VIS-FS100-A Feedback Suppressor
User Manual

V1.0 Version

VISSONIC Electronics Limited.

Meaning of Signs

■ Safety Precautions

There are signs in both the user manual and the equipments to indicate the hidden risk to your and others' personal safety and property. These signs are used to help you to operate the equipments safely and correctly, whose meanings are illustrated as bellow. Please be sure that you understand all of them before you start to operate the equipments.

	This is to remind the user that all the operation should be done following the instructions mentioned in the manual, or, death and body injure may happen due to wrong operation.
	This is to remind the user that the dangerous internal voltage that has not been grounded may cause electricity shock.
	CE Certification: means this product has already met the designated standards by the EU, and the user can use it safely.
ISO9001-2000	This product has passed ISO9001 international quality certification.
	Warning: in order to avoid electrical shock, please do not open the chassis, nor put unnecessary parts inside the chassis. Please contact the qualified personnel for after service.
	The grounding position of the equipment chassis can shield interference, protect the equipment and protect personal safety.
	Contains heavy metal elements and are forbidden to be put in the trash, must undergo professional recycling.

■ **General information instructions**

	This is to list some content which may cause unsuccessful operation or setting and some information that should be noticed.

Important Precautions

 Warning

To ensure the proper function of the equipment and the safety of the user, please following the under mentioned instructions during installation, use and maintenance:

Installation Instructions

- The power plug should be maintained to facilitate the disconnection operation, and the disconnection coupler on the front panel should also be maintained to facilitate the disconnection operation.
- The equipment must not be exposed to water droplets or splashes, and objects filled with water such as vases must not be placed on the equipment.
- Please do not use the equipment in the following environment: shaking, dusty, oily, smoky, conducting dusty, filled of corrosive gas and flammable gas. Also, please don't expose the equipment to high temperature, condensing, wind, rain. Electrical shocking, fire and wrong operation can also damage the product.
- When processing screw holes and wiring, do not drop metal shavings and wire heads into the ventilation holes of the controller, which may cause fire, failure, or wrong operation.
- At the end of the product installation work, it is necessary to ensure that there are no foreign objects on the ventilation surface, including packaging materials such as dust-proof paper, otherwise it may cause poor heat dissipation during operation, causing fire, failure, and wrong operation.
- Please don't wire or plug/unplug the cable while it's still live, or, electrical shock and circuit damage may happen.
- The installation and wiring should be stable, and the poor contact may cause wrong operation.
- In the place where sever interference exists, shielded cable should be used as the I/O cable for the high frequency signal to improve the transmitting quality.

Wiring Instruction

- The equipment should be connected to a grid power output socket with a protective earth connection.
- Before the installation and wiring, please cut all the power supply, or electrical shock or damage to the equipment can be caused.
- This product is grounded through the grounding wire of the power cord. To avoid electric shock, the grounding wire must be connected to the earth. Before connecting the input or output of this product, be sure to ground the product correctly.
- After the installation and wiring, all the sundries should be cleaned up, and the covers and panels should be put back and fixed well in order to avoid electrical shock.

Operation and maintenance instruction

- Please don't touch the connectors when they are electrified, or electrical shock or wrong operation may happen.
- Please clean and tighten the terminals after turning off the power, these operations may cause electric shock when the power is on.
- Please connect or remove the communication signal cable, the cable of the expansion module or the control unit after turning off the power, otherwise it may cause damage to the equipment and wrong operation.
- Do not disassemble the device to avoid damage to internal electrical components.
- Be sure to read this manual thoroughly and fully confirm safety before proceeding with program changes, trial operation, start and stop operations.

- The button battery must be replaced when the power is off. If the equipment needs to be replaced with electricity due to the operation of the equipment, it must be carried out by professional electrical technicians under the condition of wearing insulated gloves.

Product Disposal instruction

- Explosion of electrolytic capacitor: the electrolytic capacitor on the circuit board may explode when burned.
- Please separate collection and disposal, not thrown into domestic garbage.
- Please dispose of as industrial waste, or according to local environmental protection regulations.

Preface

This manual mainly explains the use, performance parameters and troubleshooting of the VISSONIC VIS-FS100-A five-channel automatic feedback suppressor.

If the technical parameters and system usage in this manual are changed, the manufacturer will update the version number of the manual. Please use the latest product manual.

Version	update content	Date
1.0	Publish	2020.6.15

Content

1. Product Introduction

1.1 Product function overview

VIS-FS100-A feedback suppressor independently developed by VISSONIC uses a powerful signal processor and a fully automatic adaptive algorithm. It is easy to use. On the basis of supporting 4-line/microphone input, it is also equipped with AUDIOLINK digital audio cascade interface, while supporting the 5-channel automatic mixer.

Feedback suppression function:

VISSONIC feedback suppressor uses a powerful signal processor and fully automatic adaptive algorithm. It uses echo cancellation and de-reverberation algorithms to eliminate feedback by actively filtering room reverberation that causes signal feedback. By adding masked (inaudible) noise to the output signal (music mode) or only shifting the frequency of the output signal by 5 Hz (voice mode), the feedback suppressor can detect the reverberant component of the signal and eliminate it in Before feedback occurs, keep the original signal unchanged.

