Relacart®

WAM-400
Digital & Wireless Automatic Mixer
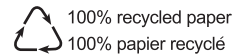
Installation and Operation

Contents

Thank you for choosing a RELACART professional wireless system. You have joined thousands of other satisfied customers. Our years of professional experience of design and manufacturing to ensure our products' quality, performance and reliability.

1. Please read instructions for safety operation carefully before installation and operation.
2. Please keep this manual.
3. Please cut off power , pull out the power plug and all connection cables before moving the device, otherwise it may damage the cables and lead to fire or electroshock.
4. Please cut off power , pull out the power plug and all connection cables before cleaning the device. Clean only with dry cloth.
5. If power cord is damaged (such as cut off or the core is bare),please contact agent to get the replacement. Continue using damaged power cord may lead to fire or electroshock.
6. If the device is not used for a long time, please cut off the power, it is better to pull out the power plug.
7. Equipment in a tropical / temperate climate conditions can be normal use.
8. Do not scratch, bend, twist , stretch or heat the power cord, otherwise the power cord may be damaged and a fire or electroshock could happen.
9. Do not open the case, otherwise it could lead to electroshock. For maintenance or repair, please contact our local agent.
10. Do not touch the plug with wet hand, otherwise a fire or electroshock could happen.
11. Do not attempt to modify this product. Doing so could result in personal injury and/or product failure.
12. Do not use this apparatus near water.
13. DO NOT block any ventilation openings. Allow sufficient distances for adequate ventilation and install in accordance with the manufacturer's instructions.
14. DO NOT cover the Ventilation holes, such as: newspaper / fabric / curtains and other items.
15. DO NOT install near any heat sources such as open flames, radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat. Do not place any open flame sources on the product.
16. Do not throw the waste battery, please put in the designated bins.
17. DO NOT expose the apparatus to dripping and splashing. DO NOT put objects filled with liquids, such as vases, on the apparatus.
18. This symbol"⚡"indicates that dangerous voltage constituting a risk of electric shock is present within this unit.
19. All Relacart products will be afforded one year free maintenance except for man-made damage, such as:
— the device is damaged by man-made factors.
— the device is damaged by improper operation.
— some components are damaged or loss after the self-disassembly.

① UHF band UHF 554MHz~936MHz wireless automatic mixer for a maximum of four wireless microphones. With AFS(Auto frequency selection) function, antenna diversity. Four channels, a total of 45 frequencies for users to selecti
②Bright and easy-to-read LCD display shows RF/AF, level and other operation status.
③Automatic gain adjustment by microprocessor control.
④2-unit daisy chain by accessory link cable to control up to 8 units microphones.
⑤Select the simultaneous open microphones to 1 unit, 2 units, 3 units or 4 units.
⑥Set the Priority Microphone.
⑦Specific circuitry helps control feedback.
⑧ Corresponding various kind of application in conference room due to priority-select function and gate hold time setting
⑨Last microphone on selectable for continuous room ambiance.
⑩Microphone hold time for 0.1s to 1s.
⑪Several inputs / outputs for audio signals:
Two RCA outputs to realize long distance with low noise transmission.
RCA iput / output for recordings.
One balanced line output (6.3mm jack).
One 3-pin XLR.
⑫Two RS-485 interface for external auto video tracking system or auto central control system.
⑬Cooperates with RELACART wireless boundary microphone UB-200, wireless conferncing microphone UD-200, handheld microphone UH-200 or lapel microphone UT-200.
⑭The WAM-400 wireless automatic mixer is ideal for meetings, seminars, teleconferencing, house of worship services, broadcast and conference applications.

Installation:

①For better operation the receiver should be at least 3ft. (1m) above the ground and at least 3ft.
away from a wall or metal surface to minimize reflections.
②Attached a pair of UHF antennas to the antenna input jacks, the antenna are normally positioned
in the shape of a "V" (both 45°from vertical) for best reception.
③Keep antennas away from noise sources such as computer, digital equipment, motors,
automobiles and neon lights, as well as away from large metal objects.
④Keep open space between the receiver and transmitter for better reception.
⑤The transmitter should be at least 3ft. from the receiver.

