TAIDEN®

Classroom Audio System

Excellent solutions for education

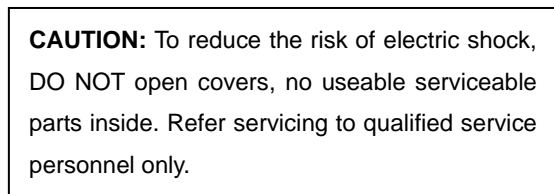**Installation and Operating Manual**

V 1.4

Remarks:

■ All rights reserved for translation, reprint or reproduction of this document.

■ Contents may change without prior announcement.

■ All technical specifications are guideline data and not guaranteed features.

■ TAIDEN is not responsible for any damage caused by improper use of this manual.

■ The equipment must be connected to earth.

■ This product conforms to the regulations of the European directive 2014/30/EU.

■ To protect your hearing, please avoid high pressure level on earphones. Adjust to a lower and convenient level.

■ If any detailed information needed, please contact your local retailer or **TAIDEN** service center in your region. Any feedback, advice and suggestion about the products are appreciated.

■ In order to extend the life time of whole system, it is strongly recommended that the classroom audio system be scheduled to shut down every day when not in use.

■ **TAIDEN** is the registered trademark of TAIDEN Industrial Co., Ltd.

Important Safety Instructions

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. The apparatus shall not be exposed to dripping or splashing and that no objects filled with liquids, such as vases, shall be placed on the apparatus.
6. The MAINS plug serving as a disconnection device should be easy to operate.
7. The apparatus should be connected to the MAINS socket-outlet with protective earth.
8. Clean only with dry cloth.
9. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
10. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
11. Do not bypass the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade and the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
12. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
13. Only use attachments/accessories specified by the manufacturer.
14. Do not leave the battery near the fire or under an environment over 60 ºC (such as under direct sunlight in the car), otherwise it may damage the protection circuit of the battery and cause fire, explosion, leakage or heat generation.
15. Unplug this apparatus during lightning storms or when unused for long periods of time.
16. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

17. Do not place the equipment on any uneven or unstable stand; original product package or appropriate package should be used to avoid damage caused by strong impacts during transportation.
18. Power supply cords:
    AC 100 V-240 V 50 Hz/ 60 Hz
19. The quantity of connected transceivers in one system should not exceed prescribed quantity. For service, please contact the nearest TAIDEN Service Center.
20. All TAIDEN products are guaranteed for definite time (see the WARRANTY CARD for details) excluding the following cases:
    A. All damage or malfunction caused by human negligence;
    B. Damage or malfunction caused by improper operating by operator;
    C. Parts damage or loss caused by disassembling the product by non-authorized personnel.
21. Use ONLY specified connection cable to connect the system equipment.
22. Upon receipt of the product, please fill out the Warranty Card enclosed and post it to TAIDEN Service Center nearby in your region.

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

CAUTION: To reduce the risk of electric shock, DO NOT open covers, no useable serviceable parts inside. Refer servicing to qualified service personnel only.

This label appears on the rear of the unit due to space limitations

The lightning flash with an arrowhead symbol, with an equilateral triangle, is intended to alert the user to the presence of uninsulated 'dangerous voltage' within the products enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation mark within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Important Safety Instructions

WARNING: These apparatuses shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases shall be placed on the apparatus.

WARNING: To reduce the risk of electric shock, DO NOT expose units to rain or moisture.

Attention: Installation should be performed by qualified service personnel only in accordance with the National Electrical or applicable local codes.

Power Disconnect: Units with or without ON – OFF switch have power supplied to the unit whenever the power cord is inserted into the power source; however, the unit is operational only when the ON – OFF switch is in the ON position. The power cord is the main power disconnect for all units

WARNING: The apparatus should be connected to a mains socket outlet with a protective earthing connection.

Lithium battery safety precautions

To change battery please power off and take off the battery immediately.

Keep the battery away from heat sources to prevent fire or explosion.

Do not use a battery that is leaking, deformed, discolored or overheats.

Take extra precautions to keep a leaking battery from fire.

Do not use a battery that emits odor or smoke.

Do not solder, disassemble, puncture or deform the battery, otherwise, it may damage the protection circuit of the battery and cause fire, leakage or explosion.

Do not short-circuit the positive and negative electrode with wire or other metal objects, otherwise it may cause fire, explosion, leakage or heat generation.

Do not store or transport the battery with metal objects (such as necklace or hair grip), otherwise it may cause fire, explosion, leakage or heat generation.

Do not heat the battery or throw it into fire, otherwise it may damage the safety valve or the protection circuit of the battery and may cause fire or explosion.

Do not put the battery in the water or moisten the electrode of the battery, otherwise it may corrode the battery and cause fire, explosion, leakage or heat generation.

Be careful to put the battery into the charging case with correct electrode position, otherwise it may cause fire, explosion, leakage or heat generation.

Do not leave the battery near the fire or under an environment over 60 ºC (such as in the car from direct sunlight), otherwise it may damage the protection circuit of the battery and cause fire, explosion, leakage or heat generation.

Please charge the battery with the dedicated base plate, using other charging unit may cause fire, explosion, leakage or heat generation.

Please use the battery in assigned unit, otherwise it may cause fire, explosion, leakage or heat generation.

Do not drop or shock the battery, otherwise it may damage the protection circuit of the battery and cause fire, explosion, leakage or heat generation.

If battery contents get into eyes it may cause blurred vision. DO NOT rub. Rinse with clear water immediately and consult a doctor.

If the battery leaks onto skin or clothing, wash the area immediately with clean water to avoid skin injury and fabric damage.

It will result in low battery and may damage the battery if the battery is not used for a long time. Please take off the battery, and fully charge the battery for every three months.

Contents

Installation & User Guide

About this manual:

This manual is a comprehensive guide to the installation and operation of TAIDEN Classroom Audio System. It includes the detailed description of the function and interface of the classroom audio system components, system connection and installation, system set-up and operation.

The manual is divided into the following chapters:

Chapter 1: System introduction

Introduction to the classroom audio system, as well as to the structure, technical principle, and aspects of system planning.

Chapter 2: TES-5680 series classroom audio system

Detailed description of functions, connection, configuration and operation of TES-5680 series classroom audio system.

Chapter 3: TES-5600 series classroom audio system

Detailed description of functions, connection, configuration and operation of TES-5600 series classroom audio system.

Chapter 4: TES-5690 series classroom audio system

Detailed description of functions, connection, configuration and operation of TES-5690 series classroom audio system.

Chapter 5: Digital infrared wireless microphone

Detailed description of functions and operation of digital infrared wireless microphone.

Chapter 6: Wired microphone

Detailed description of functions and operation of wired microphone.

Chapter 7: Accessories

Detailed description of power adapter, dedicated cable, charging station, speaker, and etc.

Chapter 8: Technical data

Mechanical and electrical details of classroom audio series equipments.

Installation & User Guide

This manual is applicable to:

■ **TES-5680 Series Classroom Audio System**

TES-5680M/30

Interactive Audio Recording System Receiver (with built-in array microphone, high performance DSP with ANC, AEC and AGC algorithm, audio localization, with digital infrared receiver, audio localization, RJ45 interface for extending receiver)

TES-5680BX/30

Interactive Audio Recording System Control Box (supports 2 wireless microphones, 1 line in, 1 line out + 1 output for recording, digital audio input/output (micro USB), can connect to TES-5600 series Wired Desktop Microphone for audio transmission, built-in audio power amplifier for connection to 4 loudspeakers, with TES-ADP24V adapter)

TES-5685MA/20

Interactive Audio Recording System Main Unit (with built-in array microphone, high performance DSP with ANC, AEC and AGC algorithm, with digital infrared receiver, supports 2 wireless microphones, analog audio input/output, output for recording, built-in audio power amplifier and integrated loudspeakers)

TES-5685MA/30

Interactive Audio Recording System Main Unit (with built-in array microphone, high performance DSP with ANC, AEC and AGC algorithm, audio localization, with digital infrared receiver, supports 2 wireless microphones, with analog audio input/output, output for recording, built-in audio power amplifier and integrated loudspeakers, RJ45 interface for extending receiver)

TES-5685MB/30

Digital Infrared Classroom Audio System Main Unit (with digital infrared receiver, supports 2 wireless microphones, analog audio input/output, built-in audio power amplifier and integrated loudspeakers, RJ45 interface for extending receiver)

TES-5685MC/30

Digital Infrared Classroom Audio System Main Unit (with digital infrared receiver, supports 1 wireless microphone, analog audio input/output, built-in audio power amplifier and integrated loudspeakers, RJ45 interface for extending receiver)

TES-5685MCP/30

Digital Infrared Classroom Audio System Main Unit (with digital infrared receiver, supports 1 wireless microphone, analog audio input/output, with built-in audio power amplifier and integrated loudspeakers, network connection for PA and network management, RJ45 interface for extending receiver)

TES-5685PA/30

Function Extension Box (for TES-5685MCP/30, 1 line out+1 line in, 1 PA in with loop out, 1 PA trigger)

TES-5685BX/20

Function Extension Box (for TES-5685M, analog audio input/output, with 1 line in and 1 line out)

TES-5685BX/30

Function Extension Box (for TES-5685M, analog audio input/output, can connect to TES-5600 series Wired Desktop Microphone for audio transmission, with 1 line in and 1 line out)

TES-5685BXP/30

Function Extension Box (for TES-5685M series, analog audio input/output, can connect to TES-5600 series Wired Desktop Microphone for audio transmission, 1 line out+1 line in, 1 PA trigger)

■ **TES-5600 Series Classroom Audio System**

TES-5600RN1/30

Digital Infrared Receiver (RJ45 interface, ceiling, wall or tripod-mounted, support 1 wireless microphones)

TES-5600RN/30

Digital Infrared Receiver (RJ45 interface, ceiling, wall or tripod-mounted, support 2 wireless microphones)

TES-5600BX1/30

Digital Infrared Classroom Audio System Control Box (with RJ45 interface, supports 1 wireless microphone, built-in audio power amplifier can be connected to 4 loudspeakers, can connect to TES-5600 series Wired Desktop Microphone for audio transmission, 2 line in, 1 line out)

Installation & User Guide

TES-5600BX2/30

Digital Infrared Classroom Audio System Control Box (with RJ45 interface, supports 2 wireless microphones, built-in audio power amplifier can be connected to 4 loudspeakers, can connect to TES-5600 series Wired Desktop Microphone for audio transmission, 2 line in, 1 line out)

TES-5600MAU/30

Digital Infrared Classroom Audio System Main Unit (supports 2 wireless microphones, built-in amplifier, supports 4 speakers, can connect to TES-5600 series Wired Desktop Microphone for audio transmission, USB interface for digital audio input/output, phantom power, RJ45 interface to extend receiver, with adapter)

■ **TES-5690 Series Classroom Audio System**

TES-5690MA

Digital Infrared Classroom Audio System Main Unit (supports 2 wireless microphones, with DSP, built-in audio power amplifier 2×200 W+2×60 W, network control)

TES-5690MB

Digital Infrared Classroom Audio System Main Unit (supports 2 wireless microphones, with DSP, built-in audio power amplifier 2×200 W, network control)

TES-5690MC

Digital Infrared Classroom Audio System Main Unit (supports 2 wireless microphones, with DSP, built-in audio power amplifier 4×60 W, network control)

■ **Digital IR Wireless Microphone**

TES-5604C

Digital Infrared Wireless Microphone (built-in rechargeable lithium battery, excl. adapter, used with TES-5600NS series neck lanyard)

TES-5604N

Digital Infrared Wireless Microphone (white, built-in rechargeable lithium battery, with laser pointer, excl. adapter, used with TES-5600NS_W neck lanyard or TES-5600CLP clip)

TES-5605

Digital Infrared Wireless Microphone (built-in rechargeable lithium battery, excl. adapter, used with TES-5600NS series neck lanyard)

TES-5606

Digital Infrared Wireless Microphone (white, built-in rechargeable lithium battery, excl. adapter, used with TES-5600NS_W neck lanyard or TES-5600CLP clip)

TES-5607

Digital Infrared Wireless Microphone (used with power bank and TES-5600NS_W neck lanyard or TES-5600CLP clip, excl. power bank)

■ **Wired Microphone**

TES-5600MIC

Wired Desktop Microphone (standard stem microphone: 60cm, optional: 50/70cm)

TES-5600CSM

Wired Desktop Microphone (standard stem microphone: 60cm, optional: 50/70cm; with a charging station for two TES-5604 series microphones, with TES- ADP5V power adapter)

TES-5600CSML

Wired Desktop Microphone (standard stem microphone: 60cm, optional: 50/70cm; with a lockable charging station for one TES-5604 series microphone, can be unlocked by scanning QR code or via central control system; with TES- ADP5V power adapter)

TES-5600CSMN

Wired Desktop Microphone (standard stem microphone: 60cm, optional: 50/70cm; with a lockable charging station for one TES-5604 series microphone, can be unlocked via central control system or via network management system; support network management when used with TES-5604NSW Wireless Microphones Management Platform; with TES- ADP5V power adapter)

■ **Charging unit**

TES-5600CSL

Charging Station (with a lockable charging station for one TES-5604 series microphone, can be unlocked by scanning QR code or via central control system; with TES- ADP5V power adapter)

Installation & User Guide

TES-5600CSN

Charging Station (with a lockable charging station for one TES-5604 series microphone, can be unlocked via central control system or via network management system; support network management when used with TES-5604NSW Wireless Microphones Management Platform; with TES- ADP5V power adapter)

TES-5604CHG/01

Charging Station (can charge one TES-5604 series microphone，excl. adapter)

TES-5604CHG/02

Charging Station (can charge two TES-5604 series microphones，excl. adapter)

TES-5604CHG/09

Charging Station (can charge nine TES-5604 series microphones at a time，excl. adapter)

■ **Microphone**

TES-1021	Clip Microphone
TES-1022	Single-ear microphone
TES-1023	Head-worn Microphone

■ **Neck Lanyard**

TES-5600NS_W	Neck Lanyard (adjustable lengt)
TES-5600CLP	Clip

■ **Power Adapter**

TES-ADP5V	Power Adapter (DC 5 V, 2.0 A)
TES-ADP24V	Power Adapter (DC 24 V, 2.7 A)
TES-ADP5V6A	Power Adapter (DC 5 V, 6.0 A)
TES-ADP19V	Power Adapter (DC 19 V, 3.42 A)

■ **Power Bank**

TES-5607PB	Power Bank (5000mAh)

■ **Dedicated Cable**

CBLRJ45-02

2 m Ethernet Extension Cable (with drain wire and shielded RJ45 plug)

CBLRJ45-05

5 m Ethernet Extension Cable (with drain wire and shielded RJ45 plug)

CBLRJ45-10

10 m Ethernet Extension Cable (with drain wire and shielded RJ45 plug)

CBLRJ45-20

20 m Ethernet Extension Cable (with drain wire and shielded RJ45 plug)

CBLRJ45-30

30 m Ethernet Extension Cable (with drain wire and shielded RJ45 plug)

CBLRJ45-40

40 m Ethernet Extension Cable (with drain wire and shielded RJ45 plug)

CBLRJ45-50

50 m Ethernet Extension Cable (with drain wire and shielded RJ45 plug)

CBL-SPK2	Speaker Cable
CBL-SPK	Speaker Cable

■ **Cable Splitter**

TES-0104T/30

1×4 Cable Splitter (RJ45 interface, for extending TES-5600RN/30)

1×2 BNC Cable Splitter

SB-408C3	1×4 Cable Splitter (third-party fittings)

■ **Tripod**

TES-5600ZJ2	Microphone/Receiver Stand
TES-5600RZJ	Fixing Bracket

■ **Suspension**

TES-5685P-05	Suspension (0.5 m)
TES-5685P-10	Suspension (1.0 m)
TES-5685P-15	Suspension (1.5 m)

■ **Speaker**

HPA-2240	Wall Mounted Speaker (8 Ω, 40W)

HCL-1090

Line Array Column Loudspeaker (6 Ω, 60 W, black, with adjustable installation brackets or fixed ones)

HCL-1200B

Line Array Column Loudspeaker (6 Ω, 200W, black, with adjustable installation brackets or fixed ones, extra charge of USD 10 for each ceiling mount)

Chapter 1 System introduction

1.1 Overview

In 2015, TAIDEN introduced its worldwide pioneering digital infrared technology into the field of multimedia teaching and released successively a series of classroom audio systems which can be categorized as Digital IR Wireless Classroom Audio Reinforcement System, Interactive Recording and Webcasting Audio System and Lecture Recording Management Platform. The audio systems featuring excellent audio clarity, great immunity to interference and convenient management fully satisfy the need for sound reinforcement, interactive recording and webcasting, and centralized management of all the multimedia equipment in classrooms. In addition, the wireless microphone of digital IR technology provides safe and RF radiation free use. What's more, the e-lock charging station for wireless microphones frees school AV/IT teams from keeping and charging the microphones.

TAIDEN Classroom Audio System includes:

TES-5680 series Classroom Audio System

TES-5600 series Classroom Audio System

1.2 Functions and features

1. World leading technology

Audio transmission and control based on proprietary digital infrared processing chip (DQPSK modulation)

TAIDEN TDIR04 digital infrared processing chip

2. Audio clarity

CD quality audio within a range of 20 meters:
- Main unit to main unit: 50 Hz-20 kHz

  Mic. to main unit: 100 Hz-20 kHz
- SNR: $\geqslant$ 90 dBA
- THD: $\leqslant$ 0.05 %

3. Zero RF radiation, green and healthy
- No health hazards resulted from RF radiation
- Worry-free use for long-time wearing

4. Convenient operation and management
- Power on to talk, no frequency tuning needed
- Personal microphone for each teacher, adding hygienic bonus

5. Immunity to interference
- Allows for simultaneous use in adjacent rooms
- Insusceptible to radio and HF-driven lighting interference
- Works perfectly in direct sunlight

6. USB Link function
- Digital audio input/output:

  a) lossless sound recording during class on computer;

  b) lossless transmission of streaming audio from computer
- Cooperating with the TES-560x microphone for remote PPT-page switch control

1.3 System technology

1.3.1 IR radiation technology

The core of the TAIDEN digital infrared classroom audio system – dirATC (digital infrared Audio Transmitting and Control technologies) - is a new technology originated by TAIDEN. It encodes and modulates audio and data signals digitally for transmission via infrared light, allowing for transmission and control of both multi-channel audio signals and data by integrating A/D (analog/digital) conversion circuit, digital encoding/decoding circuit, digital modulator/demodulator (DQPSK), as well as filtering and amplification circuit.

Figure 1.1 TAIDEN digital infrared processing chip

Infrared light is part of the electro-magnetic spectrum, which is composed of visible light, radio waves and other types of waves. Its wavelength is longer than that of visible light.

Infrared light cannot pass through opaque walls and ceilings thus guarantees the privacy of the meeting by avoiding being intercepted or disturbed. In addition, infrared light generates no radio waves and a license is not required when operating infrared light systems.

1.3.2 Carriers and channels

TAIDEN classroom audio system adopts 2-6 MHz wave band. This wave band is suitable for the transmission of wide band audio and corresponding signals. Classroom audio system uses frequency points of BANDⅣ in IEC 61603(please refer to table 1.1.)

Route	Frequency
From microphone to the digital IR wireless receiver	2.33 MHz
	3.67 MHz

Table 1.1   frequencies in classroom audio system

1.3.3 Principle of TES-5680 classroom audio system

TAIDEN TES-5680 classroom audio system dedicated to recording teacher's instruction and students' interaction in class by integrating digital infrared technology, DSP technology with array microphone. The system ensures broadcast level audio quality by picking up teachers' sound with IR microphone, and the sound can be separately routed to the classroom reinforcement system. An omnidirectional array microphone is used to pick up students' interactive activities; the sound will be further processed by the "3A" algorithm (ANC, AEC, AGC) and then mixed with the teacher's audio to be fed into a third-party recording system. (Figure 1.2)
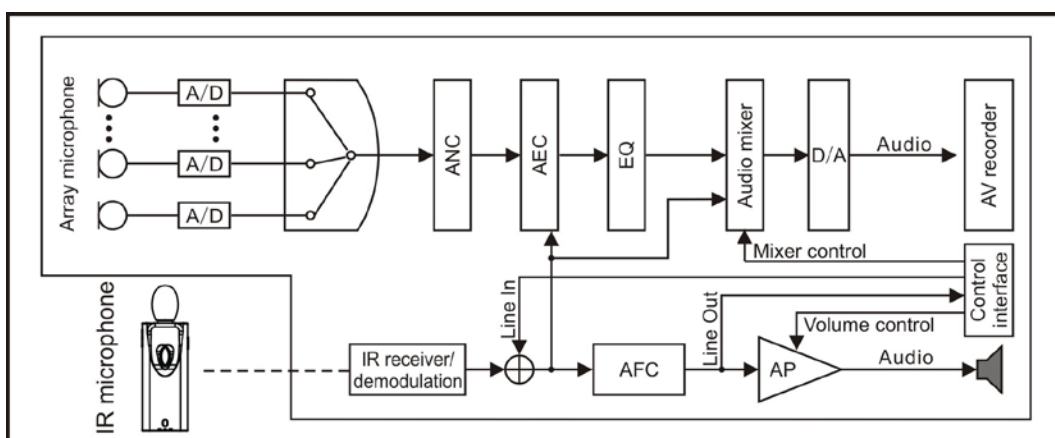
Figure 1.2   Schematic diagram of TES-5680 classroom audio system

1.4 Position planning of the digital infrared receiver

1.4.1 Position away from lighting equipment

Although TAIDEN classroom audio system has good anti-interference performance to ambient light, the distance from the receiver to lighting equipment must be at least 50 cm to guarantee adequate intensity and stability of infrared signals.
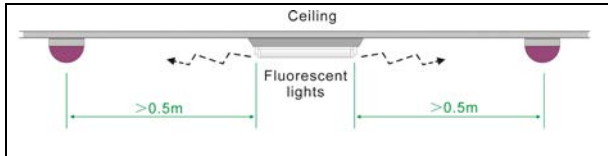

Figure 1.3   Digital infrared receiver position (near lighting equipment)

Note:

☞   If the position of lighting equipment is higher than the position of the receiver, the disturbance can be ignored.

1.4.2 Avoid direct intense light

Exposing the receiver to intense light source may cause system failure or noise. Please do not mount the receiver in such a way the intense light source irradiates directly, as shown in follow figure:
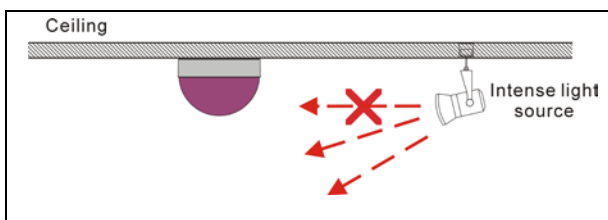

Figure 1.4   Digital infrared receiver position (avoid direct intense light)

1.4.3 Example for planning the receiver

The reception angle of the digital infrared receiver is 150° in vertical and 360° in horizontal. For a good reception, please plan the receiver according to the teaching environment.

【8m × 8m classroom】

In an 8m × 8m classroom, one receiver can be mounted on the ceiling in the front middle part of the classroom and about 2 to 3 meters (L) away from the blackboard.

Figure 1.5   Planning the receiver 1

【15m × 15m classroom】

In a 15m × 15m classroom, two receivers with a distance of 6 to 8 meters between them, can be mounted on the ceiling in the front middle part of the classroom, 2 to 3 meters (L1) away from the blackboard. And the mounting distance (L1) of TES-5685M must be more than 3 meters.
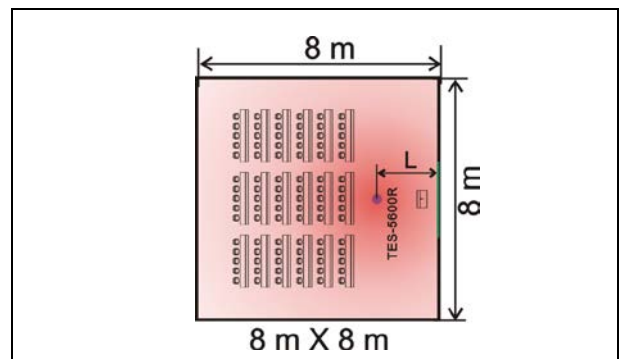
For making sure the signal is covered to the rear position, 1 or 2 receivers can be added on the ceiling, 3 or 5 meters (L2) away from the back wall in the classroom.
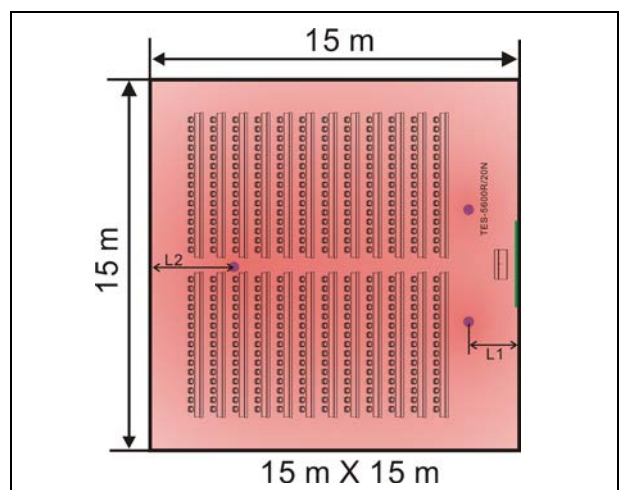

Figure 1.6   Planning the receiver 2

Chapter 2 TES-5680 Series Classroom Audio System

2.1 Overview

TES-5680 series includes classroom audio system and digital infrared wireless classroom audio system.

Types:

TES-5680M/30

Interactive Audio Recording System Receiver (with built-in array microphone, high performance DSP with ANC, AEC and AGC algorithm, audio localization, with digital infrared receiver, audio localization, RJ45 interface for extending receiver)

TES-5680BX/30

Interactive Audio Recording System Control Box (supports 2 wireless microphones, 1 line in, 1 line out + 1 output for recording, digital audio input/output (micro USB), can connect to TES-5600 series Wired Desktop Microphone for audio transmission, built-in audio power amplifier for connection to 4 loudspeakers, with TES-ADP24V adapter)

TES-5685MA/20

Interactive Audio Recording System Main Unit (with built-in array microphone, high performance DSP with ANC, AEC and AGC algorithm, with digital infrared receiver, supports 2 wireless microphones, analog audio input/output, output for recording, built-in audio power amplifier and integrated loudspeakers)

TES-5685MA/30

Interactive Audio Recording System Main Unit (with built-in array microphone, high performance DSP with ANC, AEC and AGC algorithm, audio localization, with digital infrared receiver, supports 2 wireless microphones, with analog audio input/output, output for recording, built-in audio power amplifier and integrated loudspeakers, RJ45 interface for extending receiver)

TES-5685MB/30

Digital Infrared Classroom Audio System Main Unit (with digital infrared receiver, supports 2 wireless microphones, analog audio input/output, built-in audio power amplifier and integrated loudspeakers, RJ45 interface for extending receiver)

TES-5685MC/30

Digital Infrared Classroom Audio System Main Unit (with digital infrared receiver, supports 1 wireless microphone, analog audio input/output, built-in audio power amplifier and integrated loudspeakers, RJ45 interface for extending receiver)

TES-5685MCP/30

Digital Infrared Classroom Audio System Main Unit (with digital infrared receiver, supports 1 wireless microphone, analog audio input/output, with built-in audio power amplifier and integrated loudspeakers, network connection for PA and network management, RJ45 interface for extending receiver)

TES-5685PA/30

Function Extension Box (for TES-5685MCP/30, 1 line out+1 line in, 1 PA in with loop out, 1 PA trigger)

TES-5685BX/20

Function Extension Box (for TES-5685M, analog audio input/output, with 1 line in and 1 line out)

TES-5685BX/30

Function Extension Box (for TES-5685M, analog audio input/output, can connect to TES-5600 series Wired Desktop Microphone for audio transmission, with 1 line in and 1 line out)

TES-5685BXP/30

Function Extension Box (for TES-5685M series, analog audio input/output, can connect to TES-5600 series Wired Desktop Microphone for audio transmission, 1 line out+1 line in, 1 PA trigger)

2.2 Functions and indications
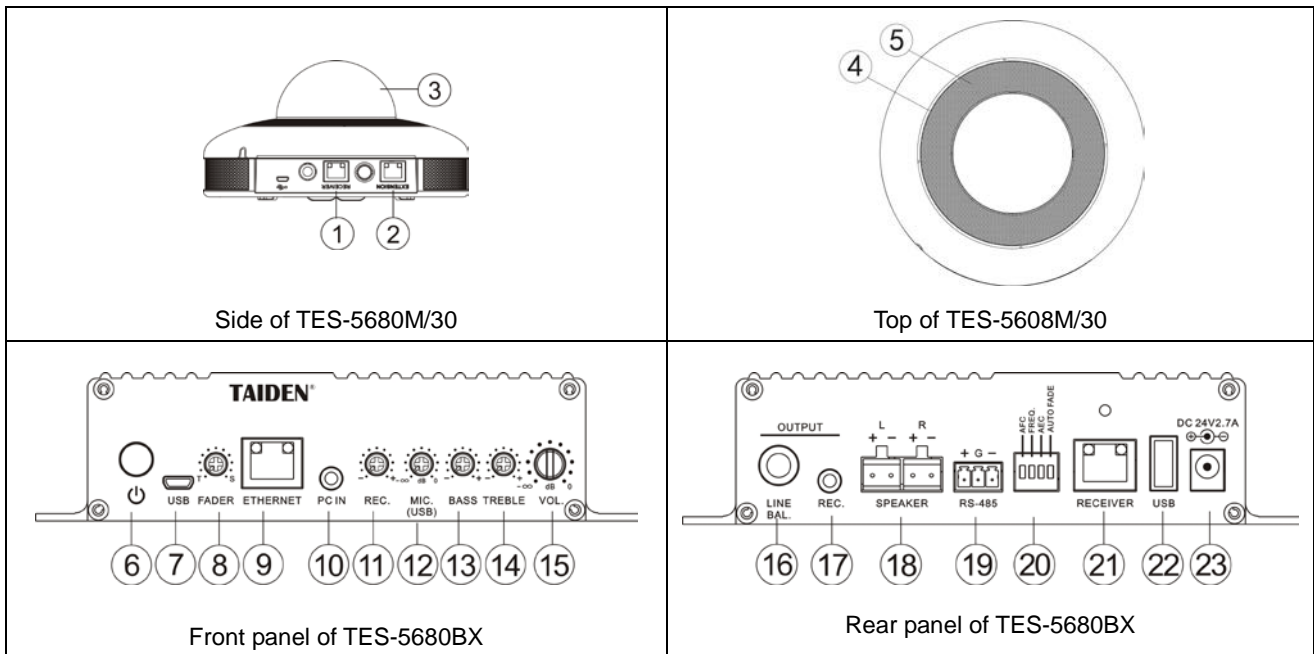
2.2.1 TES-5680M+TES-5680BX

Figure 2.1   Interactive audio recording system

Figure 2.1:

1. RECEIVER interfaces (RJ45)

- Connect to TES-5680BX for transmitting signals and power supply

2. Receiver interface

- For connecting to TES-5600R series receiver

3. IR receiver and indicator

4. Microphone indicator

- Display the status of array microphone (on or standby)
- 12-segment light indicator for accurate sound direction indication

5. Array microphone

6. Power on/off button

7. USB interface

- For firmware upgrade
- Connect to PC for remote control of PPT slides and digital audio input/output

8. Fader knob

- Sound mixing ratio adjustment fader

9. ETHERNET (RJ45)

- For connection to central control system

10. PC IN (Ø 3.5 mm)

- For audio input, the volume is 0 dB

11. REC. volume knob

12. MIC (connected via USB) sensitivity knob

13. Bass knob

14. Treble knob

15. Speaker volume knob

16. Line out (Ø 6.4 mm, balance)

17. REC. interface (Ø 3.5 mm)

18. Speaker interface

19. RS-485 interface

- Connecting to central control system for adjusting the volume of IR wireless microphones

