in Figure 4.2.14.5

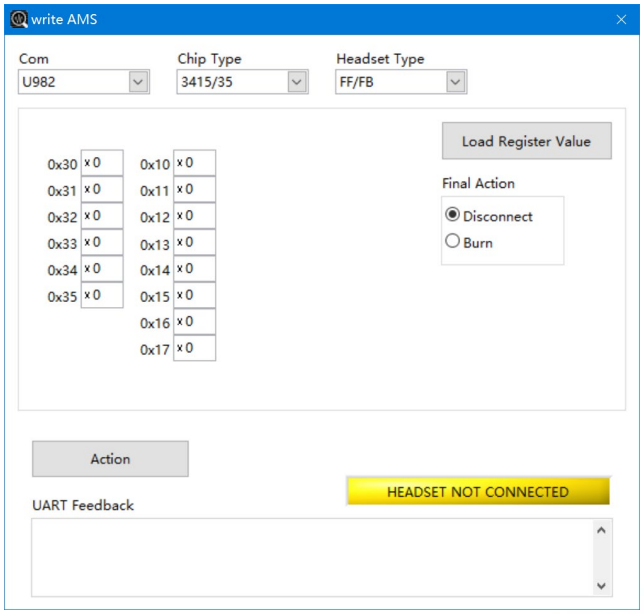


Figure 4.2.14.5 AMS Trim Box Write Register Only

4.2.14.6 BES ANC Gain Controller

Insert “BES ANC Gain Controller” step, double click step will show interface in Figure 4.2.14.6. This function is designed for auto-trimming ANC earphone’s gain, based on BES chip-set, BES is a Chinese company which can provide ANC chip-set. The most details are similar to 4.2.14.1

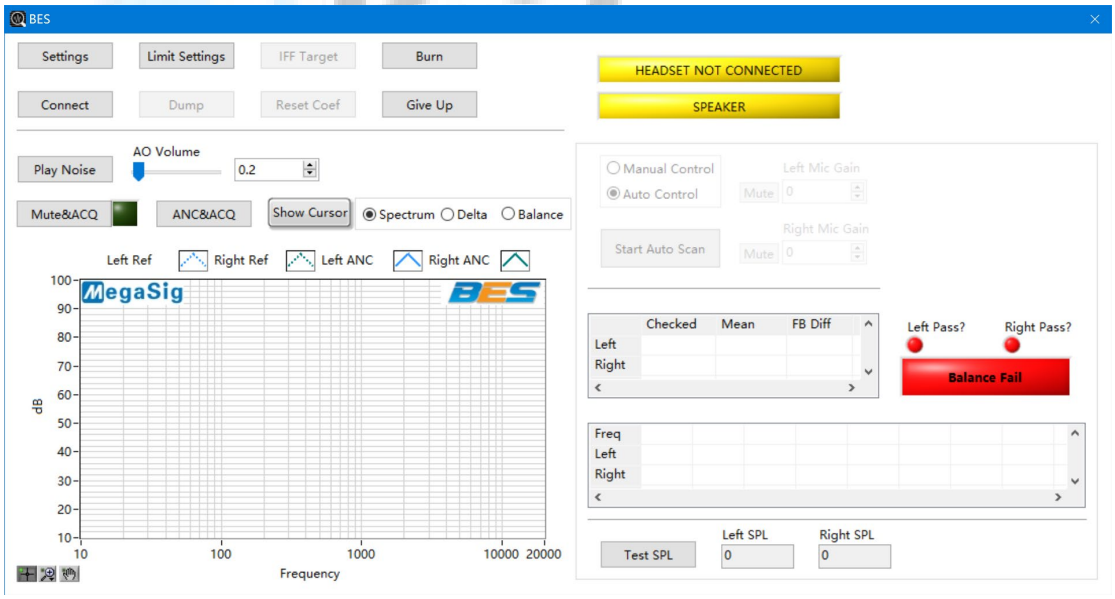
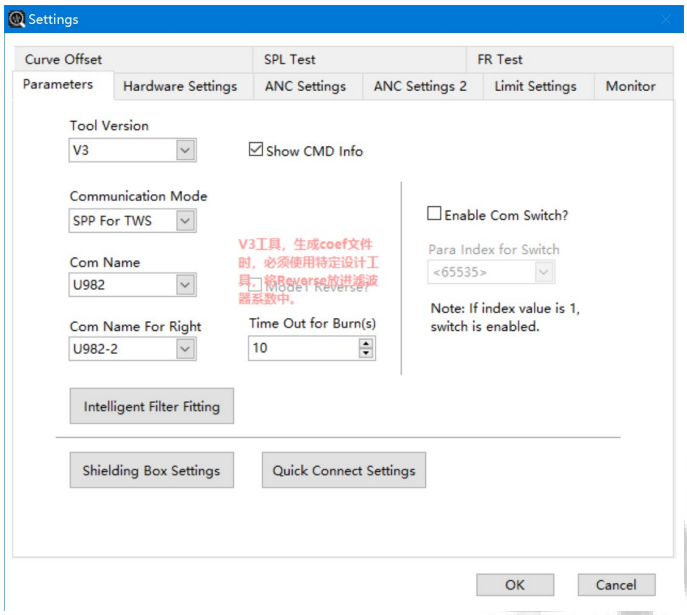


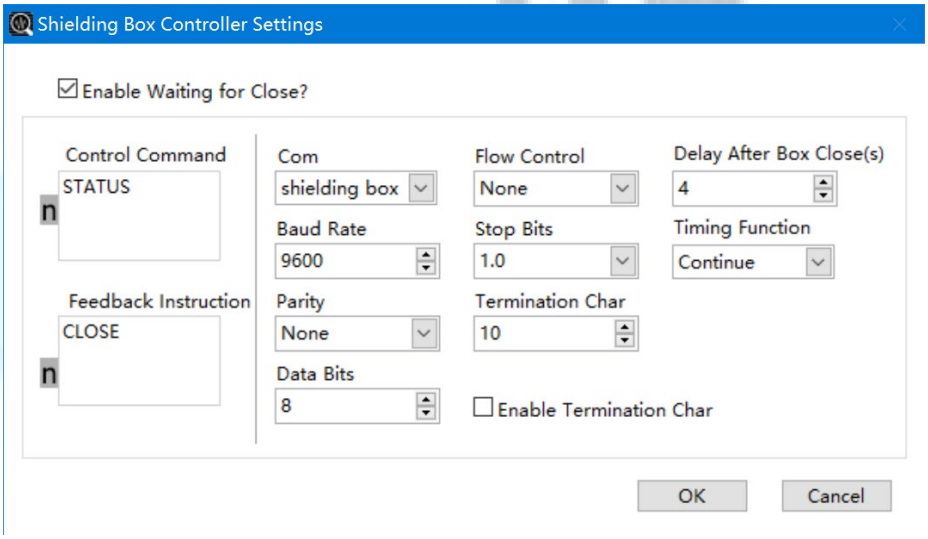
Figure 4.2.14.6 BES ANC Gain Controller

4.2.14.6.1 BES Parameters setting

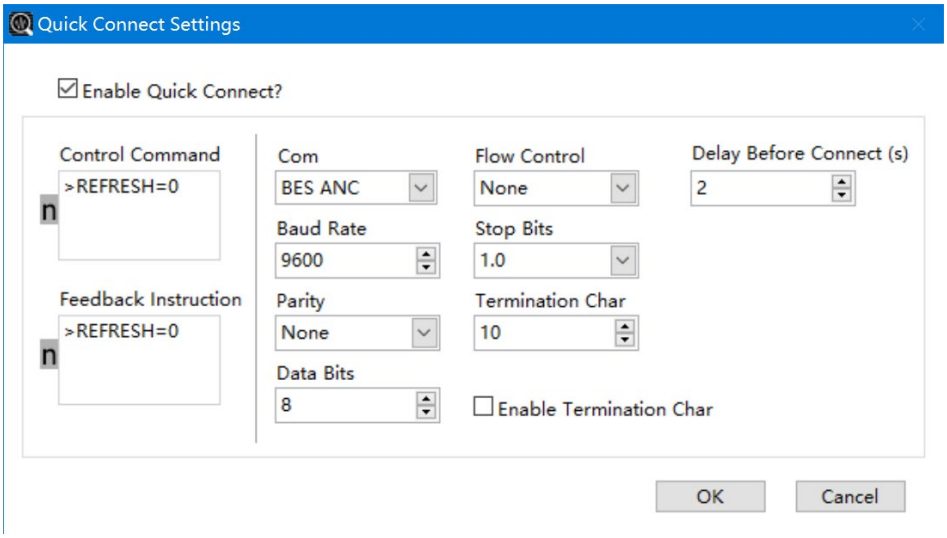
“Settings - Parameters” is show interface in Figure 4.2.14.6.1. Other settings details are similar to 4.2.14.1.



