



**Intelligent Unobtrusive Sound  
Reinforcement System**  
-  
**Classroom Application Solution**



# ■ Why do you need an intelligent unobtrusive sound reinforcement system?



## The pain point of traditional classroom sound reinforcement

- In the past, there used to be a unique "scenery" on campus - when the bell for class preparation rang, teachers would wear miniature microphones on their chests and carry "little bee" amplifiers (Voice Amplifiers for Teachers) on their waists, fully equipped as they rushed to the classrooms. Soon, the sounds of all sizes of speakers echoed through the teaching building, occasionally accompanied by a sharp whistle.
- Although the price of the voice amplifiers is affordable, the product quality is uneven, the sound produced is hoarse and some volume is too loud, which will inevitably have a negative impact on the hearing of students, especially the students in the front seats. Even if the fixed gooseneck or wireless microphone is used, there are also varying degrees of trouble in the teaching process, such as the physical and verbal expression of the teacher being constrained, the classroom sound quality being unstable, frequent failures, management difficulties and other problems, reduce students' interest in class, difficult to fully reflect the teaching effect.



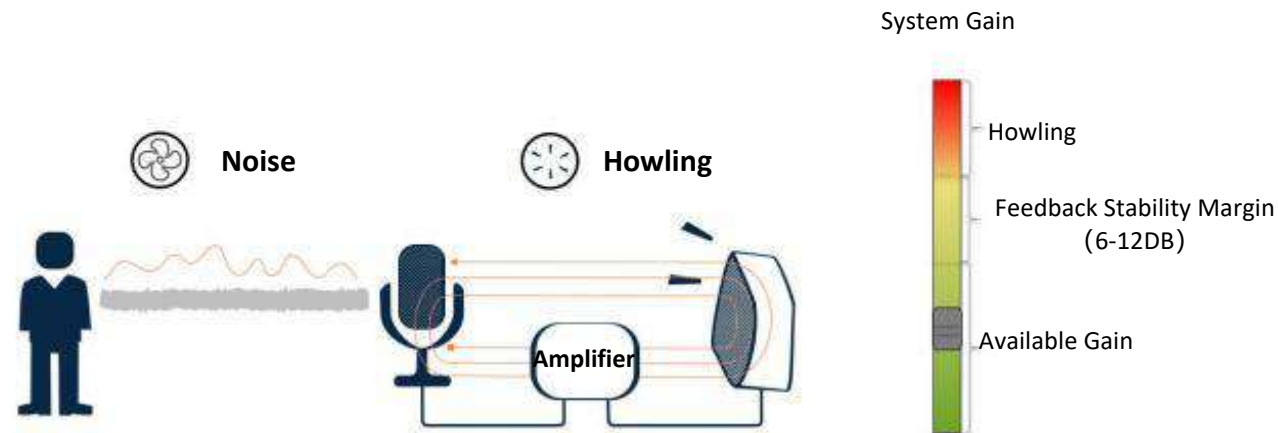
## Solution Design-Intelligent Unobtrusive Sound Reinforcement System

- The essence of the intelligent unobtrusive sound reinforcement scheme is to extend the effective pickup distance of the microphone, and ensure the 1-2 meters activity space of the spokesperson under the condition that the sound reinforcement in the fixed scene will not cause howling. The product advantage of hanging microphones is that teachers can get rid of the shackles of their hands and make it "unobtrusive and transparent", so as to ensure that the local sound is clear and loud when the teachers walk around freely in the covered area, so as to better play themselves and improve the teaching quality.
- The unique Smart Mixing and Microphone Preference technology allows the system to be configured with both close-talk microphone (gooseneck/handheld) and hanging directional microphone, and supports smart mixing and switching. Whether it's a classroom instruction, a presentation or a whiteboard writing, there is an optimal pickup method for seamless switching, perfectly balancing the convenience of teaching with the pickup of high-quality sound.
- The DSPPA intelligent unobtrusive sound reinforcement system is equipped with intelligent unobtrusive pickup microphones, which are independently developed by DSPPA technology, so that the details of sound pickup and processing are more organic and coordinated. At the same time, the one-touch mute function can block classroom noise at any time. It is undoubtedly advanced in terms of product concept.