20. Switch

1	AFC function
2	IR frequency
3	Communication mode (AEC)
4	Auto. fade

21. RECEIVER interfaces (RJ45)

- Connect to TES-5680M for transmitting signals and power supply

22. USB interface

- For connecting to TES-5600MIC and TES-5600CSM series wired microphone

23. Power supply

2.2.2 TES-5685 system

Button of TES-5685M

Side of TES-5685MA series

Side of TES-5685MB/MC/30

Side of TES-5685MCP/30

TES-5685BX series

TES-5685BXP/30

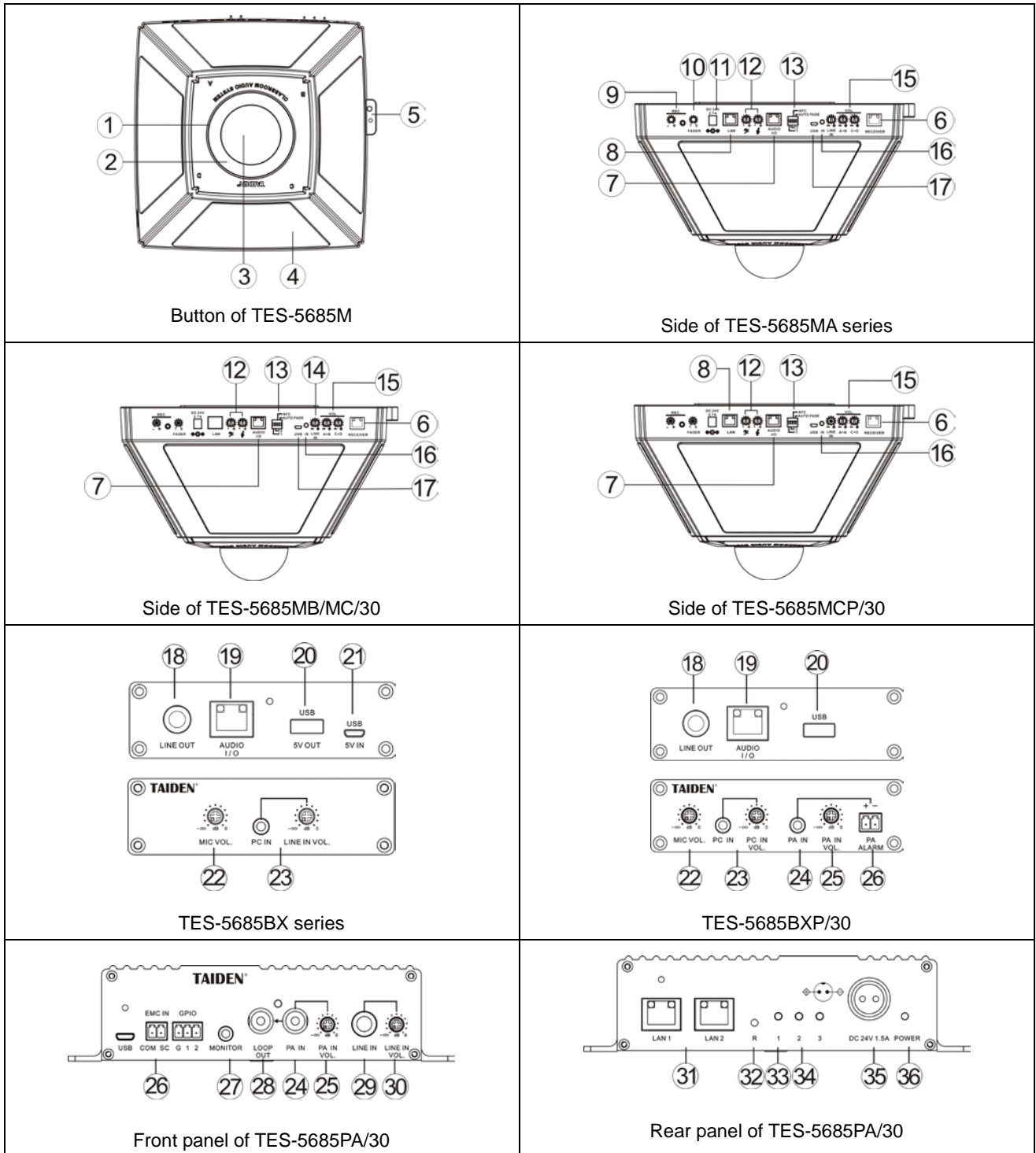Front panel of TES-5685PA/30

Rear panel of TES-5685PA/30

Figure 2.2　TES-5685 Series Classroom audio system

Figure 2.2:

1. **Microphone indicator (only TES-5685MA)**
   - Display the status of array microphone (on or standby)
   - 12-segment light indicator for accurate sound direction indication
2. **Array microphone (only TES-5685MA)**
3. **IR receiver and indicator**

4. **4 Speakers (A/B/C/D)**
5. **Hole for safety wire**
6. **Receiver interface**
   - For connecting to TES-5600R series receiver
7. **AUDIO I/O interface (RJ45)**
   - Connect to TES-5685BX for transmitting audio signal

8. **ETHERNET (RJ45)**
   - For connection to Ethernet to see the system status and adjust the system parameters
   - For upgrade
9. **REC. interface (Ø 3.5mm) and volume knob**
10. **Fader knob**
    - Sound mixing ratio adjustment fader
11. **(reserved)**
12. **Bass knob and treble knob**
13. **Switch**

F1	IR frequency
F2	Auto. Fade/ Broadcast mode
AFC	AFC function
AUTO FADE	Auto. Fade/ Remote mode

14. **Line in volume knob**
15. **Speaker volume knob**
16. **IR indicator**
17. **USB interface**
    - For firmware upgrade
    - Connect to PC for remote control of PPT slides and digital audio input/output
18. **Line out (Ø 6.4mm, balance)**
19. **AUDIO I/O interface (RJ45)**
    - Connect to TES-5685M for transmitting audio signal
20. **USB interface**
    - For connecting to TES-5600MIC and TES-5600CSM series wired microphone
21. **USB interface (reserved)**
    - TES-5685BX/30 without this interface
22. **Wired MIC sensitivity knob**
23. **PC IN (Ø 3.5mm) and volume knob**
24. **PA IN**
    - TES-5685BXP is Ø 3.5mm interface and TES-5685PA is RCA interface
25. **PA IN volume knob**
26. **PA trigger**
    - For public address system, when the PA trigger is enabled, the audio of PA IN will be routed to all the outputs with all other inputs muted
27. **Monitor earphone jack**
28. **Loop out for PA IN (RCA)**
29. **Line in (Ø 6.4mm, balance)**
30. **Line in volume knob**
31. **LAN interface (RJ45)**
    - For connecting to switch to adjust the system parameters through the Web server

   - For firmware upgrade
32. **Reset button**
    - Press it 3 times continuously to restore the factory settings
33. **PA indication**
34. **Audio in indication**
35. **Power supply (2P aviation plug, 24 V)**
36. **Power indication**

2.3 Installation

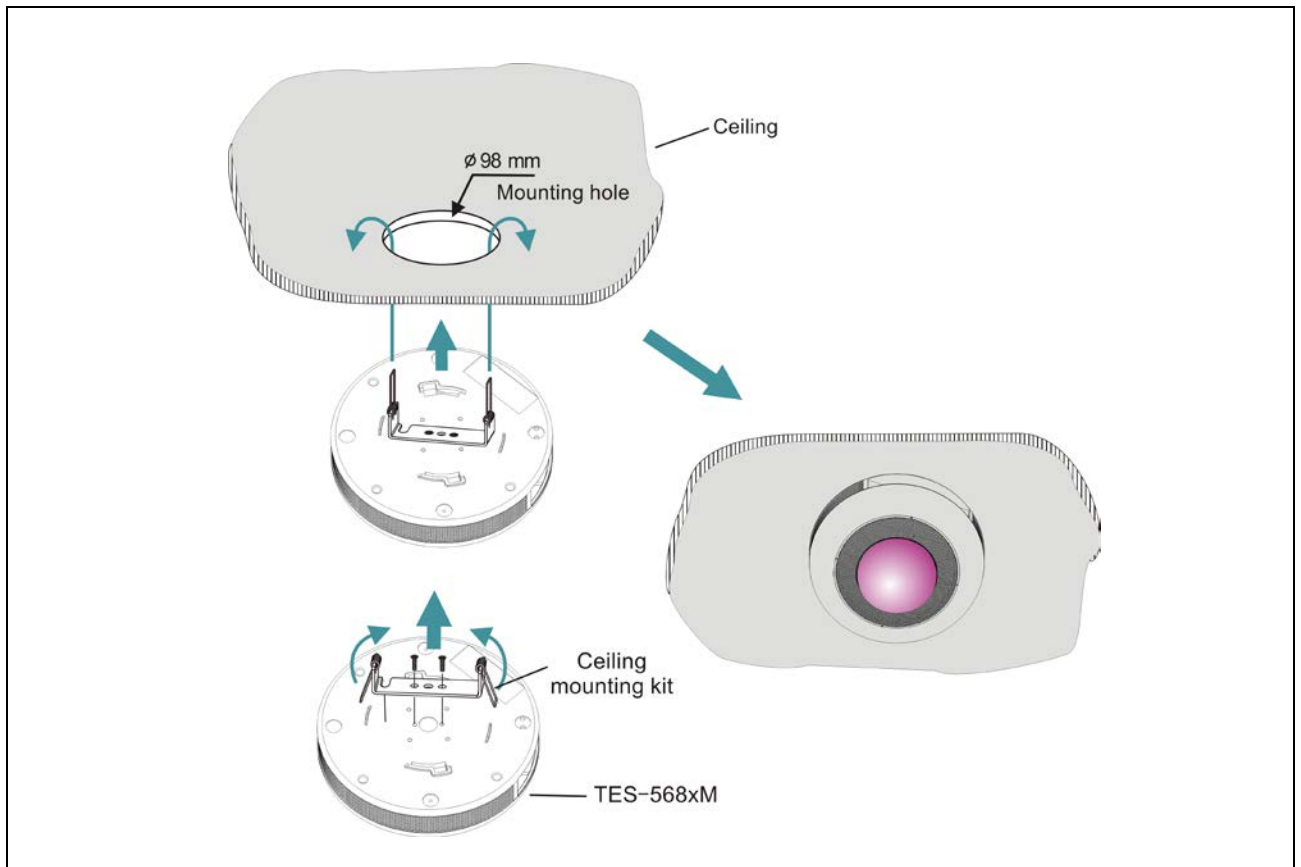### 2.3.1 Ceiling mounted of TES-5680M

2.3.1.1 Ceiling mounted 1

Figure 2.3   Ceiling mounted 1

Mounting steps:

Step 1: Install the ceiling mounting kit at the top of the TES-5680M;

Step 2: Drill a hole with 98 mm diameter into the ceiling (for mounting and heat elimination during operation);

WARNING:
☞   Do not cover the venting to keep good ventilation for the equipment.

Step 3: Hold the spring straightly and vertically, insert it into the mounting hole until the base of the TES-5680M can fit with the ceiling.

WARNING:
☞   The nameplate on the bottom of the TES-5680M will be covered after installation.
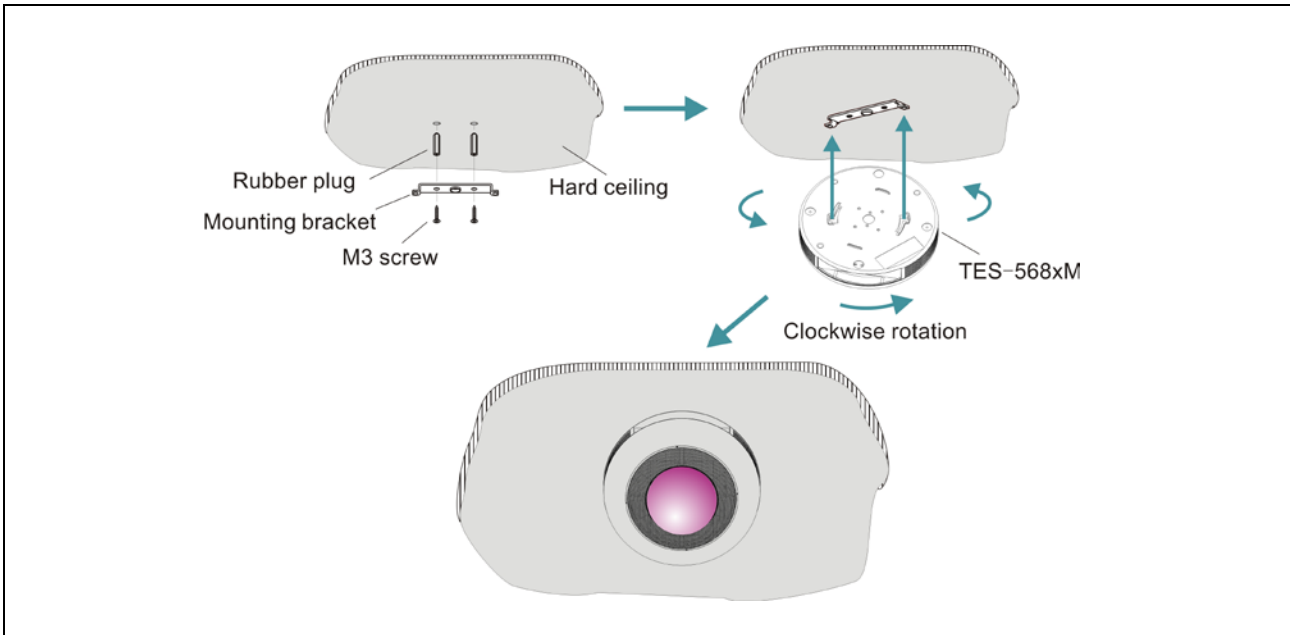
2.3.1.2 Ceiling mounted 2

Figure 2.4   Ceiling mounted 2

Mounting steps:

Step 1: Position the mounting bracket on the ceiling according to the installation location of the TES-5680M and mark the positions of the drilling holes. Drill two holes (5 mm diameter, 30 mm depth) into the ceiling.

Step 2: Put the included rubber plugs into the mounting holes on the ceiling;

Step 3: Fix the mounting bracket on the ceiling with M3 screws;

Step 4: Put the slots of TES-5680M into hard ceiling mounting bracket and fix it with clockwise rotation.

> **WARNING:**
> ☞ This installation method is applicable when the ceiling thickness is greater than the length of the rubber plug.
> ☞ The nameplate on the bottom of the TES-5680M will be covered after installation.
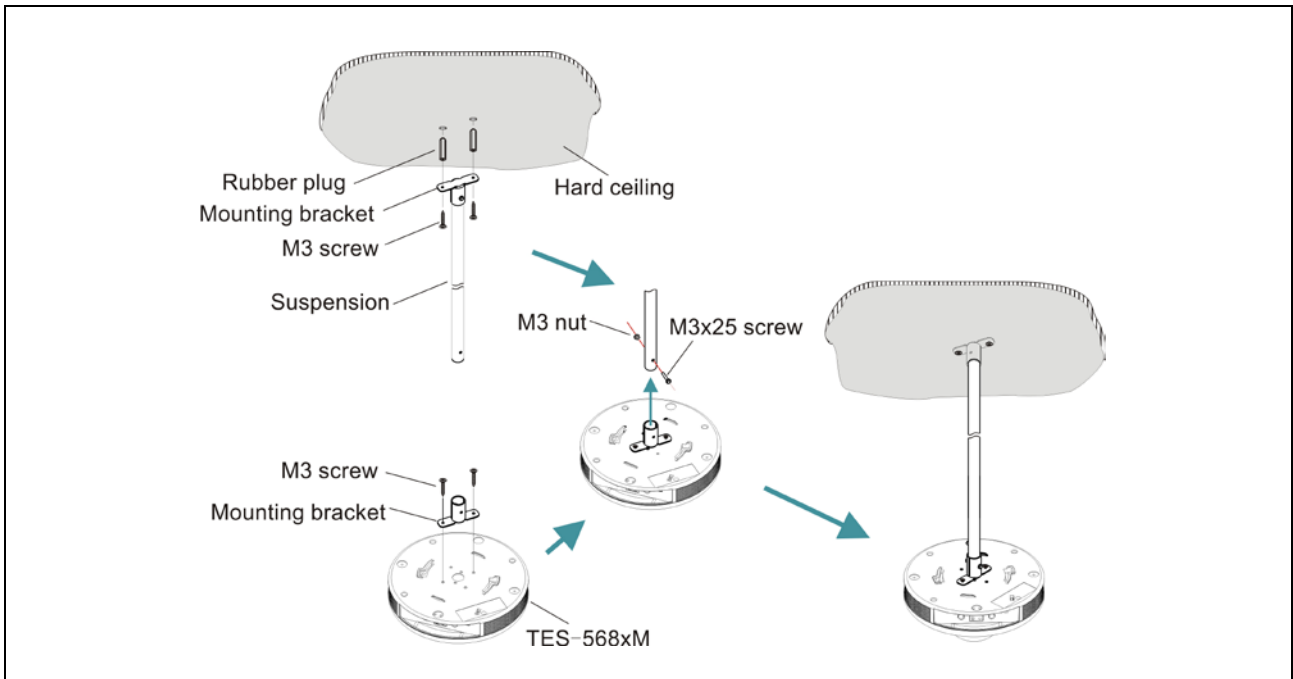
2.3.2 Suspension mounted of TES-5680M

Figure 2.5   Suspension mounted

Mounting steps:

Step 1: Position the mounting bracket on the ceiling according to the installation location of the TES-5680M and mark the positions of the drilling holes. Drill two holes (5 mm diameter, 30 mm depth) into the ceiling.

Step 2: Put the included rubber plugs into the mounting holes on the ceiling;

Step 3: Fix the mounting bracket on the ceiling with M3 screws;

Step 4: Install the other mounting bracket at the top of the TES-5680M with M3 screws;

Step 5: Put the two ends of the suspension into the mounting bracket and fix them together with M3 screws and M3 nuts.

WARNING:
☞   This installation method is applicable when the ceiling thickness is greater than the length of the rubber plug.
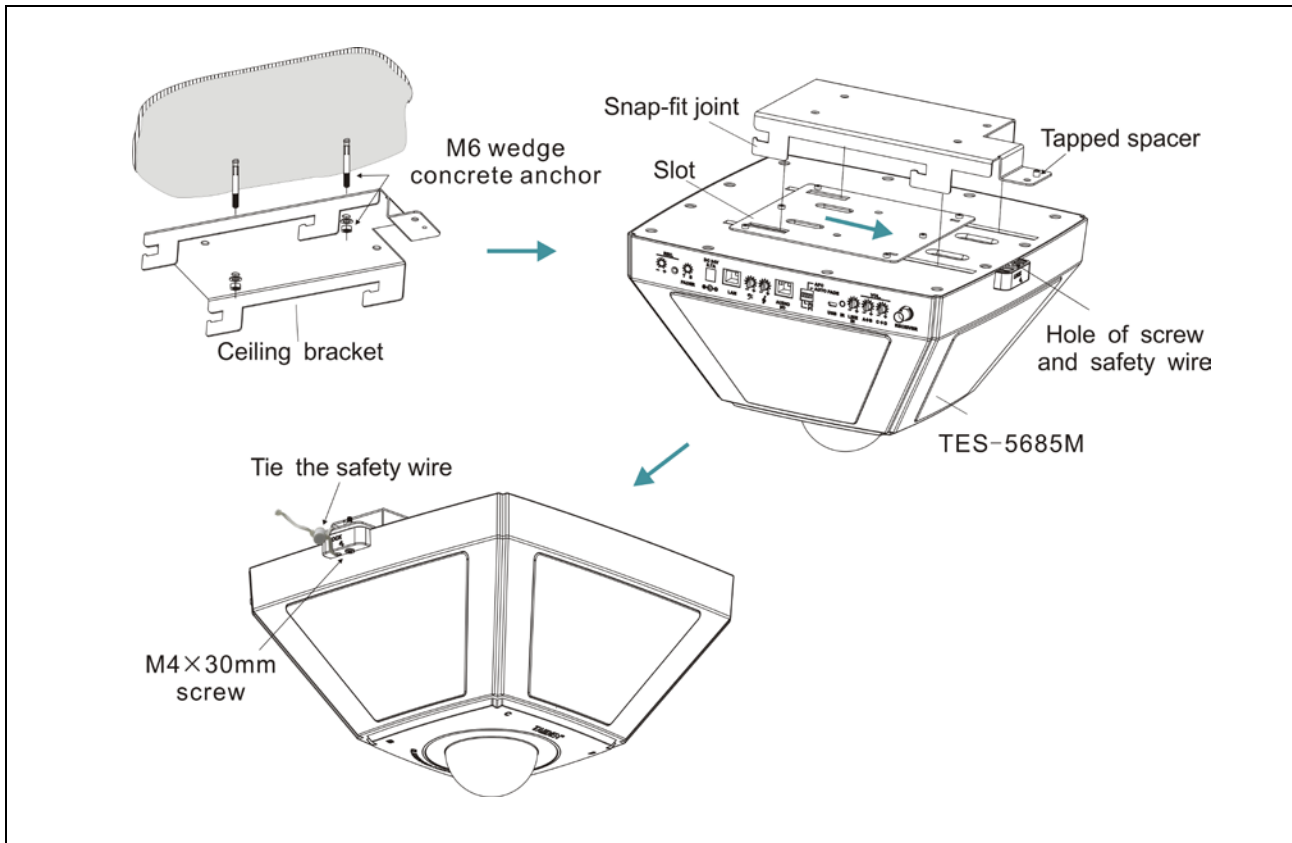
2.3.3 Ceiling mounted of TES-5685M

Figure 2.6   Ceiling mounted of TES-5685M

Mounting steps:

Step 1: Use the Ceiling Bracket as a template, mark 2 hole locations on the diagonal. Fix the ceiling bracket in the ceiling with M6 wedge concrete anchors;

Step 2: Align the slot on the top of TES-5685M to the snap-fit joint and push TES-5685M in the direction of the arrow until the tapped spacer and the screw hole are aligned;

Step 3: Insert the M4×30 mm screw into the tapped spacer to fix TES-5685M;

Step 4: Tie the safety wire.

> **WARNING:**
> ☞   The nameplate on the bottom of the TES-5685M will be covered after installation.
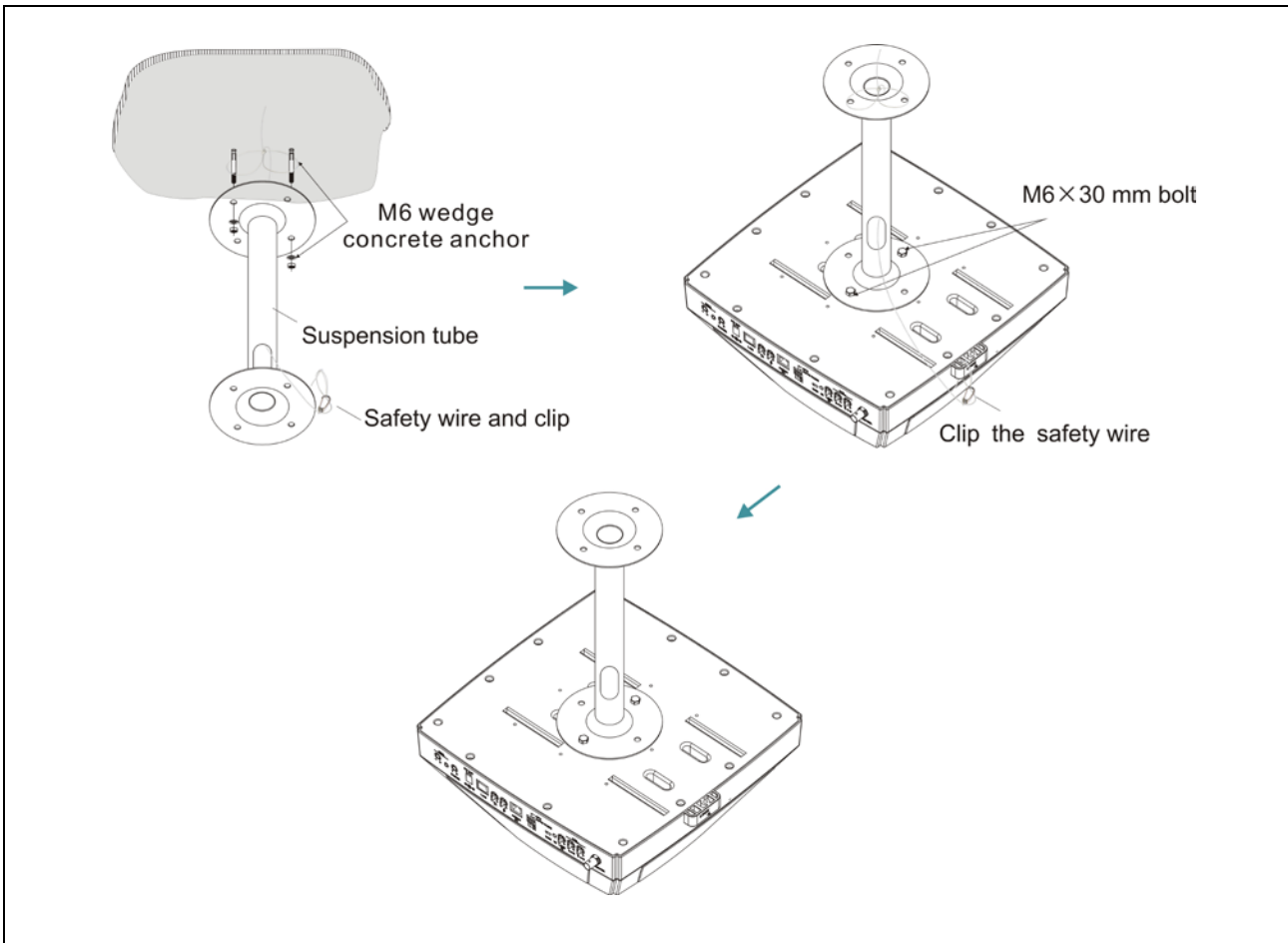
2.3.4 Suspension mounted of TES-5685M

Figure 2.7   Suspension mounted of TES-5685M

Mounting steps:

Step 1: Use the suspension tube as a template to mark 2 hole locations on the diagonal. Insert M6 wedge concrete anchor into the concrete surface;

Step 2: Loop the safety wire around the M6 wedge concrete anchors. Route the opposite end of the safety wire through the hole on the suspension tube;

Step 3: Fix the suspension tube in the ceiling with the washer and nut of M6 wedge concrete anchor;

Step 4: Align the tapped holes on the top of TES-5685M to the mounting holes on the bottom plate of the suspension tube. Insert and fully tighten 2 M6×30 mm bolts;

Step 5: Run the safety wire through the lock hole on TES-5685M and hook it back.

2.4 Connection

2.4.1 Interactive audio recording system

Interactive audio recording system integrates digital infrared technology, DSP technology with array microphone which can realize the "3A" algorithm (ANC, AEC, AGC) and support detect the sound direction for automatic video tracking.

TES-5680M connects to TES-5680BX via RECEIVER interfaces. The system can connect to extern receiver (TES-5600RN/30 series) via Receiver interface (RJ45), connect to extern audio device via PC IN (PC) or USB interface （TES-5600MIC or TES-5600CSM series）, connect to device like amplifier for output balance audio via LINE BAL, connect to recording device via REC., and connect speakers via SPEAKER (TES-5680BX).
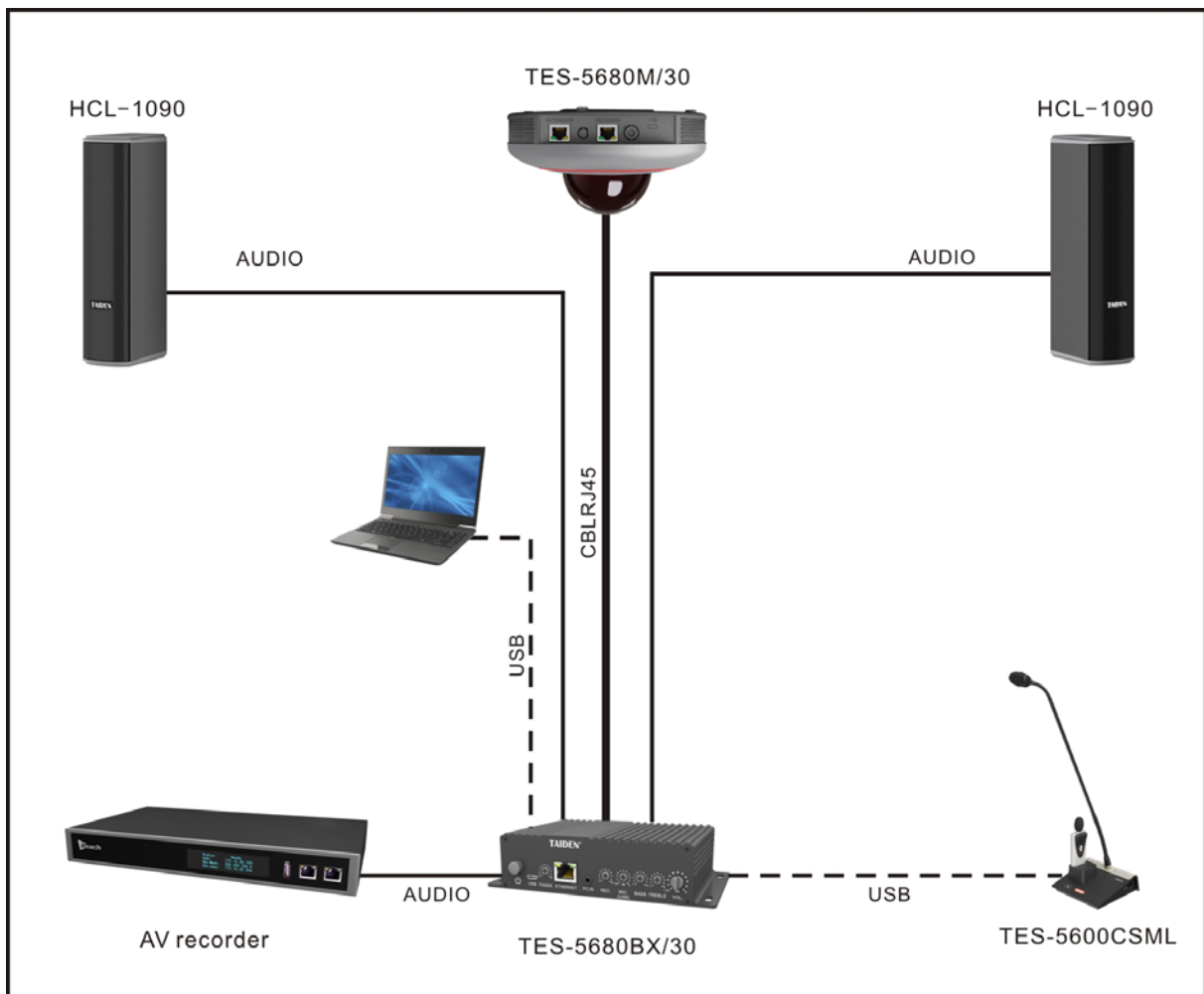

Figure 2.8   System connecting for TES-5680M+TES-5680BX

2.4.2 TES-5685MA interactive audio recording system

TES-5685MA Interactive Audio Recording System integrates speakers, control main unit, digital infrared receiver and amplifier, built-in DSP technology with array microphone which can realize the "3A" algorithm (ANC, AEC, AGC).

TES-5685MA connects to TES-5685BX series via AUDIO I/O interfaces. The system can connect to extern receiver (TES-5600RN/30 series) via Receiver interface (RJ45), connect to extern audio device via PC IN (PC) or USB interface （TES-5600MIC or TES-5600CSM series）, connect to device like amplifier for output balance audio via LINE OUT and connect to recording device via REC.
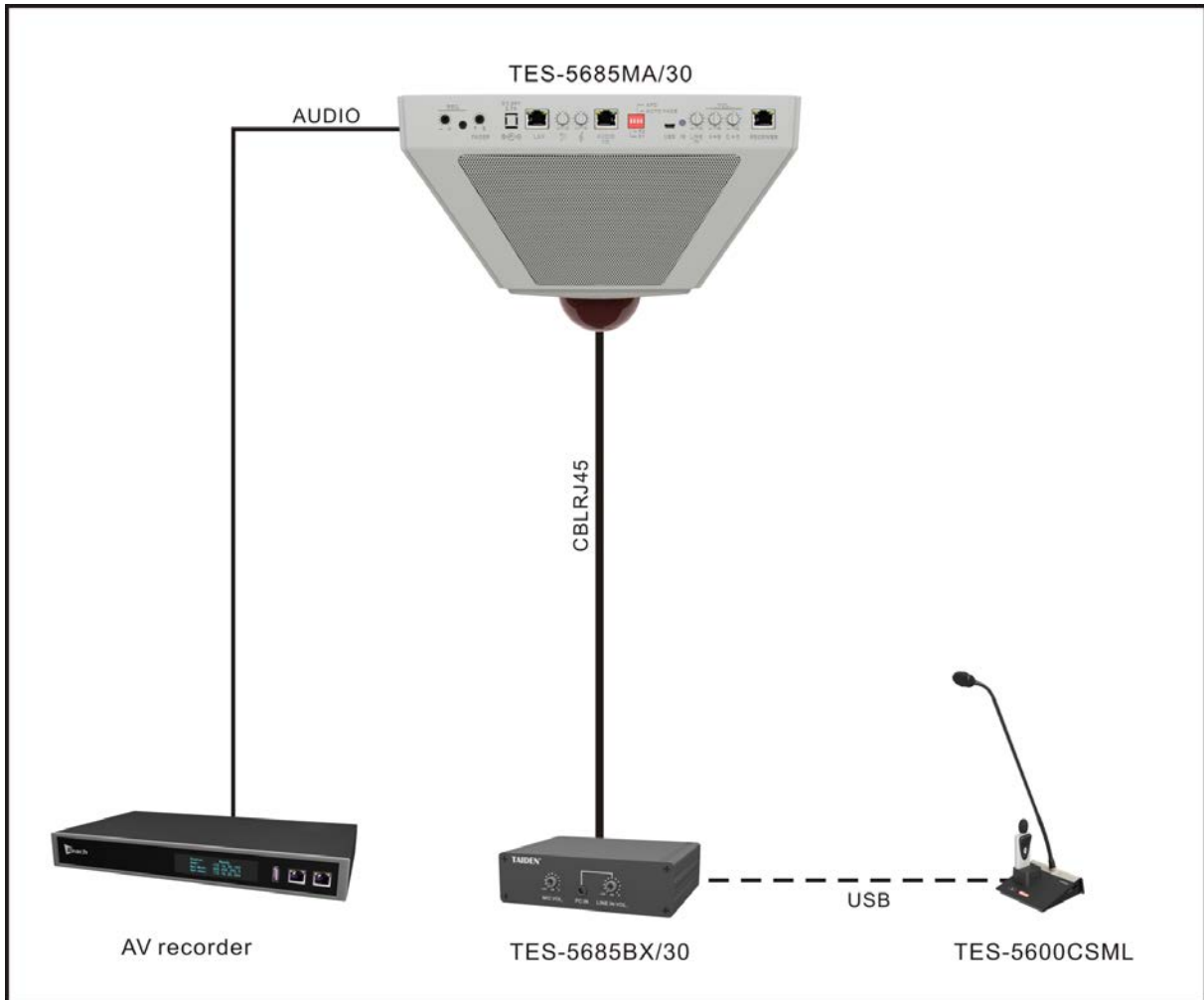

Figure 2.9   TES-5685MA interactive audio recording system

2.4.3 TES-5685MB/MC digital infrared classroom audio system

TES-5685MB/MC Digital Infrared Classroom Audio System integrates speakers, control main unit, digital infrared receiver and amplifier, supports 1 or 2 digital IR microphones.