Connections:

①The switching power supply is designed to operate properly from any AC power source 100-240V,
50/60Hz without user adjustment. Simply connect the receiver to a standard AC power outlet, using
only an IEC-type input cordset approved for the country use. Power to the unit is controlled by the
front panel power switch.
②There are two audio outputs on the rear panel: an XLR microphone output and a 1/4" (6.3mm)
phone jack instrument output. The two isolated audio outputs permit simultaneous feeds to two
different inputs. Use the appropriate shielded audio cable for connections between the receiver and
the input(s) of the mixer or other equipment.

Figure A: WAM-400 Front Panel
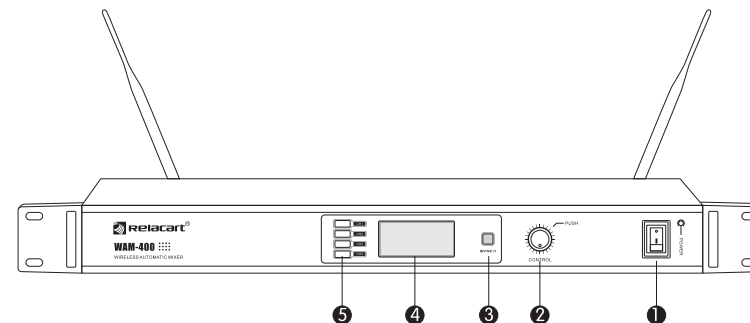
①Power Switch.
②CONTROL Knob: Rotate this knob to select function options and edit function choice.
③Infrared Data Transfer Window (SYNC): Transmit system data from the receiver to the
transmitter, From CH1 to CH4 can use this window.
④LCD Window: Liquid Crystal Display indicates control setting and operational readings.
⑤Channel Buttons: Press CH1 / CH2 / CH3 / CH4 button, in conjunction with the CONTROL
knob, to step through menus, select operating frequency and infrared data transfer.

Figure B: WAM-400 Rear Panel
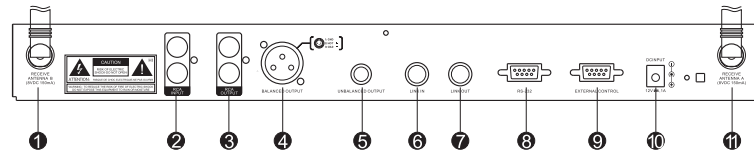
① Antenna Input Jack: BNC type antenna connector for tuner "B", attached the antenna directly.

② RCA Audio Line Input: Two RCA audio line input，Can be connected to the input of mixer / MP3 / DVD, RCA input is mono.

③ RCA Audio Line Output: Two RCA audio line input,Can be connected to the output of mixer / MP3 / DVD, RCA output is mono.

④ Balanced Output Jack: XLR type connector. A standard 2 conductor shielded cable can be used to connect the receiver output to a balanced microphone level input on a mixer or integrated amplifier.

⑤ Unbalanced Output Jack: 1/4" (6.3mm) phone jack, can be connected to an aux-level input of a mixer, guitar amp or tape recorder.

⑥ Link In: Use a Relacart standard connecting cable to connect with the Link Out from another WAM-400, can link up for 5 units WAM-400.

⑦ Link Out: Use a Relacart standard connecting cable.

⑧ RS-232 Jack: Can be connected to Automatic Video Tracking System VTS-1000 or the other controlsystems.(More information please check P24)

⑨ External Control: To connect with the control systems.(More information please check P24)

⑩ DC Power Input: 12V / 700mA.

⑪ Antenna Input Jack: BNC type antenna connector for tuner attached the antenna directly.

Wireless Boundary Microphone UB-200
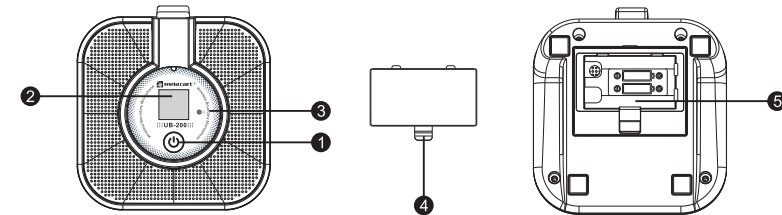
① Power Button
a)Power Supply Button: Press power button in 3 seconds to turn on power and the indicator light turns into green, 3 seconds to turn off the power.
b)Mute Button: Once the power is ON, press this button 1 second, it will be mute, and LCD screen display "MUTE", you will also find the indicator light turns into orange. Press 1 second more to eliminate "Mute" function, letter "MUTE" disappear on the LCD screen, indicator light is back to green.