# Function Advantage 1

## Noise howling feedback suppression technology

- Local sound reinforcement will inevitably produce howling problems. The traditional acoustic feedback suppression technology is developed based on the close-talk microphone (handheld microphone/gooseneck microphone), which has limited sound reinforcement gain, and the speech is limited to the short distance of the microphone, which is difficult to meet the sound reinforcement needs of free teaching in education informationization.
- The key to solving free lectures is long-distance sound pickup. Therefore, the microphone can be installed in places far away from the teacher, such as booms and ceilings, so that there will be no restriction on the teacher's actions. However, long-distance pickup will bring two important problems: one is that the feedback stability margin is compressed, and it is more likely to cause howling in local sound reinforcement than close-talk microphones; the other is that it is easier to pick up a lot of noise, resulting in deterioration of signal-to-noise ratio. The key to solve these two problems is advanced Adaptive Feedback Cancellation (AFC) and Automatic Noise Suppression (ANS).

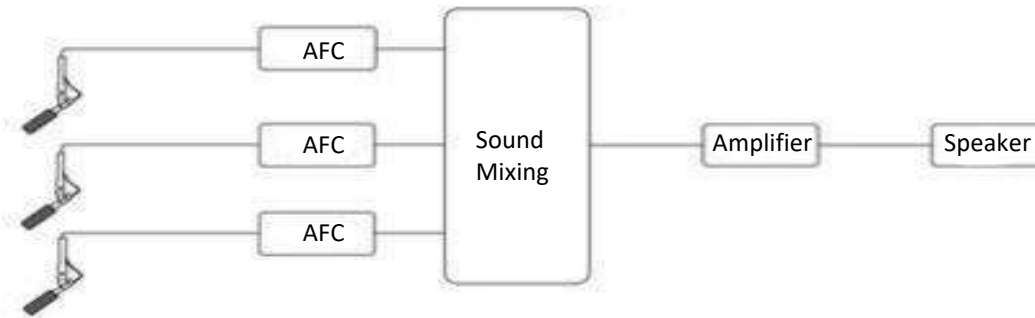


The key technologies for long-distance sound pickup are howling suppression and noise suppression.

## ■ Function Advantage 2

### Multi-channel mixing feedback suppression technology

- Sound transmission gain is the most important index to measure the sound reinforcement system. Typically, doubling the number of microphones in the same PA system will reduce the gain by about 3 dB, and for intelligent unconscious sound reinforcement, this value will be even greater. Therefore, most unconscious sound reinforcement systems have chosen a single microphone solution, which creates a number of limitations in pickup range. To perfectly solve this problem, multi-channel mixing feedback suppression technology is needed.