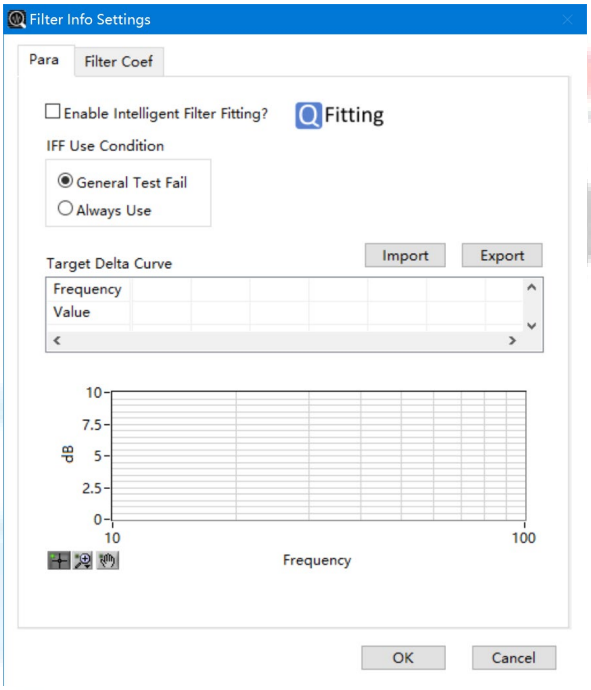
a、Parameters



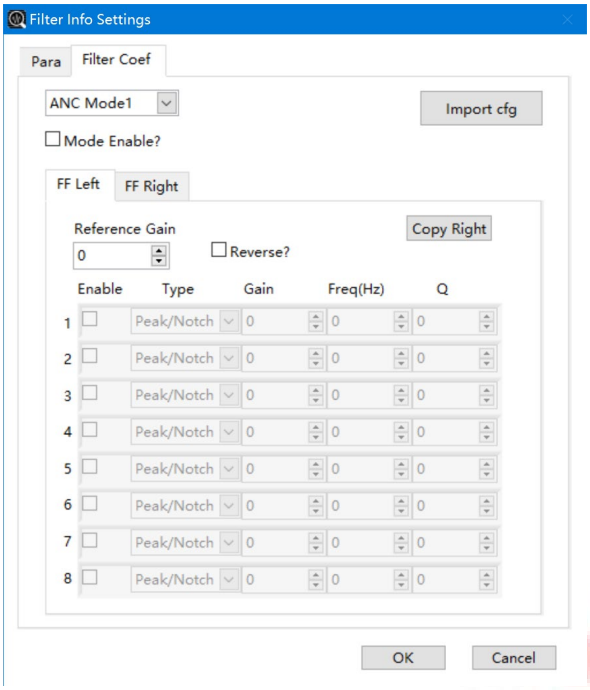
b、Shielding Box Settings



c、Quick Connect Serrings



d、Filter-Para



d、Filter-Coef

Figure 4.2.14.6.1 BES Parameters Settings

Parameters

Choose BES Chip Version, the AudioExpert folder needs to have the corresponding version of the json file and bin file.

Shielding Box Settings

You can check whether to enable the shielding box wait off function.

The parameter and function settings are consistent with those described in 4.2.9.6

Quick Connect Serrings

You can check whether to enable the ANC fast connection function.

This module only corresponds to the earphones ANC connected through the USB serial port board. After this function is checked, 5V power can be automatically switched on, and ANC communication can be carried out by omits the press switch.

Filter Info Settings - Para

After checking "Enable Intelligent Filter Fitting", the enabling condition of QFitting algorithm can be selected.

General Test Fail: QFitting is performed after gain search fails.

Always Use: gain search is no longer carried out, and QFitting is carried out directly.

Target Delta Curve: ANC target curve

Filter Info Settings - Coef

Import cfg: Select the original filter file .Cfgv3, the parameters of the filter can be automatically imported.

ANC Mode selects different filter banks, and the values in the coefficient table are automatically read according to the .Cfgv3 file. By default, ANC Mode 1 is used for online filter fitting. After test, all fitting records with Mode checked are burned.

4.2.14.7 BES ANC Gain Controller Hybrid

This function is designed for auto-trimming Hybrid mode ANC earphone's gain, based on BES chip-set. The other Settings are consistent with the previous sequence (as above 4.2.14.6.1 and 4.2.14.1).

4.2.14.8 QCC ANC Gain Controller

This function is designed for auto-trimming ANC earphone's gain, based on QCC chip-set. The other Settings are consistent with the previous sequence (as above 4.2.14.1).

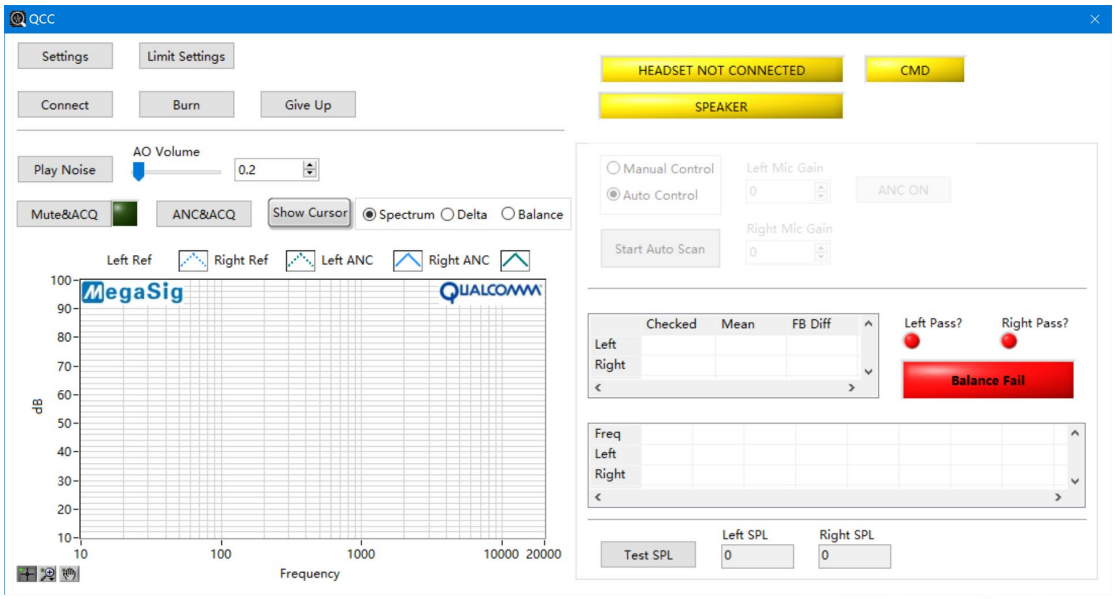


Figure 4.2.14.8 QCC ANC Gain Controller

4.2.14.9 QCC ANC Gain Controller Hybrid

This function is designed for auto-trimming Hybrid mode ANC earphone's gain, based on QCC chip-set. The other Settings are consistent with the previous sequence (as above 4.2.14.1).

4.2.14.10 Realtek ANC Gain Controller

This function is designed for auto-trimming Hybrid mode ANC earphone's gain, based on Realtek chip-set. The other Settings are consistent with the previous sequence (as above 4.2.14.1).

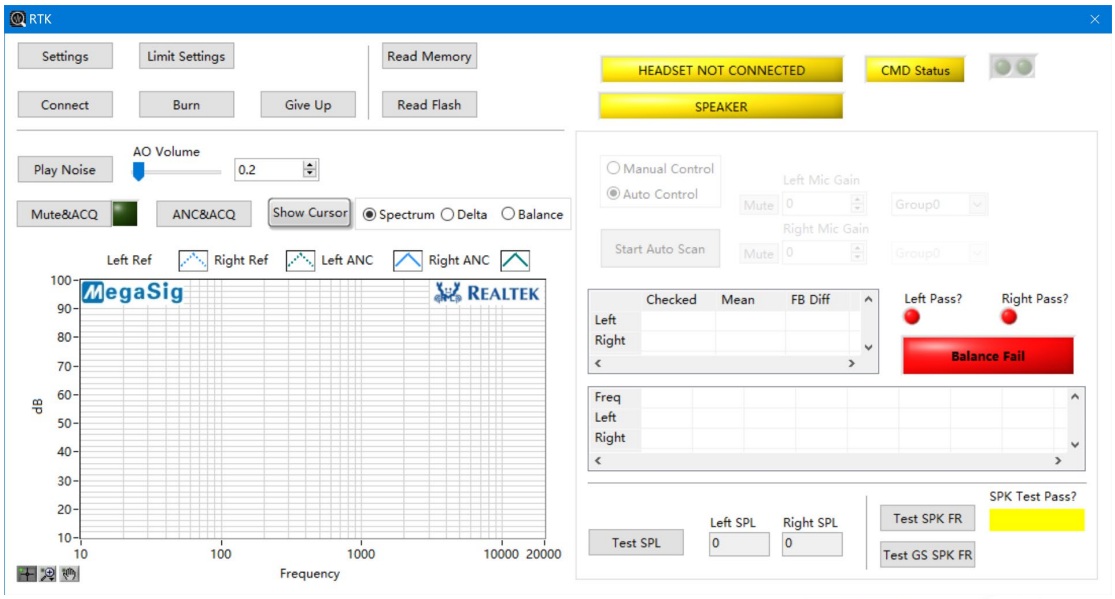


Figure 4.2.14.10 Realtek ANC Gain Controller

4.2.14.11 Realtek ANC Gain Controller Hybrid

This function is designed for auto-trimming Hybrid mode ANC earphone's gain, based on Realtek chip-set. The other Settings are consistent with the previous sequence