② LCD Window: Liquid crystal display indicates operational frequency / channel, mute, lock status and battery condition. The transmitter's "fuel gauge" battery indicator displays a maximum of 4 bar segments. When it leaves 1 bar segment, the batteries should be replaced immediately to ensure continued operation.

③ Infrared Data Receiving Window (iR): Use to receive the data signal from the receiver.

④ Battery Door Switch: Open the battery door by sliding the switch.

⑤ Battery Compartment: Insert 2 fresh 1.5V AA batteries. (Alkaline type is recommended, always replace both batteries.)
Warn: Observe correct polarity as marked inside the battery compartment to avoid damage to the internal electric parts.

Wireless Conferencing Microphone UD-200
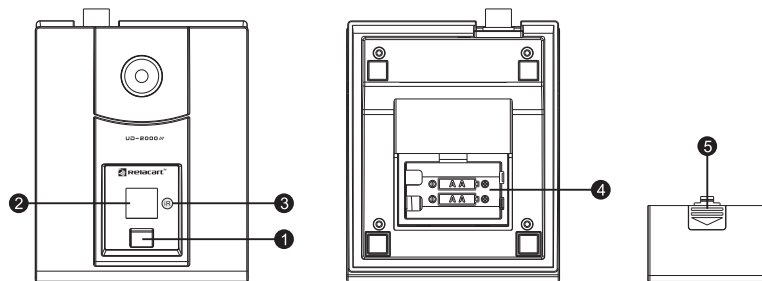
① Power Button.
② LCD Window: Liquid crystal display indicates operational frequency and battery condition. The transmitter's "fuel gauge" battery indicator displays a maximum of 4 bar segments. When it leaves 1 bar segment, the batteries should be replaced immediately to ensure continued operation.
③ Infrared Data Receiving Window (iR): Use to receive the channel data from the receiver
④ Battery Cover: Unscrew it can reveal the battery compartment.
⑤ Battery Compartment: Insert 2 fresh 1.5V AA batteries. (Alkaline type is recommended, always replace both batteries.) Observe correct polarity as marked inside the battery compartment.

Wireless Handheld Microphone UH-200
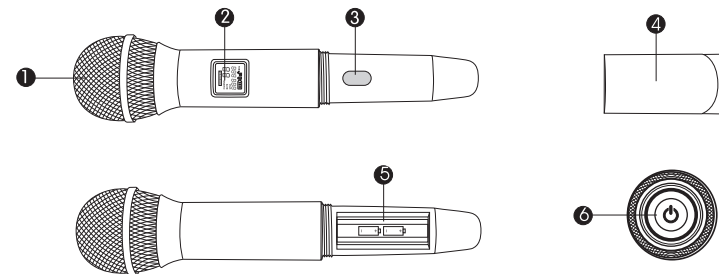
① Microphone Head: The microphone head is separate to change other microphone head if needed.
② LCD Window: Liquid crystal display indicates operational frequency and battery condition. The transmitter's "fuel gauge" battery indicator displays a maximum of 4 bar segments. When it leaves 1 bar segment, the batteries should be replaced immediately to ensure continued operation.
③ Infrared Data Receiving Window (iR): Use to receive the channel data from the receiver.
④ Battery Cover: Unscrew it can reveal the battery compartment.
⑤ Battery Compartment: Insert 2 fresh 1.5V AA batteries. (Alkaline type is recommended, always replace both batteries.) Observe correct polarity as marked inside the battery compartment.
⑥ Power Button.