TES-5685MB/MC connects to TES-5685BX series via AUDIO I/O interfaces. The system can connect to extern receiver (TES-5600RN/30 series) via Receiver interface (RJ45), connect to extern audio device via PC IN (PC) or USB interface （TES-5600MIC or TES-5600CSM series）, connect to recording device via REC.

TES-5685MCP with a RJ45 interface to connect TES-5685PA and PC via switcher for seeing the status and adjusting parameter.

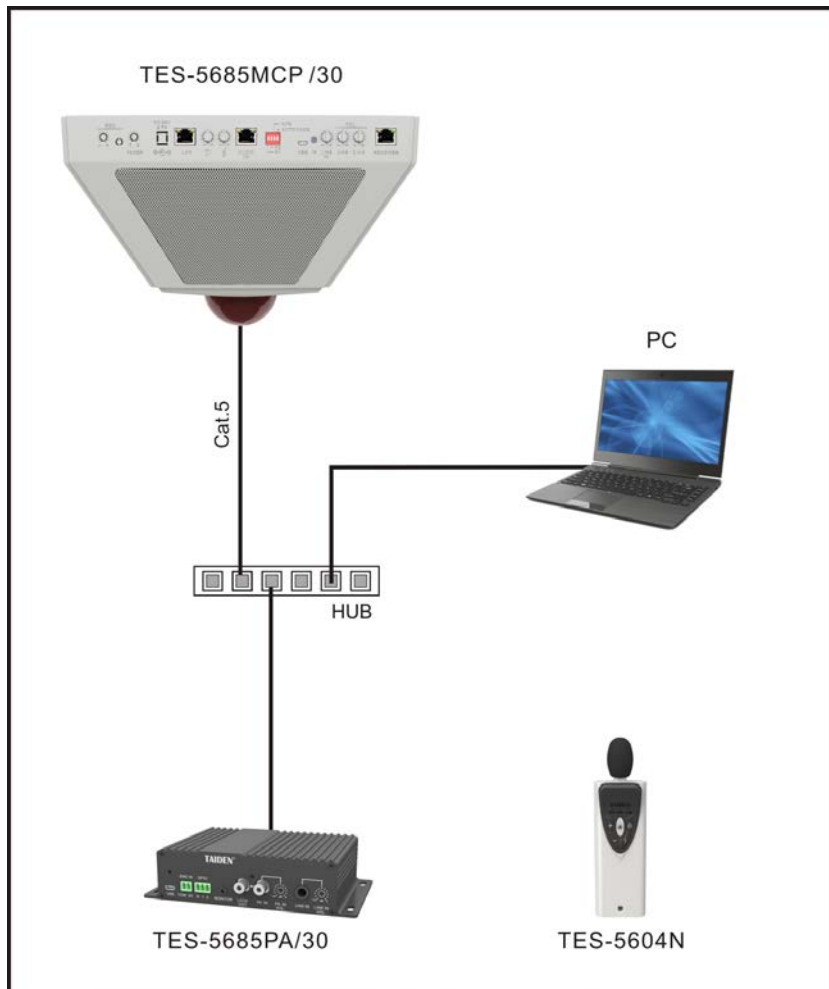Figure 2.10 TES-5685MB digital infrared classroom audio system

Figure 2.11 TES-5685MCP digital infrared classroom audio system

2.5 Operation

All operation of TAIDEN Classroom Audio System will be introduced one by one in this section.

2.5.1 TES-5680M+TES-5680BX

1. Speaker volume

Adjust the speaker via the "VOL." knob on the TES-5680BX control box.

2. Treble/bass

Adjust the treble/bass of line out and speakers via the "Treble"/"Bass" knobs on the TES-5680BX control box, range: treble: -15 dB to 15 dB, bass: -12 dB to 12 dB.

Note:
☞ The bass/treble is usually adjusted only during the initial installation.

3. REC. volume

Adjust the recording volume via the REC. knob on the TES-5680BX.

4. External microphone in and volume

A USB interface can connect to the external microphone (TES-5600CSM series or TES-5600MIC wired microphone) and adjust the volume via MIC(USB) knob.

5. IR wireless microphone volume

TES-5680BX with RS-485 interface for connecting to central control system, which can adjust the volume of IR wireless microphone via the command.

➢ **Parameter:**

Baud rate	115200
Fluid control	null
Data form	start: 1 bit, data: 8 bits, stop: 1 bit, no parity check bit

6. Function switcher

Setting the function parameters via the dip switcher (switch up is 1, switch down is 0)

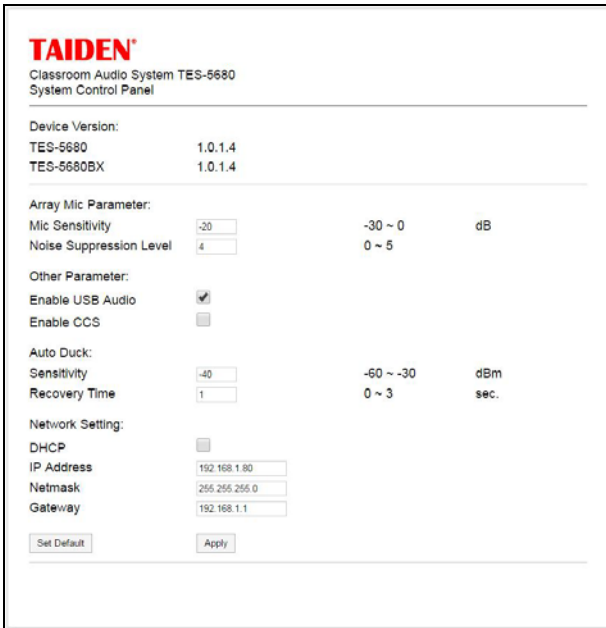| Function	1	0
1. AFC function	On	Off
2. IR frequency	2.33/3.67MHz	1.67/3.0MHz
3. Communication mode	PC	Recorder
4. Auto. fade	On	Off

Note:
☞ The function parameters are usually adjusted only during the initial installation.
☞ The IR microphone is disabled when the communication mode is PC, and the array microphone with AEC (cancel the audio of speakers), and mute the REC audio in PC IN.

7. Fader rate

Adjust the fader rate between IR microphone and array microphone via the FADER knob on the TES-5680BX control box: reduce the array microphone (sound of students) until mute it with clockwise rotation and reduce the IR microphone (sound of teacher) until mute with anticlockwise rotation.

8. Web server

TES-5680BX control box connects to PC via ETHERNET interface, input the IP address of Classroom Audio System (see the IP address via "TAIDEN Device Discovery" software) into web browser to search the version and set the parameters:

> **Device Version:** the version of current system;
> **Array Mic Parameter:**
>   • **Mic Sensitivity:** adjust the sensitivity of array microphone, range: -30 to 0 dB;
>   • **Noise Suppression Level:** adjust the noise reduce range (0 to 5 level) of the array microphone, the smaller the value, the more the noise but the farer the working distance, vice versa.
> **Other Parameter:**
>   • **Enable USB Audio:**

	Tick	Un checking
PPT slide	✓	✓
Digital audio input/output	✓	×
PC IN	×	✓
External microphone	×	✓

>   • **Enable CCS:** when clicked, user can control the digital IR wireless microphones and the speakers in the system via center control command.
> **Auto Dodge** (effective when the AUTO FADE switcher on the TES-5680BX control box is on)**:**
>   • **Sensitivity:** adjust the trigger sensitivity of IR microphone, range: -60 to -30 dB. The array microphone will be mute after triggering.
>   • **Recovery Time:** setting the recovery time range (0 to 3 seconds) of the array microphone and whose sound will be recovered gradually in the set time.

> **Network Setting**
>   • Setting the IP address, netmask and gateway, reboot the device after setting. Click the DHCP can get the address automatically.
> **Apply:** apply the setting
> **Set Default:** default the device, user can also switch the AFC on the TES-5680BX control box four times in 5 seconds to default the device.

9. USB link

Interactive audio recording system has a built-in USB LINK (2 channels, 16bit, 48kHz) which can be connected to the computer through USB cable (software requirement: Win7 or higher) for digital audio input/output. Cooperating with the TES-560x microphone can realize remote control PPT slide. In the following we take Win7 system as an example to introduce the function and operation of the USB LINK.

(1) Connect to PC

The TES-5680BX control box connects to the computer; the TES-5680 USB LINK will be detected automatically. If it is connected for the first time, the USB device driver will be recognized and installed automatically, as shown in the following figure:
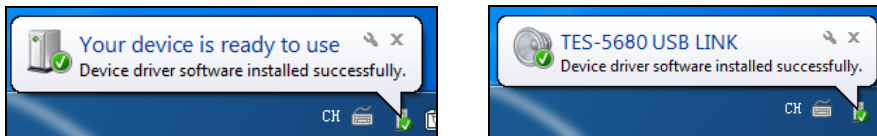

Figure 2.12   Installing USB LINK

After successful installation, the user can check the information of TES-5680 USB LINK from "Device Manager", as shown in the following figure:
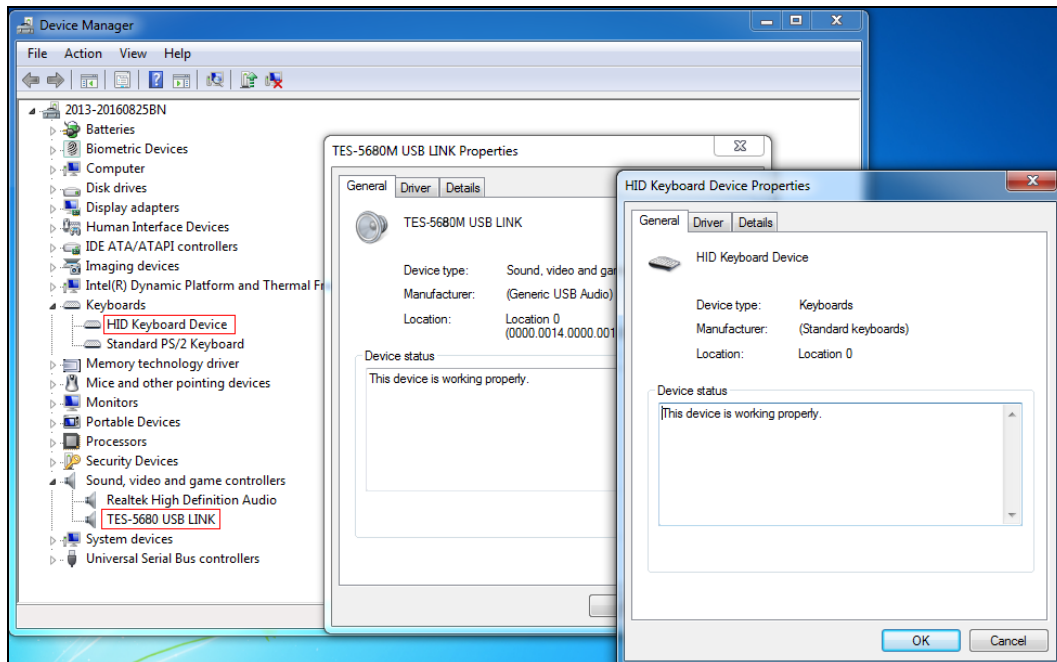

Figure 2.13   Information of USB LINK

(2) Digital audio output

When the TES-5680BX is connected to computer with USB cable, lossless sound can be recorded during class on computer. Using the recording software or the third party communication software, such as recorder, Skype and so on, functions like recording, remote instruction, remote communication can be implemented.

Please adjust and test the TES-5680 USB LINK to a suitable volume when first using. Adjust method: open the control panel-sound (or right click the volume icon on the taskbar and select sound), and select the Microphone (TES-5680 USB LINK) and modify its setting on the Recording dialog box. Shown as the following figure:
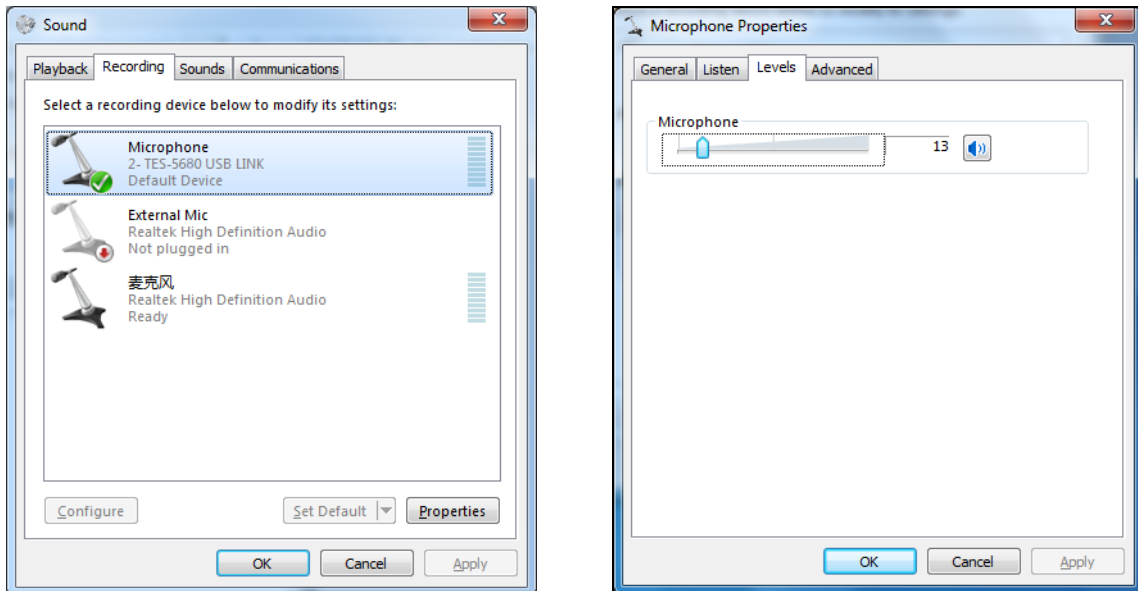
Figure 2.14　Adjusting microphone volume

Note:

☞ *High volume may lead to distortion, user can confirm a suitable volume by recording and playback when necessary;*

☞ *When recording, the audio quality may be affected if using unsuitable sampling rate or resolution so it is suggested to select 48 kHz or its multiple for the sampling rate and 16 bit for the resolution;*

☞ *In "Microphone Properties- Listen", please disable "Listen to this device" (TES-5680 USB LINK) to avoid echo.*

☞ *Please select the TES-5680 USB LINK as the current device on recording or communication. Usually, TES-5680 USB LINK will be automatically activated after connecting to the computer, instead of the default audio device. If there is error in recording, please select the sound card manually in case there is a mistake in the setting.*

(3) Digital audio input

The TES-5680BX can be connected to the computer for digital audio input. Please adjust and test the TES-5680 USB LINK to a suitable volume when using for the first time. Adjust method: open the control panel-sound (or right click the volume icon on the taskbar and select sound), and select the speakers (TES-5680 USB LINK) and modify its setting in the Playback dialog box, as shown in the following figure:
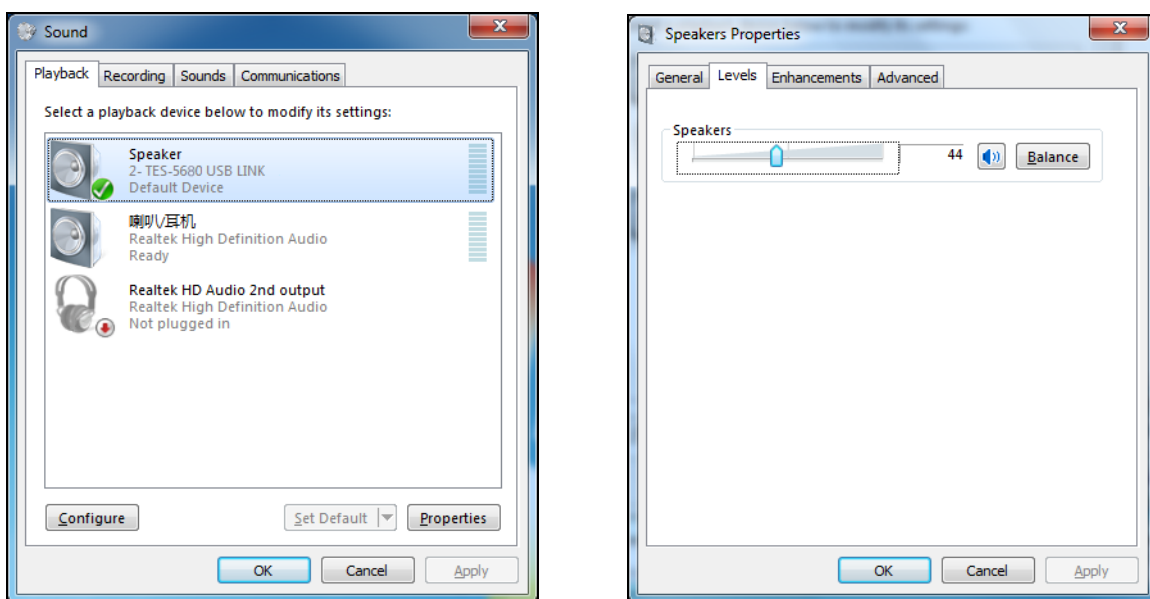

Figure 2.15　Adjusting playback volume

Note:

☞ *Please select the TES-5680 USB LINK as the current device on playback. Usually, TES-5680 USB LINK will be activated after connecting to the computer, instead of the default audio device. If there is an error in playback, please select the TES-5680 USB LINK manually in case there is a mistake in audio device selection. Take the Media Player as an example to show the audio device selection:*
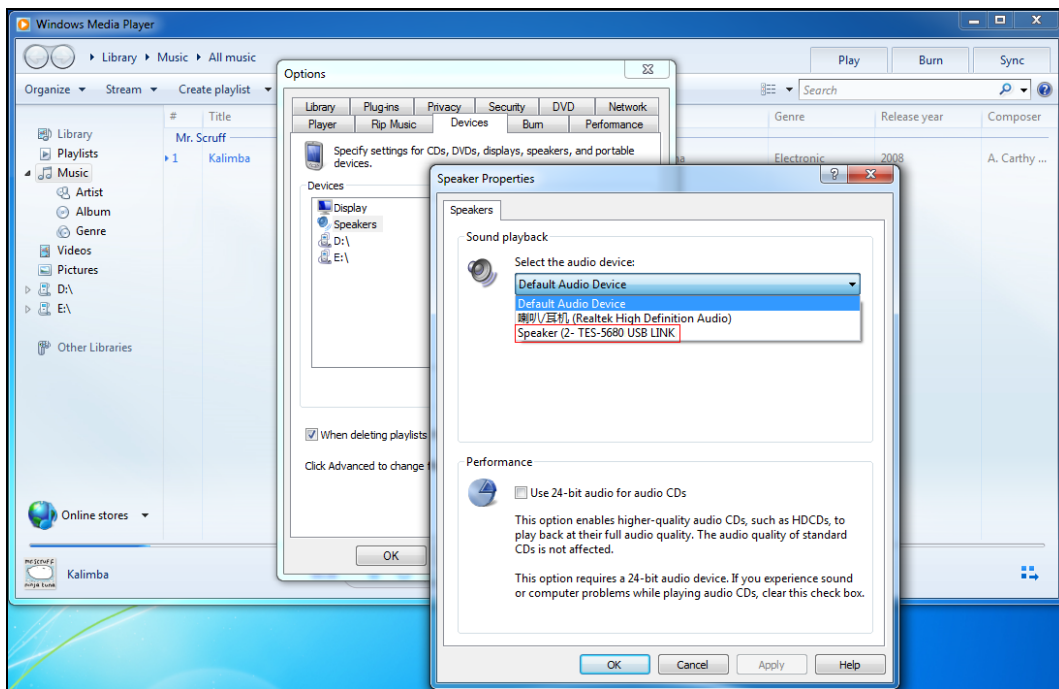

Figure 2.16   Audio device selection

(4) PPT-page switch

The Classroom Audio System cooperates with the TES-560x series microphone to realize remote PPT-page switch control. See 5.4.

2.5.2 TES-5685M+TES-5685BX

1. Speaker volume

TES-5685M combo unit integrates four speakers (A/B/C/D) which be divided into 2 groups (A+B and C+D), adjust the two groups of speakers via the "VOL." knob. Range: Mute, -30 to 0 dB.

2. Treble/bass

Adjust the treble/bass of line out and speakers via the "Treble"/"Bass" knobs on the TES-5685M combo unit, range: treble:

TES-5685MA: -15 dB to 15 dB, bass: -12 dB to 12 Db;

TES-5685MB/MC: -10 dB to 10 dB.

> **Note:**
> ☞ The bass/treble is usually adjusted only during the initial installation.

3. External microphone in and volume

A USB interface can connect to the external microphone (TES-5600CSM series or TES-5600MIC wired microphone) and adjust the volume via MIC(USB) knob. Range: -30 to 0 dB.

4. Function switcher

Setting the function parameters via the switcher (switch up is 1, switch down is 0)

Function		1	0
IR frequency (F1)		TES-5685MA/MB: 2.33/3.67 MHz	TES-5685MA/MB: 1.67/3.0 MHz
		TES-5685MC: 2.33 MHz	TES-5685MC: 1.67 MHz
F2	TES-5685MA: Auto. Dodge	On	Off
	TES-5685MB/MC: Broadcast mode	On	Off
AFC function		On	Off
Auto. fade		On	Off

> **Note:**
> ☞ Broadcast mode: the speakers output the signal of LINE IN, and the LINE OUT outputs the signal of microphone;
> ☞ The function parameters are usually adjusted only during the initial installation.

5. PPT-page switch

TES-5685MB/MC combo unit connects to PC via USB interface cooperates with the TES-560x series microphone to realize remote PPT-page switch control. See 5.4.

6. Fader rate (only for TES-5685MA)

When the Auto. Fade is off, the fader rate between IR microphone and array microphone can be adjusted via the FADER knob on the TES-5685MA combo unit: reduce the array microphone (sound of students) until mute it with clockwise rotation and reduce the IR microphone (sound of teacher) until mute with anticlockwise rotation.

7. Public address (only for TES-5685BXP)

TES-5685BXP control box is equipped with a PA IN for public address: when the PA trigger is enabled, the audio of PA IN will be routed to all the outputs with all other inputs muted, and the volume can be adjusted by PA IN volume knob.

8. Web server (only for TES-5685MA)

TES-5685MA combo unit connects to PC via LAN interface, input the IP address of Classroom Audio System (see the IP address via "TAIDEN Device Discovery" software) into web browser to search the version and set the parameters:

> ➢ **Device Version:** the version of the devices;
> ➢ **Array Mic Parameter:**
>   • **Mic Sensitivity:** adjust the sensitivity of array microphone, range: -30 to 0 dB;

- **Noise Suppression Level:** adjust the noise reduce range (0 to 3 level) of the array microphone, the smaller the value, the more the noise but the farer the working distance, vice versa.
- ➢ **Auto Dodge** (effective when the AUTO FADE switcher on the TES-5680BX is on)**:**
  - **Sensitivity:** adjust the trigger sensitivity of IR microphone, range: -60 to -30 dB. The array microphone will be mute after triggering.
  - **Recovery Time:** setting the recovery time range (0 to 3 seconds) of the array microphone and whose sound will be recovered gradually in the set time.
- ➢ **Network Setting**
  - Setting the IP address, netmask and gateway, reboot the device after setting. Click the DHCP can get the address automatically.
- ➢ **Apply:** apply the setting
- ➢ **Set Default:** default the device, user can also switch the AFC on the TES-5685BX four times in 5 seconds to default the device.

2.5.3 TES-5685MCP+TES-5685PA

1. Speaker volume

TES-5685MCP combo unit integrates four speakers (A/B/C/D) which be divided into 2 groups (A+B and C+D), adjust the two groups of speakers via the "VOL." knob. Range: Mute, -30 to 0 dB.

2. Treble/bass

Adjust the treble/bass of line out and speakers via the "Treble"/"Bass" knobs on the TES-5685M combo unit, range:

treble: -15 dB to 15 dB, bass: -12 dB to 12 dB.

> **Note:**
> ☞ The bass/treble is usually adjusted only during the initial installation.

3. Function switcher

Setting the function parameters via the switcher (switch up is 1, switch down is 0)

Function	1	0
IR frequency (F1)	2.33 MHz	1.67 MHz
Reset (F2)	--	--
AFC function	On	Off
Auto. Fade	On	Off

> **Note:**
> ☞ Function switcher usually adjusted only during the initial installation;
> ☞ Switch F2 four times in 5 seconds can reset the IP address as 192.168.2.88.
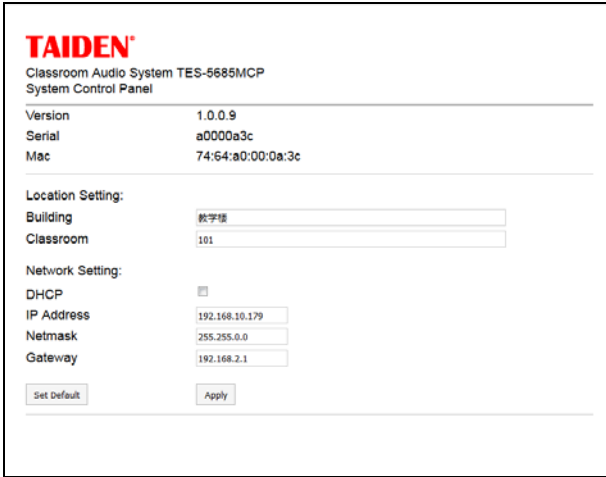
4. Public address

TES-5685PA control box is equipped with a PA IN and a LOOP OUT for public address: when the PA trigger is enabled, the audio of PA IN will be routed to all the outputs with all other inputs muted. The volume can be adjusted by PA IN volume knob and the PA indicator will be turned on.

5. Web server

a. TES-5685MCP

TES-5685MCP combo unit connects to PC via LAN interface, input the IP address of Classroom Audio System (see the IP address via "TAIDEN Device Discovery" software) into web browser to search the version and set the parameters:

➢ **Version:** the version of the devices;

➢ **Serial:** the serial of the devices;

➢ **Mac:** the Mac of the devices;

➢ **Location Setting:** setting building and classroom;

➢ **Network Setting**

• Setting the IP address, netmask and gateway, reboot the device after setting. Click the DHCP can get the address automatically.

➢ **Apply:** apply the setting.

➢ **Set Default:** default the device.

b. TES-5685PA

TES-5685PA control box connects to PC via LAN interface. Use the "TAIDEN Device Discovery" software to search the IP address of TES-5685PA, as shown below:
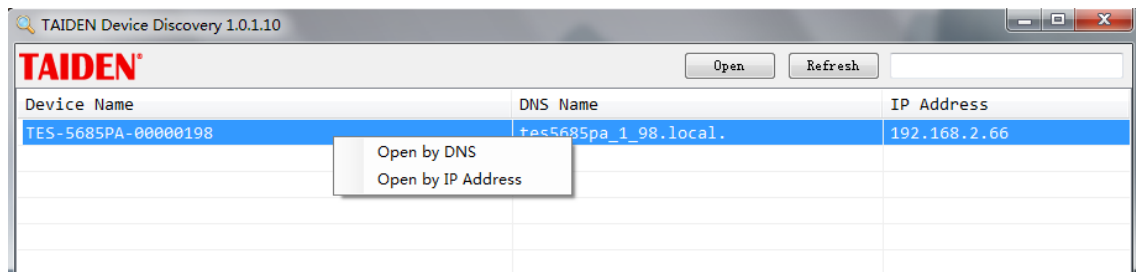
How to enter Web server:

● Using TAIDE Device Discovery tool, select the device, click "Open" button;

● Or, Using TAIDE Device Discovery tool, select the device, right click on it, and click " Open by DNS / Open by IP Address";

● Or, input the IP address of the device (for example 192.168.2.66) in the web browser.

Four icons at the top-right of Web interface are "Audio Setting(≠)", "Device Management (♣)", "Regional Group Management (♀)" and "Device Parameters(♣)".

(1) Audio Setting

   The interface includes the audio parameters of PA in, Line in, PA out, Monitor out; and the setting of audio input/output at the right side.

Figure 2.17　Audio setting

➢ **Audio parameters:** includes volume, Mute and DSP setting

   • CH name: include four channels: PA in、Line in、PA out、Monitor out. User can double click it to change the name and the current channel will green background display.

   • Volume: adjust the volume of channels, the range of PA/Line in is -30~+30 dB; the range of Monitor out is -30~0 dB.

   • Mute: mute the channel

   • DSP: Click "DSP" button to go to DSP setting interface. Select channel in drop-down box, and DSP parameters can be saved in scene, supports up to four scenes. Monitor out without DSP function.

   PEQ:

   In PEQ (parametric equalizer) interface, frequency response curve is displayed at the top. The default parameter curve is a straight line. Channel name and gain are displayed at the bottom. There are 5 filters with type of "Parametric", "Low Shelf", and "High Shelf". And "Freq.", "Gain" and quality "Q" can be set.

Figure 2.18　PEQ setting

GEQ:

31 segment graphical equalization, drag pushers to adjust equilibrium parameter. It is only for output channel. You can also enable/disable low-cut and high-cut features, and set their frequency point.
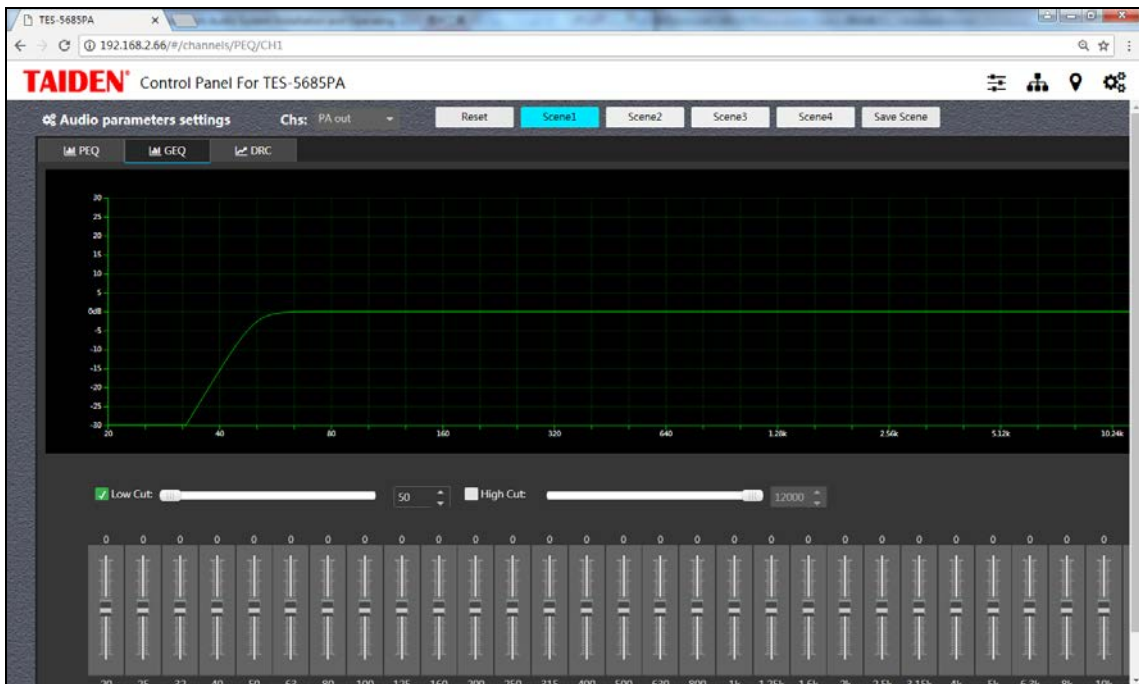

Figure 2.19　GEQ setting

DRC:

DRC (dynamic ratio compressor) interface is shown as below. It is only for output channel. Threshold, Ratio, Attack Time and Decay Time can be set.