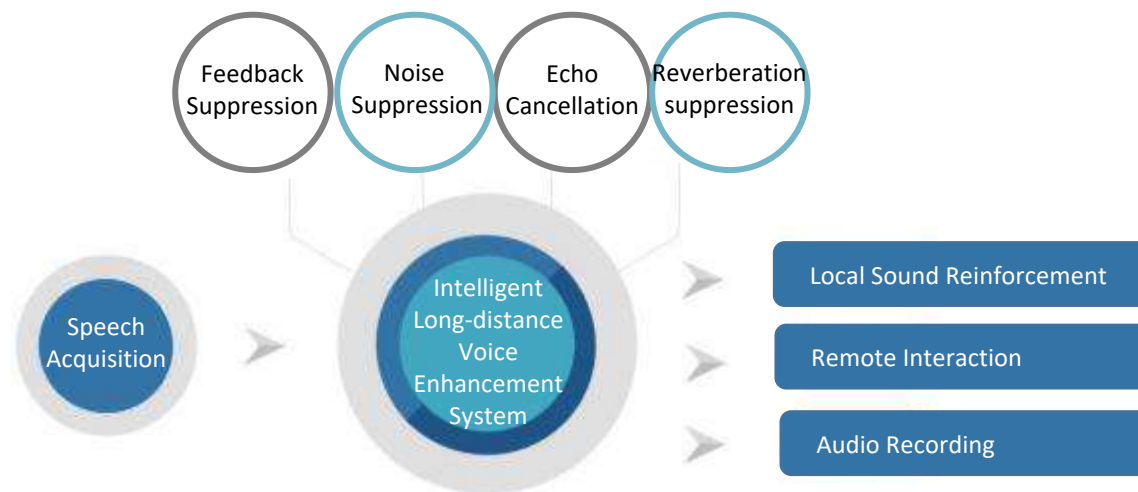


Schematic diagram of multi-channel noise suppression

## ■ Function Advantage 3

### Long-distance sound recognition technology

- The long-distance speech algorithm framework developed by DSPPA has a leading advantage in solving the above key problems. Its multi-channel feedback suppression, echo cancellation and noise suppression all adopt the most advanced algorithm theory. After dozens of version iterations, it gradually overcomes the technical problems that have not been solved for a long time in the field of intelligent unobtrusive sound reinforcement, and greatly improves the sound reinforcement gain, echo cancellation range and noise reduction range, so that the unobtrusive sound reinforcement can achieve satisfactory results in terms of sound transmission gain and sound quality. It not only performs well in teaching sound reinforcement scenes, but also has excellent performance in theaters with high sound quality requirements. This is also attributable to the excellent and rich tuning modules built into the system host, including high-pass and low-pass filters, parametric equalizers, limiters, and compression limiters.



Long-distance Speech Algorithm Framework

# Function Advantage 4

## Priority Override Function

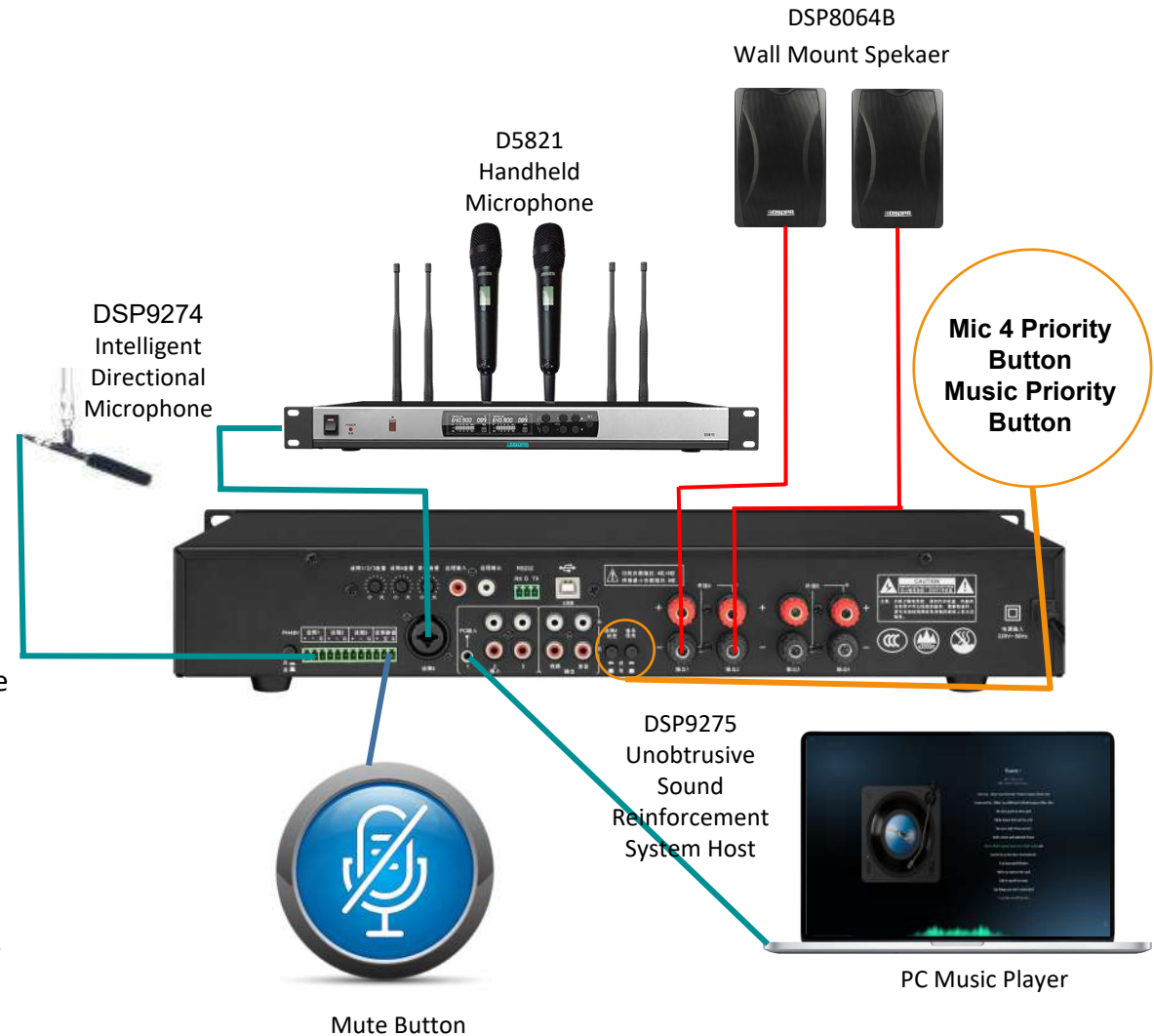
- Mic 4 priority: When configuring wireless handheld microphone and hanging directional microphone at the same time, intelligent mixing simultaneous output or switching wireless handheld microphone priority output can be carried out through the microphone 4 priority button.
- Music priority: When the line has a signal input, the system automatically mutes the microphone signal, and automatically restores the microphone signal if there is no signal input.