Wireless Bodypack Transmitter UT-200
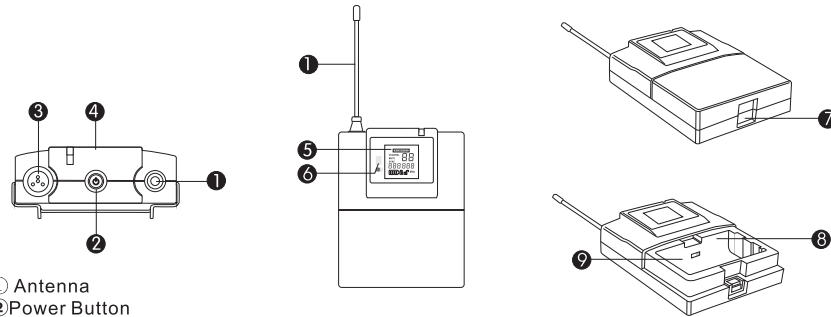
① Antenna
②Power Button
③Mute Button: When the transmitter is muted, it products RF with no audio signal modulation; when the transmitter is un-muted, it products both RF and audio.
④Audio Input Jack: To connect 4-pin mini-XLR connector.
⑤LCD Window: Liquid crystal display indicates operational frequency, channel and battery condition. The transmitter's "fuel gauge" battery indicator displays a maximum of 4 bar segments. When it leaves 1 bar segment, the batteries should be replaced immediately to ensure continued operation.
⑥Infrared Data Receiving Window (iR): Use to receive the channel data from the receiver.
⑦Battery Door Switch: Open the battery door by sliding the switch.
⑧Battery Compartment: Insert 2 fresh 1.5V AA batteries. (Alkaline type is recommended, always replace both batteries.) Observe correct polarity as marked inside the battery compartment.
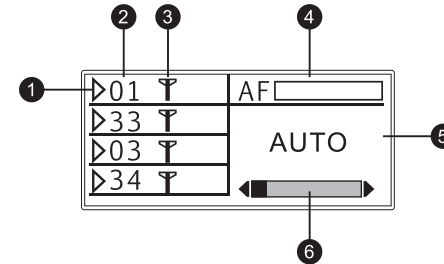⑨AF / GT Audio Input Switch: Connect an audio input device (microphone or guitar cable) to the audio input jack on the top of the body-pack transmitter. Choose AF for microphone input, then GT for guitar cable to connect with guitar or other instruments.

Main display:

1,Triangle symbol - when the triangle symbol is on, the microphone is turned on(speaking/allowed to speak). When the last lock function is opened, or when the microphone is set to priority to the channel, the triangle symbol of the corresponding channel is also on.
2, Channel Display: Channel on use.
3, RF Signal: Show the strength of receiving signal.
4, Main Volume: Show the volume output.
5, Working Status: Display the operating status.
6, Scroll Bar Display.
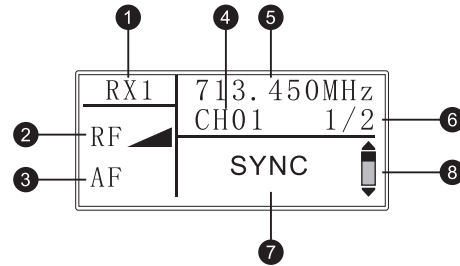
Channel display:

1, Channel number display: Show the operating channel (RX1 means receiving channel 1)
2, RF signal
3, AF signal
4, Channel display
5, Frequency display
6, Number of Linking WAM-400: ½, 1 means the first wireless mixer, 2 means the total linking mixers.
7, Operating Menu Display: Display the operating menu.
8, Scroll Bar Display.

Main System Setup

1)Turn on the wireless mixer, the LCD displays the preset data.
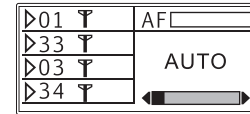
2)Rotate the CONTROL knob to view the setting status.
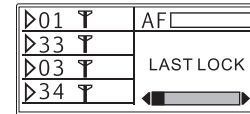
3)To enter the menu mode: Press and hold the CONTROL knob 3 seconds to enter the edit mode, rotate this knob once to select and set MODE, Last Lock, Hold Time,Priority Select, Threshold Level, Language Select, Speak Number, Keyboard lock, Contrast Ratio or Exit.