Figure 2.20   DRC setting

➢ **Audio input/output setting**
   • LINE IN: green background display when enable. It cannot be selected when the PA trigger is enabled.
   • Monitor out: select the channel of monitor out.
   • PA out setting: mode of PA out, includes: Single Device, Grouping, All Devices and Stop Broadcasting.
      ◇ Single Device: PA puts out to the only one device selected from the drop-down box of Select Decvice.
      ◇ Grouping: PA puts out to the device in groups that selected from the drop-down box of Choose Group.
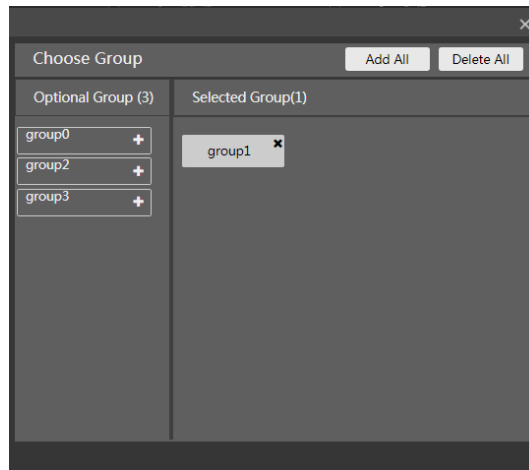
      ◇ All Devices: PA puts out to all devices in the system.
      ◇ Stop Broadcasting

(2) Device Management
   Display the status of the device, 🔁 means offline, ▦ means online. The devices that connected to TES-5685PA will display under the Online Devices column.
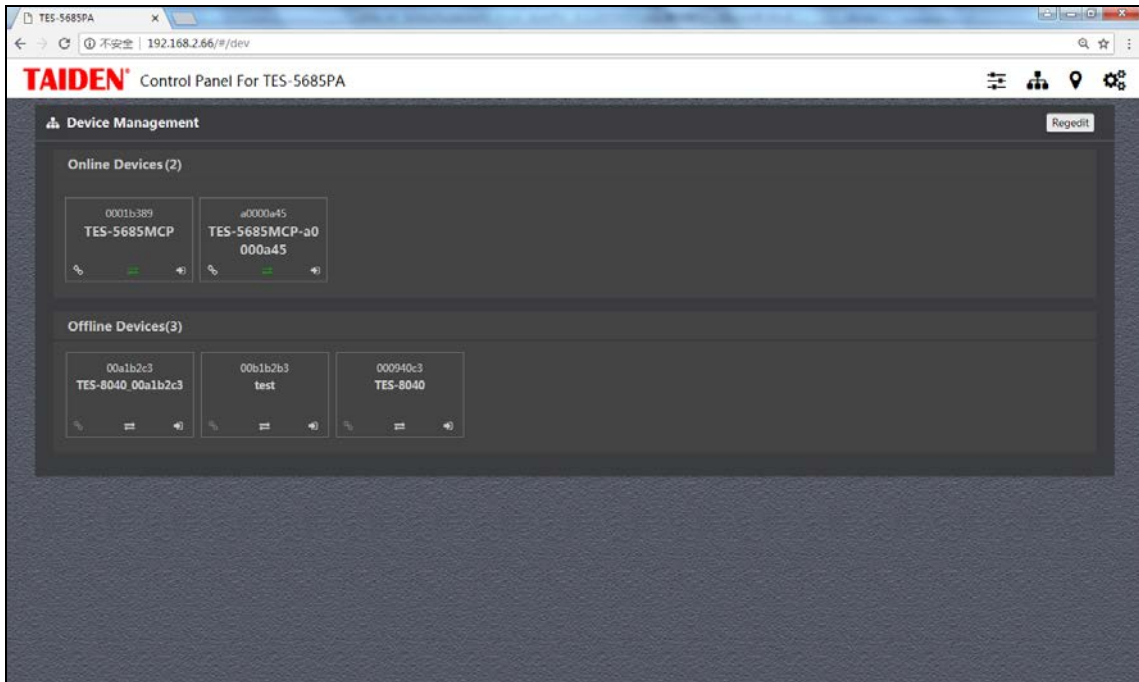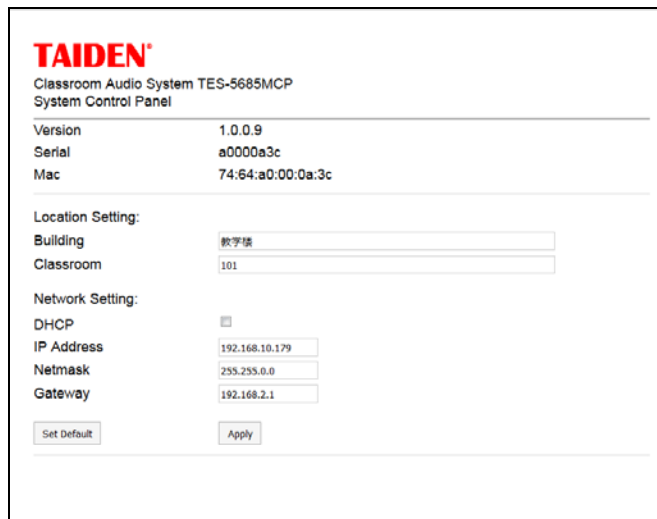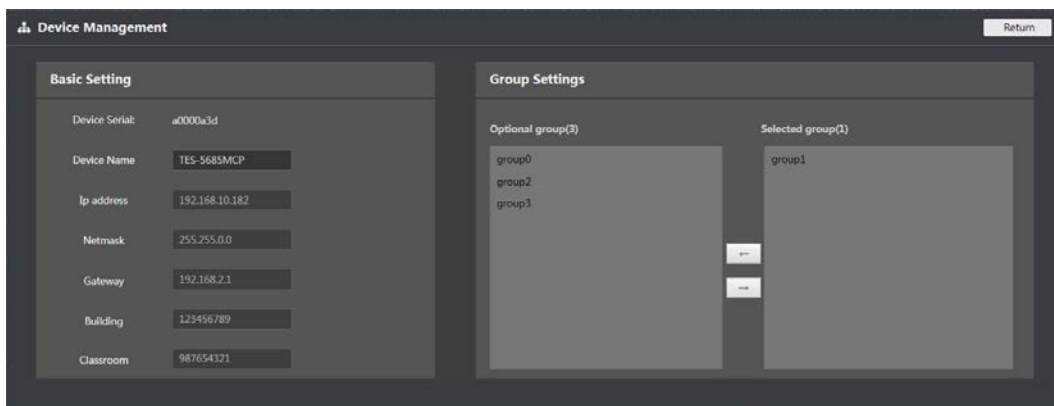
Figure 2.21 Device management

- Click [icon] of a device to enter its Web server interface;

- Click [icon] of a device to see its basic setting, the device name and optional group can be adjusted, and then click the "Return" button to save and return to device management interface.

The "Regedit" in the upper right corner of the interface can enter the search and add device page: the interface shows the existing and the new discovery devices, click "+" on existing devices bar to add a new device, click " × " on the upper right corner of a device to delete the device. Click the "Start Search" button to search for and display the new connected devices in the network, and click "+" in the lower right corner of the device to connect it. Click the "Return" button to save and return to the previous page.
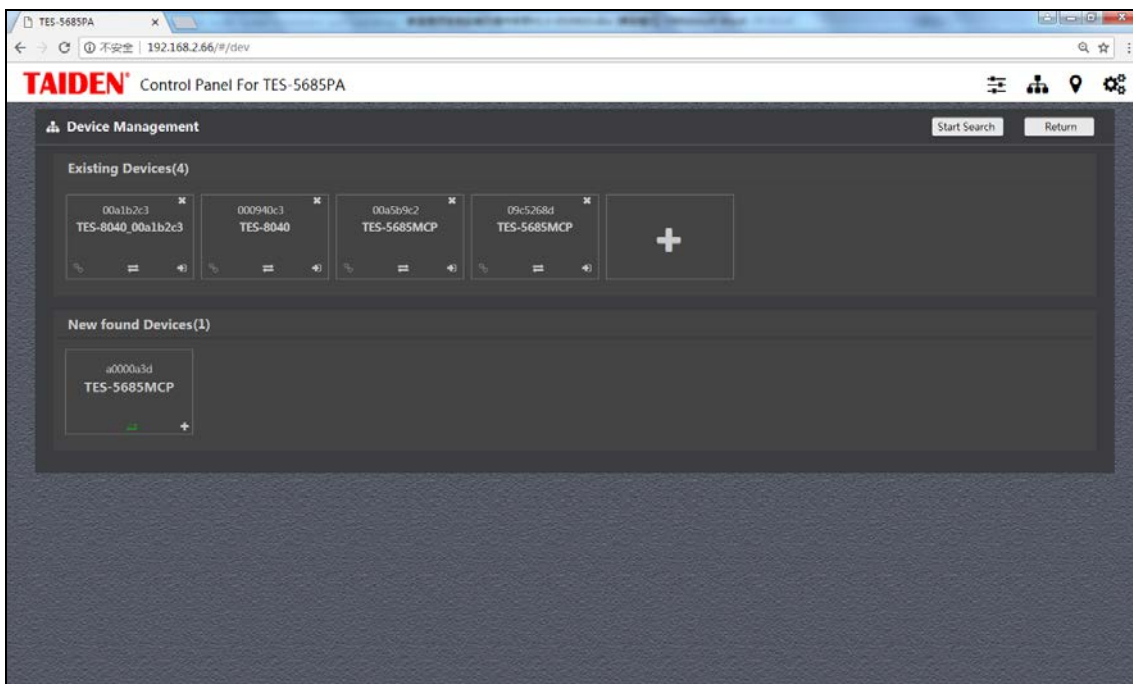

Figure 2.22   Regedit device

(3) Regional Group Management

Click the [ ] or [ ] button in the bottom to enable/ disable a group, click the " × "on the upper right corner to delete a group, and click "+" to add a new group.
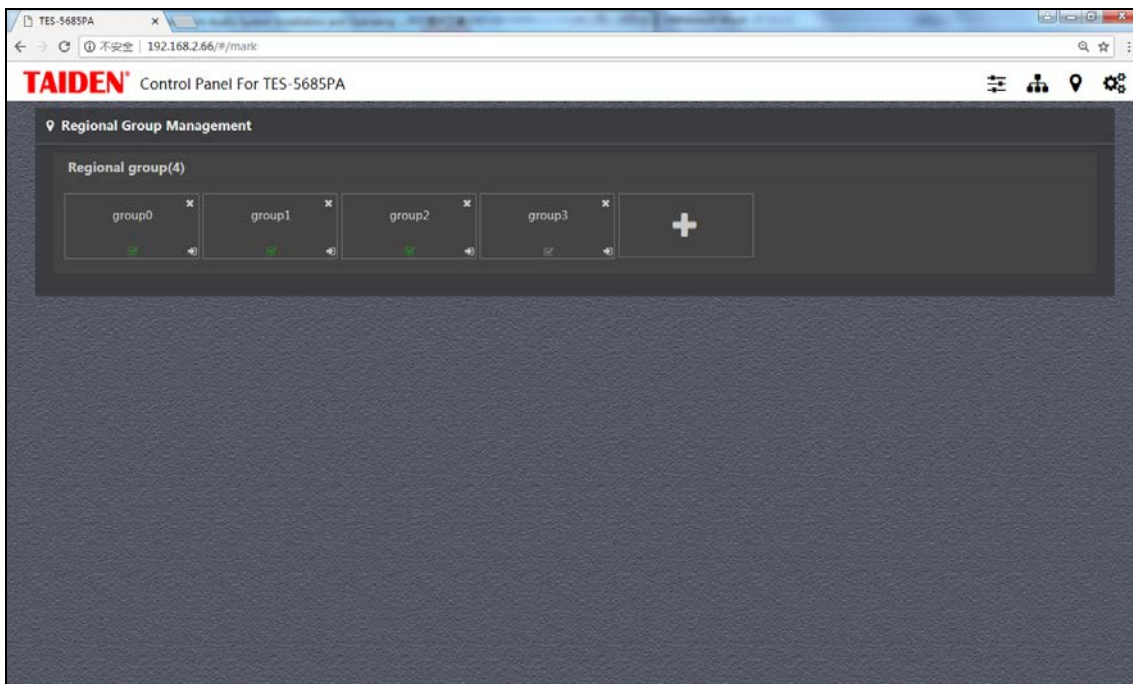

Figure 2.23   Regional Group Management

Click on the bottom of a group to enter the group management settings interface: regional group name can be changed; added devices can be displayed and click " × " to delete it; click "+" on the button of a device in No Added Deveices bar to add it to current group. Click the "Return" button to return to the previous page.
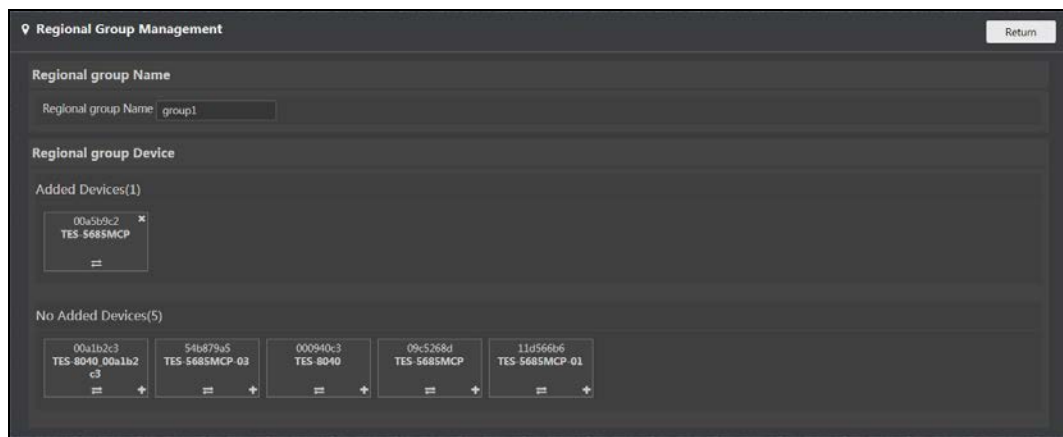
(4) Device Parameters

Setting the parameters of TES-5685PA.
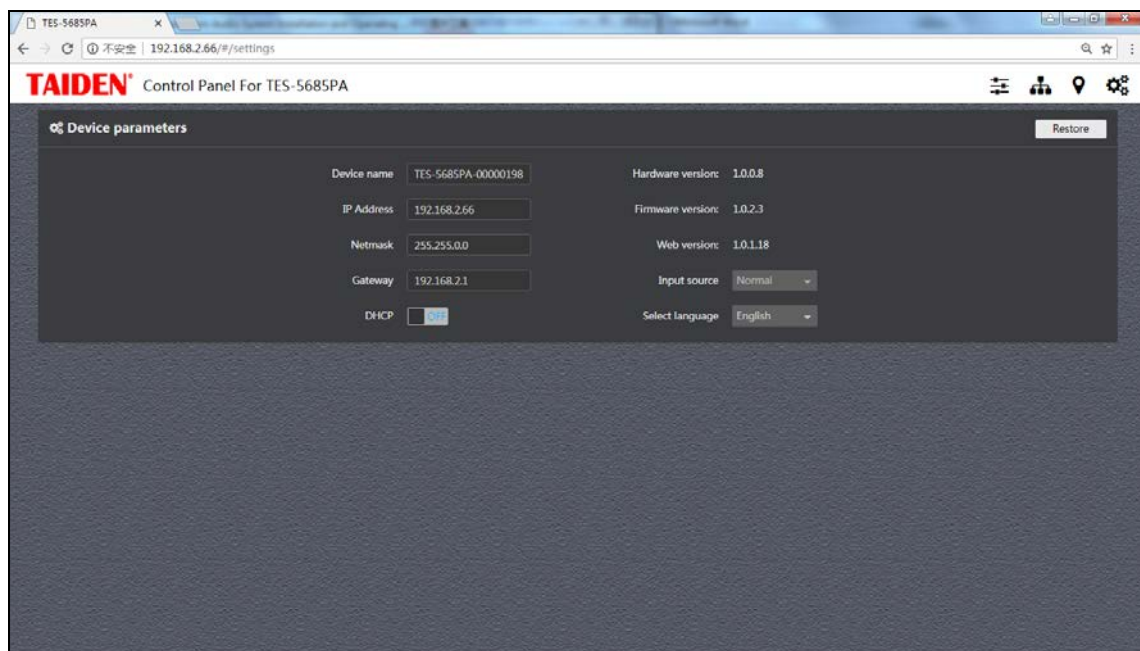
Figure 2.24   Device Parameters

- **Device name;**
- **IP Address;**
- **Netmask;**
- **Gateway;**
- **DHCP:** ON/OFF. When DHCP is OFF, IP Address, Netmask and Gateway can be set. shutting down the page and restarting the PA to take effect.
- **Hardware version;**
- **Firmware version;**
- **Web version;**
- **Input source:** Normal;
- **Select language:** English and Chinese;
- **Restore:** restore the default setting (IP address: 162.168.2.66; netmask: 255.255.0.0; audio parameters: 0 dB) of the PA, shutting down the page and restarting the PA to take effect.

Chapter 3 TES-5600 Series Classroom Audio System

3.1 Overview

TAIDEN TES-5600 series based on digital infrared technology provides an ideal audio solution for teaching environment thanks to its capabilities of anti-interference, privacy assurance, easy-manageability and audio clarity, etc.

The system consists of one digital infrared wireless control box, digital infrared receivers, and digital infrared wireless microphones. Its built-in amplifier can connect up to 4 speakers.

Types:

TES-5600RN1/30

Digital Infrared Receiver (RJ45 interface, ceiling, wall or tripod-mounted, support 1 wireless microphones)

TES-5600RN/30

Digital Infrared Receiver (RJ45 interface, ceiling, wall or tripod-mounted, support 2 wireless microphones)

TES-5600BX1/30

Digital Infrared Classroom Audio System Control Box (with RJ45 interface, supports 1 wireless microphone, built-in audio power amplifier can be connected to 4 loudspeakers, can connect to TES-5600 series Wired Desktop Microphone for audio transmission, 2 line in, 1 line out)

TES-5600BX2/30

Digital Infrared Classroom Audio System Control Box (with RJ45 interface, supports 2 wireless microphones, built-in audio power amplifier can be connected to 4 loudspeakers, can connect to TES-5600 series Wired Desktop Microphone for audio transmission, 2 line in, 1 line out)

TES-5600MAU/30

Digital Infrared Classroom Audio System Main Unit (supports 2 wireless microphones, built-in amplifier, supports 4 speakers, can connect to TES-5600 series Wired Desktop Microphone for audio transmission, USB interface for digital audio input/output, phantom power, RJ45 interface to extend receiver, with adapter)

TES-5600RN/30 series

TES-5600RN/30 series

Front panel of TES-5600BX/30 series

Rear panel of TES-5600BX/30 series

Front panel of TES-5600MAU/30
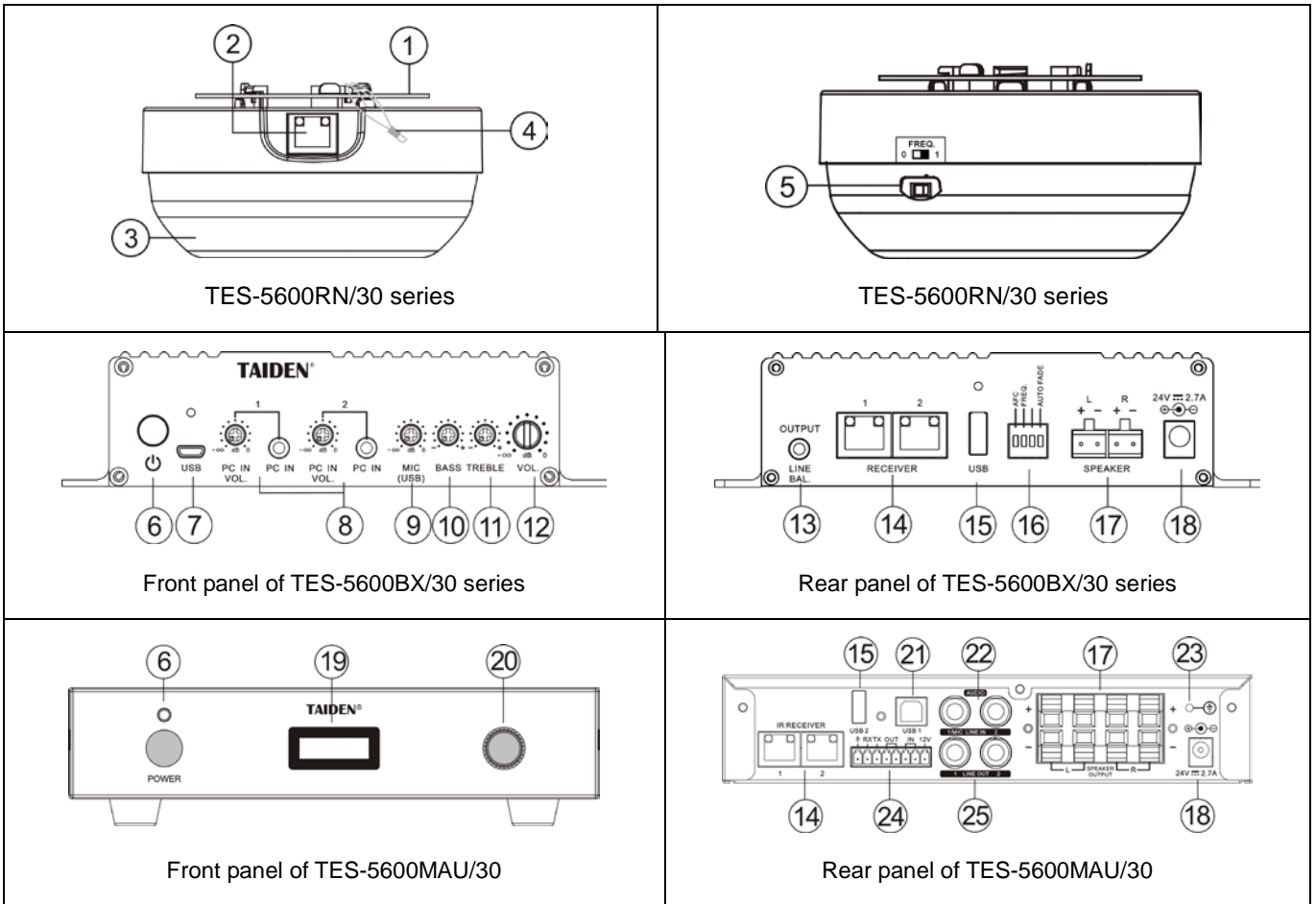
Rear panel of TES-5600MAU/30

Figure 3.1　TES-5600 series classroom audio system

Figure 3.1:

1. Fixing bracket

2. RJ45 interface

3. Infrared receiver and power indicator

> **Note:**
> ☞　To guarantee smooth signal transmission, please do not block this part in any case.

4. Safety rope, hang on fixing bracket or ceiling to prevent the receiver from falling off

5. FREQ. Switch (reserved)

1	2.33/3.67 MHz
0	1.67/3.0 MHz

> **Note:**
> ☞　Please keep the frequency the same as the main unit's.

6. Power on/off button

7. Micro USB interface

- For firmware upgrade
- Connect to PC for remote control of PPT slides

8. PC IN (Ø 3.5 mm) and volume konb

9. MIC (connected via USB) sensitivity knob

10. Bass knob

11. Treble knob

12. Speaker volume knob

13. LINE BAL. (ø 3.5 mm, balance)

- For audio output

14. Receiver interfaces (1-2, RJ45)

- Connect to TES-5600RN/30 series digital IR receiver for transmitting signals

15. A type USB interface

- For connecting to TES-5600CSM or TES-5600MIC wired microphone for audio transmission
- For public address input

16. Dip switch

1	AFC function
2	IR frequency
3	Reserved
4	Auto. fade

17. Speaker interface

18. Power supply interface

19. Menu display

- 128×36 OLED, displays main unit status and configuration menu.

20. Knob

- For menu operation;
- For master volume control.

21. B type USB interface

- For firmware upgrade
- For digital audio input/output
- Connect to PC for remote control of PPT slides

22. MIC/LINE IN (Ø 6.4mm, balance/differential input)

- LINE IN 1 can offer phantom power when being used for microphone input

23. GND

24. Phoenix interface

- For connecting to central control system
- For alarm

25. LINE OUT (Ø 6.4mm, balance/differential output)

3.3 Installation

3.3.1 TES-5600RN series ceiling mounted 1

① M3 screw
② Fixing bracket
③ Rubber plug
④ Hard ceiling (such as concrete ceiling)
⑤ TES-5600RN series digital infrared receiver

Figure 3.2   TES-5600RN digital infrared receiver ceiling mounted 1

Mounting steps:

Step 1: Position the fixing bracket on the ceiling according to the installation location of the TES-5600RN and mark the positions of the drilling holes. Drill four holes (5 mm diameter, 30 mm depth) into the ceiling;

Step 2: Put the rubber plugs into the mounting holes on the ceiling;

Step 3: Put the convex side of the bracket facing the ceiling, and fix it with M3 screws;

Step 4: Put the slots of TES-5600RN digital infrared receiver into hard ceiling fixing bracket and fix it with clockwise rotation.

WARNING:
☞ This installation method is applicable when the ceiling thickness is significantly greater than the length of the rubber plug.

3.3.2 TES-5600RN series ceiling mounted 2

① M3 screw
② Fixing bracket
③ Nut
④ Ceiling
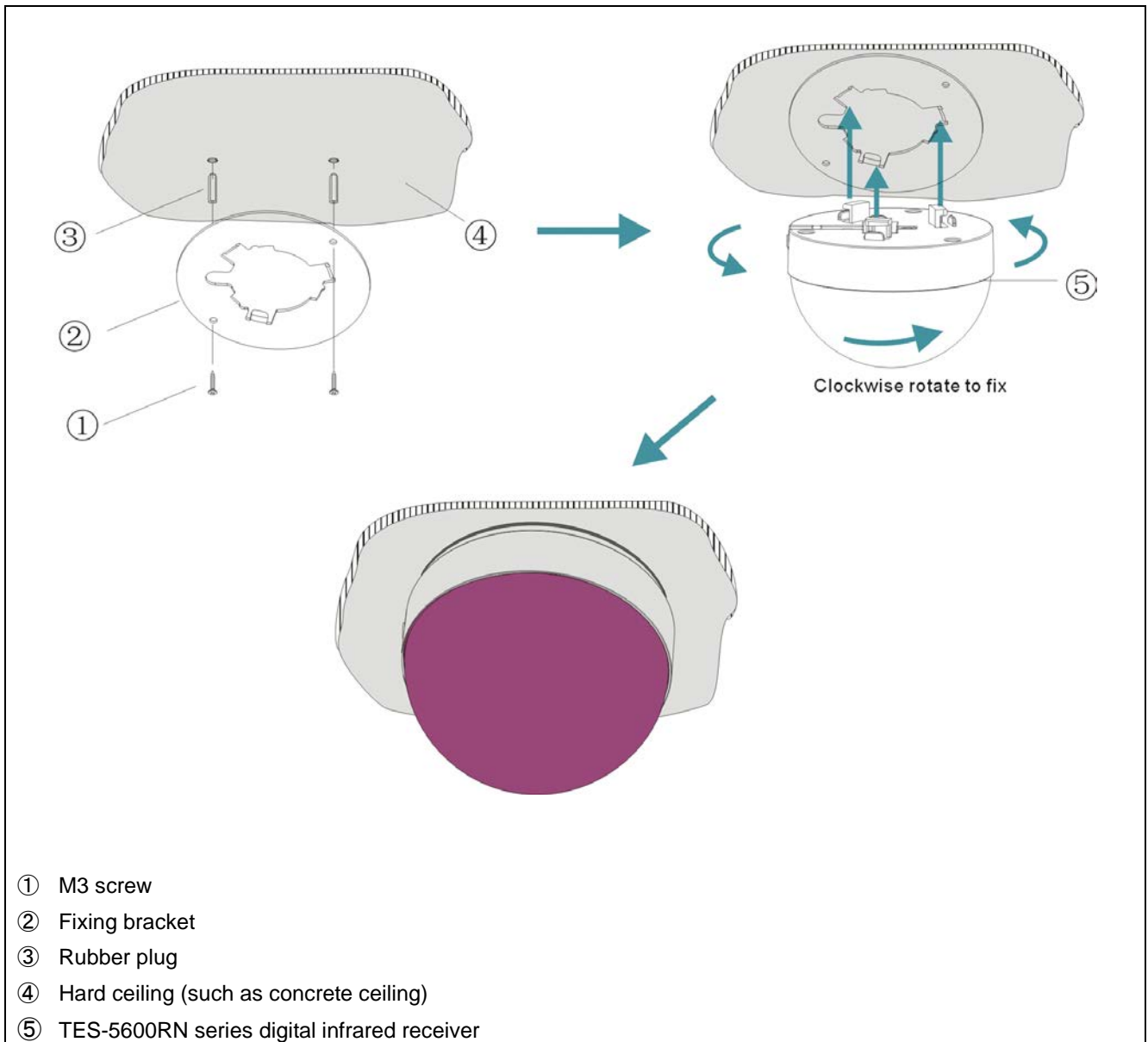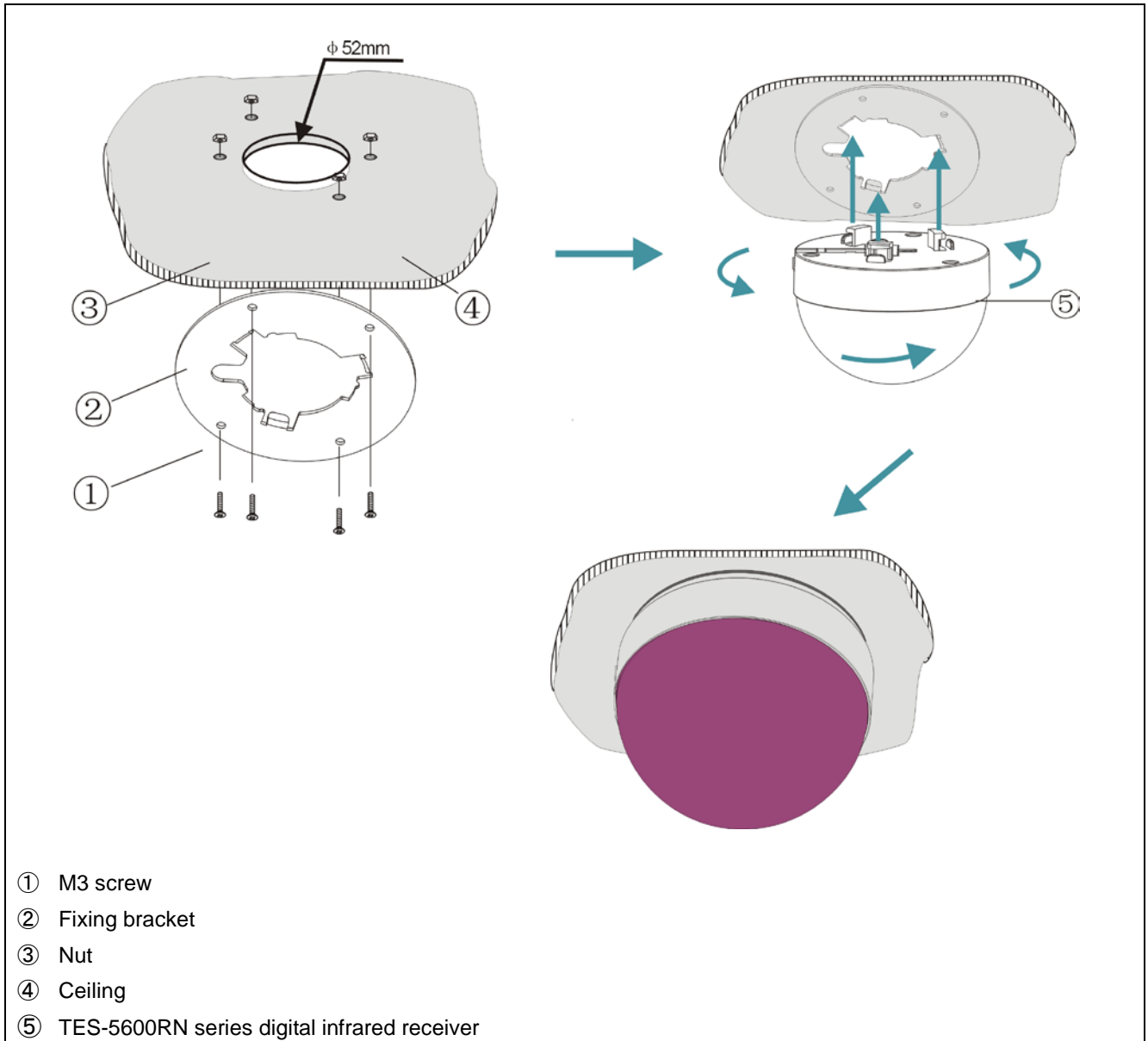⑤ TES-5600RN series digital infrared receiver

Figure 3.3   TES-5600RN digital infrared receiver ceiling mounted 2

Mounting steps:

Step 1: Position the fixing bracket on the ceiling according to the installation location of the TES-5600RN and mark the positions of the drilling holes. Drill four holes (5 mm diameter, 30 mm depth) and a vent (52 mm diameter, for mounting and heat elimination during operation) into the ceiling;

> **WARNING:**
> ☞   Do not cover the vent to keep good ventilation for the equipment.