## One-click Mute

- The system comes standard with desktop mute button, one-key mute button, and the system automatically mutes the microphone signal.

## Built-in Power Amplifier

- The device comes with 4-channel constant resistance 8 ohm output power amplifier channels. Each channel supports a maximum of 150W. It can be easily connected to the constant-resistance teaching speaker, reducing the space brought by the need to access the power amplifier.



# Function Advantage 5

## Optional built-in wireless microphone

With built-in wireless microphone external antenna interface, wireless microphone can receive signals to achieve remote handheld sound reinforcement through the antenna.



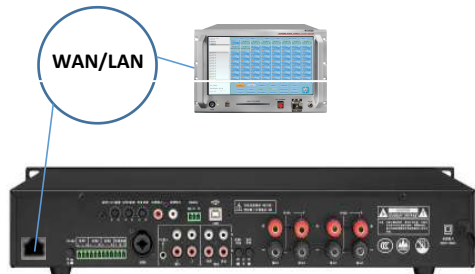
## Optional PPT page turning function

The page-turning pen communicates with the host computer, and then connects to the computer or interactive flat panel through the corresponding USB cable to achieve intelligent remote page-turning PPT.



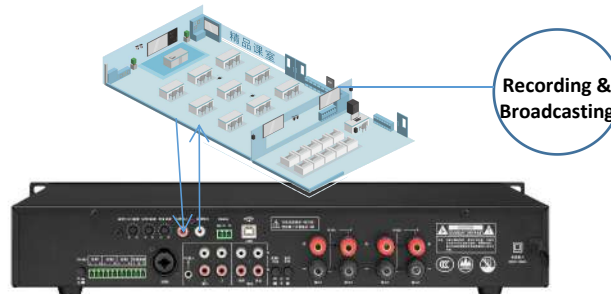
## Optional network decoding signal

With built-in network interface., it supports IP broadcast docking, decoding broadcast transmission network signals, remote transmission docking broadcast paging , class ringing and other functions



## Optional recording & broadcasting and interactive transmission

Built-in remote audio input and output ports, recording and broadcasting of teaching audio interaction, the other party's audio source is played to the local, and the local audio is transmitted to the other party. Use with interactive recording & broadcasting system.



# Function Advantage 6

## Optional Control Panel

An external control panel controls the volume level and mute of microphones and music to control device operation.



## Optional 2.4G Wireless Microphone

Connected to 2.4G wireless receiver, 2.4G microphone can be used for local sound reinforcement.



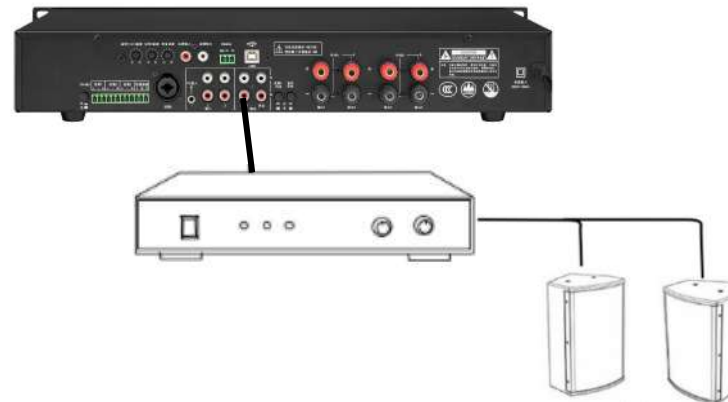
## Optional computer input isolated noise

Change the input end of the built-in audio isolator, effectively isolate the noise caused by the potential difference between computers and digital devices and this equipment.