4.2.14.12 Other ANC

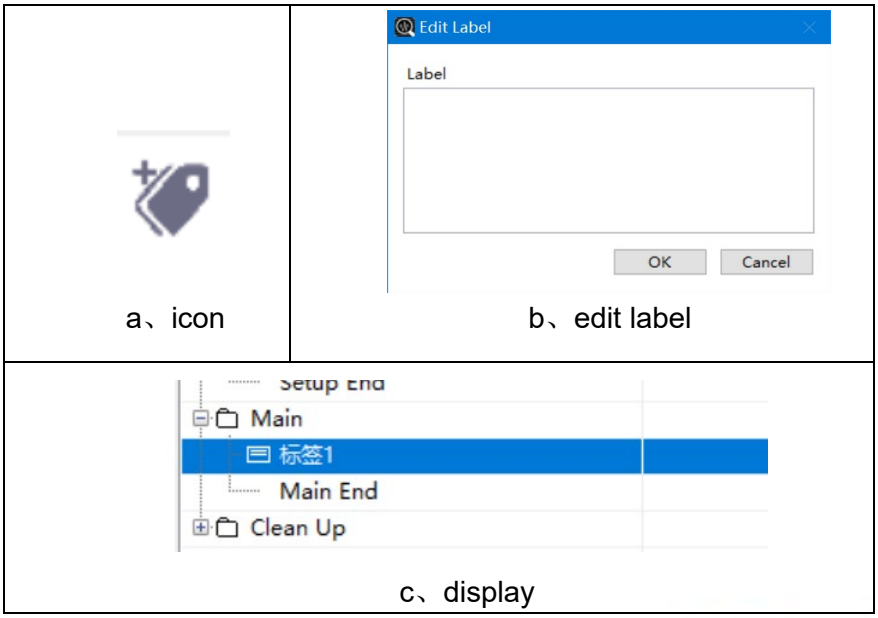
AudioExpert ANC Gain Controller interface is all consistent, except that different chips have different built-in instructions. The Settings are consistent with the previous sequence (as above 4.2.14.1).

4.3 Sequence Auxiliary Button

In the sequence interface (shown in Figure 4.0)，have six auxiliary button: Add Label, Add Group, Delete Item, Debugger, Results Info Alias Editor, Results Statistics Settings.

4.3.1 Add Label

In the sequence edit interface, click add label icon (shown in Figure 4.3.1 a), will popout edit label interface (shown in Figure 4.3.1 b), input label name in the "Label" box, click "ok" add successfully.



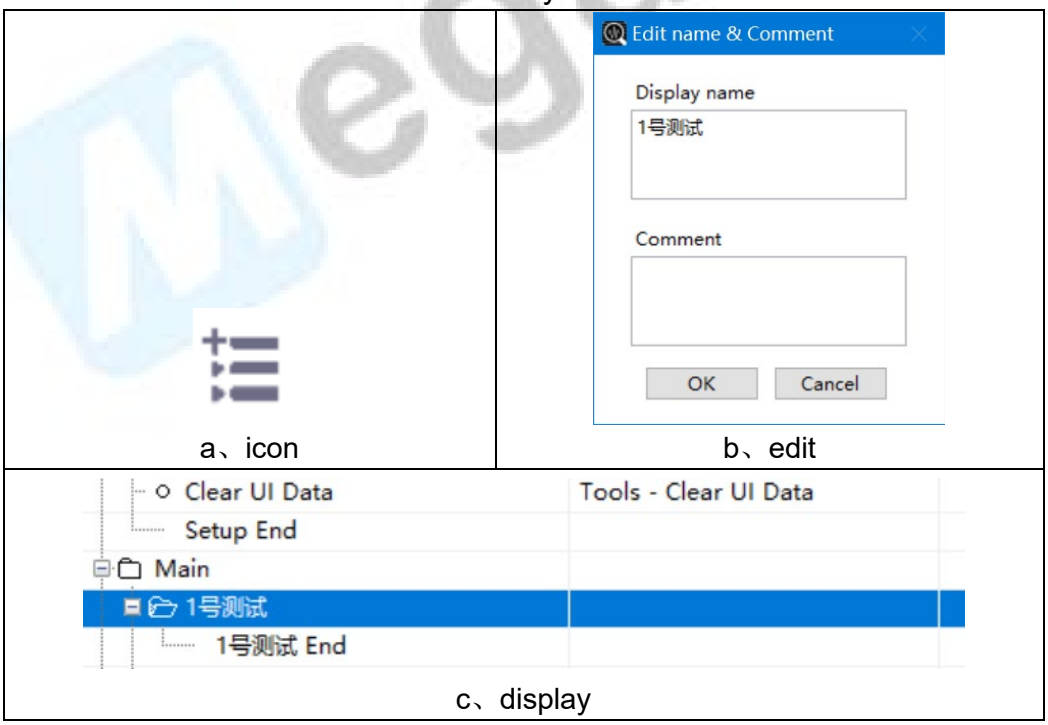
a、icon　　b、edit label

c、display

Figure 4.3.1 Add Label

4.3.2 Add Group

In the sequence edit interface, click add group icon (shown in Figure 4.3.2a), will popout edit interface (shown in Figure 4.3.1 b), input display name and then click “ok” add successfully.



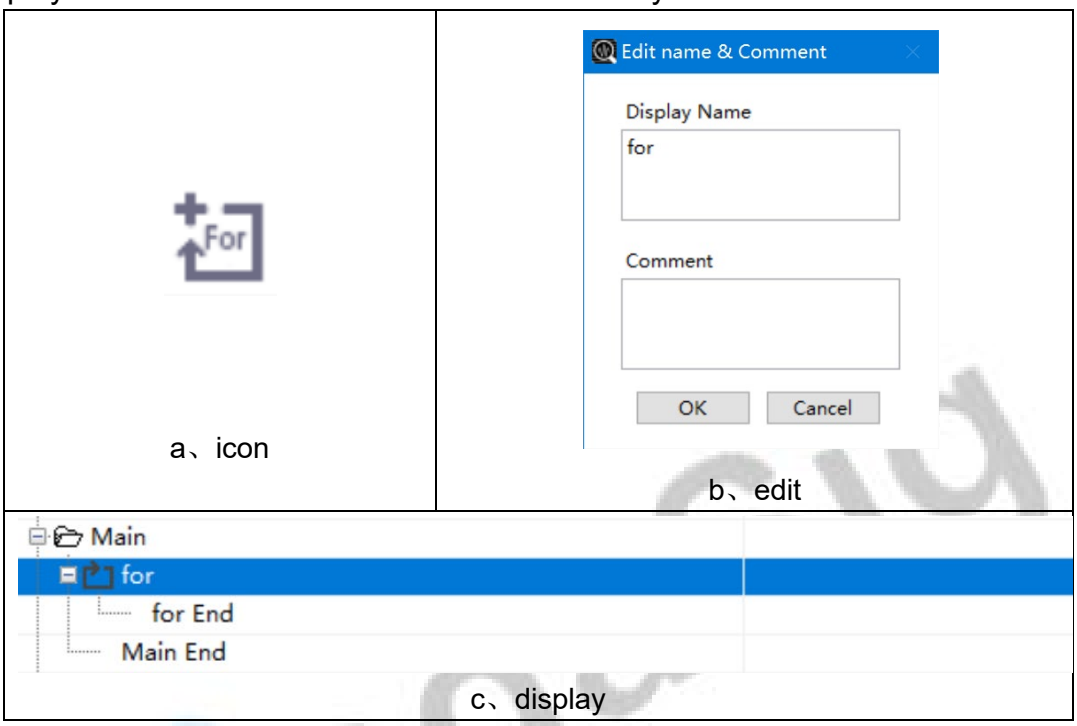
a、icon　　b、edit

c、display

Figure 4.3.2 Add Group

4.3.3 Add For Loop

In the sequence edit interface, click the Add For loop button(shown in Figure 4.3.3a), will popout edit interface (shown in Figure 4.3.3b)，input display name and then click “ok” add successfully.



a、icon

b、edit

c、display

Figure 4.3.3 Add For Loop

After inserting the For loop into the main sequence, you can customize the logic setting of the For loop as shown in Figure 4.3.3.1