Step 2: Put the convex side of the bracket facing the ceiling, and fix it with nut and M3 screws;

Step 3: Put the slots of TES-5600RN digital infrared receiver into hard ceiling fixing bracket and fix it with clockwise rotation.
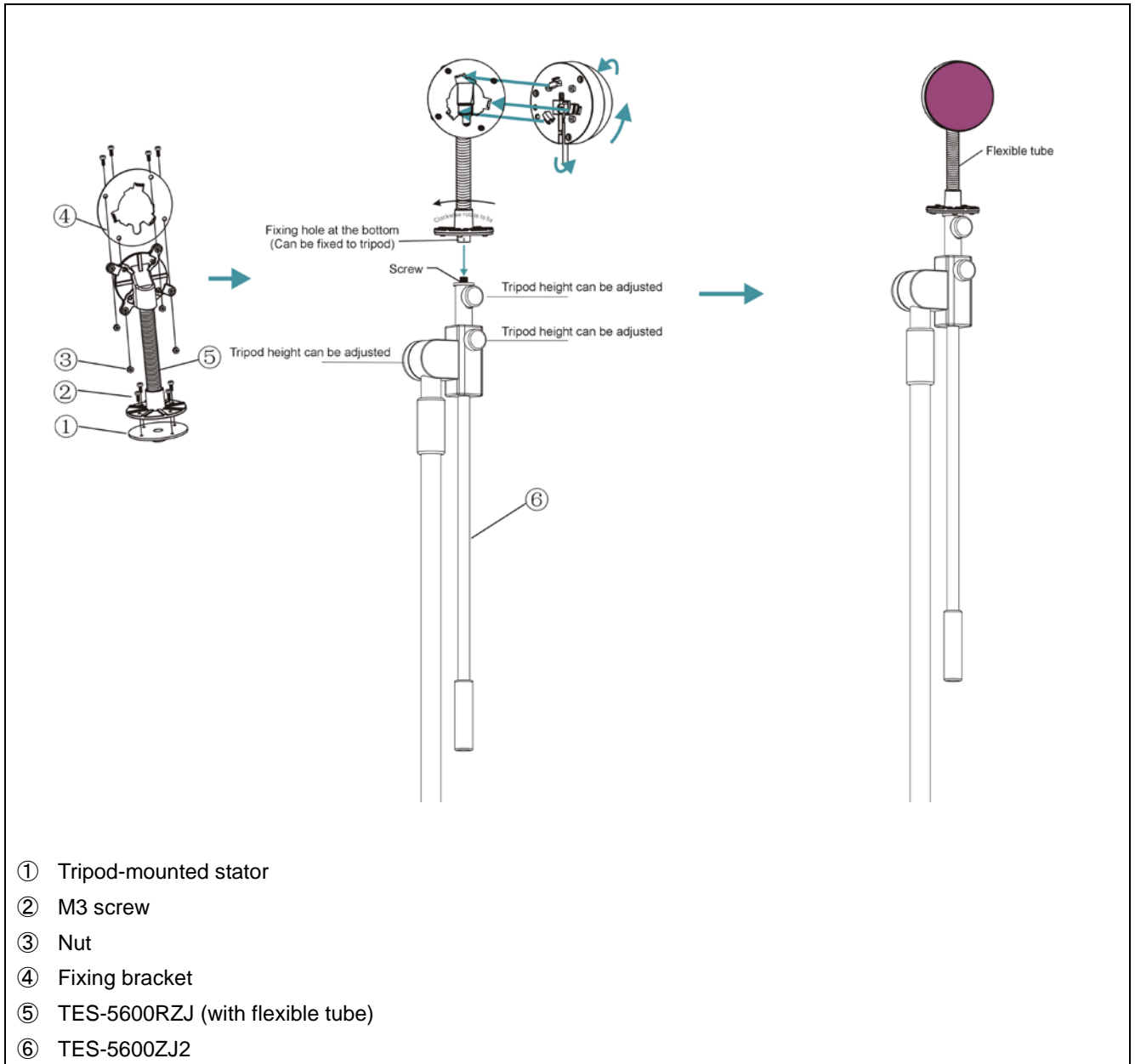
3.3.3 TES-5600RN series tripod mounted

① Tripod-mounted stator
② M3 screw
③ Nut
④ Fixing bracket
⑤ TES-5600RZJ (with flexible tube)
⑥ TES-5600ZJ2

Figure 3.4   TES-5600RN digital infrared receiver tripod mounted

Mounting steps:

Step 1: Fix the fixing bracket onto the TES-5600RZJ with M3 screws;

Step 2: Fix the tripod-mounted stator onto the other end of the TES-5600RZJ with M3 screws;

Step 3: Aim the mounting hole at the bottom of the tripod-mounted stator to the screw on the tripod and then fix it with clockwise rotation;

Step 4: Put the slots of TES-5600RN digital infrared receiver into the fixing bracket and fix it with clockwise rotation.

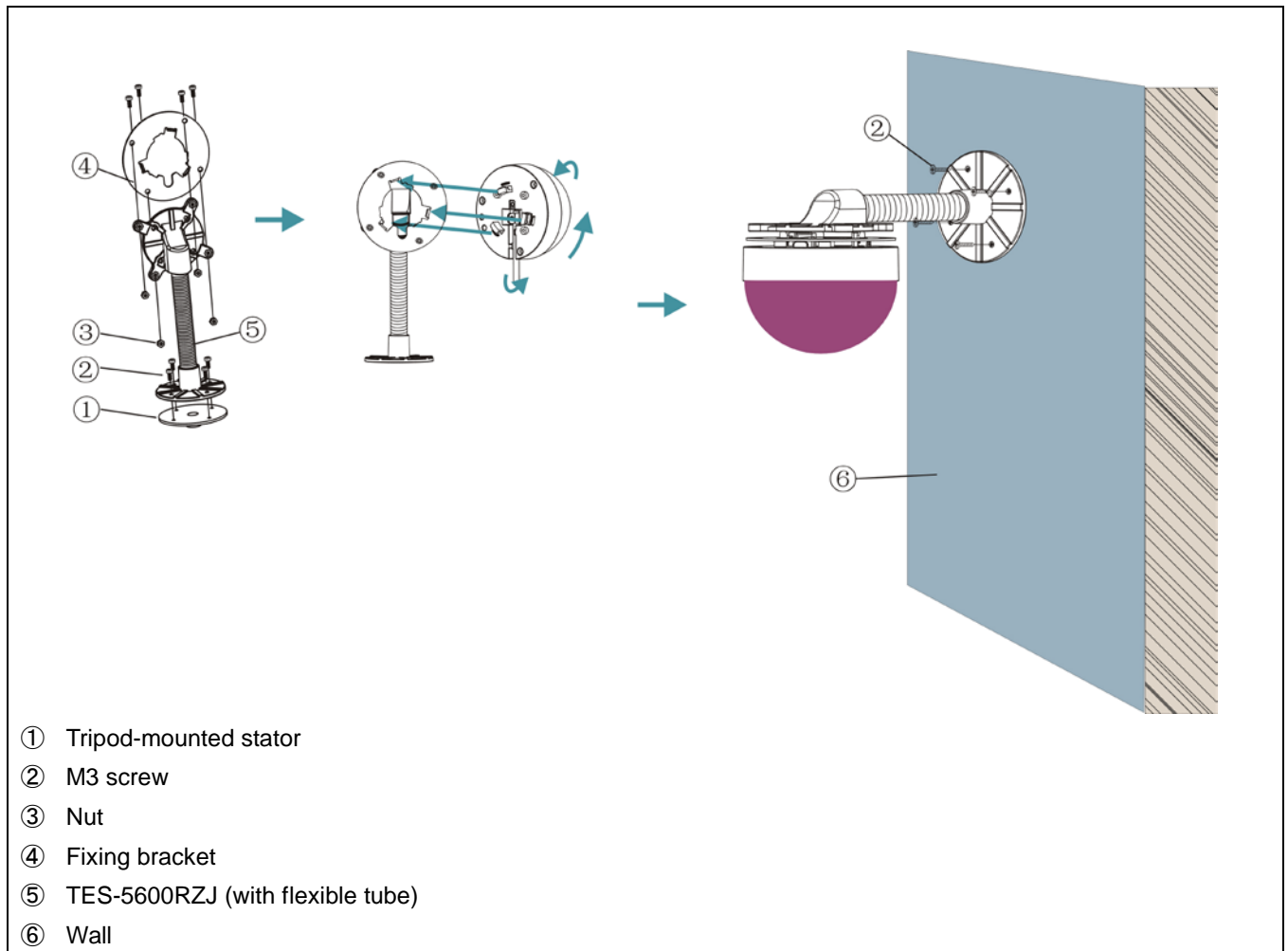### 3.3.4 TES-5600RN series wall mounted (Adjustable angle)

① Tripod-mounted stator
② M3 screw
③ Nut
④ Fixing bracket
⑤ TES-5600RZJ (with flexible tube)
⑥ Wall

Figure 3.5   TES-5600RN digital infrared receiver tripod mounted

Mounting steps:

Step 1: Fix the fixing bracket onto the TES-5600RZJ with M3 screws;

Step 2: Put the slots of TES-5600R digital infrared receiver into the fixing bracket and fix it with clockwise rotation;

Step 2: Position the wall-mounted bracket on the wall according to the installation location of the TES-5600RN and mark the positions of the drilling holes. Drill four holes (5 mm diameter, 30 mm depth) on the wall;

Step 3: Put the included rubber plugs into the mounting holes on the wall;

Step 4: Fix the TES-5600RZJ onto the wall with M3 screws.

> **WARNING:**
> ☞   This installation method is applicable when the wall thickness significantly is greater than the length of the rubber plug.

3.4 Connection

3.4.1 TES-5600BX series

The TES-5600BX/30 series control box features built-in amplifier, microphone control and volume adjustment. TES-5600BX/30 series connects to TES-5600RN/30 series via RECEIVER interfaces, and external audio (PC) can be fed via PC IN, and TES-5600CSM series or TES-5600MIC wired microphone can connect to the A type USB interface for audio transmission, audio output to external device (such as amplifier) via LINE BAL, and speakers connection via SPEAKER.
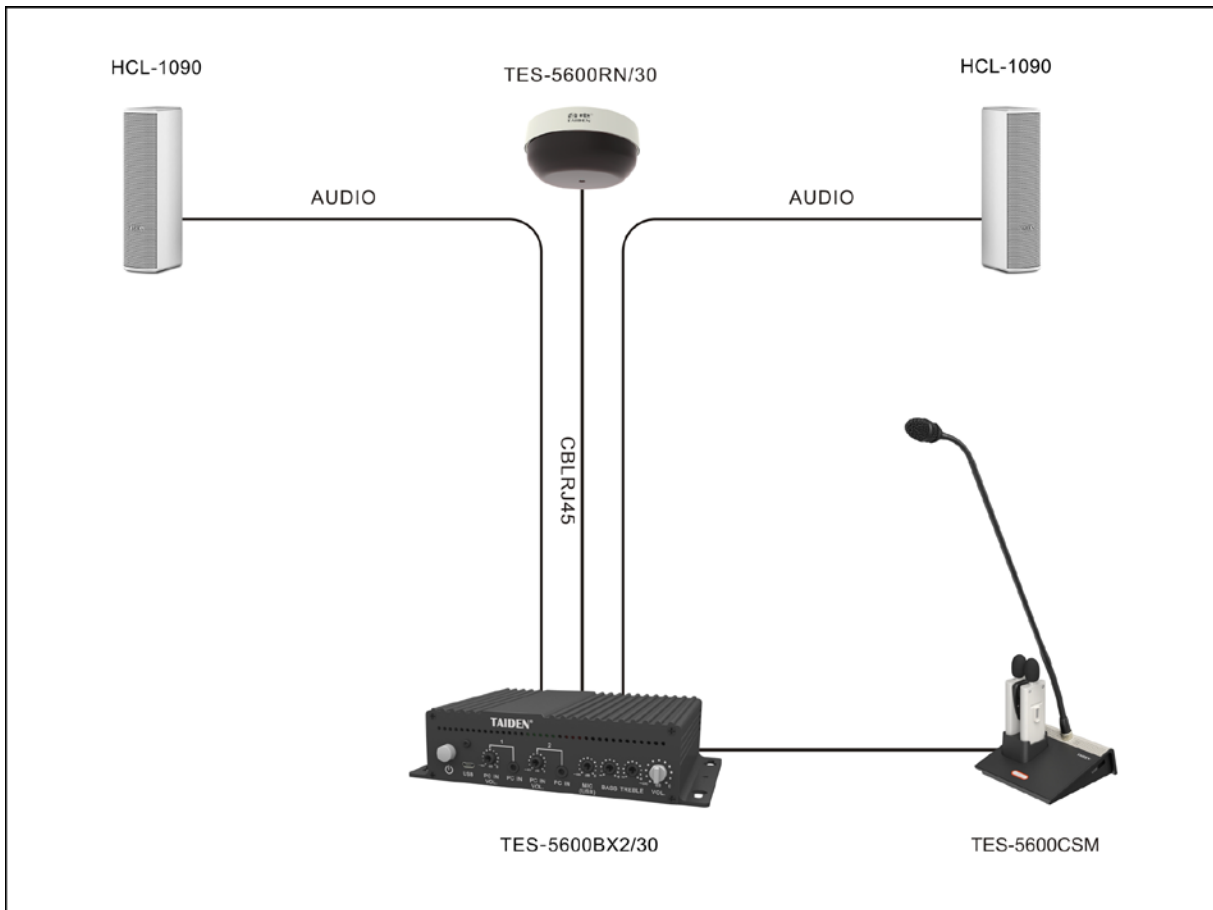

Figure 3.6   System connecting for TES-5600 series

3.4.2 TES-5600MAU/30

TES-5600MAU/30 has the functions of microphone controlling and volume adjusting.

TES-5600MAU/30 series connects to TES-5600RN/30 series via RECEIVER interfaces, and external audio can be fed via LINE IN, and TES-5600CSM series or TES-5600MIC wired microphone can connect to the A type USB interface for audio transmission, audio output to external device (such as recorder) via LINE OUT, and speakers connection via SPEAKER OUTPUT.

Also, TAIDEN TES-5600MAU/30 digital infrared wireless classroom audio system and TAIDEN HCS-6100 intelligent central control system can be joined together seamlessly, connecting various devices, hardware and environment equipment from different manufacturers together. The central control system can operate the teaching devices through wired Ethernet or wireless communication by wired/wireless touch panel. Features include power controlling, system PA volume controlling and controlling of various electric devices, such as DVD, recorder, etc. RS-232C interface is available.
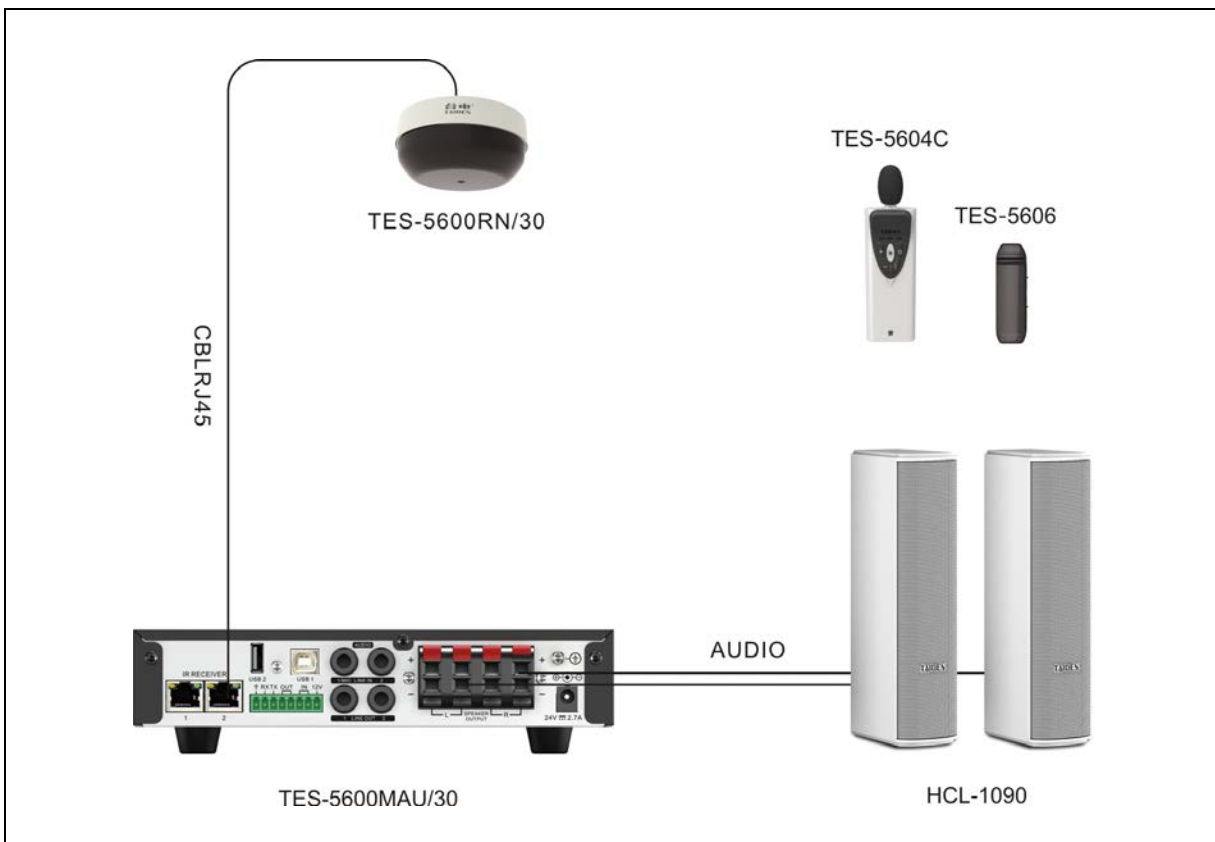

Figure 3.7   System connecting for TES-5600MAU/30

3.5 Configuration and operation of TES-5600MAU/30

TES-5600MAU/30 Digital infrared wireless system main unit can be configured and set up through menu operation with knob. All menu items operation will be introduced one by one in this section.

A) Starting initialization

Switch on and press the "POWER" button, the TES-5600MAU/30 digital infrared wireless system main unit will start initialization:

B) Initial interface on OLED

The initial interface on the OLED includes channel status and microphone battery capacity.

■ Under initial interface, switch the knob to enter the master volume control menu;

Rotate the knob to adjust the volume（range: -30 dB to 0 dB）, and then keep pressing the knob to confirm and turn back to the initial interface.

C) Access main menu

Pressing the knob under initial interface will go to main menu, which includes ten menu items:

"Mic. Sens."	"Line In Vol."
"EQ Setting"	"Auto Fade"
"FB Suppress"	"Line In 1 Set."
"Remote Ctrl."	"Mic Low Cut"
"Music/Voice"	"Child Lock"
"Language"	"Factory Reset"
"About"	

■ Rotate the knob to switch submenus one by one;
■ Press the knob to go to the corresponding submenus.

> **Note:**
> ☞ Keep pressing the knob to return to the OLED initial interface under any menu.

3.5.1 Mic Sens.

Adjust the sensitivity of the digital infrared wireless microphones.

1. Press the knob to enter the microphone selection interface;

2. Rotate the knob to select a microphone, and then press the knob to enter the sensitivity adjusting interface, the hollow pellet will turn solid;

3. Adjust the sensitivity by rotating the knob and then press the knob to confirm.

> **Note:**
> ☞ The function parameters are usually adjusted only during the initial installation.
> ☞ User can finely adjust the sensitivity of the current microphone through the wireless microphone, and the cursor indicates the actual sensitivity.

3.5.2 Line In Vol.

Adjust the volume of Line In, range: -∞ (mute), -30 dB to 0 dB.

```
2. Line In Vol.
⊋1 —○———— -20
```

1. Press the knob to enter the line in selection interface;

```
2. Line In Vol.
⊋2 —●———— -20
```

2. Press the knob to enter volume adjustment interface;

```
2. Line In Vol.          2. Line In Vol.
⊋2 —●———— -20            ⊋2 ⊗———— -∞
```
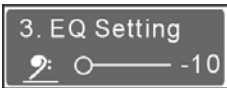
3. Rotate the knob to adjust the volume and then press the knob to confirm.

3.5.3 EQ Setting

Set up the EQ of Line Out and speaker.

```
3. EQ Setting
𝄢:  ○———— -10
```

1. Press the knob to enter and select bass or treble;

```
3. EQ Setting          3. EQ Setting
𝄢:  ○———— -10          𝄞  ○———— -10
```

   Bass   Treble

2. Press the knob to enter the EQ adjusting interface, the hollow pellet will turn solid;

```
3. EQ Setting
𝄞  ———●—— 0
```

3. Rotate the knob to adjust the EQ, range: -10 dB to +10 dB;

4. Press the knob to confirm.

3.5.4 Auto Fade

Select the trigger signal sources of LINE IN fade. LINE IN volume will be reduced 18 dB after triggering.

```
4. Auto Fade
Off
```

1. Press the knob to enter the setting interface;

```
4. Auto Fade
Low Voice
```

2. Rotate the knob to select a fade way among Off, Low Voice, High Voice and IR Signal.
- **Voice trigger:** LINE IN audio fade will be trigger when voice reaches the certain sound pressure. It includes Low Voice and High Voice.
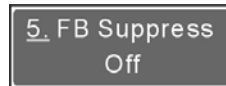- **IR signal:** LINE IN audio fade will be controlled by microphone on/off.

3. Press the knob to confirm.

> **Note:**
> ☞ Auto Fade is invalid for LINE IN 1 if it is used for microphone input.

3.5.5 FB Suppress

Set a FB (feedback) suppress level.

```
5. FB Suppress
Off
```

1. Press the knob to enter the setting interface;

```
5. FB Suppress
High
```

2. Rotate the knob to select a level among Off, High and Low.

3. Press the knob to confirm after adjusting.

> **Note:**
> ☞ The higher the FB suppress level, the better the FB suppress effect. But too high level may have an impact on the sound quality, so please select the reasonable FB suppress.

3.5.6 Line In 1 Set.

```
6. Line In 1 Set.
    Line In
```

1. Press the knob to enter the setting interface;

```
6. Line In 1 Set.
    Mic In
```

2. Rotate the knob to select a type between Line In, Mic In and USB Mic, if select "Line In" or "USB Mic", press the knob to confirm;
If select "Mic In", press the knob to enter the step 3 Phantom Power set up;
If select "USB Mic", press the knob to enter the step 4 Mute by IR Mic set up.

```
Phantom Power
    Off
```

3. Rotate the knob to select On or Off and then press the knob to enter the step 4 Mute by IR Mic set up.
If select "On", the wired microphone will be mute when the digital IR wireless microphone is on.

```
Mute by IR Mic
    Off
```

4. Rotate the knob to select On or Off and then press the knob to confirm.

3.5.7 Remote Ctrl.

User can finely adjust the sensitivity of the current microphone through the TES-560x IR wireless microphone based on the set Mic Sens. Remote Ctrl. sets the permission and adjustment range.

```
7. Remote Ctrl.
    +/-9 (dB)
```

1. Press the knob to enter the setting interface;

```
7. Remote Ctrl.
    +/-3 (dB)
```

2. Rotate the knob to select a range or off, and then press the knob to confirm.

3.5.8 Mic Low Cut

Set the low cut of microphone.

```
8. Mic Low Cut
    Solution 2
```

1. Press the knob to enter the setting interface;

```
8. Music/Voice
    Solution 1
```

2. Rotate the knob to select a solution and then press the knob to confirm.

Note:
☞ We suggest selecting solution1 when connecting to HPA-2240/2360 speaker and solution2 when connecting to HPA-1000 series line array column loudspeaker.

3.5.9 Music/Voice

Set the sound effects of speakers.

```
9. Music/Voice
    Music
```

1. Press the knob to enter the setting interface;

```
9. Music/Voice
    Voice
```

2. Rotate the knob to select a sound effect and then press the knob to confirm.

3.5.10 Child Lock

Set the child lock function.

```
10. Child Lock
    On
```

1. Press the knob to enter the setting interface;

```
10. Child Lock
    Off
```

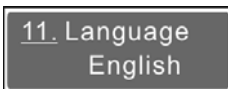2. Rotate the knob to select and then press the knob to confirm.

When the Child Lock is on, an icon "🔒" will display on the initial interface. If there is no operation in 1 minute,

an icon "🔒" will display and the menu interface is locked. The prompt interface as below:
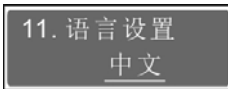
> • Locking
> Unlock First

Under this interface, operate "Press the knob and then right rotate the knob" for four times, then press the knob again to unlock.
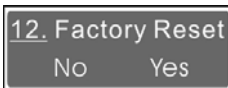
3.5.11 Language

> 11. Language
> English

1. Press the knob to enter the setting interface;

> 11. 语言设置
> 中文

2. Rotate the knob to select a language and then press the knob to confirm.

3.5.12 Factory Reset

> 12. Factory Reset
> No   Yes

1. Press the knob to enter the setting interface;

> 12. Factory Reset
> No   Yes
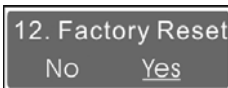
2. Rotate the knob to select "Yes" or "No".

3.5.13 About

Display the version of the device.

> 13. About
> Ver: 1. 1. 0. 0

In this interface，user also can see the information of the microphone in use, see and change the receivable frequencies of the main unit.

■ **See the information of microphone in use**

> 13. About<1.0M>
> Ver: 1. 1. 0. 0
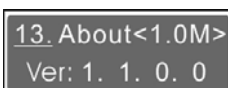
In the "About" interface, power on a microphone or press the "MUTE" button on the microphone, its version and frequency will be displayed.

■ **See the receivable frequencies of the main unit**

> 13. About.
> 🎤1 3.6M 🎤2 2.3M
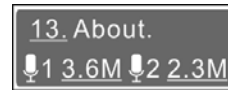
In the "About" interface, press the knob to see the receivable frequencies of the main unit and press the knob again to return to the "About" interface.

■ **Change the receivable frequencies of the main unit**

> 13. About....
> 🎤13.6M 🎤22.3M
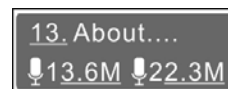
1. Press the knob and then clockwise rotate it, operate the step for 4 times (4 points will display after "About"), then press the knob to the frequency settings;

> Set Mic Freq.
> 4: 3.6M 2.3M
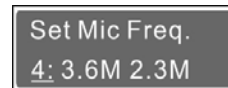
2. Press the knob to select between frequency1 and frequency2, rotate the knob to change the frequency, and then press the knob to confirm.
There are 2 groups of frequencies can be selected: 1.6 M/3.0 M and 3.6 M+2.3 M.
3. Press the knob to enable and turn back to the initial interface.

> **Note:**
> ☞ Please use the receivable frequencies changing function restrainedly for keeping normal use;
> ☞ Factory reset is invalid for receivable frequencies changing.

D) Protection

- **IR receiver protection:** activated when the IR receiver short circuit or other unusual circumstance happens, the OLED displays "IR Receiver Abnormal!"
- **Alarm function:** activated when a high level being input to the phoenix interface or the controllable microphone or central control system send an alarm signal to the main unit, the OLED displays "Alarm On!".

3.6 USB LINK

TES-5600MAU/30 series main unit and TES-5600BX series control box have a built-in USB Audio (2 channels, 16bit, 44.1kHz) which can be connected to the computer through USB cable (software requirement: Win7 or higher) for digital audio input/output. The main unit cooperating with the TES-560x microphone can realize remote PPT-page switch control. In the following we take Win7 system as an example to introduce the function and operation of the USB LINK.

3.6.1 Installation of USB LINK

Once the TES-5600MAU/30 main unit connects to the computer, the TES-5600M LINK will be detected automatically. If it is connected for the first time, the USB device driver will be recognized and installed automatically, as shown in the following figure:

Figure 3.8:　Installing USB LINK

After successful installation, the user can check the information of TES-5600M USB LINK from "Device Manager", as shown in the following figure:
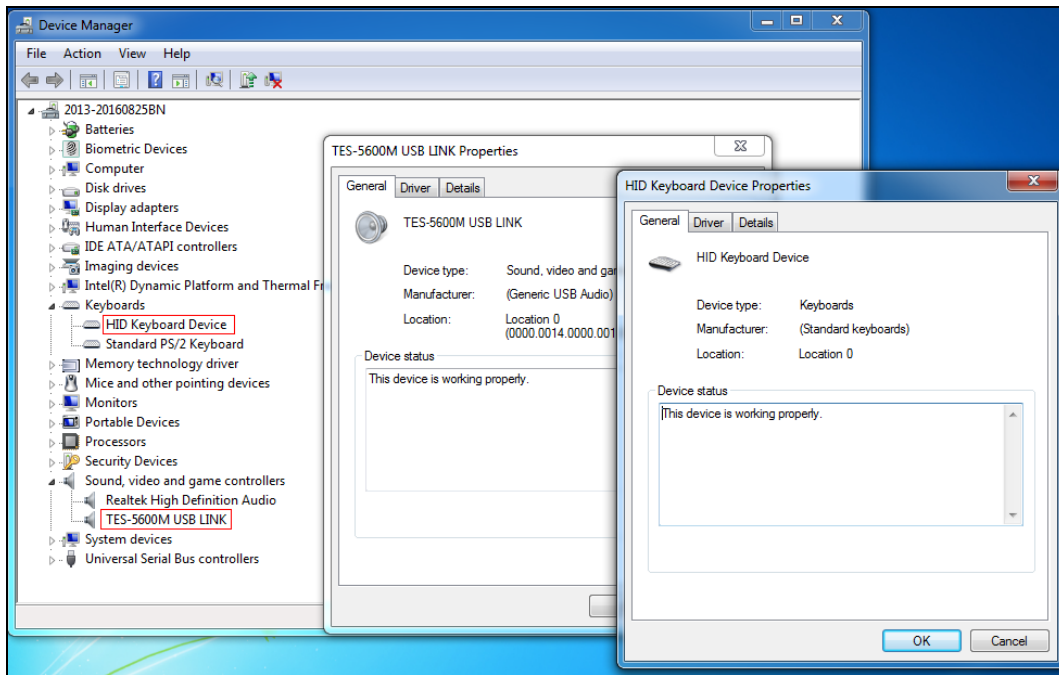

Figurer 3.9:　Information of USB LINK

3.6.2 Digital audio output

When the TES-5600MAU/30 main unit is connected to computer with USB cable, lossless sound can be recorded during class on computer. Using the recording software or the third party communication software, such as recorder, Skype and so on, functions like recording, remote instruction, remote communication can be implemented.