## Optional external speakers and amplifiers

Stereo audio output can be decoded, connected with high power amplifier or old sound system can be used.





# Sound Reinforcement Scheme with **Single Microphone**

Applied to sound reinforcement in 10\*5 meter classroom podium area



## Product List:

Order	Model	Name	QTY
1	DSP9275	Intelligent Unobtrusive Sound System Host	1
2	DSP9274	Intelligent Hanging Directional Microphone	1
3	DSP8064B	Wall Mount Speaker	2



- A small common classroom, 10M long, 5M wide, 3M high, an area of 50m<sup>2</sup>.
- Design 1 set of intelligent hanging directional microphone installed above the podium area, to meet the need for invisible pickup.
- Design a set of intelligent teaching unobtrusive sound system host, to pick up the microphone for AFC, AEC, ANS, AGC and other intelligent processing, meet the microphone and line signal access, avoid the use of analog or digital mixing console, reduce the complexity of operation, and make the operation more simple.
- Design 2 main speakers, with 1 professional amplifier, wall-mounted on both sides of the classroom to meet the needs of the daily sound reinforcement function.

# Sound Reinforcement Scheme with **Two Microphones**

Applied to sound reinforcement in 10\*8 meter classroom podium area



Schematic Diagram of Connection with Two Microphones



## Product List:

Order	Model	Name	QTY
1	DSP9275	Intelligent Unobtrusive Sound System Host	1
2	DSP9274	Intelligent Hanging Directional Microphone	2
3	DSP8064B	Wall Mount Speaker	2

- A medium-size common classroom, 10M long, 8M wide, 3M high, an area of 80m<sup>2</sup>.
- Design 2 set of intelligent unobtrusive directional microphones installed above the lectern area, to meet the need for invisible pickup.
- Design a set of intelligent teaching unobtrusive sound system host, to pick up the microphone for AFC, AEC, ANS, AGC and other intelligent processing, meet the microphone and line signal access, avoid the use of analog or digital mixing console, reduce the complexity of operation, and make the operation more simple.
- Design 2 main speakers, with 1 professional amplifier, wall-mounted on both sides of the classroom to meet the needs of the daily sound reinforcement function.

# Sound Reinforcement Scheme with **Three Microphones**

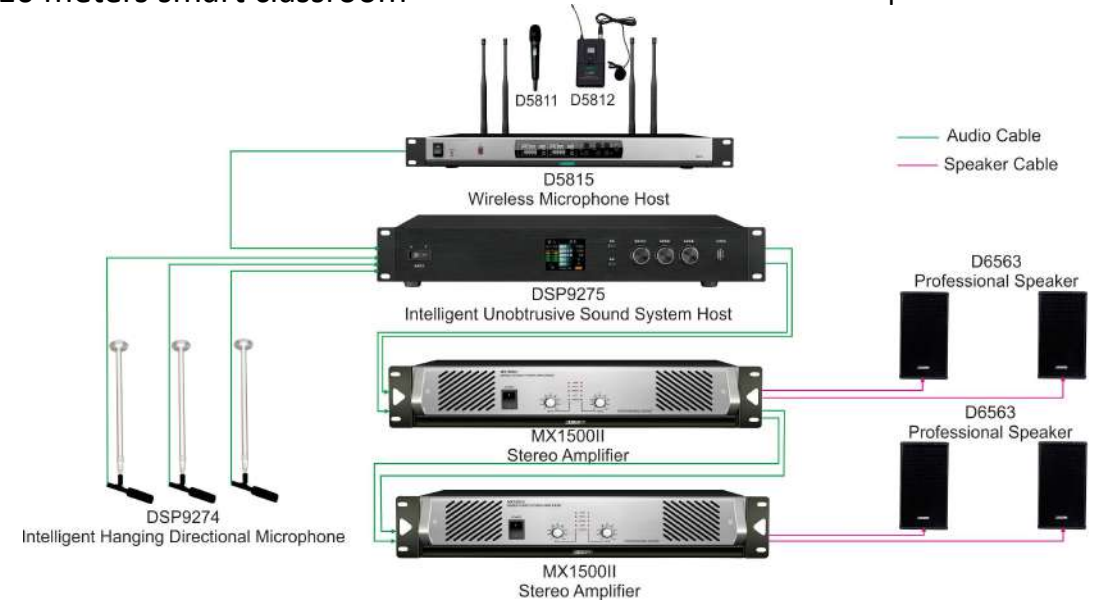
Applied to the interactive sound reinforcement of teachers and students in 20\*10 meters smart classroom