①, MODE: Selecting "MODE", then press CONTROL knob to enter edit mode, rotate this knob, the LCD will display "Manual" or "Auto", if stopping on "Manual", the Threshold Level will be set by manual; if stopping on "Auto", the Threshold Level will be set automatically by the sold Level will be set automatically by the system's micro processor (if MODE is "Auto", there will be NO "Threshold Level" setting). Press CONTROL knob to confirm the desire choice, then LCD move to the next setting.

```
        MODE
    ◄ ▮          ►
```

②, Last Lock: Lock the last microphone for continuous speaking. Selecting "Last Lock", then press CONTROL knob to enter edit mode, rotate this knob, the LCD will display "ON" or "OFF", if stopping on "ON", the last microphone will be always ON until the a new activated microphone to override it; if stopping on "OFF", the microphone will be off after the "Hold Time". Press CONTROL knob to confirm the desire choice, then LCD move to the next setting.
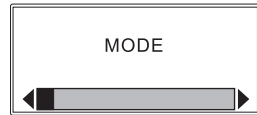
```
      LAST LOCK
    ◄ ▮          ►
```

③, Hold Time: Set the activated microphone's hold time after the speaker stop speaking. (Make sure the microphone is unlocked.) Select "Hold Time", then press CONTROL knob to enter edit mode, rotate this knob, the LCD will display in 0.1S step, providing a 0.1S to 1S range, Press CONTROL knob to confirm the desire choice, then LCD move to the next setting.

```
      HOLD TIME
    ◄ ▮          ►
```

④, Priority Select: Set the microphone at priority. Select "Priority Select", then press CONTROL knob to enter edit mode, rotate this knob, to choose the priority channel, if there are two receivers to link together for use, the LCD will display the first one A, the second one B, can set two channels at priority at the most, press CONTROL knob to confirm the desire choice. Finally contrarotate CONTROL knob, until the arrowhead on the lower right corner becomes dotted line, press CONTROL, LCD move to the next setting.
Note: in the the priority selection, all the channels are displayed: A1, A2, A3, A4, corresponding front panel respectively: CH1, CH2, CH4, CH3)
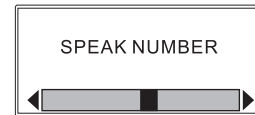
```
    PRIORITY SELECT
    ◄      ▮     ►
```

⑤,Threshold Level: According to the ambient noise to set the threshold manually, set the "Manual"
in the "MODE"."MODE". （PS: Only use this setting in manual mode）（Factory preset is "Auto"）.
 Select "Threshold Level", then press CONTROL knob to enter edit mode, rotate this knob,
LCD will display 1 dBm step, providing a 1 dBm to 10 dBm ranges. Press CONTROL knob
to confirm the desire choice, then LCD move to the next setting.

```
┌─────────────────────────┐
│                         │
│     THRESHOLD LEVEL      │
│                         │
│   ◄────  ■  ────►        │
│                         │
└─────────────────────────┘
```

⑥, Language Select, Both "Chinese" and "English" are available.

```
┌─────────────────────────┐
│                         │
│     LANGUAGE SELECT      │
│                         │
│   ◄────  ■  ────►        │
│                         │
└─────────────────────────┘
```

⑦, Speak Number: Set the simultaneous channels, there are 1 channel, 2 channels, 3
channels and 4 channels are available.

```
┌─────────────────────────┐
│                         │
│     SPEAK NUMBER         │
│                         │
│   ◄────  ■  ────►        │
│                         │
└─────────────────────────┘
```

⑧, KeyBoard lock": Enter the "lock" function,   rotate this knob, to choose the to "ON" or " OFF", if you
select "ON", and functional operation of the system into the locked state, can not use the button on the
control; if you choose "OFF", the lock is released, using any of the buttons to operate and control.

```
┌─────────────────────────┐
│                         │
│     KEYBOARD LOCK        │
│                         │
│   ◄────  ■  ────►        │
│                         │
└─────────────────────────┘
```
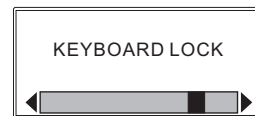
⑨, Contrast Ratio : Enter the " display contrast" function, rotate this knob, to set the screen display contrast, from 00-15 , the default factory settings of the display contrast is 10.

```
CONTRAST RATIO

◄━━━━━━━━■►
```