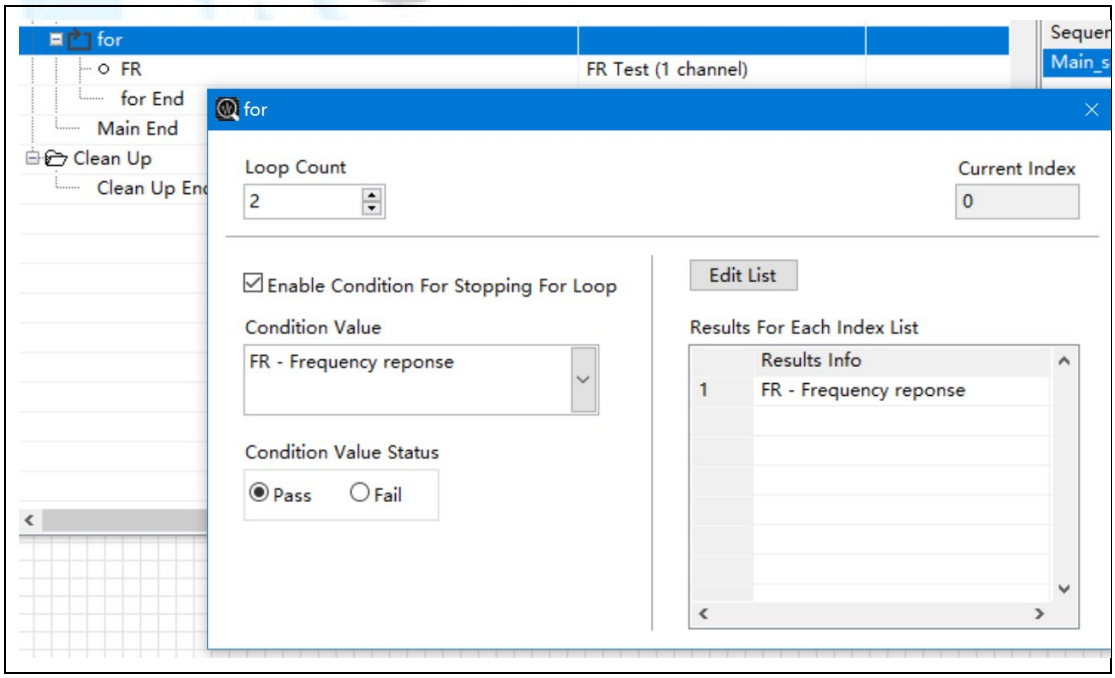


Figure 4.3.3.1

The “Loop Count” is set For the total number of loop all sequences in the For loop. When the stop condition is checked, the judgment of the condition statement can be run. When the condition value test succeeds or fails, the For loop can be stopped and the sequence test after the For loop can be carried out.

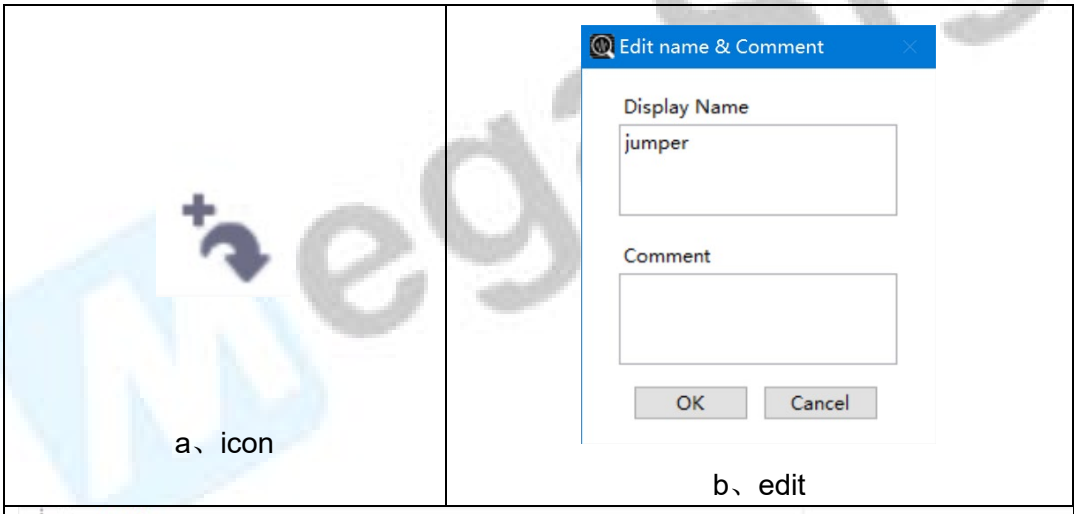
For example, in Figure 4.3.3.1, the frequency response is tested, and the loop count is twice. As set, there are two scenarios at runtime:

1. If the first loop passes the limit condition, the For loop is directly terminated;

2. If the first loop test fails, the loop test will be repeated. Whether the second test result passes or fails, the run of the For loop will be finished.

4.3.4 Add Jumper

In the sequence edit interface, click the Add Jumper button (shown in Figure 4.3.4a), will popout edit interface (shown in Figure 4.3.4b), input display name and then click “ok” add successfully.



a、icon

b、edit

c、display

Figure 4.3.4 Add Jumper

Advanced jump module can make logical jump after judging the conditions of "and" or "for multiple test results.After inserting the advanced jump, double-click to enter the jump edit (as shown in Figure 4.3.4.1), click the edit list, and then add and select the results.

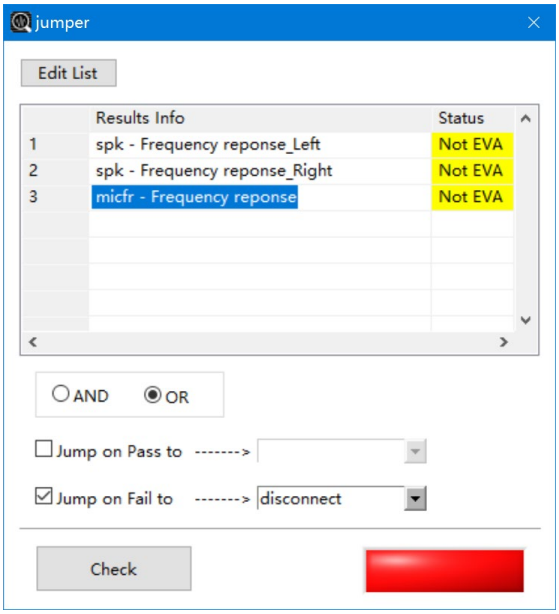
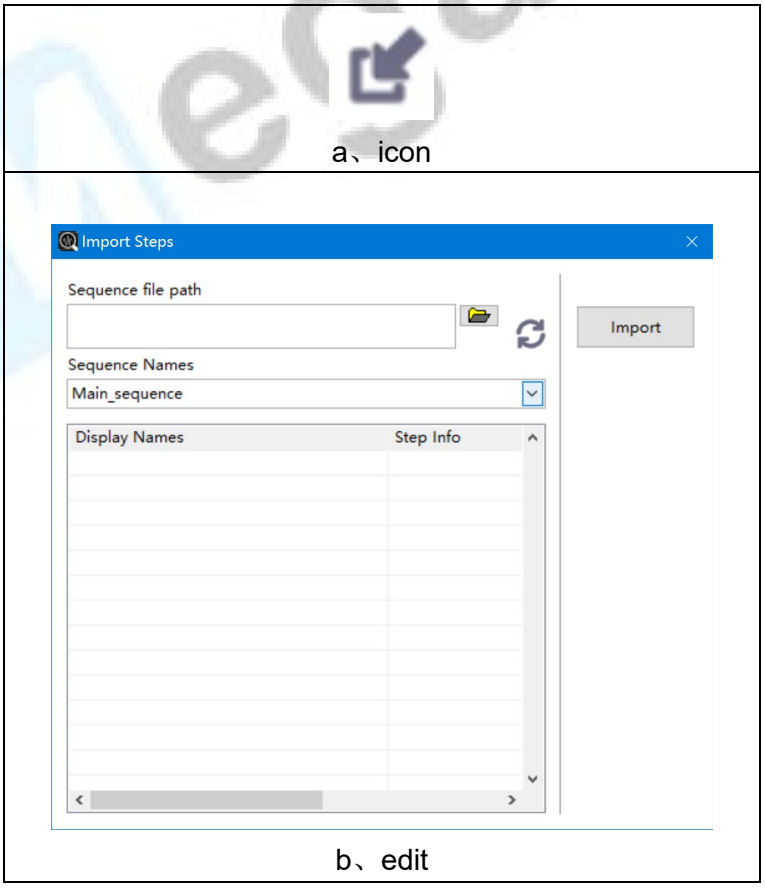


Figure 4.3.4.1

4.3.5 Import Steps

In the sequence edit interface, click the Import Steps button (shown in Figure 4.3.5a), will popout edit interface (shown in Figure 4.3.5b), input display name and then click “ok” add successfully.



a、icon

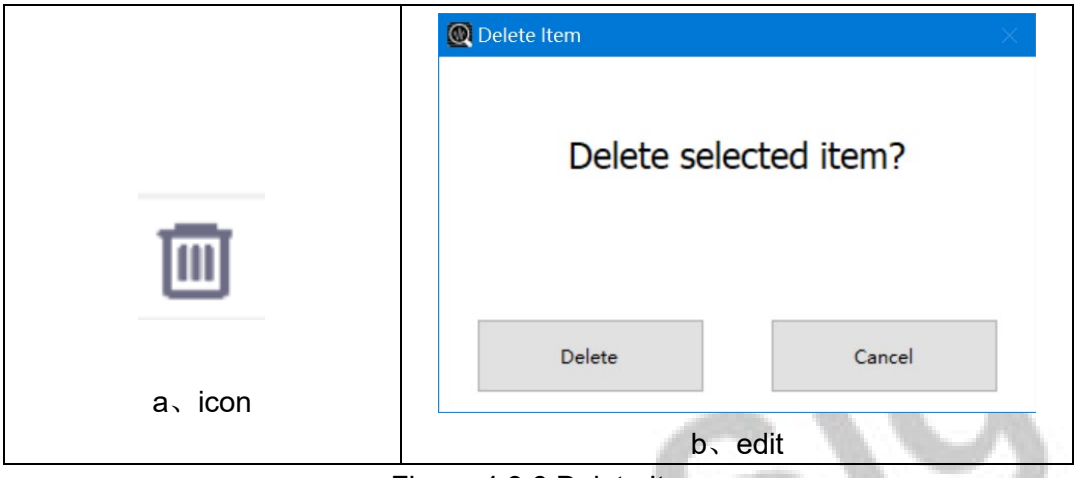
b、edit

Figure 4.3.5 Import Steps

Click the folder icon, select the source sequence of steps to be imported, check the steps to be imported, and click "Import".