Please adjust and test the TES-5600M USB LINK to a suitable volume when first using. Adjust method: open the control panel-sound (or right click the volume icon on the taskbar and select sound), and select the Microphone (TES-5600M USB LINK) and modify its setting on the Recording dialog box. Shown as the following figure:
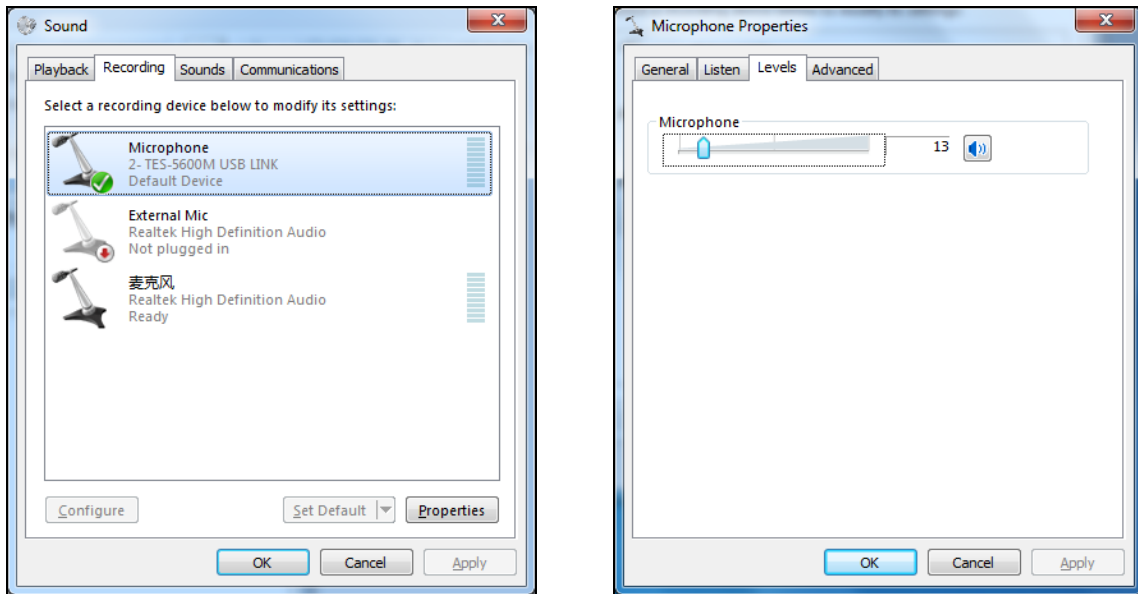
Figurer 3.10:   Adjusting microphone volume

Note:

☞ *High volume may lead to distortion, user can confirm a suitable volume by recording and playback when necessary;*

☞ *When recording under compressed format such as MP3, the audio quality may be affected if using unsuitable sampling rate or resolution so it is suggested to select 44.1kHz or its multiple for the sampling rate and 16 bit for the resolution;*

☞ *In "Microphone Properties- Listen", please disable "Listen to this device" (TES-5600M USB LINK) to avoid echo.*

☞ *Please select the TES-5600M USB LINK as the current device on recording or communication. Usually, TES-5600M USB LINK will be automatically activated after connecting to the computer, instead of the default audio device. If there is error in recording, please select the sound card manually in case there is a mistake in the setting.*

3.6.3 Digital audio input

The TES-5600MAU/30 main unit can be connected to the computer for digital audio input. Please adjust and test the TES-5600M USB LINK to a suitable volume when using for the first time. Adjust method: open the control panel-sound (or right click the volume icon on the taskbar and select sound), and select the speakers (TES-5600M USB LINK) and modify its setting in the Playback dialog box, as shown in the following figure:
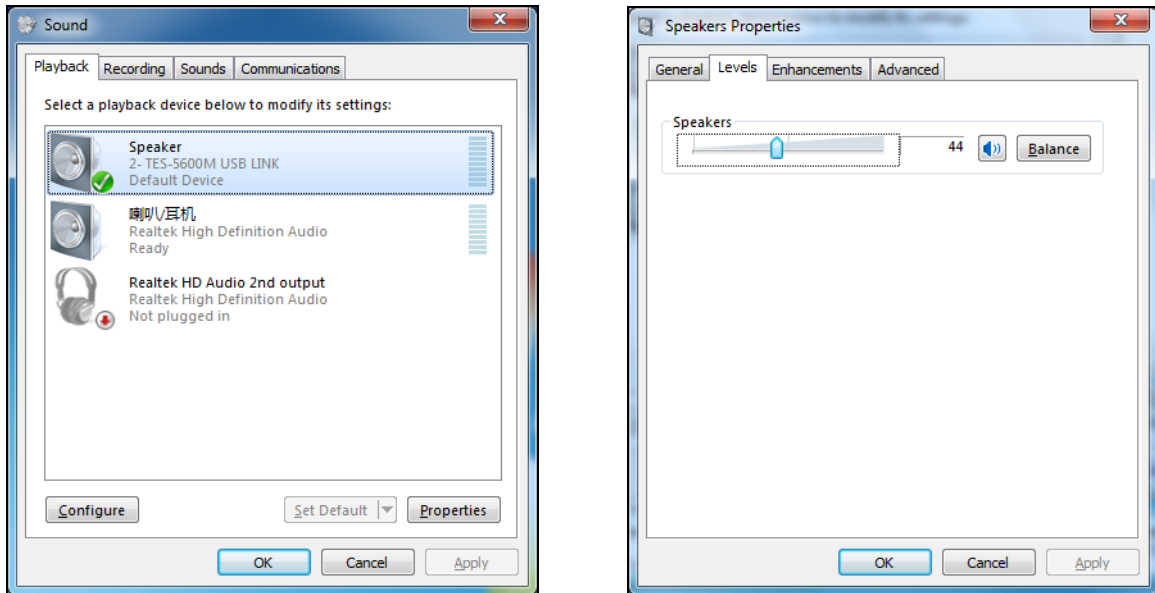
Figurer 3.11:   Adjusting playback volume

Note:

☞ *Please select the TES-5600M USB LINK as the current device on playback. Usually, TES-5600M USB LINK will be activated after connecting to the computer, instead of the default audio device. If there is an error in playback, please select the TES-5600M USB LINK manually in case there is a mistake in audio device selection. Take the Media Player as an example to show the audio device selection:*
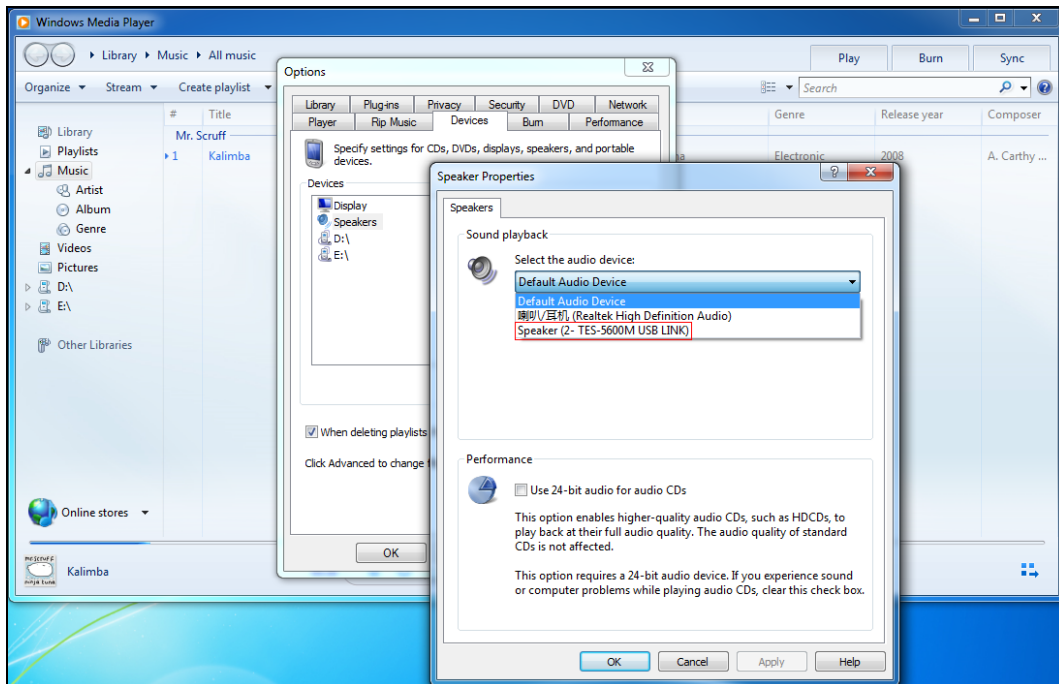

Figurer 3.12:   Audio device selection

3.6.4 PPT-page switch

The TES-5600MAU/30 main unit cooperates with the TES-560x series microphone to realize remote PPT-page switch control. See 5.4.

3.7 Operation of TES-5600BX series

1. Speaker volume

Adjust the volume of speakers and LINE OUT via the "VOL." knob on the TES-5600BX/30 control box, range -30 dB to 0 dB.

2. Treble/bass

Adjust the treble/bass of line out and speakers via the "Treble"/"Bass" knobs on the TES-5600BX/30 control box, range -10 dB to 10 dB.

> **Note:**
> ☞ The bass/treble is usually adjusted only during the initial installation.

3. PC IN and volume

TES-5600BX/30 control box has two PC IN interfaces for external audio input, and puts out their mixed audio, the volume can be adjusted via PC IN knobs.

4. External microphone in and volume

An A type USB interface can connect to the external microphone (TES-5600CSM series or TES-5600MIC) and adjust the volume via MIC(USB) knob.

5. Function switcher

Setting the function parameters via the switcher (switch up is 1, switch down is 0)

Function	1	0
1. AFC function	On	Off
2. IR frequency	TES-5600BX2/30 2.33/3.67 MHz TES-5600BX1/30 2.33 MHz	TES-5600BX2/30 1.67/3.0 MHz TES-5600BX1/30 1.67 MHz
3. Mic low cut	Solution 2	Solution 1
4. Auto. fade	On	Off

> **Note:**
> ☞ The function parameters are usually adjusted only during the initial installation.
> ☞ Mic low cut: We suggest selecting solution1 when connecting to HPA-2240 speaker and solution2 when connecting to HPA-1000 series line array column loudspeaker.
> ☞ The auto fade only effect for line in.

6. PPT Slide

TES-5600BX/30 control box connects to PC via a Micro USB interface, cooperates with the TES-560x series microphone to realize remote PPT slide control. See 4.4.

Chapter 4 TES-5690 Series Classroom Audio System

4.1 Overview

TAIDEN TES-5690 series digital infrared classroom audio system integrated main unit and professional digital audio power amplifier, which can connect to speakers, support 2 IR microphone for interaction of teacher and students. It with central control interface for realizing centralized control.

TES-5690M is rack mounted to make the cabinet more concise.

Types:

TES-5690MA

Digital Infrared Classroom Audio System Main Unit (supports 2 wireless microphones, with DSP, built-in audio power amplifier 2×200 W+2×60 W, network control)

TES-5690MB

Digital Infrared Classroom Audio System Main Unit (supports 2 wireless microphones, with DSP, built-in audio power amplifier 2×200 W, network control)

TES-5690MC

Digital Infrared Classroom Audio System Main Unit (supports 2 wireless microphones, with DSP, built-in audio power amplifier 4×60 W, network control)

Front panel of TES-5690M

Rear panel of TES-5690MA

Rear panel of TES-5690MB
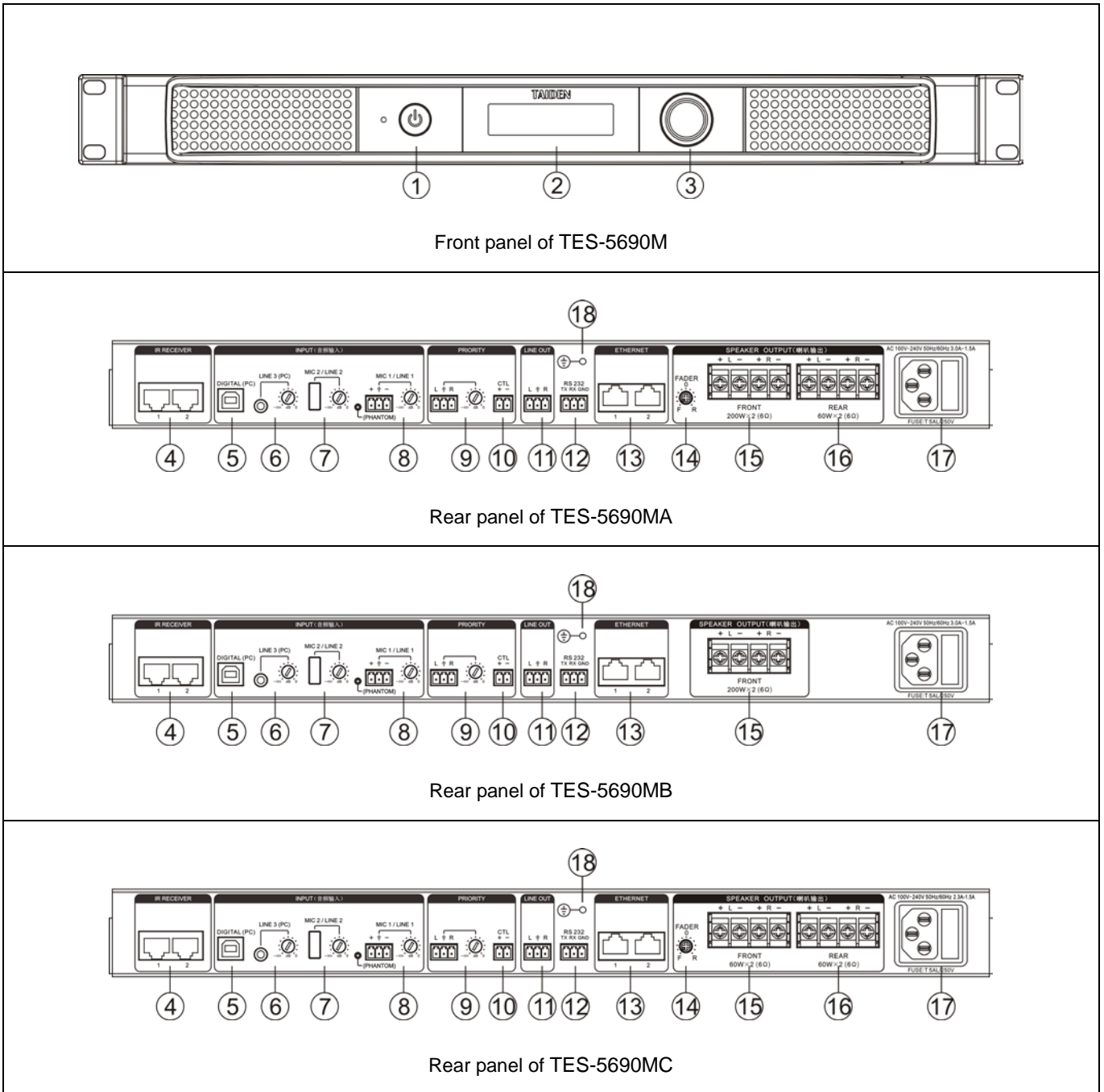

Rear panel of TES-5690MC

Figure 4.1   TES-5690 series classroom audio system

Figure 4.1:

1. Power button

2. Menu display

- LCD displays main unit status and configuration menu.

3. Knob

- For menu operation;
- For master volume control.

4. IR RECEIVER (RJ45)

- Connect to TES-5600RN/30 series digital IR receiver or TES-0104T/30 splitter for transmitting signals

5. B type USB interface

- For firmware upgrade
- For digital audio input/output
- Connect to PC for remote control of PPT slides

6. LINE3 (PC) IN and volume konb

- Ø 3.5 mm, for stereo analog audio input

7. MIC2/LINE2 IN and volume konb

- A tape USB, for onnecting to TES-5600CSM or TES-5600MIC wired microphone for audio transmission

8. MIC1/LINE1 IN and volume konb

- 3P phoenix interface, for analog balanced audio input, with phantom power

9. Priority IN and volume konb

- 3P phoenix interface, for stereo analog audio input

10. CTL trigger interface

- System output the audio of priority interface when it is short circuiting.

11. LINE OUT

- 3P phoenix interface, for stereo analog audio input

12. RS232 interface

- 3P phoenix interface, for connecting to central control system

13. ETHERNET

- Connecting to Ethernet for searching status and adjusting parameters through web page

14. FADER knob

- For adjusting the fader between front speakers and rear speakers

15. Front speaker interface (6Ω)

16. Rear speaker interface (6Ω)

- For extended rear field supplementary speaker

17. Power interface

18. GND

4.3 Connection

The TES-5690M series Digital Infrared Classroom Audio System Main Unit connects to TES-5600RN/30 series Digital Infrared Receiver which features built-in amplifier, microphone control and volume adjustment. TES-5690M series connects to TES-5600RN/30 series via RECEIVER interfaces, and external audio (PC) can be fed via LINE1/LINE3, and TES-5600CSM series or TES-5600MIC wired microphone can connect to LINE2 (A type USB) for audio transmission. TES-5690M main unit is equipped with a priority interface, when the CTL trigger is enabled, the audio of priority will be routed to all the outputs with all other inputs muted.

TES-5690M main unit is also equipped with a B type USB which can connect to PC for digital audio input/output, and remote control of PPT slides can be realized with a TES-560x series digital IR wireless microphone.

In the system, audio output to external device (such as amplifier) via LINE OUT, and speakers connection via SPEAKER and the fade is adjustable.
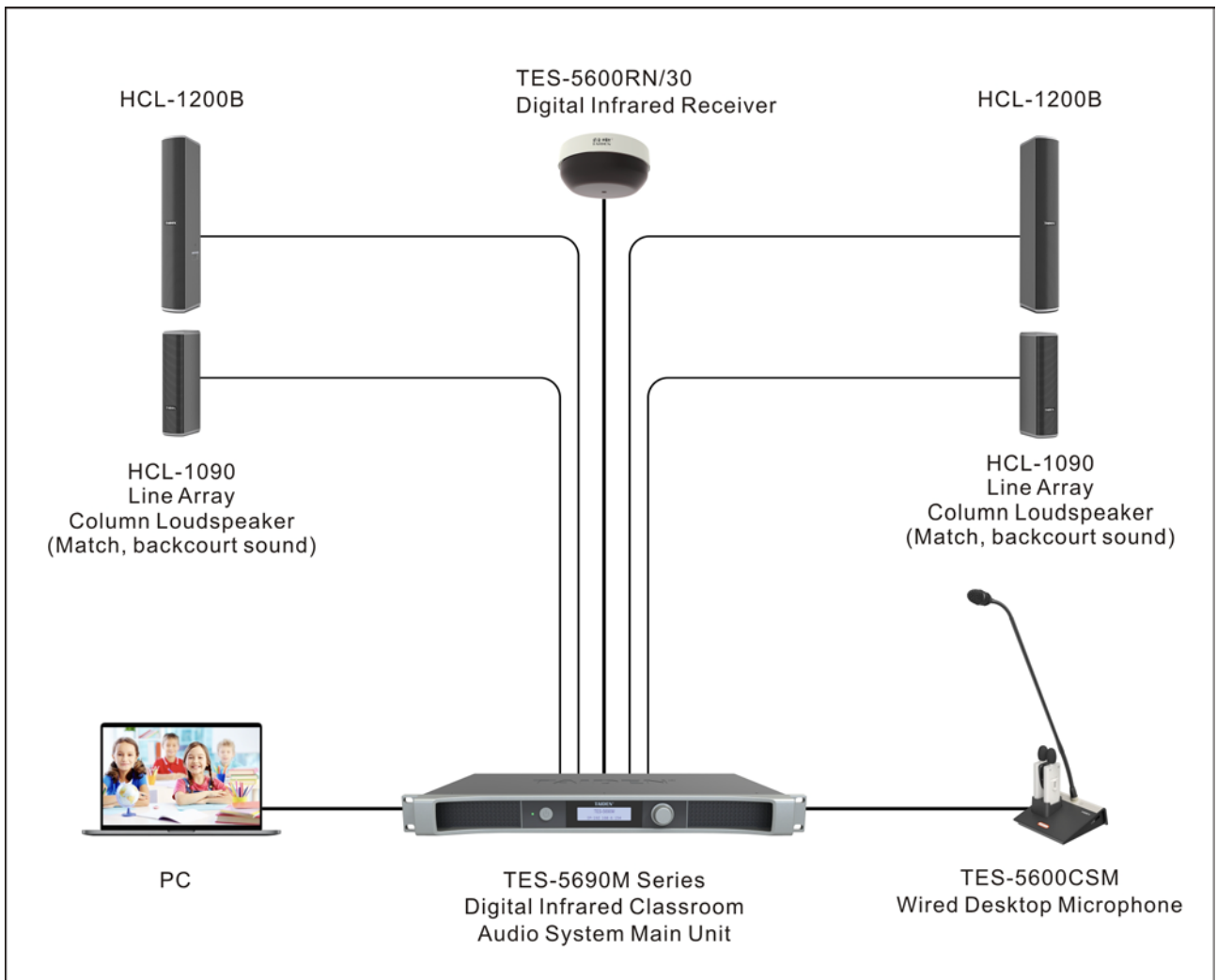

Figure 4.2   System connecting for TES-5690 series

4.4 Configuration and operation

TES-5690M series Digital infrared wireless system main unit can be configured and set up through menu operation with knob. All menu items operation will be introduced one by one in this section.

A) Initial interface on LCD

The initial interface on the LCD includes channel, alarm and web status.

■ Under initial interface, switch the knob to enter the speaker volume control menu;

Rotate the knob to adjust the volume（range: -30 dB to 0 dB）, and then pressing the knob to confirm and turn back to the initial interface.

B) Access main menu

Pressing the knob under initial interface will go to main menu, which includes ten menu items:

"IR Mic Sens."	"Line Out Vol."
"Phantom Power"	"Mute by IR Mic"
"Remote Ctrl"	"Carrier Select"
"Language"	"Network"
"Auto Fade"	"FB Suppress"
"Factory Reset"	"About"
"Return"	

■ Rotate the knob to switch submenus one by one;
■ Press the knob to go to the corresponding submenus.

Note:
☞ Keep pressing the knob to return to the OLED initial interface under any menu.

4.4.1 IR Mic Sens.

Adjust the sensitivity of the digital infrared wireless microphones.

1. Rotate the knob to select a microphone, and then press the knob to enter the microphone selection interface;

2. Adjust the sensitivity by rotating the knob and then press the knob to confirm;
3. Select ↵ to return main menus.

Note:
☞ The function parameters are usually adjusted only during the initial installation.
☞ User can finely adjust the sensitivity of the current microphone through the wireless microphone, and the cursor indicates the actual sensitivity.

4.4.2 Line Out Vol.

Adjust the volume of Line out, range: -∞ (mute), -30 dB to 0 dB.

Rotate the knob to adjust the volume, then press the knob to confirm and return main menus.

4.4.3 Phantom Power

Set up the phantom power function of MIC1/LINE1.

Rotate the knob to select "on" or "off", then press the knob to confirm and return to main menus.

4.4.4 Mute by IR Mic

If select "On", the wired microphone will be mute when the digital IR wireless microphone is on.

Mute by IR Mic
Off

Rotate the knob to select On or Off, then press the knob to confirm and return to main menus.

4.4.5 Remote Ctrl.

User can finely adjust the sensitivity of the current microphone through the TES-560x IR wireless microphone based on the set Mic Sens. Remote Ctrl. sets the permission and adjustment range.

Remote Ctrl.
+/-3 (dB)
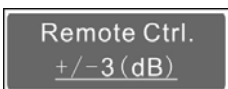
Rotate the knob to select a range (±3 dB, ±6 dB, ±9 dB) or off, then press the knob to confirm and return main menus.

4.4.6 Carrier Select
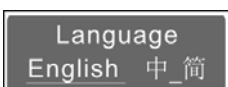
Select the carrier of system.

Carrier Select
2.3MHz/3. 6MHz
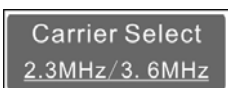
Rotate the knob to select a group of carrier, then press the knob to confirm and return main menus.

Note:

☞ Please use the receivable frequencies changing function restrainedly for keeping normal use

4.4.7 Language

Language
English 中_简

Rotate the knob to select a language and then press the knob to confirm.

4.4.8 Network

Set the IP address, subnet mask, gateway of the system.
■ IP address

IP Address
192.168. 2. 96 ↵

1. Rotate the knob to switch between the four numbers, and press the knob to select a number;

IP Address
192.168. 2._96 ↵

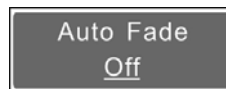2. Rotate the knob to adjust the value, press the knob to confirm;
3. Select ↵ to return main menus.
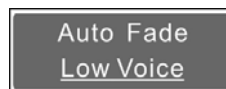
■ Subnet mask and gateway

The same chronological order as for the "IP address" set up.

4.4.9 Auto Fade

Select the trigger signal sources of LINE IN 1/2/3 fade. Volume of LINE IN 1/2 will be reduced 18 dB after triggering.

Auto Fade
Off

1. Press the knob to enter the setting interface;

Auto Fade
Low Voice

2. Rotate the knob to select a fade way among Off, Low Voice, High Voice and IR Signal.
■ **Voice trigger:** LINE IN audio fade will be trigger when voice reaches the certain sound pressure. It includes Low Voice and High Voice.
■ **IR signal:** LINE IN audio fade will be controlled by microphone on/off.
3. Press the knob to confirm.

4.4.10 FB Suppress

Set a FB (feedback) suppress level.

```
FB Suppress
    Off
```

Rotate the knob to select a level among Off, High and Low, then press the knob to confirm after adjusting.

> **Note:**
> ☞ The higher the FB suppress level, the better the FB suppress effect. But too high level may have an impact on the sound quality, so please select the reasonable FB suppress.

4.4.11 Factory Reset

Set whether to restore production settings.

```
Factory Reset
 Yes      No
```

Rotate the knob to select "Yes" or "No".

4.4.12 About

Display the version of the device.

```
TES-5690MA
Mver: 1. 00. 00. 8
Ser : td56785656
Gen : AUG 28 2020
```

4.4.13 Return

Press the knob to return to the Initial interface.

4.4.14 Protection

Alarm function: activated when a high level being input to the phoenix interface or the controllable microphone or central control system send an alarm signal to the main unit, the LCD displays "Alarm On!".

4.5 USB LINK

TES-5690 series main unit built-in USB Audio (2 channels, 16bit, 48 kHz) which can be connected to the computer through USB cable (software requirement: Win7 or higher) for digital audio input/output. The main unit cooperating with the TES-560x microphone can realize remote PPT-page switch control. In the following we take Win7 system as an example to introduce the function and operation of the USB LINK.

4.5.1 Installation of USB LINK

Once the TES-5690M main unit connects to the computer, the TES-5690M LINK will be detected automatically. If it is connected for the first time, the USB device driver will be recognized and installed automatically, as shown in the following figure:
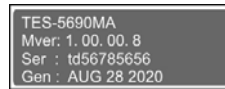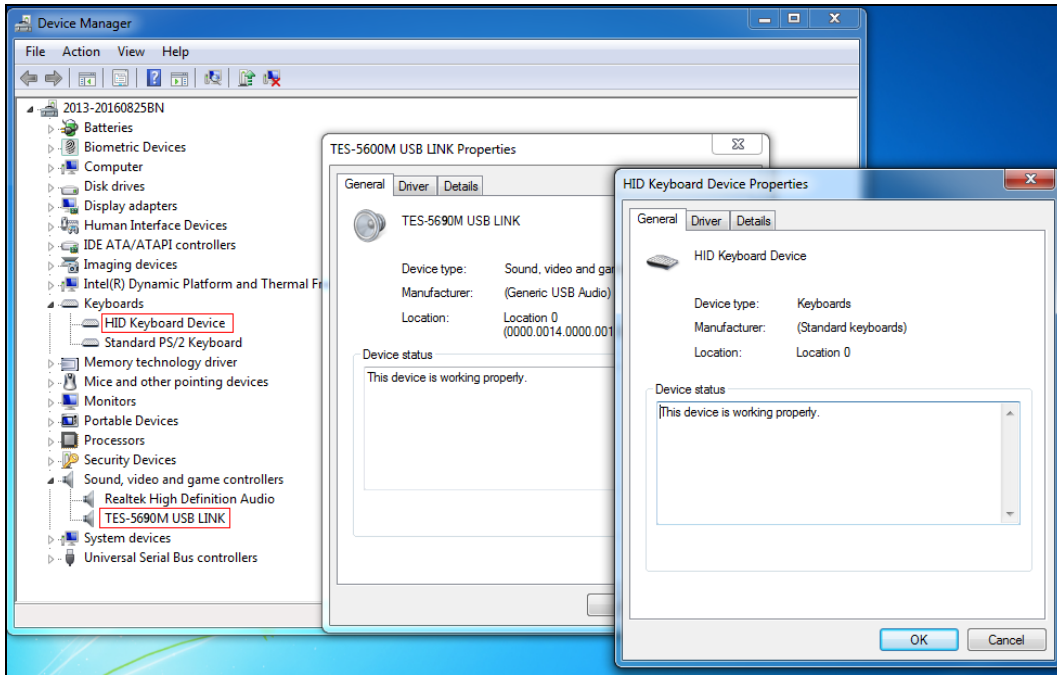

Figure 4.3   Installing USB LINK

After successful installation, the user can check the information of TES-5690M USB LINK from "Device Manager", as shown in the following figure:

Figurer 4.4   Information of USB LINK

4.5.2 Digital audio output

When the TES-5690M main unit is connected to computer with USB cable, lossless sound can be recorded during class on computer. Using the recording software or the third party communication software, such as recorder, Skype and so on, functions like recording, remote instruction, remote communication can be implemented.

Please adjust and test the TES-5690M USB LINK to a suitable volume when first using. Adjust method: open the control panel-sound (or right click the volume icon on the taskbar and select sound), and select the Microphone (TES-5690M USB LINK) and modify its setting on the Recording dialog box. Shown as the following figure:
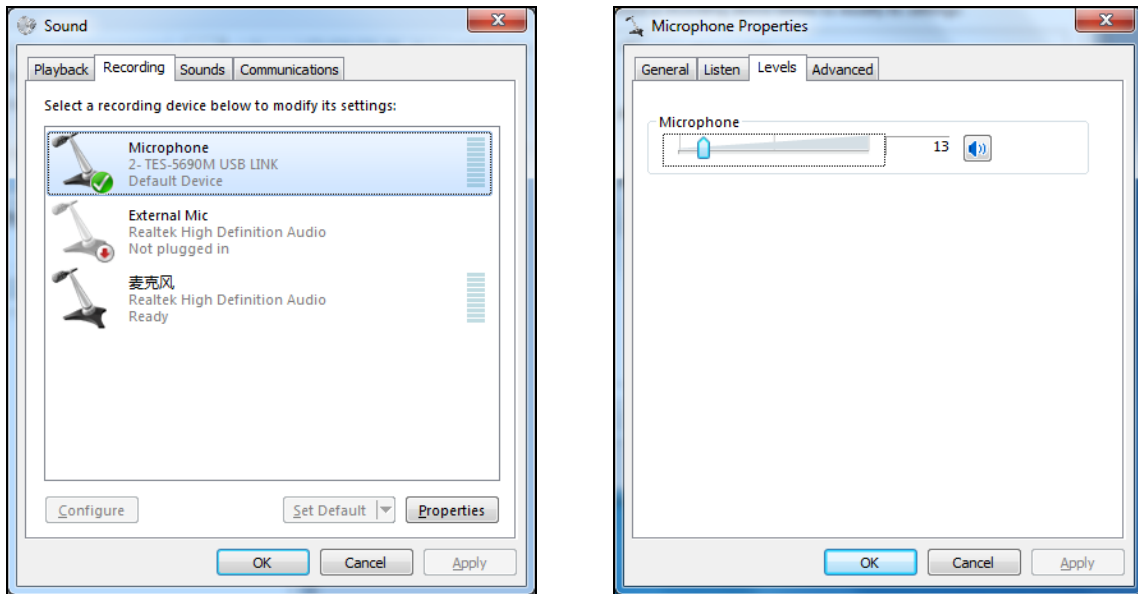

Figurer 4.5   Adjusting microphone volume

Note:

☞   *High volume may lead to distortion, user can confirm a suitable volume by recording and playback when necessary;*

☞   *When recording under compressed format such as MP3, the audio quality may be affected if using unsuitable sampling rate or resolution so it is suggested to select 44.1kHz or its multiple for the sampling rate and 16 bit for the resolution;*

☞   *In "Microphone Properties- Listen", please disable "Listen to this device" (TES-5690M USB LINK) to avoid echo.*

☞   *Please select the TES-5690M USB LINK as the current device on recording or communication. Usually, TES-5690M USB LINK will be automatically activated after connecting to the computer, instead of the default audio device. If there is error in recording, please select the sound card manually in case there is a mistake in the setting.*

4.5.3 Digital audio input

The TES-5690M main unit can be connected to the computer for digital audio input. Please adjust and test the TES-5690M USB LINK to a suitable volume when using for the first time. Adjust method: open the control panel-sound (or right click the volume icon on the taskbar and select sound), and select the speakers (TES-5690M USB LINK) and modify its setting in the Playback dialog box, as shown in the following figure:
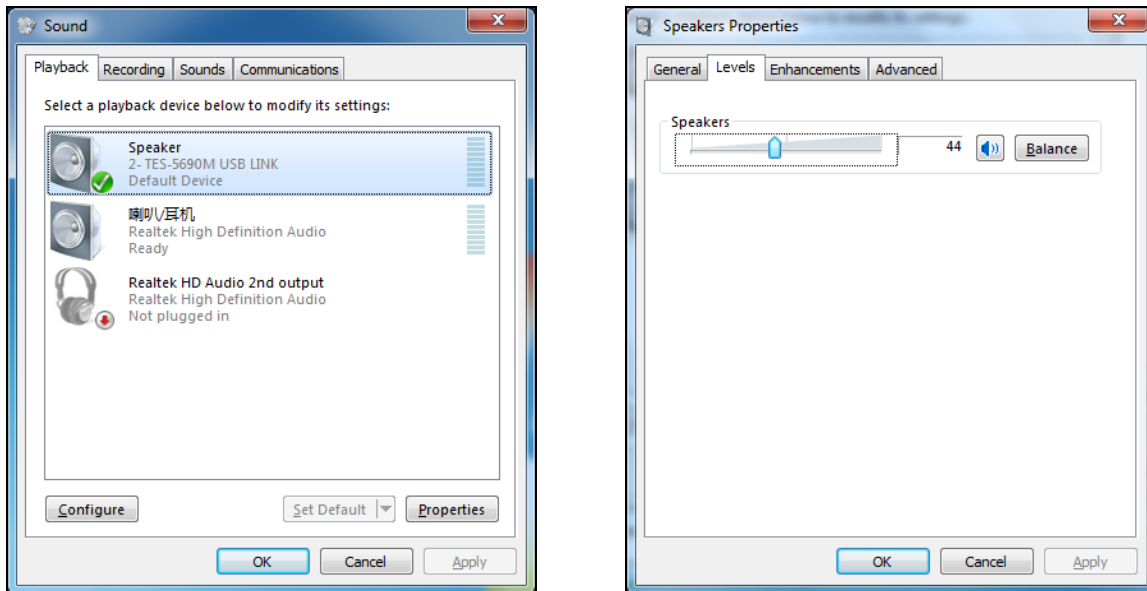
Figurer 4.6:   Adjusting playback volume

Note:

☞ *Please select the TES-5690M USB LINK as the current device on playback. Usually, TES-5690M USB LINK will be activated after connecting to the computer, instead of the default audio device. If there is an error in playback, please select the TES-5690M USB LINK manually in case there is a mistake in audio device selection. Take the Media Player as an example to show the audio device selection:*
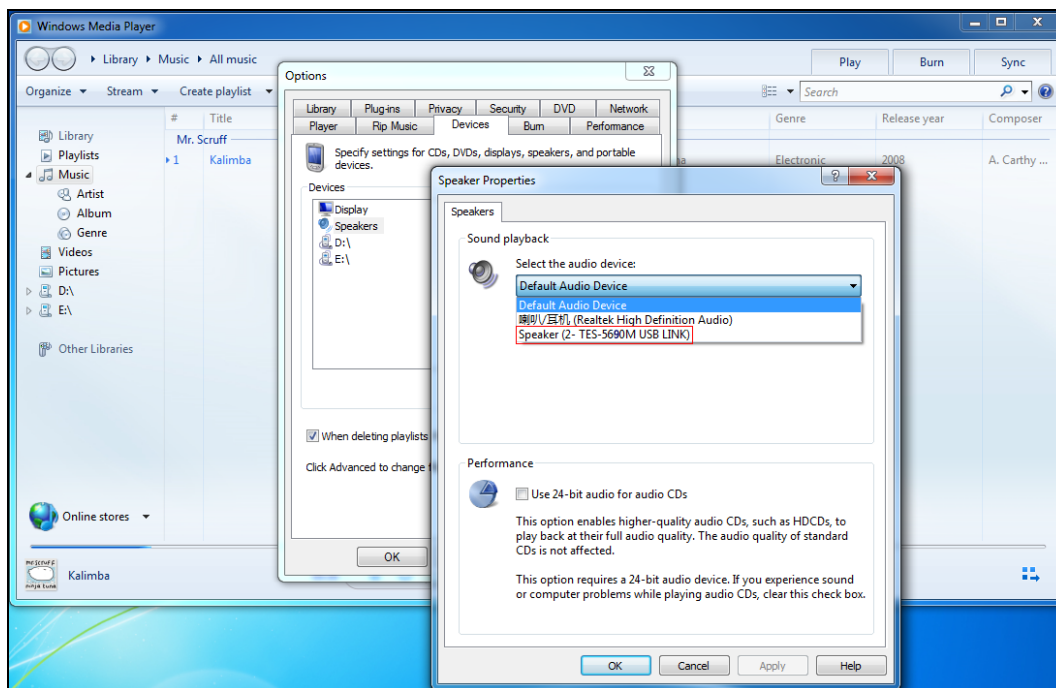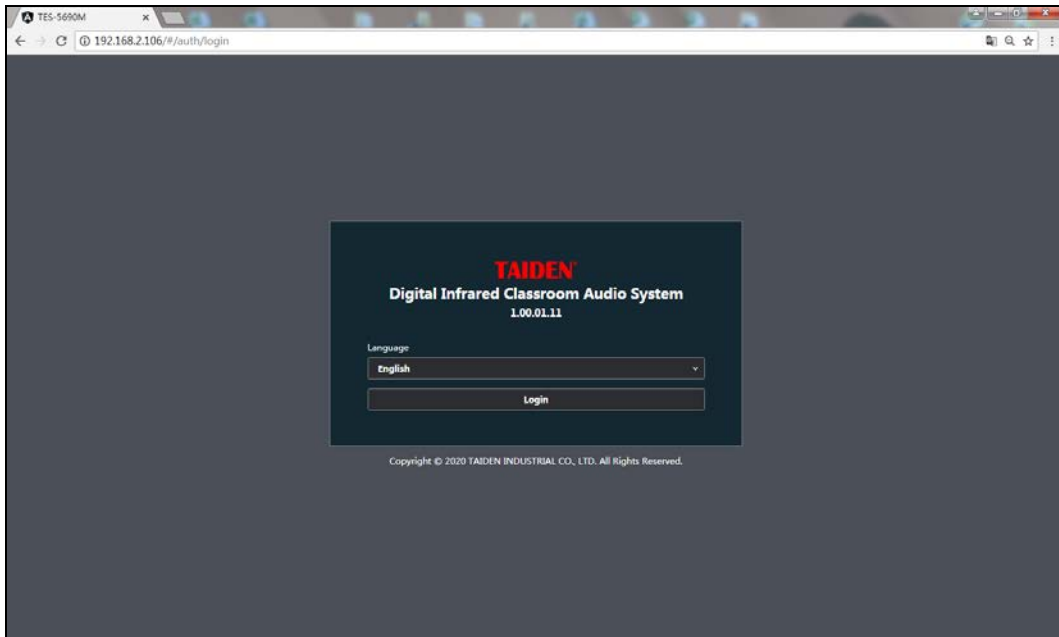

Figurer 4.7   Audio device selection

4.5.4 PPT-page switch

The TES-5690MAU/30 main unit cooperates with the TES-560x series microphone to realize remote PPT-page switch control. See 5.4.