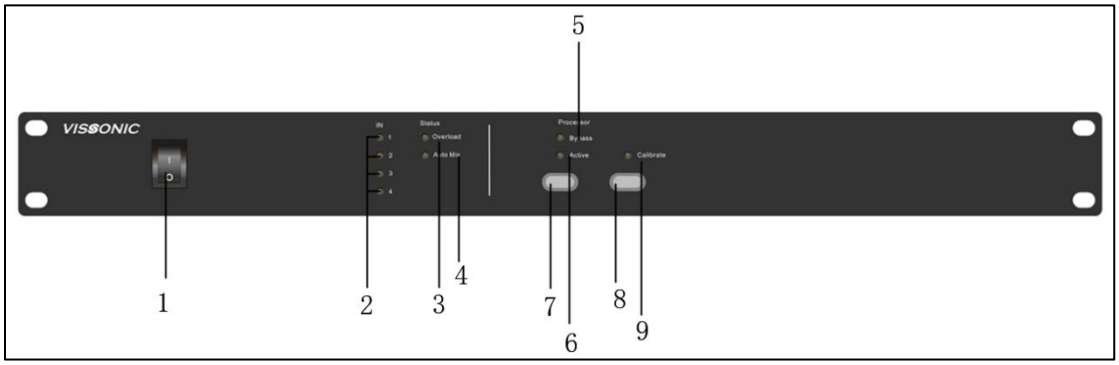
Automatic mixing function:

VISSONIC feedback suppressor also has a built-in automatic mixer to realize four-way microphone input. In many cases, such as on a podium, forum or conference table, the use of the above two microphones can better capture the voice of a moving speaker, and this often increases the risk of acoustic feedback.

In view of this problem, the automatic mixer in the feedback suppressor will automatically reduce the gain of the microphone with the weaker signal input and increase the gain of the other microphone with the stronger signal input. In this way, it can track the moving speaker and produce the best sound clarity. At the same time, since the total amount of gain remains constant, the maximum volume without acoustic feedback is maintained.

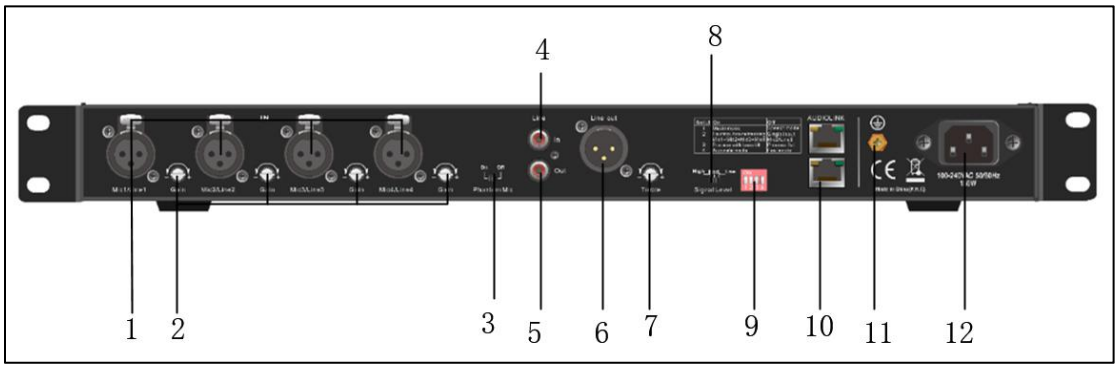
1.2 Product panel introduction

1.2.1 Controls and indicators(front)



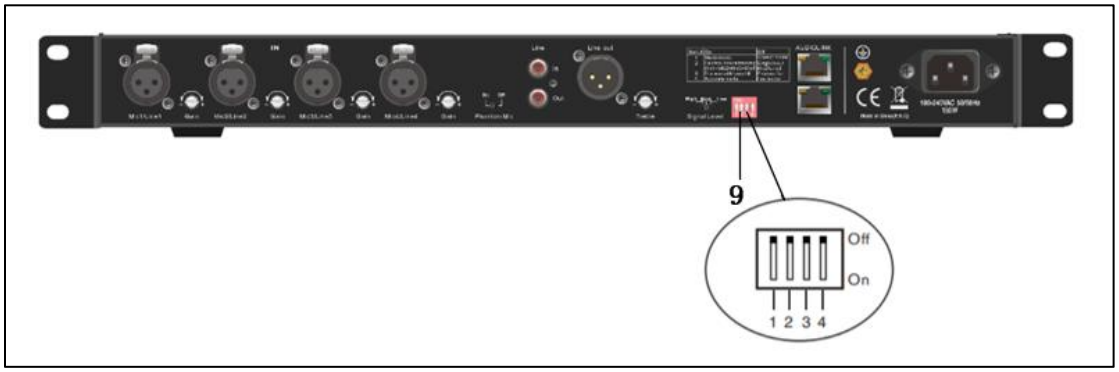
1. Power button
2. Input signal indicator, the 1, 2, 3, 4 indicators respectively represent the 4-channel (XLR/balanced) audio input interface of the feedback suppressor. When an audio signal input is detected on the input channel, the corresponding LED will light up . Channels 3 and 4 can only be used when Dual input Auto Mix is turned on.
3. The input signal overload indicator LED lights up to indicate that the input signal is too high. The input sensitivity can be adjusted by the signal level switch on the back.
4. Auto Mix indicator, the LED lights up to indicate that the Auto Mix function is active.
5. Bypass indicator, the LED lights up to indicate that the feedback suppression function is off.
6. The feedback inhibition activation indicator, the LED lights up to indicate that the feedback inhibition algorithm is active.
7. Bypass switch.
8. Calibration button After pressing the calibration button, random noise of -6 dBr will be generated within a few seconds, so that the feedback suppression algorithm can be quickly calibrated.
9. Calibrate indicator, after pressing the calibration button (8), the LED will light up, indicating a quick calibration cycle.