4.3.6 Delete Item

In the sequence edit interface, click delete item icon (shown in Figure 4.3.6a), will popout interface is shown in Figure 4.3.6b.



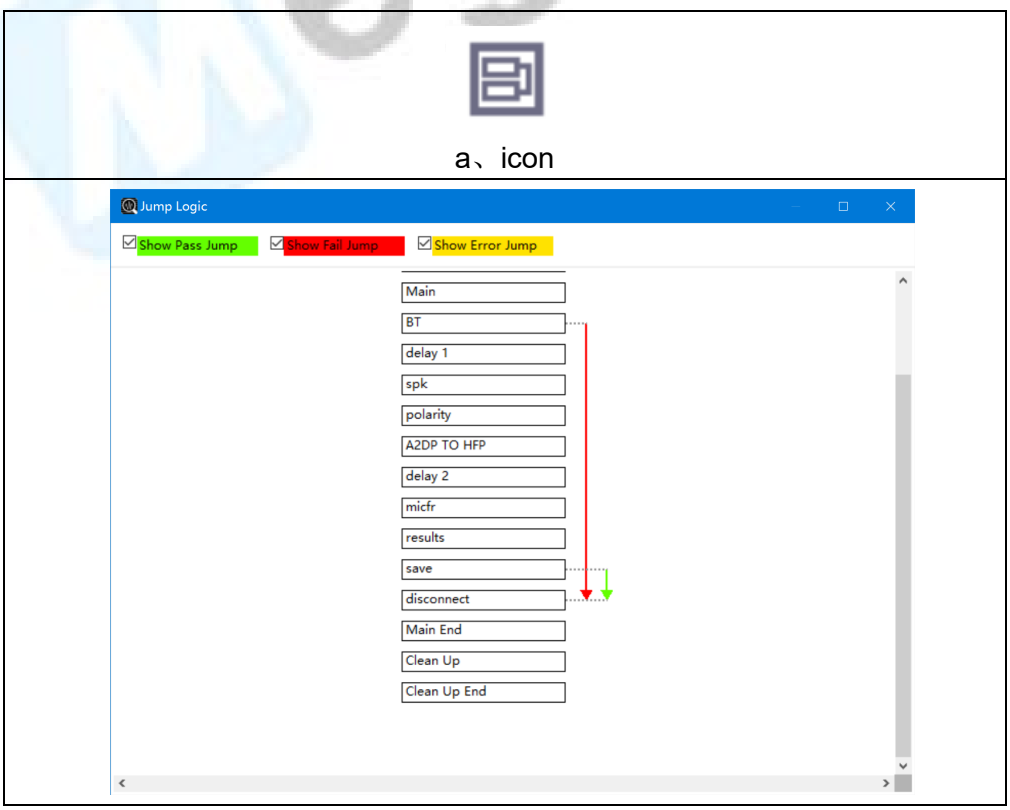
a、icon

b、edit

Figure 4.3.6 Delete Item

4.3.7 Jump Logic

In the sequence edit interface, click Jump Logic icon (shown in Figure 4.3.7a), will popout interface is shown in Figure 4.3.7b.



a、icon

b、edit

Figure 4.3.7 Jump Logic

4.3.8 Debugger

In the sequence edit interface, click debugger icon (shown in Figure 4.3.8a), will popout interface is shown in Figure 4.3.8b. This function is used to check and debug the test sequence.

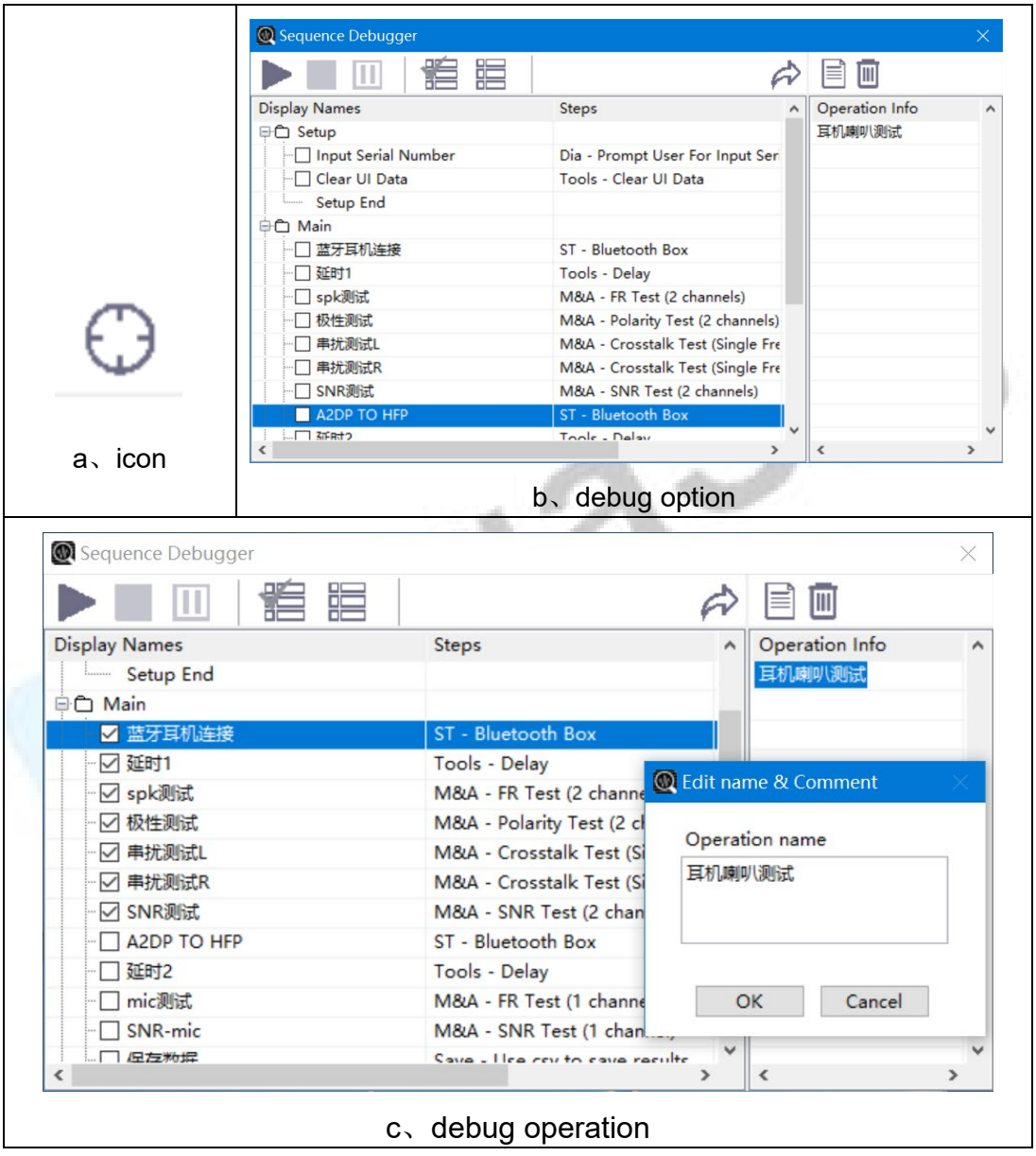


Figure 4.3.8 Debugger button

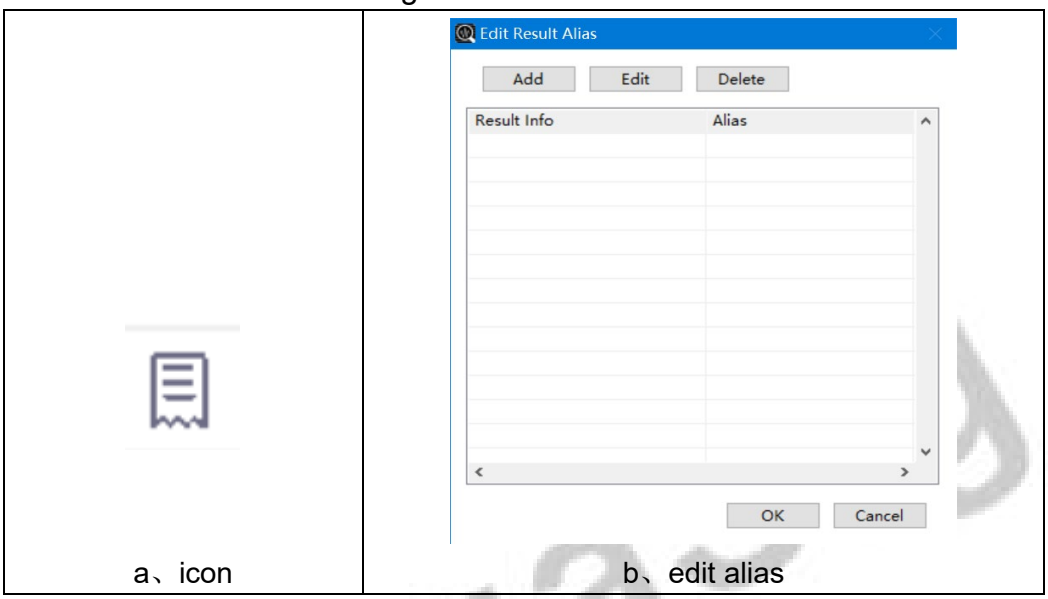
Operation Info：Displays the added step. Click “” icon, you can group checked test step into a operation group.