ETHERNET interface of TES-5690 connected to PC through switch, input the device address in the browser Web address bar to open the Web server interface. As shown below:


Figurer 4.8   Login

Select the interface language and click login to enter the main interface.

TES-5690M Web server include Main Unit State, Audio Settings, System Info. three main interface, they can be switched through the left side of the interface taskbar.

(1) Main Unit State

The interface includes the phantom power, infrared microphone, carrier settings and infrared remote control settings.
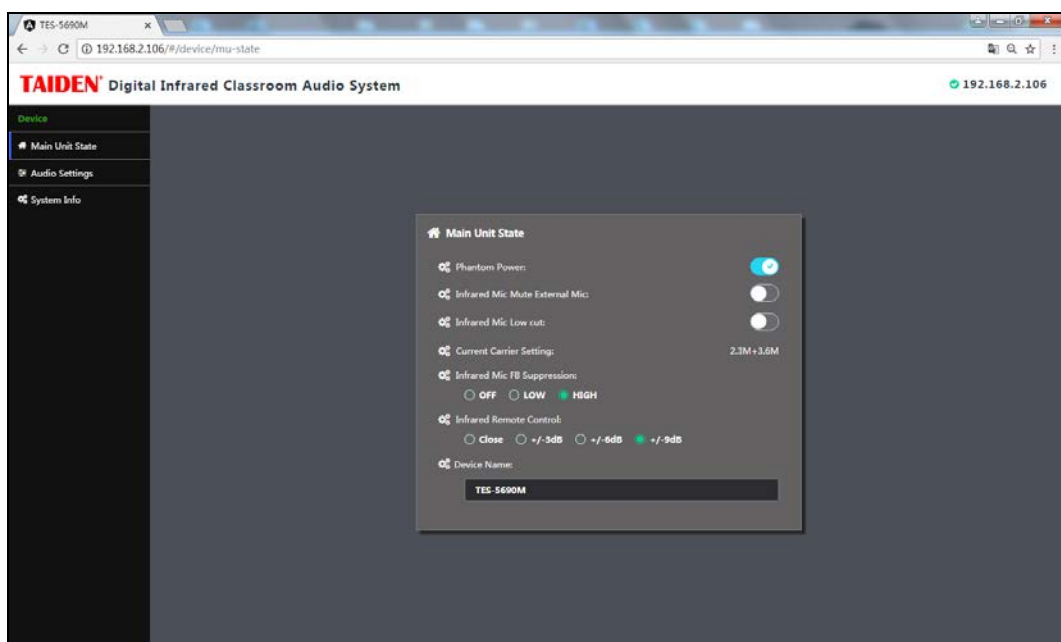

Figurer 4.9   Main Unit State

- **Phantom Power:** set the phantom power supply function of MIC1/LINE1 interface;
- **Infrared Mic Mute External Mic:** if it is enable, the microphone or USB microphone will be mute when the

infrared microphone is turned on;

- **Infrared Mic Low cut:** turn on / off the low cut function of the infrared microphone;
- **Current Carrier Setting:** displays the current frequency;
- **Infrared Mic FB Suppression:** with OFF/ LOW / HIGH three steps. The higher the FB suppress level, the better the FB suppress effect. But too high level may have an impact on the sound quality, so please select the reasonable FB suppress;
- **Infrared Remote Control:** the user can fine-tune the current microphone volume by TES-560x the digital infrared wireless microphone on the basis of the set microphone volume. The fine-tuning range is Close /±3 dB/±6 dB/±9 dB;
- **Device Name:** set the name of the current device.

(2) Audio Settings
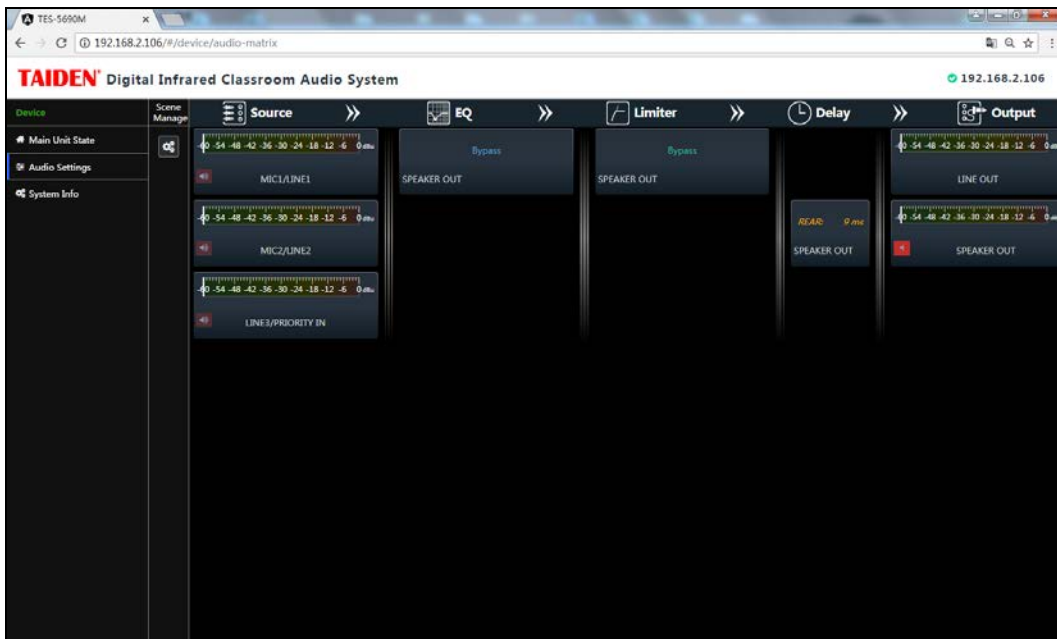
Figurer 4.10　Audio Settings

- **Scene Manage:** support up to 4 scenario settings, including add, delete, rename, call, parameter save.
- **Source:** set the parameters of input audio, including three audio sources MIC1/LINE1、MIC2/LINE2 and LINE3/PRIORITY IN. Click the icon on the left horn of an audio source channel to mute it. Click on an audio source channel to enter its audio parameter adjustment interface:

Adjustable the input gain (range: mute, 0 to 60 dB). Click " " to adjust the PEQ (parameter equalization).

The channel frequency response curve displays on the interface. There are five filters available, the type (parameter filter, low shelf, elevated), quality factor (Q), frequency point (F0) and amplification low cut (Boost) of each filter can be set. The default is "through" and the filter cannot be set when "Through" is selected. Click

" " to restore default settings and the curve is shown as a straight line now.

- **EQ:** click to enter the GEQ settings of SPEAKER OUT.
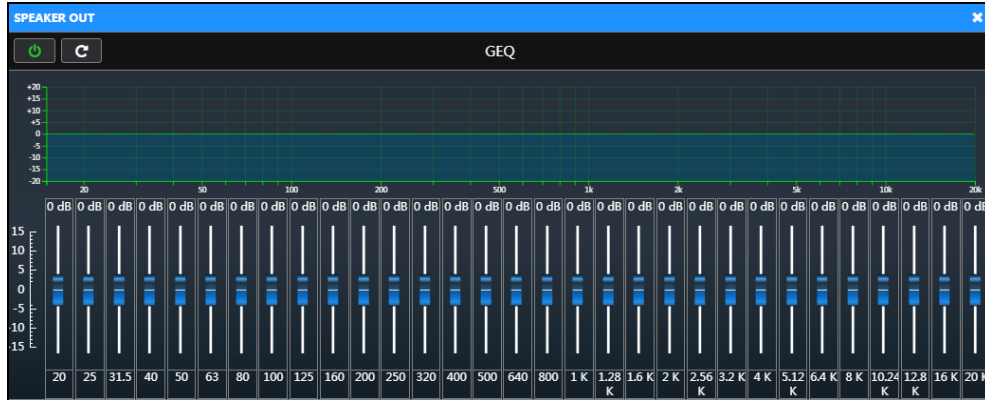
Click " " can adjust the GEQ, support 31 graphical equalization, drag the push of frequency to adjust the

equalization parameters. Click " " to restore the default settings and the curve is displayed as a straight line

now.

- **Limiter:** click to enter the pressure limiter settings of SPEAKER OUT.
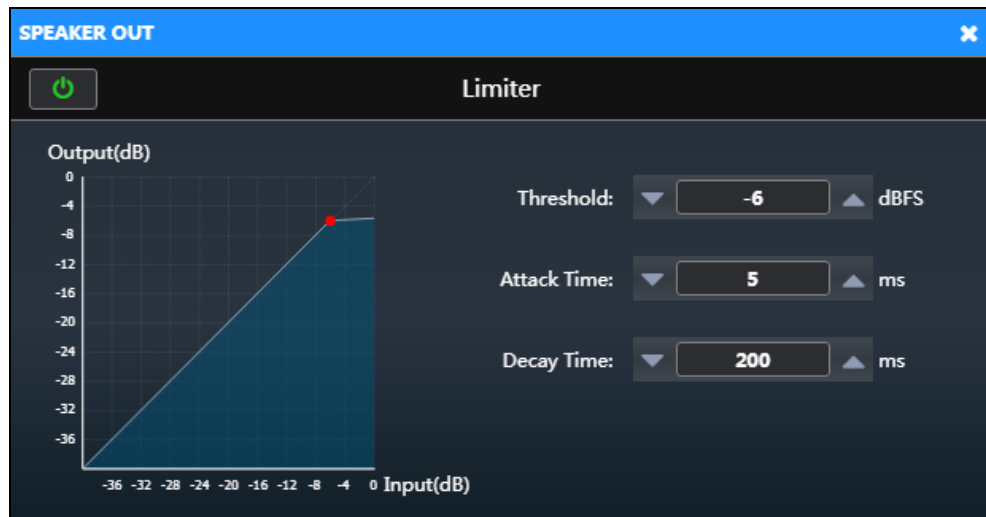
Click " " to adjust the pressure limit, the Threshold, Attack Time and Decay Time can be set.

- **Delay:** click to enter the delay settings of SPEAKER OUT, range :0 to 30 ms.
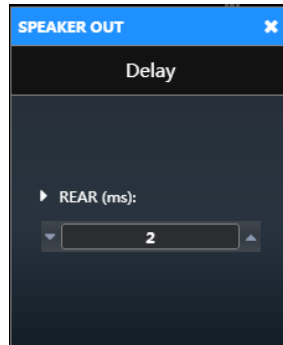
- **Output:** Set the output volume, including LINE OUT and SPEAKER OUT. Click the icon on the left horn of an channel to mute it, click a output channel to enter its volume adjustment interface, drag the push to adjust the volume, range :0 to -30 dB.
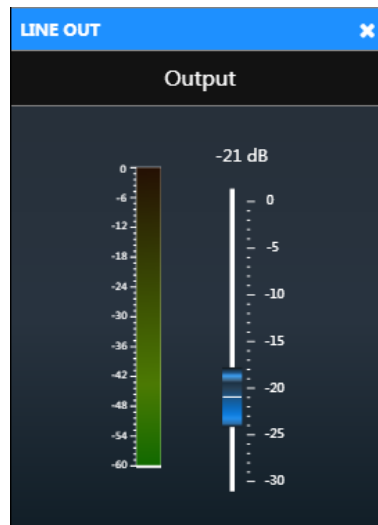
(3) System Info.
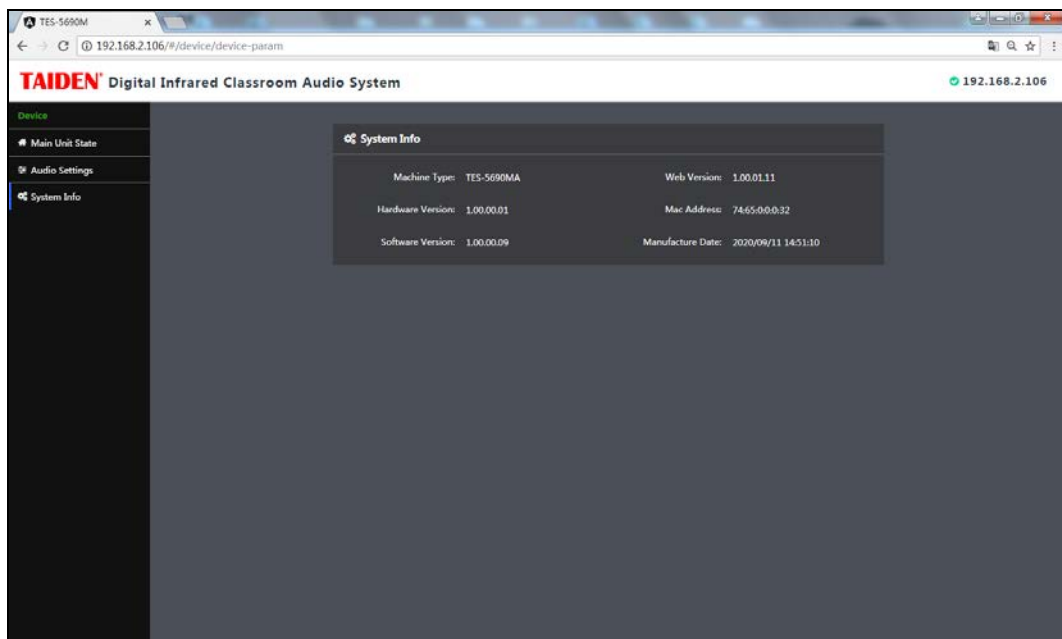
Enquire equipment system information, including machine type, hardware version, software version, web version, Mac address and manufacture date.

Chapter 5 Digital infrared wireless microphone

5.1 Overview

TES-560x series digital infrared wireless microphone is ergonomically compact and of elegant design, can be held in hand hung around the neck via a nice strap or fit into the shirt pocket. Functions can be realized: speak, frequency selection, remote volume control, etc.

Types：

TES-5604C

Digital Infrared Wireless Microphone (built-in rechargeable lithium battery, excl. adapter, used with TES-5600NS series neck lanyard)

TES-5604N

Digital Infrared Wireless Microphone (white, built-in rechargeable lithium battery, with laser pointer, excl. adapter, used with TES-5600NS_W neck lanyard or TES-5600CLP clip)

TES-5605

Digital Infrared Wireless Microphone (built-in rechargeable lithium battery, excl. adapter, used with TES-5600NS series neck lanyard)

TES-5606

Digital Infrared Wireless Microphone (white, built-in rechargeable lithium battery, excl. adapter, used with TES-5600NS_W neck lanyard or TES-5600CLP clip)

TES-5607

Digital Infrared Wireless Microphone (used with power bank and TES-5600NS_W neck lanyard or TES-5600CLP clip, excl. power bank)

Front of TES-5604C

Side of TES-5604C

Top and button of TES-5604C

Front of TES-5604N

Top and button of TES-5604N

Front of TES-5605

Side of TES-5605

Front and bottom of TES-5606

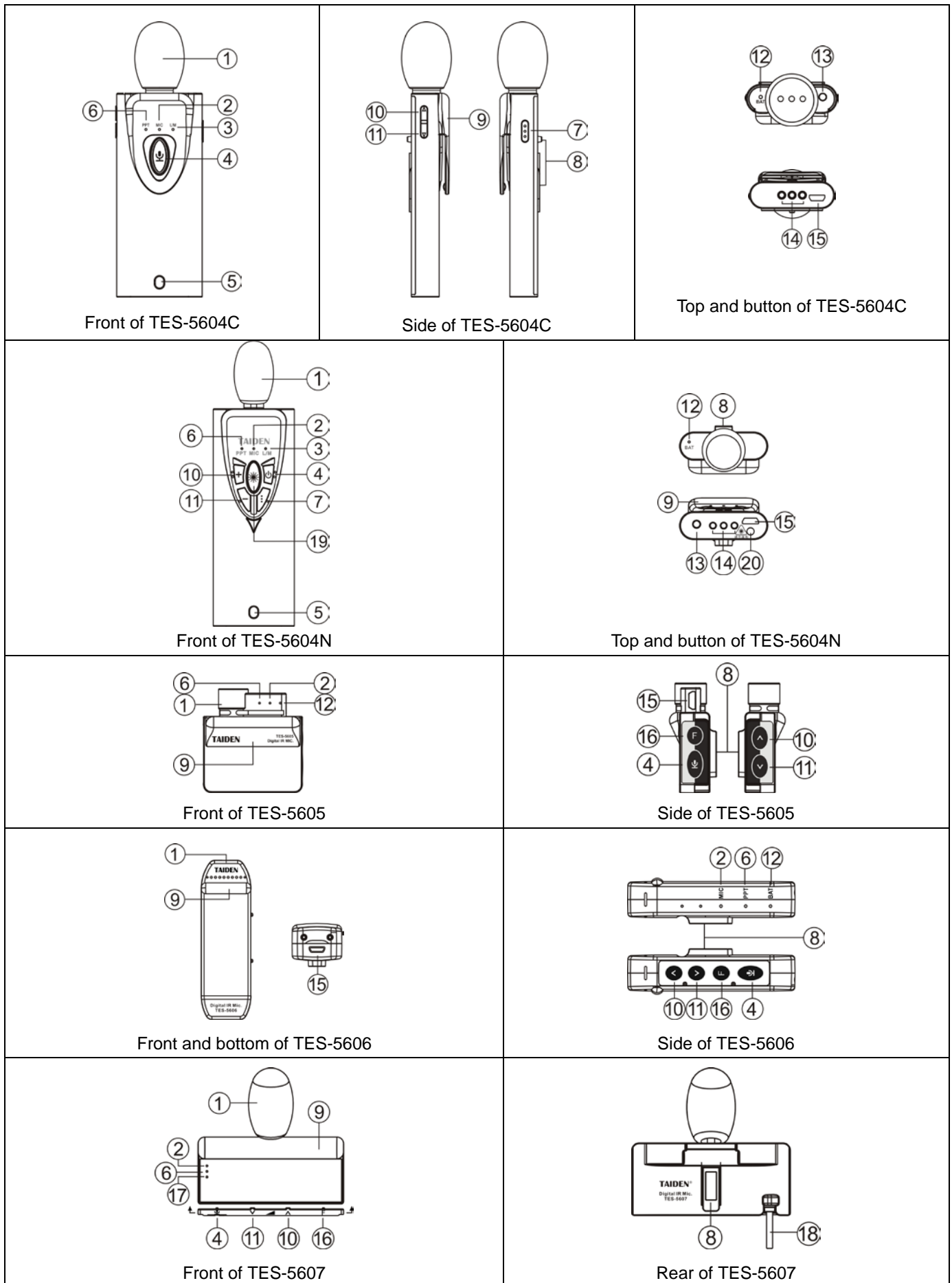Side of TES-5606

Front of TES-5607

Rear of TES-5607

Figure 5.1   Digital infrared wireless microphone

Figure 5.1:

1. Microphone

2. MIC indicator

3. L/M indicator

- For adjusting the parameters

4. Microphone on/off button

> **Note:**
>
> ☞ TES-5607 with touch button which is on the top of the blind spot.

5. Hole of electronic lock

6. PPT mode indicator

- Turn red when in PPT mode

7. "…" button

- Switch between PPT mode and MIC mode;
- Adjusting parameters with other button

8. Hanging piece slot

9. IR transmitter (TES-5604C with pocket clip)

> **Note:**
>
> ☞ To guarantee smooth signal transmission, please do not block this part in any case.

10. Adjust button (+)

- Increase the volume of the MIC;
- Page up of the current PPT

> **Note:**
>
> ☞ TES-5607 with touch button which is on the top of the blind spot.

11. Adjust button (-)

- Reduce the volume of the MIC;
- Page down of the current PPT.

> **Note:**
>
> ☞ TES-5607 with touch button which is on the top of the blind spot.

12. Battery indicator

13. Auxiliary audio input (AUDIO IN, ⌀ 3.5 mm)

- Connect to external MIC;
- Connect to auxiliary audio device (LINE IN)

14. Charging contacts

15. Micro USB interface

- Connect to adapter for charging;
- For upgrade
- For auxiliary audio input (TES-5605/06)

16. "F" button

- Switch between PPT mode and MIC mode;
- Adjusting parameters with other button

> **Note:**
>
> ☞ TES-5607 with touch button which is on the top of the blind spot.

17. Function indicator

18. Charging cable (with USB interface)

- Connect to power bank for power supply

19. Laser pointer button

20. Laser transmitter

> **Note:**
>
> ☞ Do not look directly at the laser transmitter port.

5.3 Infrared light coverage

Infrared light is directional invisible light. Infrared wireless microphone gets best sensitivity when it directly faces a receiver. The infrared transmitter on TES-560x series digital infrared wireless microphone is designed to be at its best position to guarantee maximum emission angle and to ensure the most effective infrared signal transmission.

The vertical transmission angle is 90°, and the horizontal transmission angle is 120°.
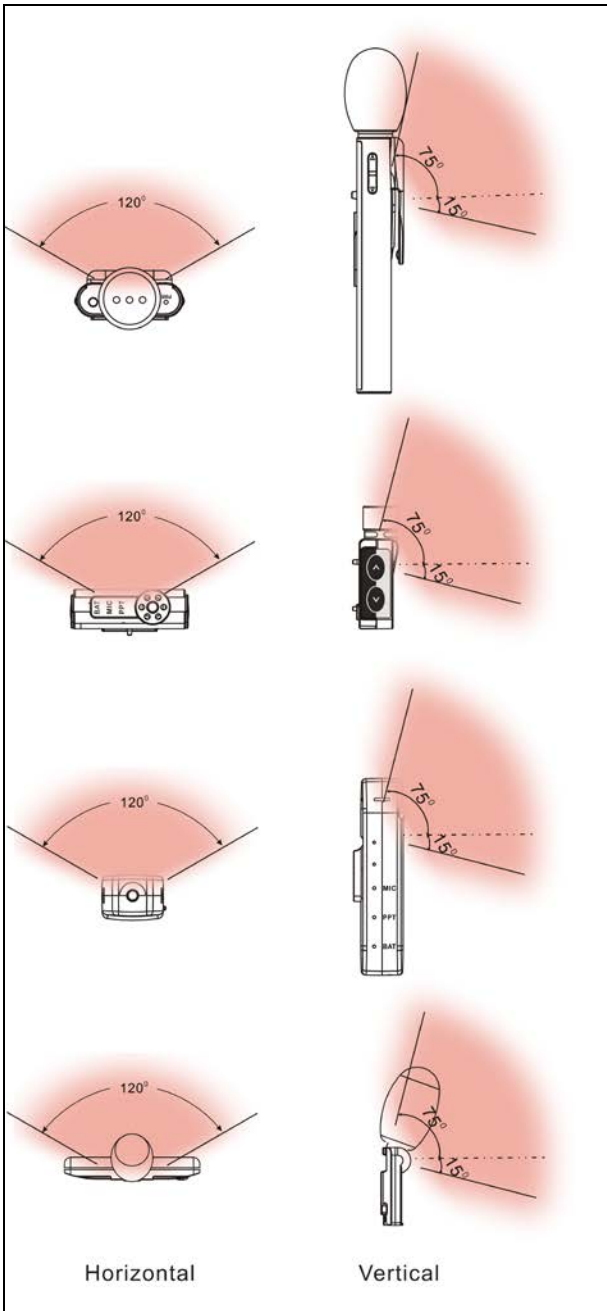

Horizontal   Vertical

Figure 5.2   Coverage of digital IR wireless MIC

5.4 Operation

The TES-560x series digital infrared wireless microphone combines functions including speaking, working mode setting, volume control and PowerPoint slide control. Other peripheral devices like external microphone, MP3 player and so on can also be connected for more functionality.

1.   Mic. On/Off and frequency channel selection

■ Keep pressing the microphone on/off button about 2 seconds to power on and turn on the microphone, the PWR/MIC indicator will be turned on and the BAT/PWR indicated battery status:

Battery status	Indicator
Enough	Off
Low	Red (blink)

■ Press the microphone on/off button to turn off the microphone.

■ TES-560x offers 5 frequency channels: 1.0 MHz, 1.67 MHz, 2.33 MHz , 3.0 MHz and 3.67 MHz.

Frequency channel selection:

a. Press and hold simultaneously the "…" /"F" and microphone on/off buttons for more than 2 seconds. All signal indicators shall flicker in turn twice when entering frequency selection mode, and the default frequency channel is the one chosen for previous use;

b. Select a frequency channel by pressing the "…" /"F" button. The signal indicators indicates different frequency channel:

TES-5604 series				
Frequency	BAT	PPT	MIC	L/M	BAT
1.0 MHz	ON				ON
1.67 MHz	ON	ON			ON
2.33 MHz	ON		ON		ON
3.0 MHz	ON			ON	ON
3.67 MHz	ON		ON	ON	ON
TES-5605				
Frequency	BAT	MIC	PPT	BAT	
1.0 MHz					
1.67 MHz	ON			ON	
2.33 MHz		ON			

Frequency	BAT	PPT	MIC		
3.0 MHz			ON		
3.67 MHz		ON	ON		
TES-5606					
Frequency	BAT	PPT	MIC		
1.0 MHz					
1.67 MHz	ON				
2.33 MHz		ON			
3.0 MHz			ON		
3.67 MHz		ON	ON		
TES-5607					
Frequency	M	P	F		
1.0 MHz					
1.67 MHz	ON				
2.33 MHz		ON			
3.0 MHz			ON		
3.67 MHz		ON	ON		

c. Press the microphone on/off button to save and the corresponding indicator(s) will blink;

d. Mic will power off automatically and please reboot it to apply the frequency channel.

> **Note:**
> ☞ Microphones with the same frequency channel cannot be used in one classroom at the same time.
> ☞ The default frequency is 2.33 MHz.
> ☞ The maximal number of active microphones is according to the type of the system.
> ☞ TES-5607 without battery status indication.

2. Volume control

a. Press the "…" /"F" to select volume control function, the MIC indication will turn on;

b. Adjust the volume by the "▲/   "/"∧/∨" buttons. The volume will be increased/decreased (MIC indicator flashes) until it reaches the maximum/minimum.

3. Auto. shut down mode

When enable the auto. Shut down mode, TES-560x series will turn off if no speaking voice is detected for 15 minutes.

Steps:

a. Press and hold simultaneously the "▲"/"∧" and the microphone on/off buttons for more than 2 seconds,

all signal indicators shall flicker in turn twice;

b. Switch the mode by pressing the "…"/"F" button. The signal indicators indicates the current working mode :

Auto. shut down mode	BAT	PPT	M
TES-5604 Series			
Off	ON		
On	ON	ON	
TES-5605/06			
Off			
On	ON		
TES-5607			
Off			
On			ON

c. Press the microphone on/off button to confirm;

d. Mic. will power off automatically and please reboot it to apply the setting.

4. PTT mode (only for TES-5604/06)

When the PTT (push to talk) mode is enabled, user can press and hold the "…"/"F" button to talk. The "…"/"F" button can only used for PTT now.

The mode is disabled by default.

Steps:

a. Press and hold simultaneously the "▼"and the microphone on/off buttons for more than 2 seconds, all signal indicators shall flicker in turn twice;

b. Switch on the mode by pressing the "…"/"F" button, The signal indicators indicates the current working mode:

PTT mode	BAT	PPT
TES-5604 series		
Off	ON	
On	ON	ON
TES-5606		
Off		
On	ON	

c. Press the microphone on/off button to save.

5. Audio input

● **TES-5604 series**

External audio devices (such as MP3) or microphone can be connected via the Ø3.5 mm AUDIO IN interface and the microphone will be muted automatically. The volume from AUDIO IN can be adjusted by the "▲/▼" buttons.

Keep pressing the "…" button to adjust audio input mode, L/M indicator indicates the current working mode:

L/M	Input mode
OFF	MIC IN
ON	LINE IN

● **TES-5605/06**

TES-5605/06 microphone comes with an audio cable (one end is USB interface and the other is Ø 3.5 mm plug), external audio devices (such as MP3) can be connected via the audio cable and the microphone will be muted automatically. The volume can be adjusted by the "▲/▼" buttons.

● **TES-5607**

External audio devices (such as MP3) can be connected via the Ø3.5 mm AUDIO IN interface on the TES-5607PB power bank. Press and hold the "F" button for more than 5 seconds, the MIC indicator turns green for external audio input and the microphone will be muted automatically. The volume cannot be adjusted on TES-5607 microphone.

6.   Remote control of PPT slide

Remote control of PowerPoint slide can be realized on the TES-560x microphone, when TES-56xxBX control box connects to PC.

Steps:

a.   Press the "…"/"F" button to switch to PPT mode, and the PPT indicator turns red

b.   Press the "▲/▼"/"∧/∨" button to turn pages of the PPT slides.

Note:
☞   The PPT mode is off by default.

7.   Charging and power supply

● **TES-5604/05/06**

TES-5604/05/06 microphone is equipped with built-in Lithium battery, which can be charged via USB port, TES-5604 also can be charged on charging station. When charging, microphone shut down automatically and the BAT indicator indicates the charging status:

Charging status	PWR indicator
Charging	Green (blink)
Full	Green (on)
Error	Yellow (blink)

● **TES-5607**

TES-5607 microphone without battery, it can be power supplied by connecting to TES-5607PB power bank via USB interface.

8.   Fitting the microphone

Put the hanging piece of the TES-5600NS series neck lanyard into the slot, adjust the looped part's length of the neck lanyard to find a suitable position for the speaker and for a perfect sound pickup.

TES-5604C with pocket clip can be attached to the shirt pocket.

TES-5605/06/07 microphone also can be used with the TES-5600CLP clip. User can disassemble the clip through the screw in the middle and change the direction of the clip.

Note:
☞   The pocket clip must be put outside of the shirt pocket.