1.2.2 Control and connection(rear)



1. Left to right XLR 4 input channels (XLR balanced)
2. Input gain adjustment knob for 4 input channels from left to right
3. Phantom Mic power switch, which enables and disables the microphone input (1In and 2In) and the phantom power switch on the input (4In and 5In). When inputting through the line, the phantom power must be turned off.
4. Line input (RCA unbalanced)
5. Line output (RCA unbalanced)
6. Line output (XLR balanced)
7. XLR line output gain adjustment knob(Treble)
8. Signal level switch
9. Mode option switch (refer to 1.3)
10. The AUDIOLINK interface can cascade multiple feedback suppressors
11. Ground screw
12. Power connector (3 poles)

1.3 Mode setting option switch



Feedback suppressor with four option switches(9)：

Switch number	ON position	OFF position
1	Music mode	Speech mode
2	Four input voice tracking (Mic1+Mic2+Mic3+Mic4)	Single input (Mic1+Mic2)
3	Process with bass lift	Process flat
4	Accurate mode	Fast mode

1.3.1 Music mode/Speech mode

In the "music" mode (recommended for music, but also suitable for speech), depending on the acoustic environment, up to 6 dB of additional gain can be achieved before acoustic feedback occurs.

In speech mode (not recommended for use in music), an additional gain of up to 12 dB can be achieved compared to bypass mode before sound feedback occurs. Speech mode (5 Hz frequency shift) is faster and more effective than music mode in terms of feedback.

1.3.2 Four input voice tracking (Auto Mix mode)

Dual input automatic mixing mode

In this mode, the automatic mixing function is enabled(refer to 1.1).

1.3.3 Process with bass lift/Process flat

Due to the natural reverberation of the room, for example, the voice of the speaker usually sounds full. As feedback suppression, the use of de-reverberation algorithms can filter and reduce the room's reverberation, which may cause the room's low-frequency response to be less obvious, especially in larger halls. Provides a "bass lift" option to correct this phenomenon.

1.3.4 Accurate mode/Fast mode

The adaptive filter can be switched between fast filter mode and accurate filter mode. The accurate filter mode is suitable for the situation where the microphone position is fixed. For example, the acoustic environment on the stage will be more stable, and the convergence speed of the adaptive filter will become slower, thereby further suppressing the reverberation component.

In the fast filter mode, the system converges faster. Therefore, this mode is suitable for situations where the microphone position changes over time, such as when a handheld microphone is used or in a discussion system with multiple switching microphones.

1.4 Mode option switch usage scheme

1.4.1 Signal level switch setting

Set the signal level switch (8) to an appropriate position to optimize the signal-to-noise ratio and prevent overload. See the table below

Line in:

	Low	Med	High
Input level	-12dBV	0dBV	+12dBV
Output level	-12dBV	0dBV	+12dBV

Mic in:

	Low	Med	High
Input level	-42dBV	-30dBV	-18dBV
Output level	0dBV	0dBV	0dBV

1.4.2 Mode option switch setting

The following table shows the recommended positions of the option switches for the specific configuration settings described in section 3.1.

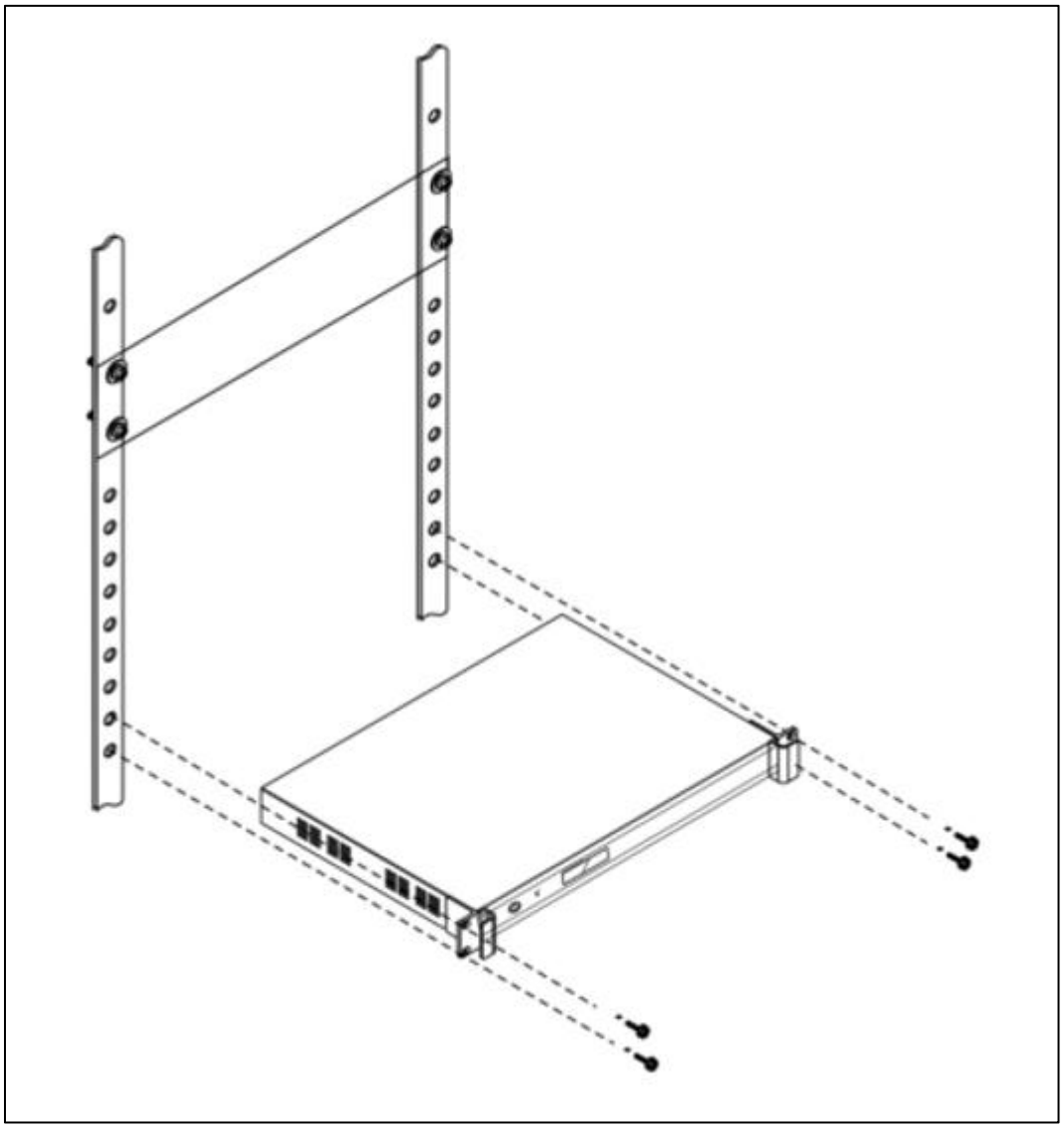
Scene configuration and mode switching:

Scene	Setting 1	Setting 2	Setting 3	Setting 4
Conference	Music mode	Single input	Process with bass lift	Fast mode
Live host	Speech mode	Four input Auto Mix	Process with bass lift	Fast mode
Lectures, training, classrooms	Speech mode	Four input Auto Mix	Process with bass lift	Accurate mode
Mixed input	Music mode	Single input	Process with bass lift	Fast mode

2. Install equipment and start up

2.1 Installation

The feedback suppressor is available for desktop use, or you can install it in a 19-inch rack using the bracket provided with the device. Keep the distance between the installation equipment up and down 2-4U. Pay attention to the ventilation and heat dissipation of the cabinet, avoid too much dust adsorption to affect the heat dissipation of the equipment, and ensure that the ambient temperature of the equipment in the rack does not exceed 55°C. As shown below.



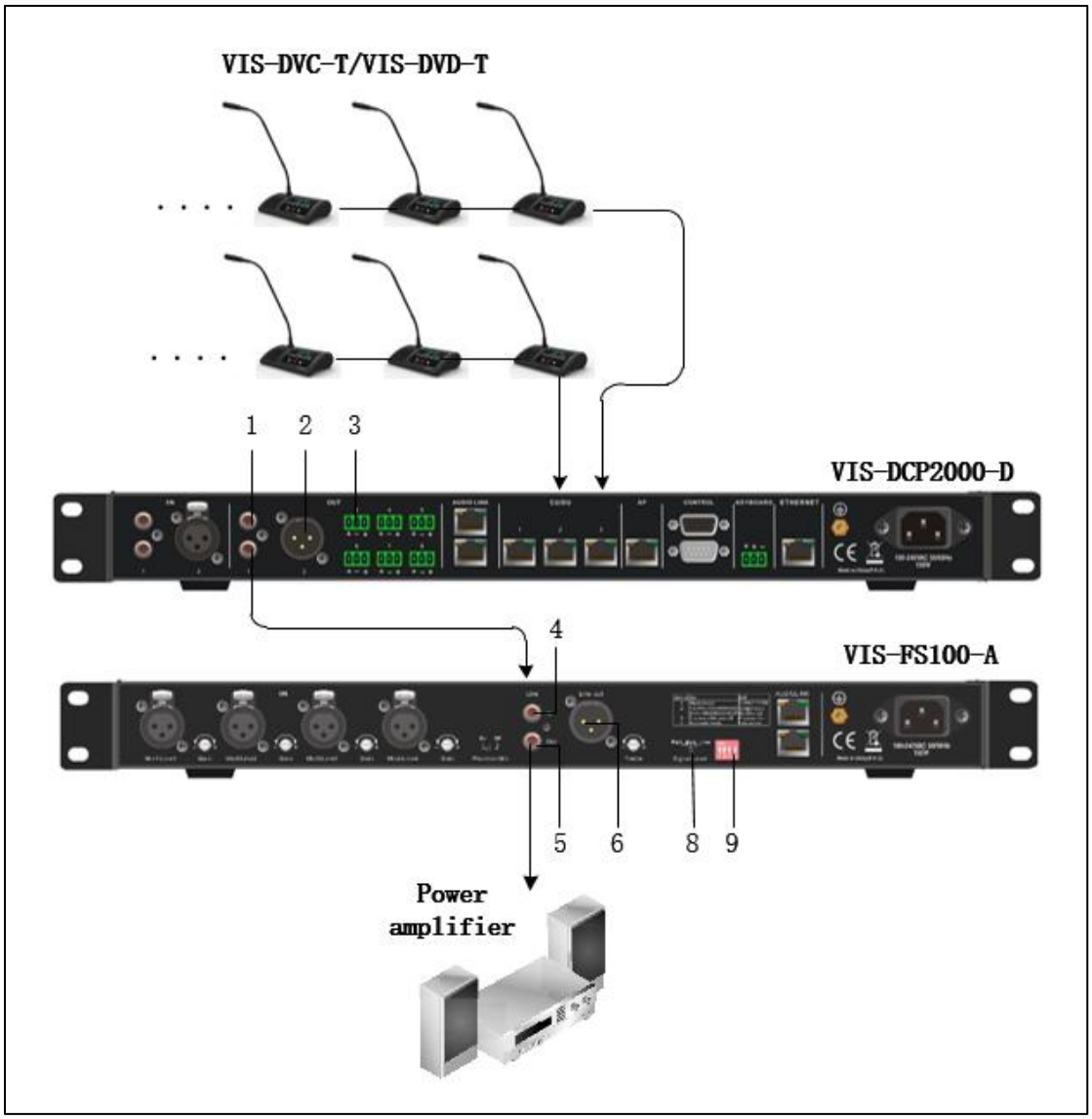
2.2 Start up

1. Make sure that all settings and connections (please refer to 3.1) are correct.
2. Set the main volume of the power amplifier to 0.