⑩, Exit: To exit the system.

```
EXIT

◄━━━━━━━━━■►
```

WAM-400 Menu Display:

```
                    Mode ───┬── Manual ("Threshold Level" setting)
                            └── Auto ( Factory preset, automatic setting by system micro processor)

                 Last Lock ──┬── ON ( the microphone will be always "ON")
                             └── OFF ( the microphone will be OFF after the "Hold Time")

            ── Hold Time  (Set the activated microphone's hold time after the speaker stop speaking)
            ── Priority Select (Set the microphone at priority, 2 units at the most)
            ── Threshold Level  (Set the "Manual" in the "Mode", then set the Threshold Level. PS:
CONTROL                             Only use this setting in manual mode)
(3 seconds)
            ── Language Select ──┬── Chinese
                                 └── English

            ── Speak Number (Set the simultaneous speaking channels, 4 channel at the most)
            ── Keybard Lock(Lock the keyboard)
            ── Contrast Ratio(Set the Contrast Ratio from 00 to 15)
            ── Exit (Exit the system)
```
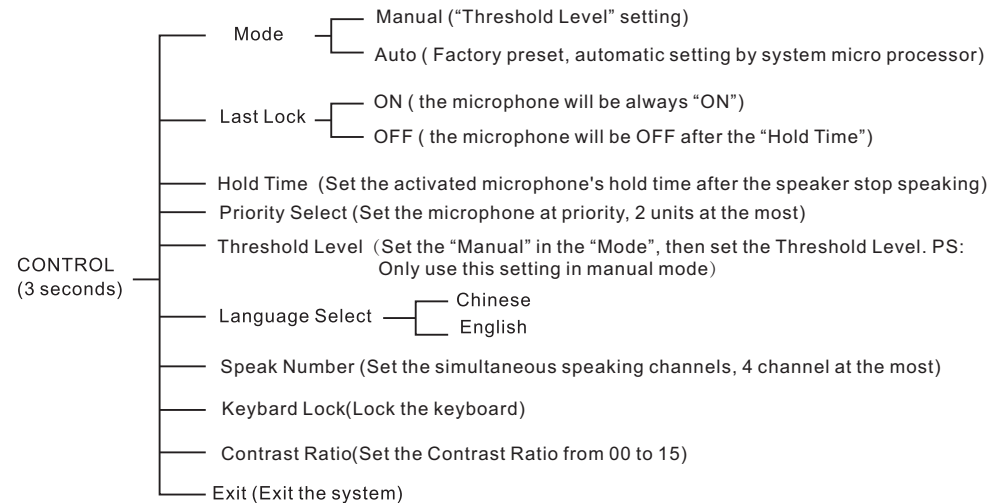
Each Channel Setup

1, Press CH1 button, rotate "CONTROL" knob to select and set Sync, Scan, Channel, SQELCH, or Volume, press "CONTROL" again to enter edit mode:

①Sync: Infrared data transmitting. Let the transmitter's IR window face to "SYNC" window, press "CONTROL", to receive the data signal from the receiver.

②Scan: Stop at "Scan", then press "CONTROL" knob, system will auto-scan and lock on to an open, interference-free frequency in 40 S.
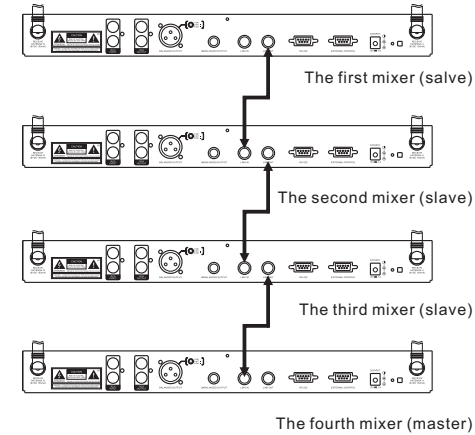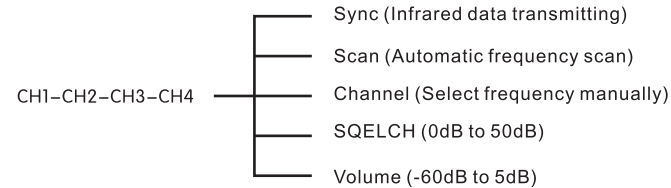
③Channel: Stop at "Channel", then press "CONTROL" knob to select the preset 32 channels manually.