Chapter 6 Wired microphone

6.1 Overview

Types:

TES-5600MIC

Wired Desktop Microphone (standard stem microphone: 60cm, optional: 50/70cm)

TES-5600CSM

Wired Desktop Microphone (standard stem microphone: 60cm, optional: 50/70cm; with a charging station for two TES-5604 series microphones, with TES- ADP5V power adapter)

TES-5600CSML

Wired Desktop Microphone (standard stem microphone: 60cm, optional: 50/70cm; with a lockable charging station for one TES-5604 series microphone, can be unlocked by scanning QR code or via central control system; with TES- ADP5V power adapter)

TES-5600CSMN

Wired Desktop Microphone (standard stem microphone: 60cm, optional: 50/70cm; with a lockable charging station for one TES-5604 series microphone, can be unlocked via central control system or via network management system; support network management when used with TES-5604NSW Wireless Microphones Management Platform; with TES- ADP5V power adapter)
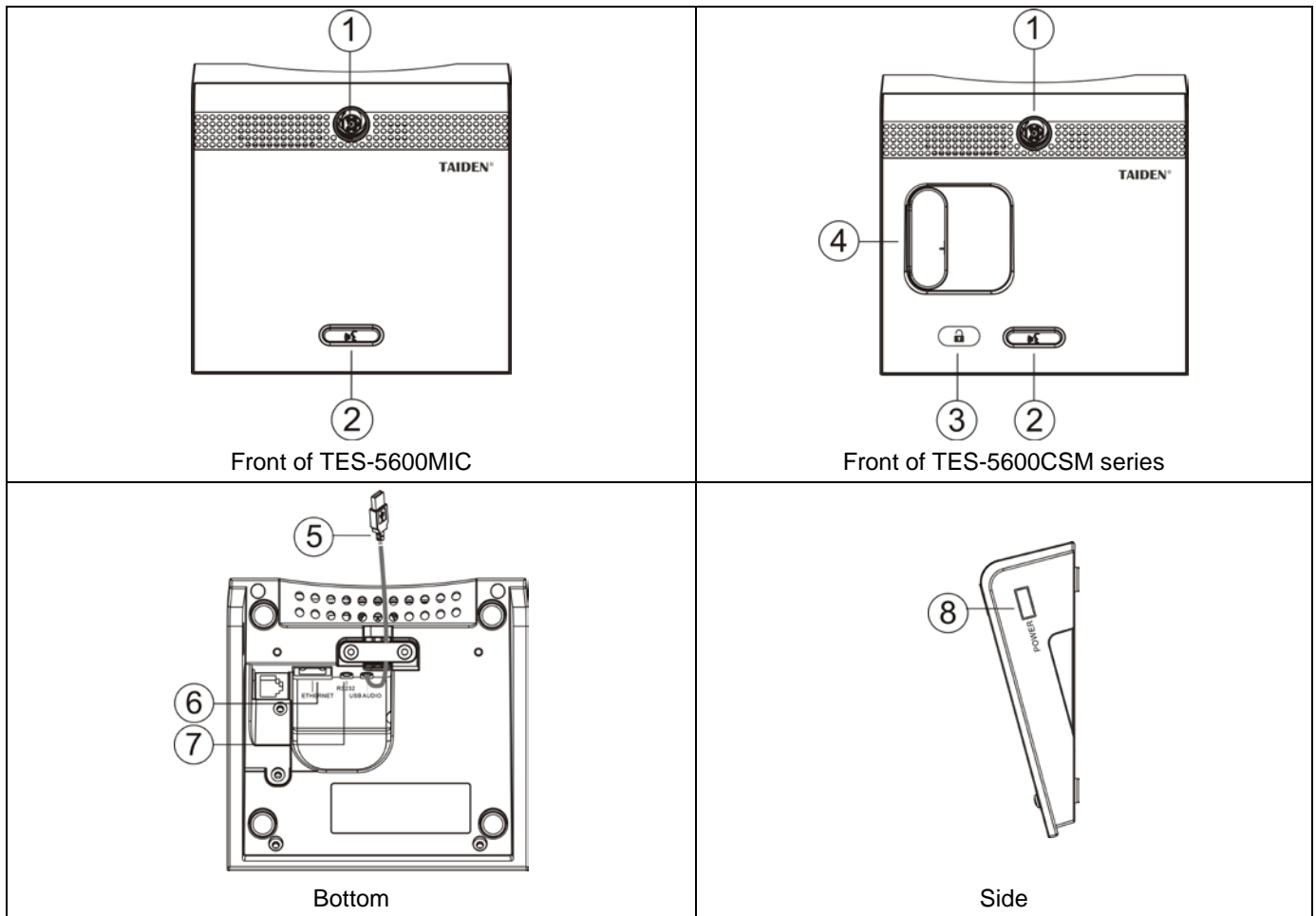
6.2 Functions and indicators

Front of TES-5600MIC	Front of TES-5600CSM series
Bottom	Side

Figure 6.1   Wired microphone

Figure 6.1:

1. Dismountable microphone socket

2. Microphone on/off button

3. Touch key

• For unlocking wireless microphone

4. Charging station

• TES-5600CSML/CSMN with a lockable charging
station for one TES-5604 series microphone

• TES-5600CSM with a charging station for two
TES-5604 series microphones

5. Audio cable

• With an A type USB interface for connecting to the
main unit to transmit audio

6. RJ45 interface (Only for TES-5600CSMN)

• For connecting to network, cooperate with
Education Management Platform to set information
of wired microphone

7. RS232 (3.5 mm, Only for TES-5600CSMN/CSML)

• For unlocking wireless microphone via central
control system

8. A type USB (Only for TES-5600CSM series)

• For adapter charging

1. Mic. On/Off

The wired microphone connects to the digital infrared classroom audio system main unit via the A type USB interface, and then press the mic. on/off button to turn on/off microphone.

2. Unlock microphone via central control

TES-5600CSML/CSMN with a lockable charging station for TES-5604 series microphone, it connects to control equipment (electric relay) and central control system via the RS-232 interface, and user can unlock the microphone by press the touch key or sand a central control command.

3. Unlock microphone via scanning QR code

TES-5600CSML/CSMN with a lockable charging station for TES-5604 series microphone, user can use the "TES-5600" APP to scan QR code for unlocking microphone.

> **Note:**
> ☞ Please scan the QR code on www.taiden-edu.com to install the "TES-5600" APP.

4. Network control

TES-5600CSMN series weird microphone connects to network via RJ45 interface, cooperate with TES-5604NSW Classroom Audio System Management Platform to unlock wireless microphone, set information of wired microphone.

Chapter 7 Accessories

7.1 Power Adapter

● TES-ADP24V power adapter

Connect the TES-ADP24V to the power adapter interface at the rear panel of theTES-5680/5600BX control box.

Figure 7.1   TES-ADP24V power adapter

● TES-ADP5V power adapter

Used for charging TES-560x series digital infrared wireless microphone and TES-5604CS series, TES-5604CHG/01 charging station.

Figure 7.2   TES-ADP5V power adapter

● TES-ADP5V6A power adapter

Connect to TES-5604CHG/09 for charging TES-5604 series digital infrared wireless microphones.

Figure 7.3   TES-ADP5V6A power adapter

● TES-ADP19V power adapter

Used for the classroom audio system with 4 speakers.

Figure 7.4   TES-ADP19V power adapter

7.2 Power Bank

● TES-5607PB power bank

Used for power supply of TES-5607 microphone. It has 4 LEDs to indicator the current power status.

Interface: an Ø 3.5 mm earphone interface for audio in;

a Micro USB for power in;

a USB for power supply of TES-5607.

Capacity: 5000 mAh;

Charging voltage: 5 V, 2 A (TES-ADP5V);

Weight: 120 g;

Dimension (mm): 92 × 47 × 21.

Figure 7.5   TES-5607PB

TES-5607PB with a power bank bag, users can wear it around the waist for holding the TES-5607PB power bank.

Figure 7.6　Power bank bag

Note:

☞　Please make sure that the battery is fully charged at least every three months.
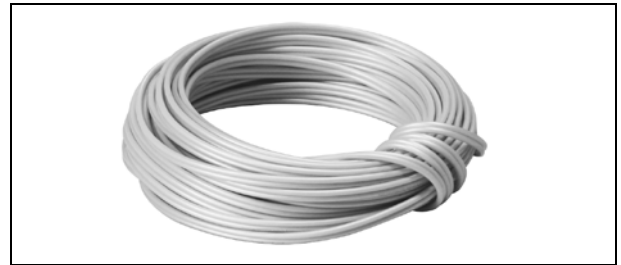
7.3 Dedicated Cable

● CBLRJ45 Ethernet Extension Cable

CBLRJ45 Ethernet Extension Cable is used to connect between the TES-5600RN/30 receiver or the TES-56xxM classroom audio system and the TES-56xxBX control box. It features with drain wire and 2 shielded RJ45 plug.

Available lengths: 2, 5, 10, 20，30, 40 or 50 meters.

Figure 7.7　CBLRJ45 dedicated cable

● CBL-SPK2 speaker cable

CBL-SPK2 Speaker cable is used for the HCL-1090 line array column loudspeaker or HPA-2240/2360 loudspeaker.

- 18AWG×2C
- Length of per roll：610 meter
- Weight of per roll: 13.4 kg
- Color: black with white stripe

Figure 7.8　CBL-SPK2

● CLB-SPK speaker cable

CBL-SPK speaker cable is used for the HCL-1200 line array column loudspeaker.

- Length of per roll：305 meter
- Weight of per roll: 14.1 kg
- Color: pearl white

Figure 7.9　CBL-SPK

● Power adapter extension cable and connection terminal

Power adapter extension cable is used for TES-ADP24VN power adapter.

Figure 7.10　Power adapter extension cable

Figure 7.11　connection terminal

7.4 Charging Station

● **TES-5600CSL charging station**
- ■ Charging one TES-5604 series IR microphone
- ■ Built-in electronic lock in the charging station to safeguard the wireless microphone, scan the QR code with "TES-5600" APP or central control system via RS232 to unlock microphone.
- ■ Powered by TES-ADP5V adapter
- ■ Dimensions: 58 × 97 × 58 mm
- ■ Color: white
- ■ Weight: 0.3 kg

Figure 7.12　TES-5600CSL charging station

● **TES-5600CSN charging station**
- ● Charging one TES-5604 series IR microphone
- ● Built-in electronic lock in the charging station to safeguard the wireless microphone, can be unlocked via central control system (RS-232) or via network management system (TES-5604CSW Classroom Audio System Management Platform).
- ● Powered by TES-ADP5V adapter
- ● Dimensions: 58 × 97 × 58 mm
- ● Color: white
- ● Weight: 0.3 kg

Figure 7.13　TES-5600CSN charging station

> **Note:**
> ☞ Please scan the QR code on www.taiden-edu.com to install the "TES-5600" APP.

● **TES-5604CHG/01 charging station**

TES-5604CHG/01 can charge one TES-5604 series microphone with TES-ADP5V.

Figure 7.14　TES-5604CHG/01 charging station

● **TES-5604CHG/02 charging station**

TES-5604CHG/021 can charge two TES-5604 series microphones with TES-ADP5V.

Figure 7.15　TES-5604CHG/02 charging station

● **TES-5604CHG/09 charging station**

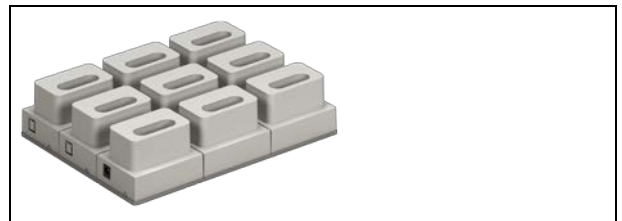TES-5604CHG/09 can charge nine TES-5604 series microphones at the same time with TES-ADP5V6A.

Figure 7.16　TES-5604CHG/09 charging station

7.5 Microphone

● **TES-1021 clip microphone**

Used for TES-5604/07 series microphones.
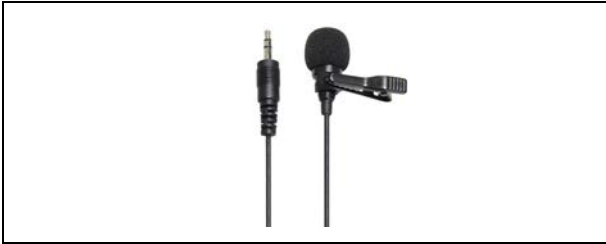- ■ Ø 3.5 mm stereo plug with a 0.3- meter cable
- ■ Weight: 10 g

Figure 7.17   TES-1021

● **TES-1022 single-ear microphone**

Used for TES-5604/07 series microphones.
- ■ Ø 3.5 mm stereo plug with a 0.3- meter cable
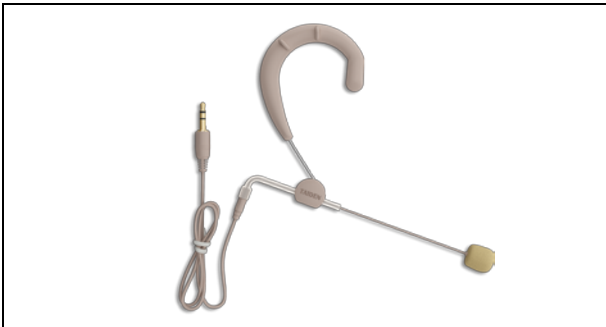- ■ Weight: 11 g

Figure 7.18   TES-1022

● **TES-1023 head-worn microphone**

Used for TES-5604/07 series microphones.
- ■ Ø 3.5 mm stereo plug with a 1.2- meter cable
- ■ Weight: 18 g

Figure 7.19   TES-1023

7.6 TES-5600ZJ2

Figure 7.20   TES-5600ZJ2

TES-5600ZJ2 stand is used to mount the TES-5600RN series receiver and TES-5630MA combo unit, its height can be adjusted from 1.1 m to 2.7 m, weight 3.9 kg.

7.7 TES-5600RZJ

TES-5600RZJ is suitable for tripod or wall mounted of TES-5600R(N).

- ● Length: 115 mm
- ● Weight: 110 g

Figure 7.21   TES-5600RZJ

7.8 TES-5685P Series Suspension

Used for TES-5685M series classroom audio system.
Length: 0.5/1.0/1.5 m.

Figure 7.22　TES-5685P suspension

7.9 TES-5604NS Neck Lanyard

● **TES-5600NS_W**

Used for TES-560x series microphones, withe hanging piece, weight: 17 g
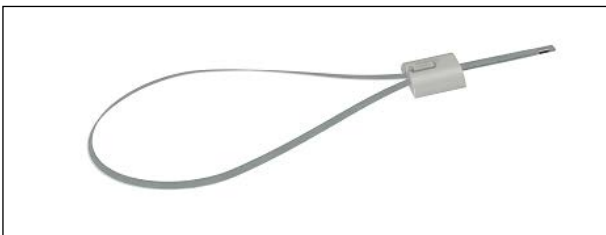

Figure 7.23　TES-5600NS_W

● **TES-5600CLP**

Used for TES-560x series microphones, direction adjustable, weight: 6 g.

Figure 7.24　TES-5600CLP

7.10 Cable Splitter

● **TES-0104T/30**

Used for extending TES-5600RN/30 series receiver, with 1 input and 4 output RJ45 interfaces.
Weight: 68 g

Figure 7.25　TES-0104T/30

● **1 ✕2 BNC cable splitter**

Used for extending TES-5600R series receiver, with 1 input and 2 output BNC interfaces.
Weight: 115 g

Figure 7.26　1 × 2 BNC cable splitter

● **SB-408C3 (third-party fitting)**

Used for extending TES-5600R
One input and four output interfaces
5 F interfaces, used with RG-6/U cable
Weight: 30 g

Figure 7.27　SB-408C3

Note:
☞ The length of every extent cable must be the same.

7.11 Speaker

● **HCL-1090 line array column loudspeaker**

Components: 2.5 inch full-range×3;

Wall-mounted or stand-mount;

Enclosure: Fiberglass reinforced ABS cabinet, painted aluminum grille;

Outdoor capability: IP-54 rated, per IEC529, moisture- and water-proof, dust-proof, water-proof cable gland;

Coverage pattern: Horizontal: 150°, vertical: 30°;

Max. SPL: 105 dB

Power consumption: 60 W (240 W peak), 2 hrs

36 W (144 W peak), 100 hrs;

Impedance: 6 Ω;

Frequency response: 80 Hz~18 kHz;

Sensitivity: 90 dB;

Dimensions: 400×102×160 mm;

Weight: 2.2 kg

Figure 7.28   HCL-1090 line array column loudspeaker

● **HCL-1200 line array column loudspeaker**

Components: 2.5 inch full-range×8;

Swivel (pan) / tilt wall-mounted or stand-mount;

Enclosure: Fiberglass reinforced ABS cabinet, painted aluminum grille;

Outdoor capability: IP-54 rated, per IEC529, moisture- and water-proof, dust-proof, water-proof cable gland;

Coverage pattern: Horizontal: 150°, vertical: 30°;

Max. SPL: 120 dB (speech mode)

117 dB (music mode);

Power consumption: 200 W (800 W peak), 2 hrs

120 W (480 W peak), 100 hrs;

Impedance: 6 Ω;

Frequency response: 80 Hz~18 kHz (-10 dB);

Sensitivity: 93 dB (speech mode)

89 dB (music mode);

Dimensions: 620×102×155 mm;

Weight: 5.3 kg

Figure 7.29   HCL-1200 line array column loudspeaker

- **HPA-2240(A/B) wall-mounted speaker**

Wall-mounted, equipped with U bracket;

Dimensions: 290 × 215 × 190 mm;

Power consumption: 8 Ω, 40 W;

                     6 Ω, 40 W (HPA-2240B);

Line voltage: 70~100 V (HPA-2240A);

Frequency response: 65 Hz~20 kHz;

Sensitivity: 90 dB;

Weight: 3.4 kg

Figure 7.30   HPA-2240 wall-mounted speaker

Chapter 8 Technical data

8.1 System specification

System performance

Conforms to IEC 60914, the international standard for conference systems

Transmission characteristics

IR transmission wavelength: 870 nm
Modulation frequency: 1 to 8 MHz
Protocol and modulation: DQPSK

System environmental conditions

Working conditions fixed/stationary/transportable
Temperature range:
- Transport: -40 °C to +70 °C
- Operating: 0 °C to +45 °C

Max. Relative humidity: < 95% (not condensing)
Safety: Compliant with EN 60065
EMC emission: Compliant with EN 55022
EMC immunity: Compliant with EN 55024
EMC approvals: CE, FCC
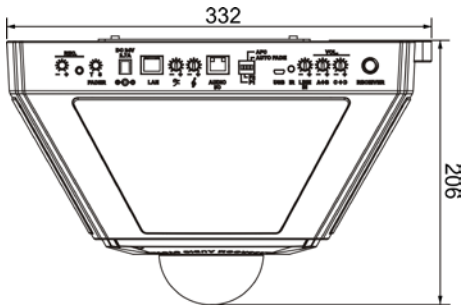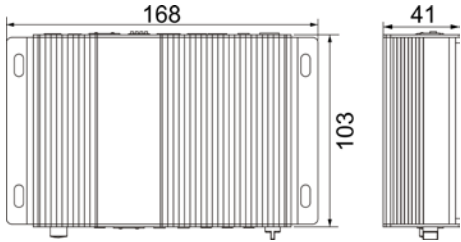**Power harmonics:** Compliant with EN 61000-3-2
Voltage fluctuations and flicker: Compliant with EN 61000-3-3
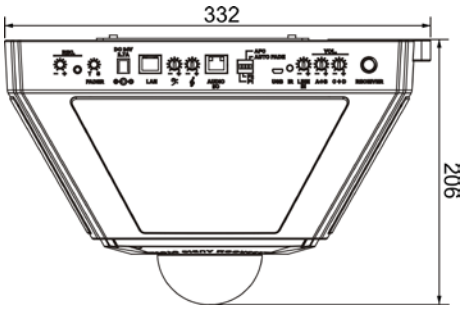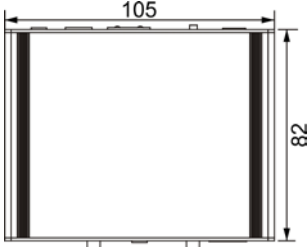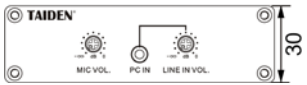
8.2 TES-5680 classroom audio system

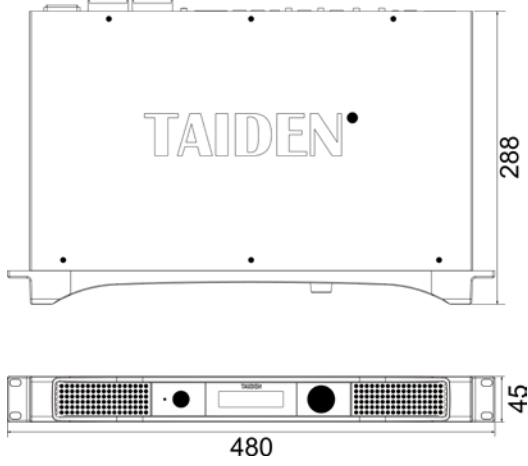| Type	TES-5680M	TES-5680BX/30
Power	Power supply by TES-5680BX	DC 24 V 2.7 A (TES-ADP24V adapter)
Cable	CBLRJ45 Ethernet Extension Cable	
Line in	Nominal value: +2 dBu; maximum value: +11 dBu	
Line in impedance	22 kΩ	
Line out	Nominal value: +2 dBu; maximum value: +11 dBu	
Line out impedance	100 Ω	
Maximal number of microphone	2	
Speaker interface (Max.)		2 × 60 W (8 Ω) 4 × 30 W (8 Ω)
External control terminal	RS-485, 3-pin Phoenix	
Weighted signal-to-noise ratio	Mic. to main unit: ⩾ 85 dB(A)	
Audio frequency response	Main unit to main unit :50-20000 Hz Mic. to main unit: 100-20000 Hz	
Total harmonic distortion at 1 kHz	Mic. to main unit: ⩽ 0.05 %	
Dynamic range	Mic. to main unit: ⩾ 81 dB	
Array microphone — Weighted signal-to-noise ratio	⩾65.5 dB(A)	
Array microphone — Audio frequency response	100 Hz – 10 kHz	
Array microphone — Total harmonic distortion	⩽0.1% (at 1 kHz)	
Array microphone — Directivity	± 15° (Beam forming)	
Pickup range	5 m radius with medium ambient noise 8 m radius in a quiet environment	
Dimensions (mm)		
Weight	0.4 kg	0.4 kg
Color	Silver	Black

8.3 TES-5685 series classroom audio system

Type	TES-5685MA/30	TES-5685MB/30	TES-5685MC/30	TES-5685BX series
Power	100-240V 50/60 Hz			Power supply by TES-5685M
Cable	CBLRJ45 Ethernet Extension Cable			
Line in	Nominal value: +2 dBu; maximum value: +10 dBu			
Line in impedance	22 kΩ			
Line out	Nominal value: +11 dBu; maximum value: +17 dBu			
Line out impedance	100 Ω			
Maximal number of microphone	2	2	1	--
Speaker interface (Max.)	4 × 30 W (12 Ω)			--
Weighted signal-to-noise ratio	Mic. to main unit: ⩾ 90 dB(A)			
Audio frequency response	Main unit to main unit :50-20000 Hz Mic. to main unit: 100-20000 Hz			
Total harmonic distortion	Mic. to main unit: ⩽ 0.05 % (at 1 kHz)			
Dynamic range	Mic. to main unit: ⩾ 85 dB			

Array microphone	Weighted signal-to-noise ratio	> 65.5 dB(A)	
	Audio frequency response	100 Hz – 10 kHz	
	Total harmonic distortion	< 0.1% (at 1 kHz)	
	Directivity	± 15° (Beam forming)	

Dimensions (mm)		
Weight	3.5 kg	0.2 kg
Color	White	Black

Type	TES-5685MCP/30	TES-5685PA/30
Power	100-240V 50/60 Hz	DC 24V, 1.5 A
Cable	CBLRJ45 Ethernet Extension Cable	
PC/PA in	Nominal value: +2 dBu; maximum value: +10 dBu	Max. +20 dBu
Line in impedance	22 kΩ	
Line out	Nominal value: +11 dBu; maximum value: +17 dBu	--
Line out impedance	100 Ω	
Maximal number of microphone	1	--
Speaker interface (Max.)	4 × 30 W (12 Ω)	--
Weighted signal-to-noise ratio	Mic. to main unit: ⩾ 90 dB(A)	
Audio frequency response	Main unit to main unit :50-20000 Hz Mic. to main unit: 100-20000 Hz	
Total harmonic distortion	Mic. to main unit: ⩽ 0.05 % (at 1 kHz)	
Dynamic range	Mic. to main unit: ⩾ 85 dB	
Dimensions (mm)		
Weight	3.5 kg	0.4 kg
Color	White	Black

8.4 TES-5600 series digital infrared wireless classroom audio system

Type	TES-5600RN series	TES-5600MAU/30	TES-5600BX/30
Power	Supplied from TES-5600BX/TES-5600MAU	24V DC, 2.7 A (TES-ADP24V)	
Current consumption	CBLRJ45 Ethernet Extension Cable		
Line in	--	Nominal value: +2 dBu; maximum value: +12 dBu	Nominal value: +6 dBu; maximum value: +12 dBu
Line out	--	Nominal value: +8 dBu; maximum value: +18 dBu	Nominal value: -20 dBu; maximum value: +18 dBu
Line out impedance	--	100 Ω	500 Ω
Weighted signal-to-noise ratio	Mic. to main unit: ≥ 90 dB(A)		
Dynamic range	Mic. to main unit: ≥ 85 dB		
Audio frequency response	Main unit to main unit: 50-20000 Hz Mic. to main unit: 100-20000 Hz		
Total harmonic distortion	Mic. to main unit: ≤ 0.05% (at 1 kHz)		
Maximal microphone	1（TES-5600RN1/30） 2（TES-5600RN/30）	1（TES-5600BX1/30） 2（TES-5600MAU, TES-5600BX2/30）	
Speaker interface (Max.)	--	2×60 W (8 Ω) 4×30 W (8 Ω)	
Dimensions (mm)	TES-5600RN	TES-5600MAU/30 TES-5600BX/30	
Weight	0.2 kg	0.4 kg	
Color	Dark red	Black	

8.5 TES-5680 classroom audio system

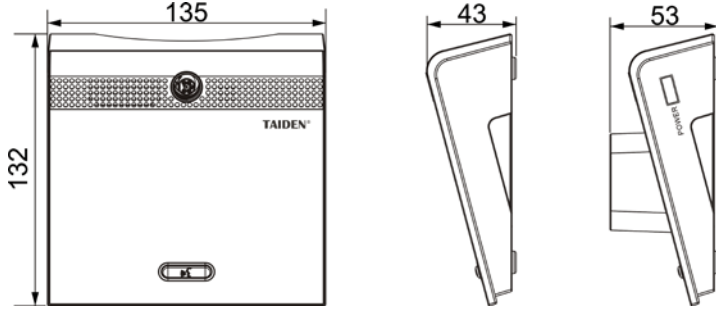| Type	TES-5690MA	TES-5690MB	TES-5690MC
Power	AC 100-240 V, 3.0-1.5A		AC 100-240 V, 3.0-1.5A
Line in	Nominal value: +6 dBu; maximum value: +12 dBu		
Line in impedance	Single-ended input :10 kΩ; differential input :20 kΩ		
Line out	Nominal value: -20 dBu; maximum value: +18 dBu		
Line out impedance	50 Ω		
Maximal number of microphone	2		
Speaker interface (Max.)	2 × 200 W +2 × 60 W (6 Ω)	2 × 200 W (6 Ω)	4 × 60 W (6 Ω)
Weighted signal-to-noise ratio	Mic. to main unit: ⩾ 90 dB(A)		
Audio frequency response	Main unit to main unit :50-20000 Hz Mic. to main unit: 100-20000 Hz		
Total harmonic distortion at 1 kHz	Mic. to main unit: ⩽ 0.05 %		
Dynamic range	Mic. to main unit: ⩾ 85 dB		
Dimensions (mm)	288 480 45		
Weight	4.3 kg	4.0 kg	
Color	Black		

8.6 Digital infrared wireless microphone

Type		TES-5604	TES-5605	TES-5606	TES-5607
Remote volume control		√			
Power		USB supply (5 V)			Supply from TES-5607PB
Current consumption		≤ 290 mA			
Infrared emitter	Wavelength	870 nm (AM: Brightness modulation)			
	Modulation method	DQPSK			
	Carrier frequency	Audio channel 1: 1.0 MHz Audio channel 2: 1.67 MHz Audio channel 3: 2.33 MHz Audio channel 4: 3.0 MHz Audio channel 5: 3.67 MHz			
	Emission angle	Vertical: 0° ~ 90° , Horizontal: 120°			
	Emission range	Optical range: 25 m			
Operation time of battery		6 hours	4 hours	5 hours	20 hours
Capacity of battery		1600 mAh	800 mAh	1000 mAh	5000 mAh (TES-5607PB)
Charging time		2 hours	1.5 hours		--
Microphone input impedance		600 Ω			
Mic. sensitivity adjustable range		-12 dB, -3 dB			
Dimensions (mm)		TES-5604C TES-5604N			
Weight		60 g	30 g	40 g	30 g
Color		White		Dark red	White

8.7 Power adapter

Type	TES-ADP24V	TES-ADP5V6A	TES-ADP5V	TES-ADP19V
Mains voltage	AC 100-240 V, 50 /60 Hz			
Output	24 V DC, 2.7 A	5 V DC, 6.0 A	5 V DC, 2.0 A	19 V DC, 3.42 A
Cable Length	3 m	2.8 m	1.0 m	1.5 m
Dimensions (mm) w x h x d	115 x 50 x 32	121 x 52 x 33	39 x 27 x 43	121 x 52 x 33
Weight	0.4 kg	0.4 kg	50 g	0.3 kg
Color	Black	Black	White	Black

8.8 Charging unit / microphone

| Type		TES-5600MIC	TES-5600CSM	TES-5600CSML	TES-5600CSMN
Voltage		5 V DC, 2.0 A (TES-ADP5V)			
Dimensions (mm)					
Weight		0.4 kg		0.3 kg	
Color		Black			
Microphone	Type	Uni-directional electret condenser microphone			
	Sensitivity	-46 dBV/Pa			
	Frequency response	30-20000 Hz			
	Directivity 0°/180°	≥20 dB (1kHz)			
	Equivalent noise	20 dBA (SPL)			
	Maximum sound pressure level	125 dB (THD<3%)			
	Stem microphone	MS60EGD2B (standard) MS50EGD2B / MS70EGD2B (optional)			

Type	TES-5600CSL	TES-5600CSN
Voltage	5 V DC, 2.0 A (TES-ADP5V)	
Dimensions (mm)		
Weight	0.3 kg	
Color	White	

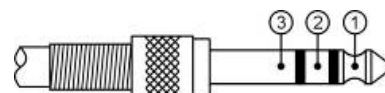| Type	TES-5604CHG/09	TES-5604CHG/01	TES-5604CHG/02
Voltage	5 V DC, 6.0 A (TES-ADP5V6A)	5 V DC, 2.0 A (TES-ADP5V)	
Dimensions (mm)			
Weight	0.8 kg	0.1 kg	0.2 kg
Color	White		

8.9 Connection details

6.4 mm Jack plug

Tip① Balance/ Unbalance signal +
Ring② Balance/ Unbalance signal -
Sleeve③ Ground/ Shield
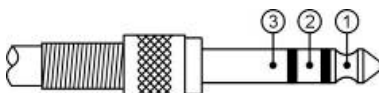
3.5 mm Jack plug

Tip① Left signal
Ring② Right signal
Sleeve③ Ground/ Shield

Appendix

How to Select and Wire Ethernet Cable for TAIDEN New Generation System

CAT5e Ethernet cable with a drain wire connected to shielded RJ45 crimp connectors is required for setting up TAIDEN New Generation System. Audio and control signal, and other data are all transmitted over CAT5e cables. No attenuation in signal quality and amplitude, can avoid ground noise and possible interferences from other devices, providing improved system reliability. Users can also lay cables beforehand, enjoying greater convenience and flexibility.
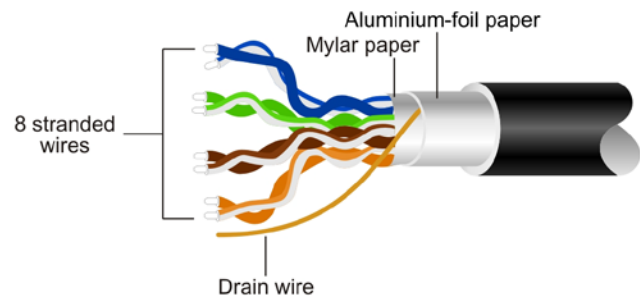
1. CAT5e Ethernet cable is applicable for:

TES-5600RN/30 series digital infrared receiver

2. Materials needed for wiring CAT5e Ethernet cable:

RJ45 metal shield

Shielded RJ45 crimp connector

8 stranded wires
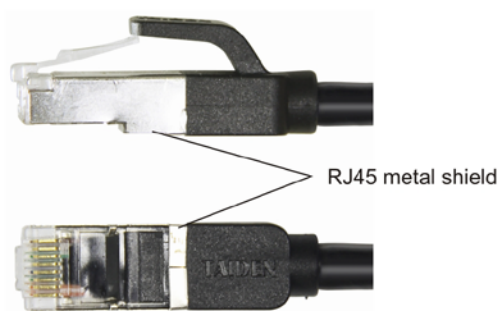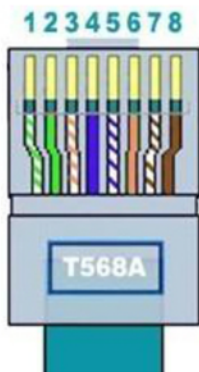
Aluminium-foil paper
Mylar paper

Drain wire

CAT5e cables as shown above,
with a drain wire between aluminium-foil paper and mylar paper

3. How to wire CAT5e Ethernet cable:

Arrange the colored wires according to T568A and T568B standards.
RJ45 pinout wiring order: Clip is pointed away from you. The order from left to right is shown below:

Wiring order (1-8) according to T568A standard:
white-green, green, white-orange, blue,
white-blue, orange, white-brown, brown

Wiring order (1-8) according to T568B standard:
white-orange, orange, white-green, blue,
white-blue, green, white-brown, brown

Ethernet Cable used for TAIDEN New Generation System should be straight through, with both ends using the same wiring standard (T568B is commonly used).
Please connect the drain wire to the metal shield of the RJ45 connector.