3. Press the power button (1) to turn on the feedback suppressor.
4. Enable automatic feedback suppression by pressing the bypass switch (7). The feedback inhibition activation indicator (6) will light up, indicating that the feedback inhibition algorithm has been activated.

3. Scene setup and connection

3.1 Scenario scheme

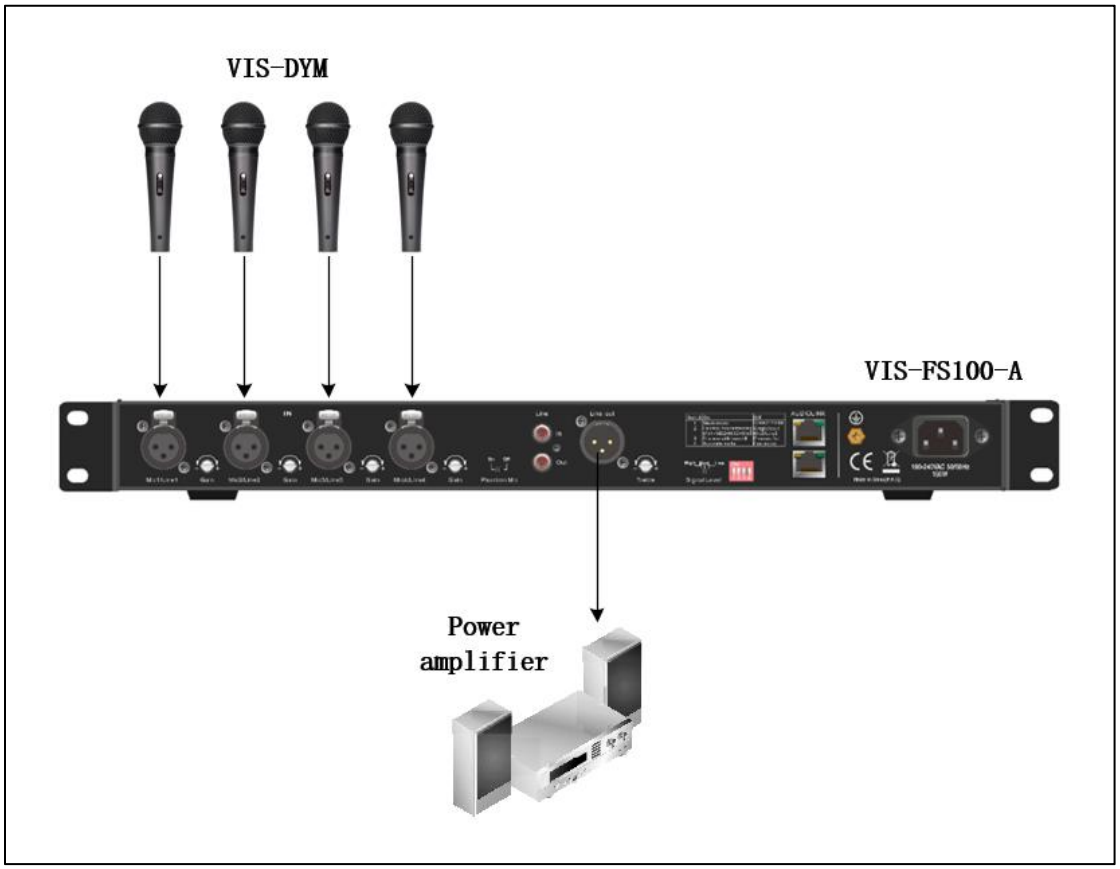
3.1.1 Conference scene setting



In the conference scene, the conference controller VIS-DCP2000-D connects the conference microphone VIS-DVC-T/VIS-DVD-T audio signal input, through the conference controller configuration (1, 2, 3) output channel any one input to the feedback suppressor unbalanced RCA line input (4), turn off the conference controller DSP sound processing, press the bypass switch button to open the feedback suppression function, the feedback suppression indicator lights up, indicating that the feedback suppression function has been activated. RCA unbalanced output 5 or XLR balanced output 6 can be used to connect to amplifiers or mixer equipment.