：edit “Operation Info”

：delete “Operation Info”

4.3.9 Result Info Alias Editor

In the sequence edit interface, click result info alias editor icon (shown in Figure 4.3.9a), will popout interface is shown in Figure 4.3.9b. This function is designed to customize the name of the test result display area. You can add, edit and delete result alias through the buttons.



a、icon　　b、edit alias

Figure 4.3.9 Result Info Alias Editor

4.3.9.1 Add Result Alias

In the Figure 4.3.9b interface, click “Add” button，popout the interface is shown in Figure 4.3.9.1. Choose test result and then input alias.

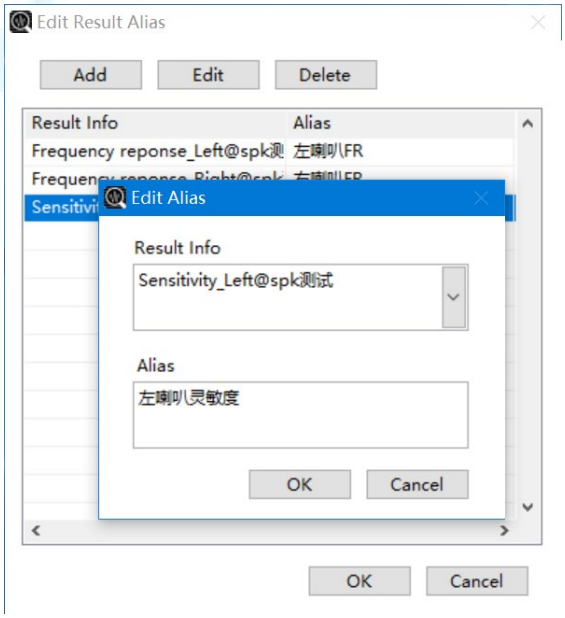


Figure 4.3.9.1 Add / Edit Alias

4.3.9.2 Test Result Display Comparison

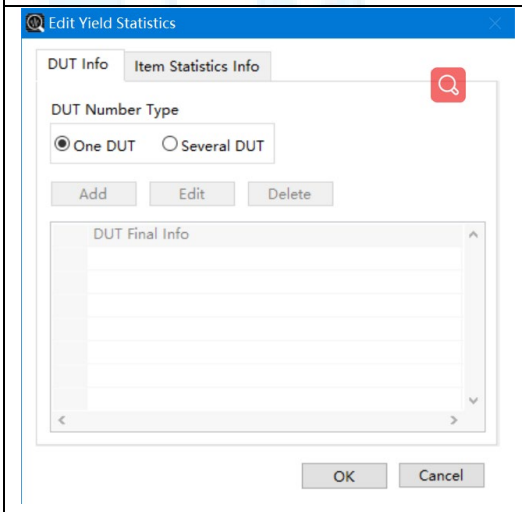
a、original test results display　　b、alias display

Figure 4.3.9.2 Test Result Display Comparison

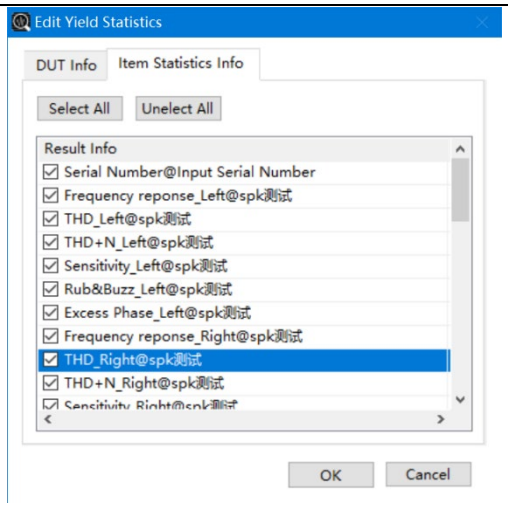
4.3.10Result Statistics settings

In the sequence edit interface, click result rtatistics settings icon (shown in Figure 4.3.10a), will popout interface is shown in Figure 4.3.10b. This function is designed to custom display yield statistics.

a、icon



b、edit DUT



c、edit statistics item

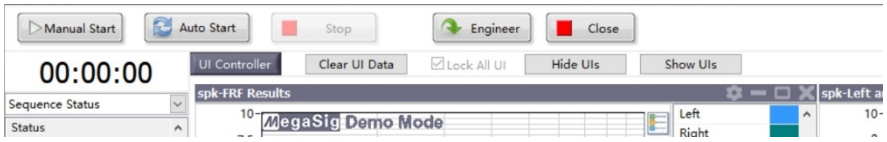
Figure 4.3.10 Result Statistics settings

5 UI function instructions

5.1 Setting panel

In the setting panel, main control buttons are shown in Figure 5.1

a、Main control interface

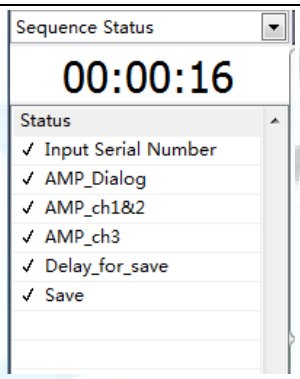


b、Operator interface

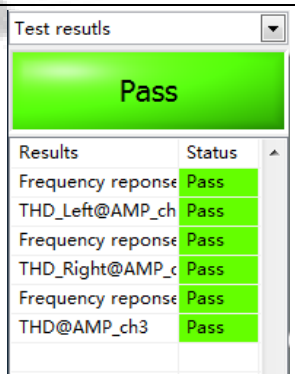
Figure 5.1 Main control buttons

5.2 Test flow viewer instructions

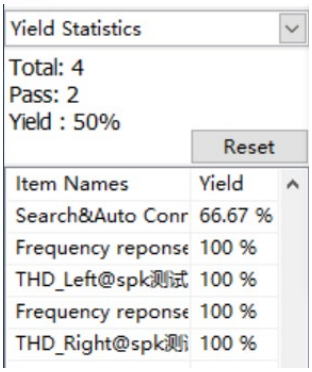
In the main interface left, Displays current test steps, test results states for each step, yield statistics function. The three mode are shown in Figure 5.2.



a. Test steps



b. Test results



c、yield statistics

Figure 5.2 Test flow viewer

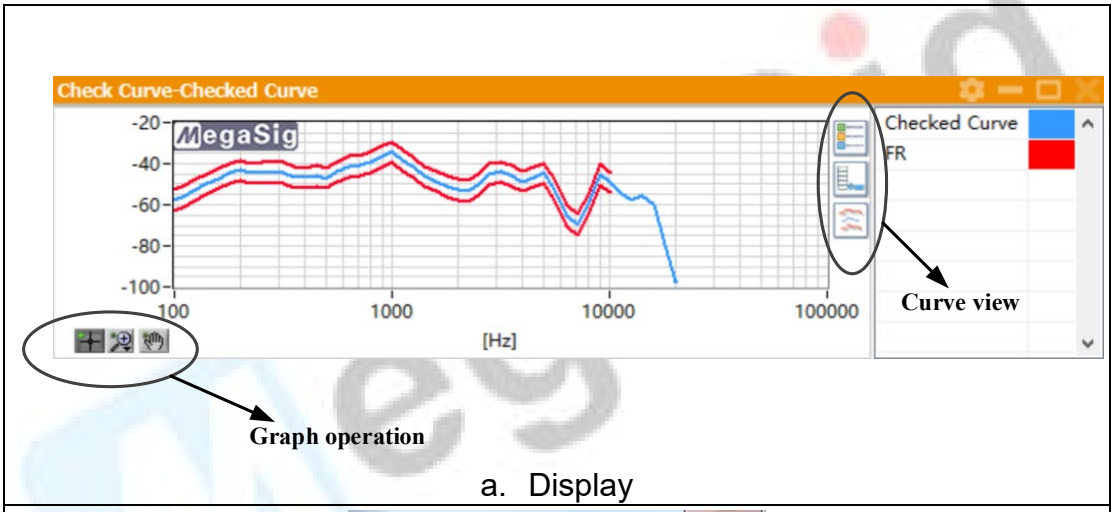
5.3 Data viewer instructions

5.3.1 Curve view instructions

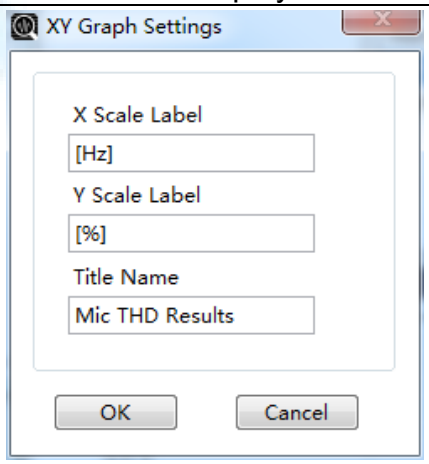
Output results is curve, will show Figure 5.3.1a interface. The sidebar “Curve view” icons are hidden curve list, curve overlay display, and display curve limit from top to bottom. The “Graph operation” icons, detail in Table 1.