Schematic Diagram of Connection with Three Microphones



## Product List:

Order	Model	Name	QTY
1	DSP9275	Intelligent Unobtrusive Sound System Host	1
2	DSP9274	Intelligent Hanging Directional Microphone	3
3	MX1500II	Stereo Amplifier	2
4	D6563	Professional Speaker	4
5	D5815	Wireless Microphone Host	1
6	D5811	Wireless Handheld Microphone	1
7	D5812	Wireless Collar Microphone	1



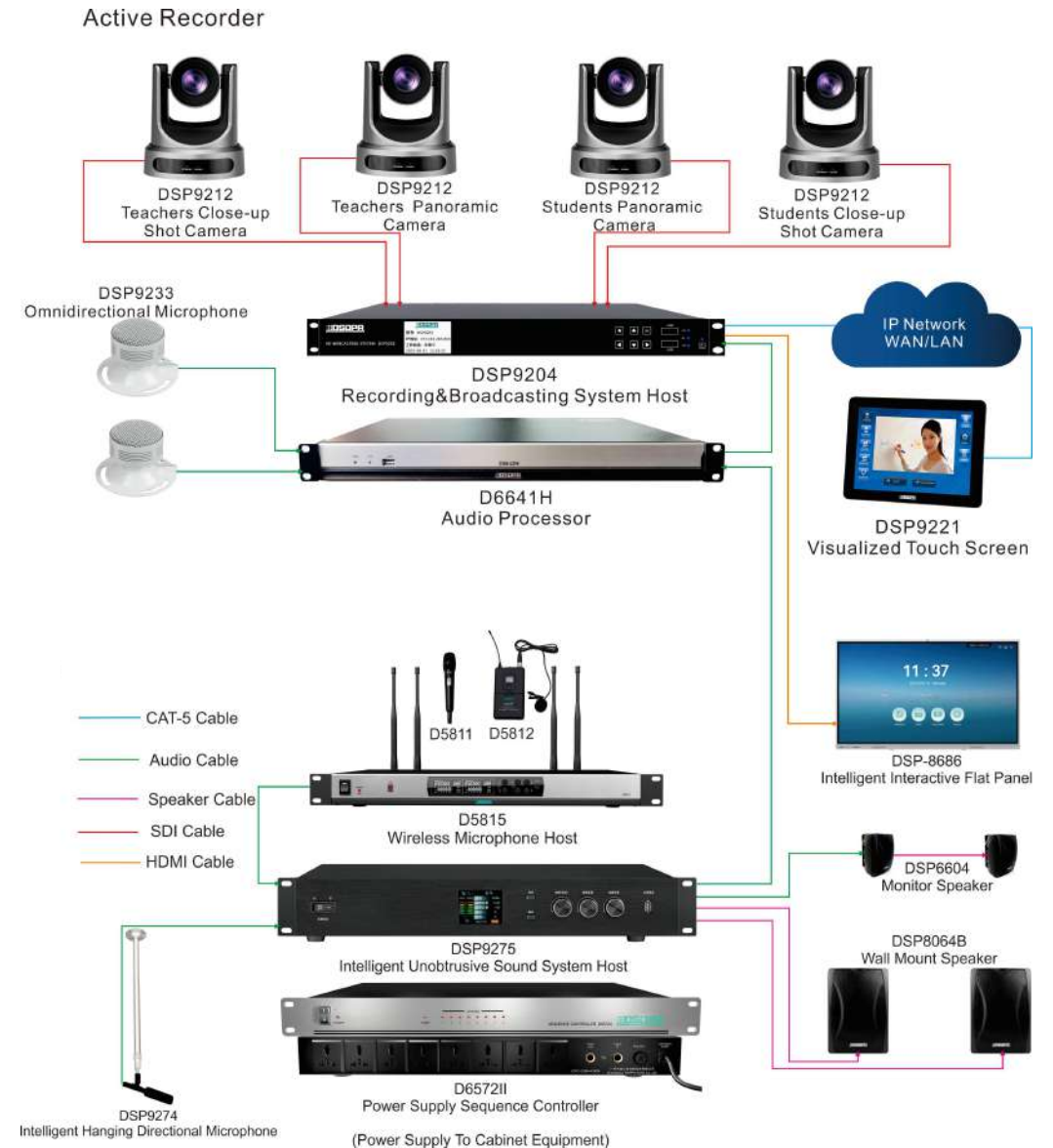
- A medium-size common classroom, 20M long, 10M wide, 3M high, an area of 200m<sup>2</sup>.
- Design 3 set of intelligent unobtrusive directional microphones installed above the lectern area, to meet the need for invisible pickup.
- Design a set of intelligent teaching unobtrusive sound system host, to pick up the microphone for AFC, AEC, ANS, AGC and other intelligent processing, meet the microphone and line signal access, avoid the use of analog or digital mixing console, reduce the complexity of operation, and make the operation more simple.
- Design 4 high-power speakers, with 2 professional amplifiers, wall-mounted in front of the training classroom and the middle wall, covering the audience in the front and back areas, and also meeting the sound reinforcement function needs in large places.