When the unbalanced RCA line is input, the level signal switch is pushed to the high level, and the input level is optimized; Process with bass lift is set to the on state to enhance the bass effect; Fast mode is turned on, and the Music mode is turned on to make the sound clearer(Please refer to 1.3);

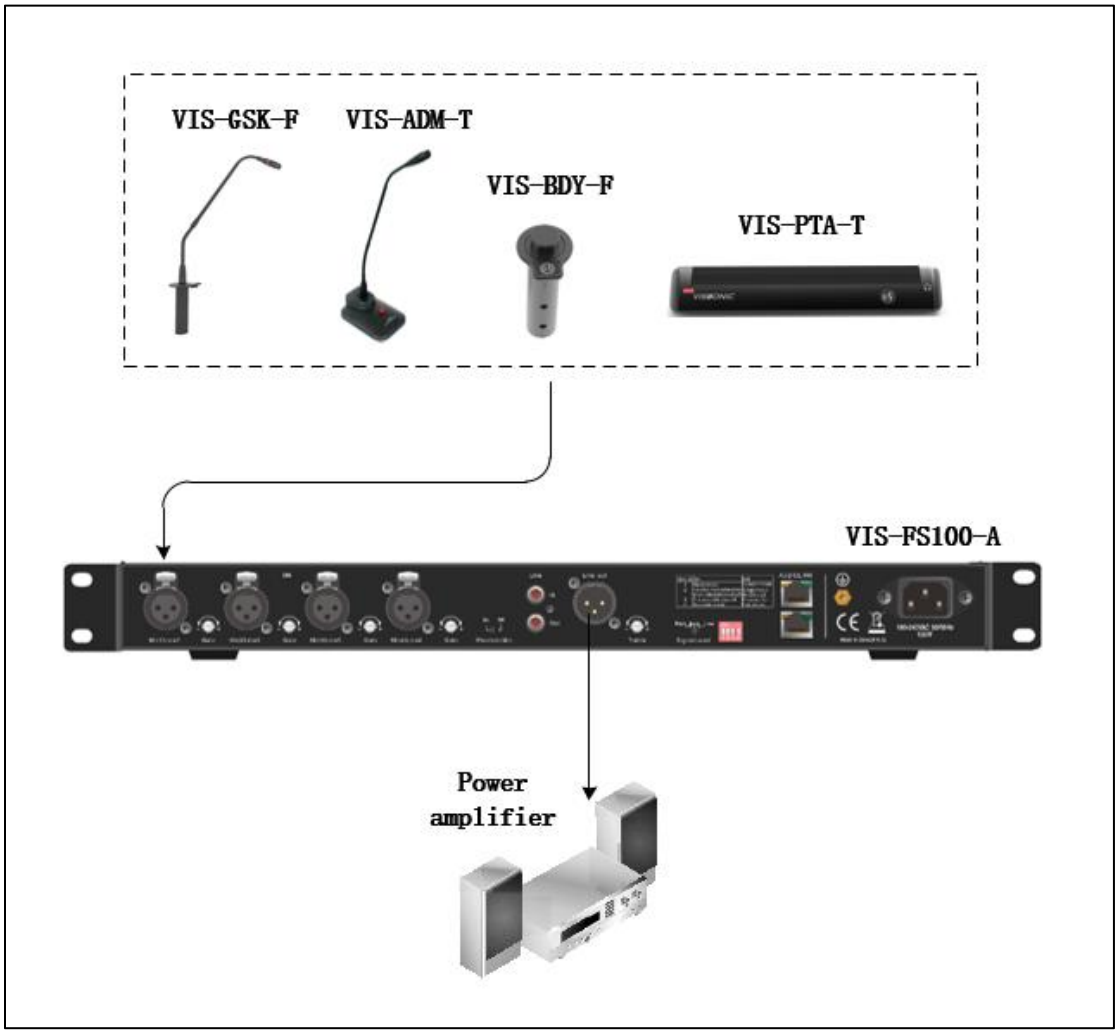
3.1.2 Live hosting scene



The feedback suppressor is equipped with 4 microphone XLR balanced inputs. By default, channel 1 and channel 2 are on, and channel 3 and channel 4 are off. When the 4-channel automatic mixing mode is turned on, the 4-channels are fully open, which can be connected to the 4-channel microphone input or mixer input and perform the automatic mixing function (see 1.1).

When inputting an unbalanced RCA line, push the level signal switch to a low level to optimize the input level. Turn on the phantom power switch, and set Process with bass lift to on to enhance the bass effect; turn on the fast mode and speech mode to make the sound more transparent (see 1.3).