Click the “Settings” button in the upper right corner, popout setting interface is shown in Figure 5.3.1b.

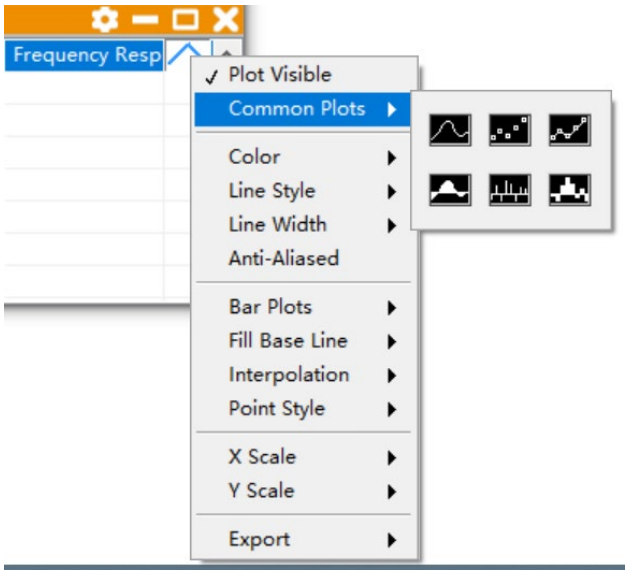
Double-click the curve list name, can be modify name. Select the color area and click, can be set the parameters of the curve (shown in Figure 5.3.1c).



a. Display



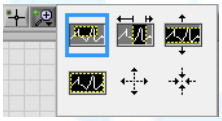
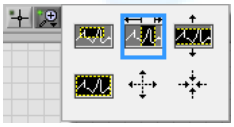
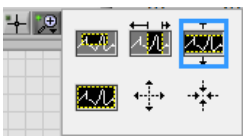
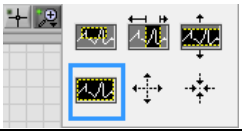
b. display setting

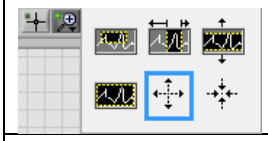
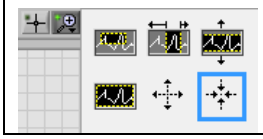


c. curve setting

Figure 5.3.1 Curve view

Table 1 Graph operation

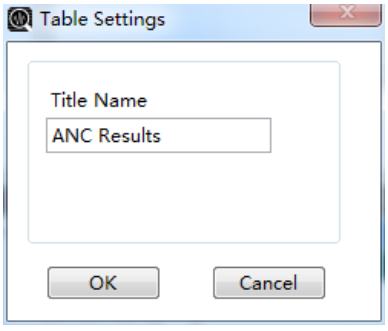
Operation icon	**Function**
First icon 	This software doesn't work temporarily
Last icon 	Use the mouse to drag the moving curve
Second icon - 1 	Use the mouse to draw a rectangular area to enlarge the curve, showing more details of the signal.
Second icon - 2 	Drag the mouse left and right to enlarge the curve, showing more details of the signal.
Second icon - 3 	Drag the mouse up and down to enlarge the curve, showing more details of the signal.
Second icon - 4 	Restore the original signal curve

Second icon - 5 	With the mouse click position as the center to amplify the signal curve display. Show more details of the signal.
Second icon - 6 	With the mouse click position as the center to shrink the signal curve display. Show more details of the signal.

5.3.2 Table viewer instructions

Output results is table, will showFigure 5.3.2a interface. Click the “Settings” button in the upper right corner, popout setting interface is shown in Figure 5.3.2b.

a、table display



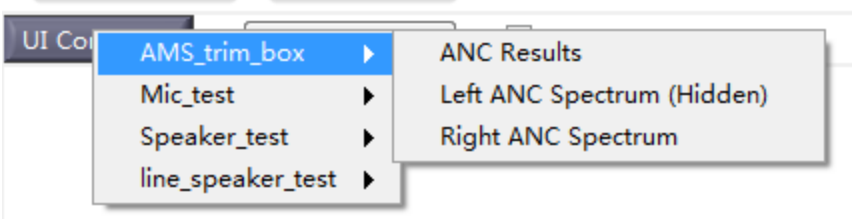
b、table settings

Figure 5.3.2 Table viewer

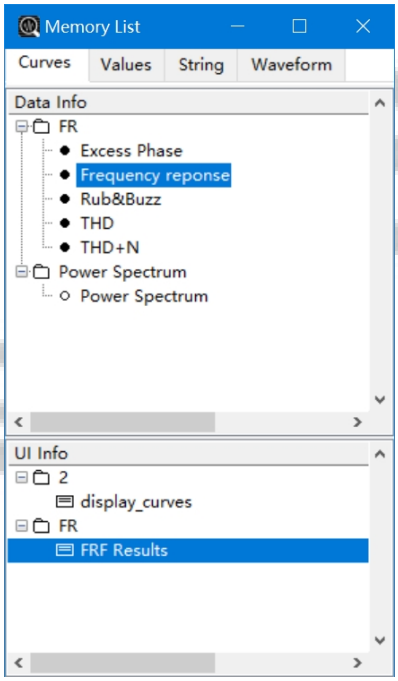
5.3.3 UI interface buttons instructions

UI interface is shown in Figure 5.3.3a. You can control UI, get test histories in the memory list.

a、buttons



b、 UI controller



c、Memory list

Figure 5.3.3 UI interface buttons

6 Remote control

Click “Remote” button in the main interface, will popout interface show in Figure 6.0. Under this mode, AudioExpert run as server, waiting the command sent from customer’s software, all the command and feedback data can be customized.

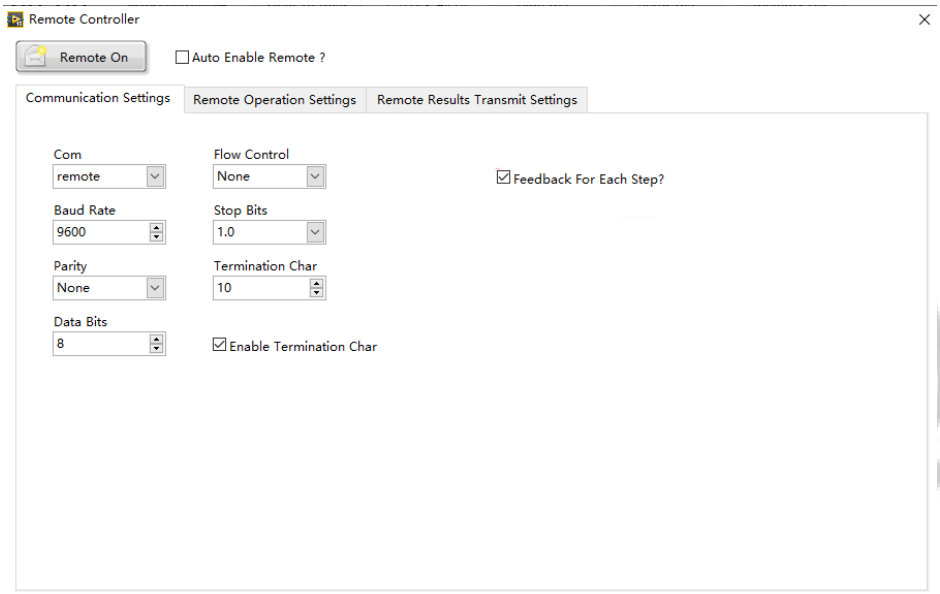


Figure 6.0 Remote control

6.1 Communication Settings

Communication settings interface is shown in Figure 6.1.

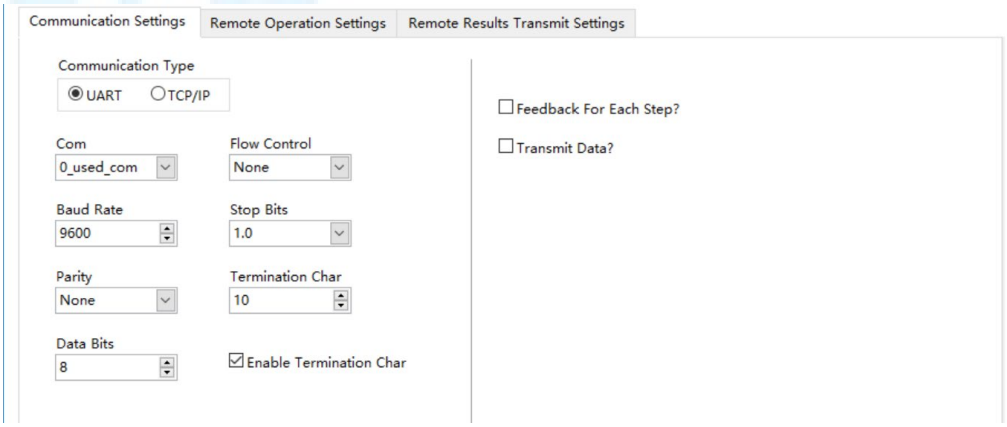


Figure 6.1 Communication settings

The com port is assigned to be listened by AudioExpert, customer’s software will listen another com port, these 2 com ports are bound together by virtual.