# Work with Recording & Broadcasting System

## Product List:

Order	Model	Name	QTY
1	DSP9275	Intelligent Unobtrusive Sound System Host	1
2	DSP9274	Intelligent Hanging Directional Microphone	1
3	DSP8064B	Wall Mount Speaker	2
4	DSP9212	Student Panoramic Camera	1
5	DSP9212	Student Close-up Camera	1
6	DSP9212	Teacher Panoramic Camera	1
7	DSP9212	Teacher Close-up Camera	1
8	DSP9221	Visualized Touch Screen	1
9	DSP9233	Ominidirectional Microphone	2
10	D6641H	Audio Processor	1
11	DSP9204	Recording & Broadcasting System Host	1
12	D6572II	Power Supply Sequence Controller	1
13	DSP6604	Monitor Speaker	1
14	D5815	Wireless Microphone Host	1
15	D5811	Wireless Handheld Microphone	1
16	D5812	Wireless Collar Microphone	1
17	DCP-8686	Intelligent Interactive Flat Panel	1

Schematic Diagram of Connection with Recording & Broadcasting System



## ■ Explanation of Matching the Recording & Broadcasting System

- Applied to high-quality recording and broadcasting classrooms, it is equipped with unobtrusive sound reinforcement to free the hands of the teacher, ensuring that the local sound reinforcement sounds clear and loud when the teacher walks around the coverage area at will, so that he can better develop himself and improve the quality of teaching.
- Design a set of intelligent teaching unobtrusive sound reinforcement host, and perform intelligent processing such as AFC, AEC, ANS, AGC on the microphone pickup, to meet the access of microphones and line signals, avoid the use of analog or digital mixing console, and reduce the complexity of the use of the operation, making it easy for users to operate.
- With a set of long-distance wireless receiving collar clip microphone and wireless handheld microphone, you can walk out of the podium and use it for interactive sound reinforcement with students.
- 4-camera recording camera, combined with tracking close-up, real-time recording restores on-site teaching. Cooperate with the recording and broadcasting host and intelligent unobtrusive sound reinforcement system, it can perfectly transmit the sound, images and live broadcast situation. You can also save the playback and send it to parents to help children learn at home.
- With a visualized touch screen, you can observe the scene in real time to ensure that the output is no problem. With one key click, you can start recording and save the recording automatically.
- In the class observation room, it can not only observe the scene situation with one-way glass, but also with active monitoring audio, real-time output of the scene sound. Without disturbing the students' class, it can perfectly record the class situation.

# ■ Distribution chart with recording & broadcasting solution





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