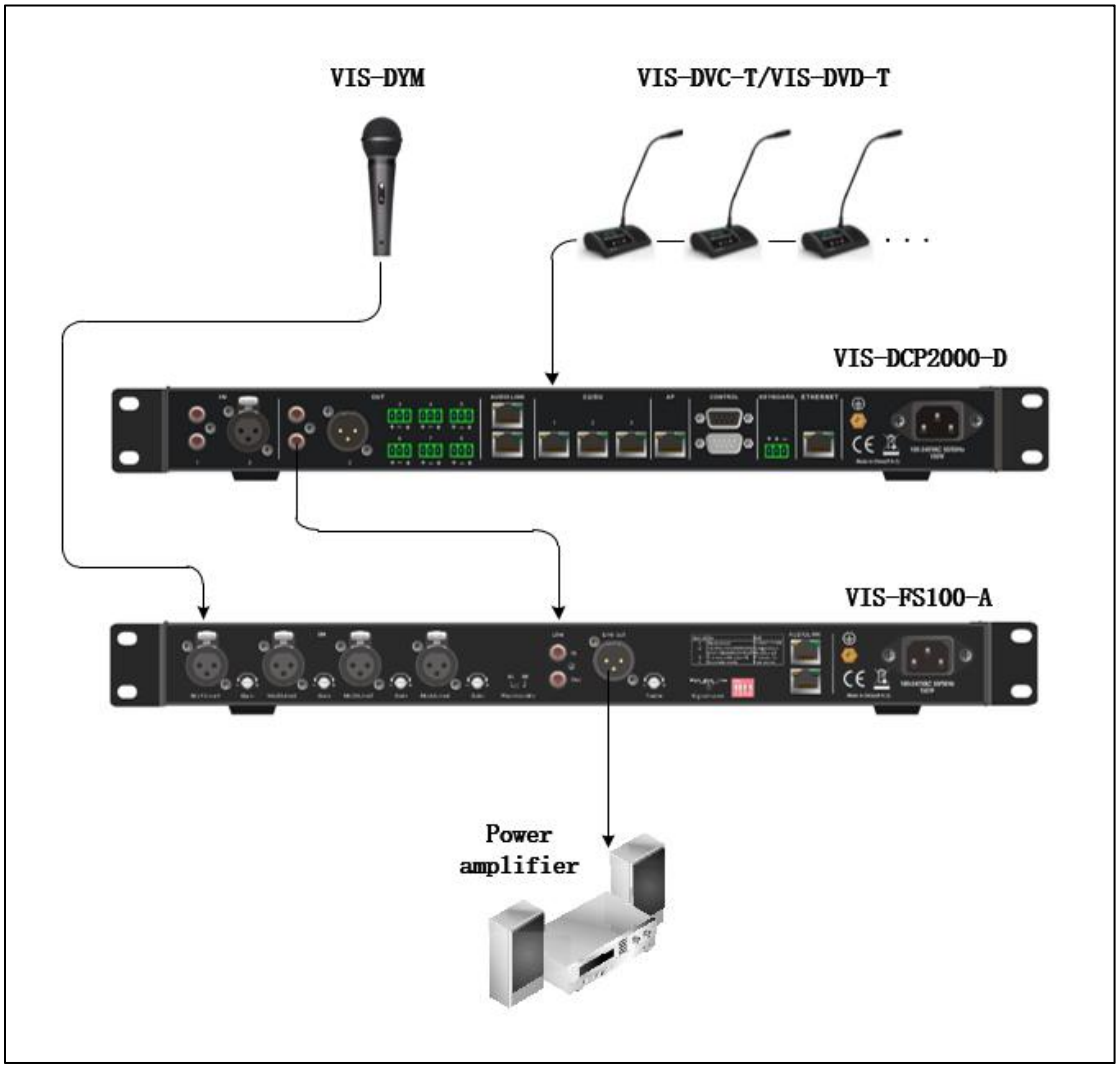
3.1.3 The layout of lectures and training rooms, classrooms, etc.



If the feedback suppressor uses only one microphone, connect it to the microphone 1 line input (Mic 1In). If you connect two microphones, you can turn on the auto mix switch. When two people talk at the same time, the auto mixer will automatically reduce the gain of the microphone with the lowest input signal and increase the gain of the microphone with the highest input signal to make the sound clearer and more layered.

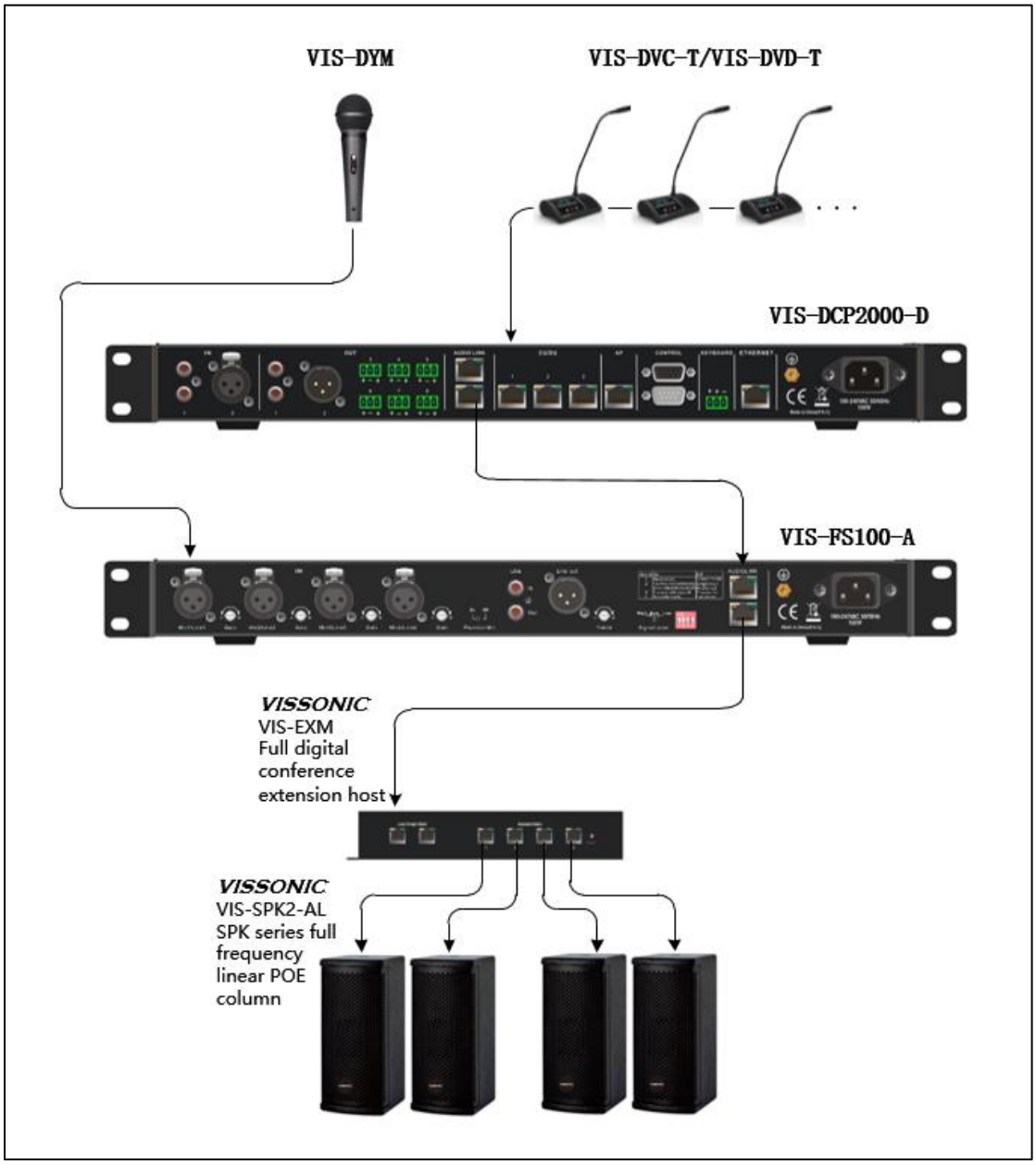
When the unbalanced RCA line is input, the level signal switch is pushed to high level, and the input level is optimized; turn on the phantom power switch, and set Process with bass lift to the on state to enhance the bass effect; turn on the Accurate mode and turn on the Speech mode, Make the sound more transparent (refer to 1.3).