6.2 Remote Operation Settings

Remote operation settings interface is shown in Figure 6.2

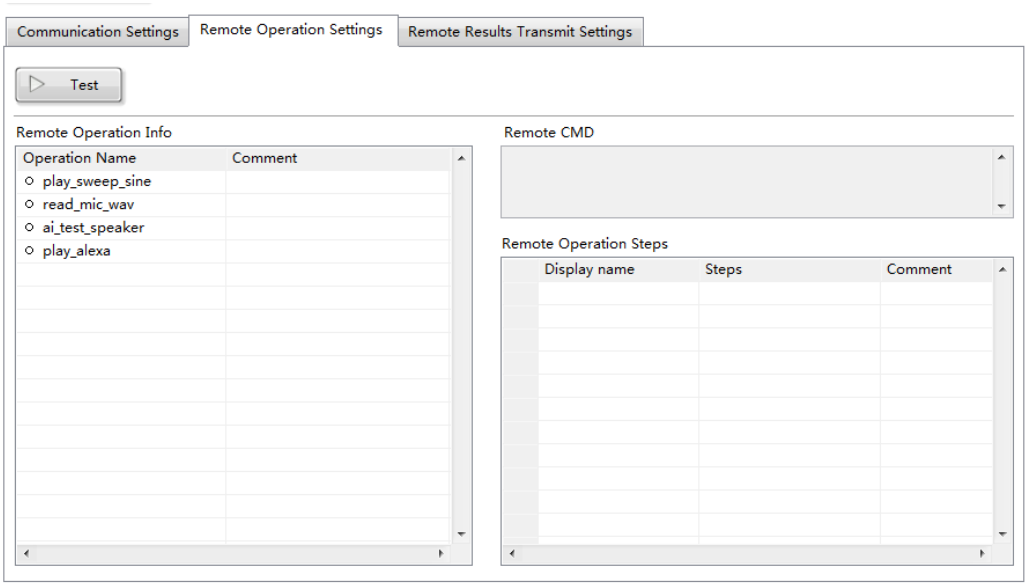


Figure 6.2 Remote operation settings

You can add / edit remote operation group here. The detail operation of adding and editing is shown in 6.2.1

Remote CMD and remote operation steps are displayed by adding remote operation info.

6.2.1 Remote Operation Info instructions

In the remote operation info, right click blank table, you can add, edit, delete and enable / disable remote operation group.

6.2.1.1 Add Remote Operation

In the remote operation info, right click “Add Operation”, will display the interface shown in Figure 6.2.1.1.

Define operation name and remote CMD, tick out which step you want to execute when receive the CMD.

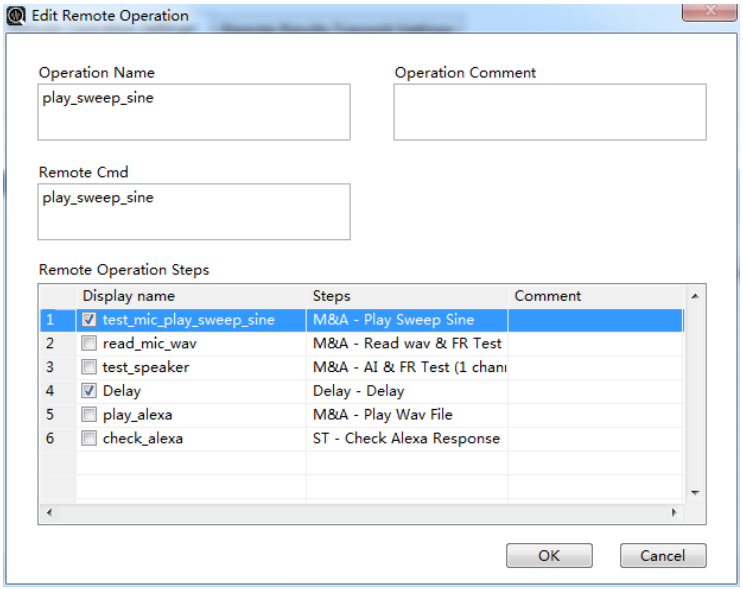


Figure 6.2.1.1 remote operation edit / add

6.2.2 Remote operation protocol command

6.2.2.1 Control Command

The form of the control command is $CMD#, CMD is the real command，which is the “Remote CMD” edited in 6.2.

6.2.2.2 Immediate feedback after receiving command

Feedback that can be immediate execution: $cmd^0^OK#

Feedback that cannot be executed: $cmd^1^OK#

6.2.2.3 Feedback after execution

After execution, but there was no feedback on the judgment result: $cmd_over^0^OK#

After execution, there was feedback on the judgment result: $cmd_over^result:’pass’, result1:’pass’, result2:’fail’^OK#

6.2.2.4 Invalid command feedback

When the send command is an invalid command:

send→◇$xxx#

feedback←◆$xxx^1^Invalid_cmd^NG#

6.3 Remote Results Transmit Settings

Remote results transmit settings interface is shown in Figure 6.3. In the blank table, right click, you can add, edit, delete and enable / disable transmit data. The feedback result need to add in transmit list.

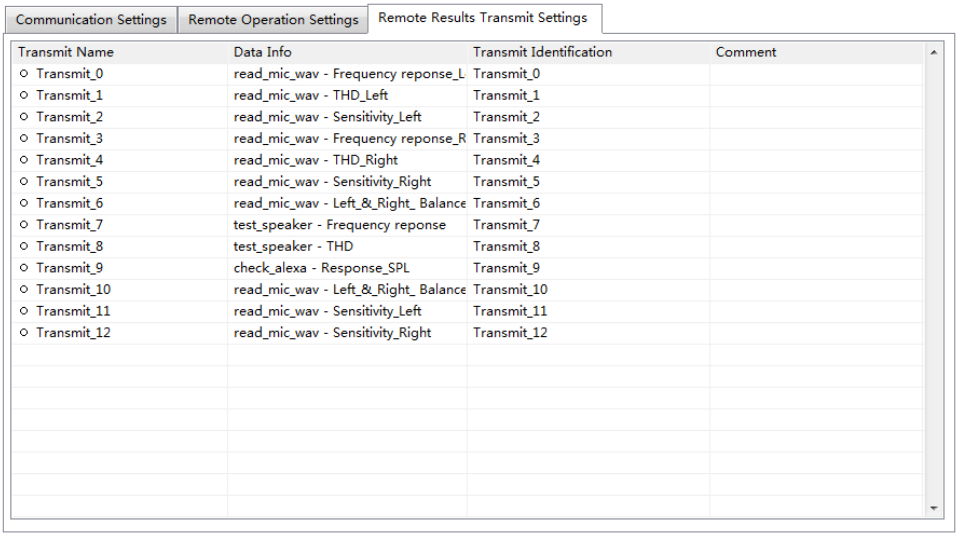


Figure 6.3 Remote Results Transmit

6.3.1 Add Transmit

In the remote results transmit settings interface, right click choose add, will display the interface shown in Figure 6.3.1. Select which individual result you want to pass back the limit result.

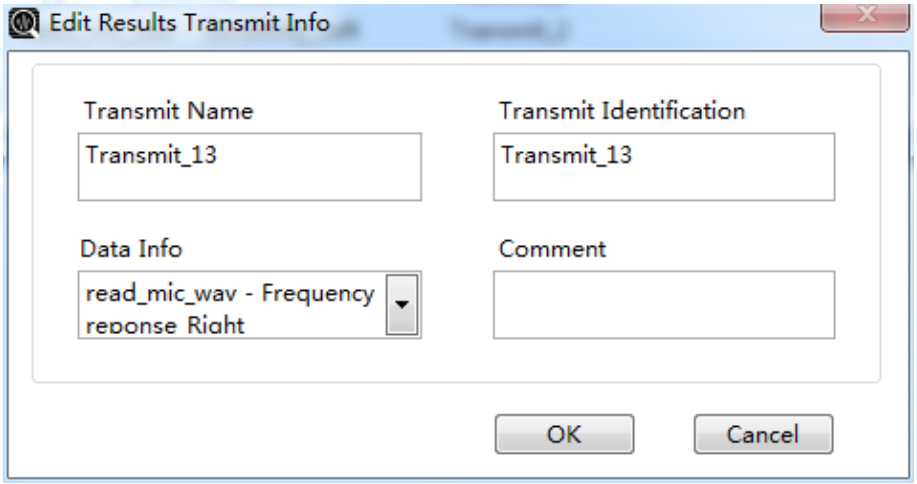


Figure 6.3.1 add / edit transmit