3.1.4 Mixed input scene



When the line input is mixed with the microphone input, the microphone is connected to the XLR balanced input, and the phantom power needs to be turned on. Therefore, the RCA output interface of the conference controller can only be connected to the RCA input of the feedback suppressor, the level signal switch is pushed to the high level, the input level is optimized, and the volume is adjusted to the appropriate level through the XLR input gain adjustment knob; Process with bass lift is set to on to enhance the bass effect; turn on Fast mode and turn on Music mode to make the sound more transparent (refer to 1.3).

Audio link connection：



4. Feedback suppressor calibration

4.1 Calibration

Increase the master volume to the required level before commissioning to test feedback. In contrast to traditional feedback reduction systems, feedback suppressors suppress feedback before it occurs. Therefore, disabling the suppression algorithm may result in immediate feedback.

After checking that there is no problem with the connection settings (or before the event or meeting), debug the feedback suppressor and give the feedback suppressor an input source signal to measure the acoustic environment and set the adaptive filter.

When there is a signal source:

Input the signal source to the connected channel (for example, in a meeting scene, use normal volume and a slightly higher volume to speak). When the device detects that the input signal is too high, the input signal overload indicator (3) lights up. In this case, please use the signal level switch on the back of the device to adjust the input signal level until the input signal will not be overloaded under normal use volume.

When a howling sound is heard, the feedback suppressor will work at its feedback suppression limit. In this case, please lower the overall signal gain (for example, by lowering the microphone gain on the mixing panel or by lowering the main volume on the power amplifier).

When there is no signal source:

Press the calibration button (8), it will generate -6 dBr random noise and keep for a few seconds, so that the feedback suppression algorithm can be quickly calibrated. During this time, the calibration indicator (9) will light up.

4.2 General advice to prevent feedback

1. Make sure to arrange the microphone and speakers correctly. Please pay special attention to the directivity of the microphone and the speaker and the appropriate distance between the microphone and the speaker. This is especially suitable for buildings with long reverberation times, such as halls, large conference rooms, etc.

2. The microphone and speaker must be used in accordance with the manufacturer's technical guidelines.

3. Improve poor room acoustics, such as covering highly reflective (flat) walls and floors with curtains or carpets.

4. Do not use speakers that exceed its rated power. Due to the power compression of the speaker, the feedback margin is reduced. Try to make sure there is enough headroom.

5. Technical data

5.1 Electrical characteristics

Power supply voltage	230VAC/115VAC, ±10%, 50/60HZ
Max power consumption	15W
Max starting power	1.5A(230VAC)/ 3A(115VAC)

5.2 Performance characteristics

Sampling Rate	32KHZ
Frequency response	125HZ-15KHZ
Distortion	1KHZ 时<0.1%
Gain adjustment	Mic input: 12dB/0dB/-12dB (Low/Med/High), Line input: Gain 0dB
Gain adjustment range	Mute~20dB
S/ N ratio	>90DB
Signal delay	<11ms
Uncoupler frequency variation	Up to 5Hz shielding noise

5.3 Line/ microphone input

Max input level	6dBv
Output resistance	<100Ω
CMRR>25DB	(50HZ-20KHZ)
Phantom power	24V(Microphone only, switchable)
Max output level	10dBv

5.4 Conventional

Relative temperature	<95%
Net weight	2.8kg
Working temperature	-10℃~45℃
Storage temperature	-20℃~50℃
Relative humidity	<95%
Aluminum surface size	L*H=481mm*46mm
Chassis size	L*W*H=429mm*234mm(Including aluminum surface 4.2mm thickness)*44mm