④SQELCH: Stop at "SQELCH", then press "CONTROL" knob, the squelch level is adjustable in ten 5dB steps, providing a 50dB range. Press "CONTROL" confirm the desired choice. (If interference is a problem, first consider trying a different frequency, either manually or scanning.)

⑤Volume: Volume output of CH1, stop at "Volume", then press "CONTROL" knob, the volume output is adjustable in sixty-five 5dB steps, providing a -60dB to 5dB range. Press "CONTROL" confirm the desired choice.
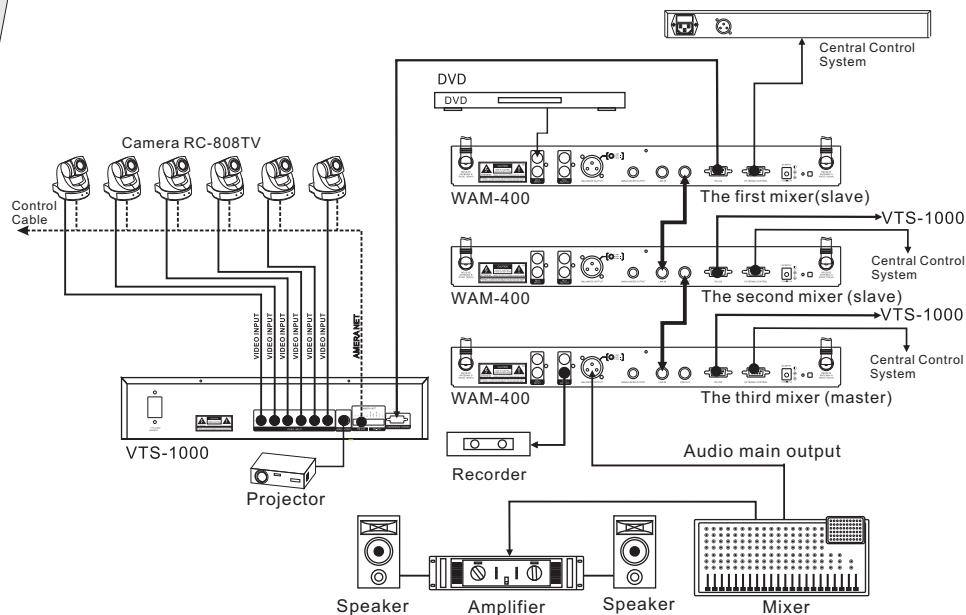
2, Same operation as CHI, to set CH2, CH3 and CH4.

Channel Setup Menu Display

Sync (Infrared data transmitting)

Scan (Automatic frequency scan)

CH1−CH2−CH3−CH4   Channel (Select frequency manually)

SQELCH (0dB to 50dB)

Volume (-60dB to 5dB)

The first mixer (salve)

The second mixer (slave)

The third mixer (slave)

The fourth mixer (master)

To link multiple mixers, connect the LINK OUT of the first mixer to the LINK IN of the next mixer. The last mixer will be the master, all audio will be output from the master unit. (Figure)
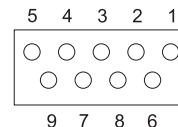
4 units daisy chain by accessory link cable to control up to 16 units microphone.

Central Control System

DVD
DVD

Camera RC-808TV

Control Cable

WAM-400
The first mixer(slave)

VTS-1000

Central Control System

WAM-400
The second mixer (slave)

VTS-1000

Central Control System

WAM-400
The third mixer (master)

VIDEO INPUT

AMERA NET

VTS-1000

Projector

Recorder

Audio main output

Speaker   Amplifier   Speaker   Mixer

Automatic video tracking connection   Logic connection

5   4   3   2   1   5   4   3   2   1

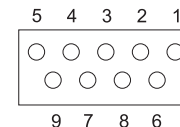9   7   8   6   9   7   8   6

RS-232

The pin connections:
1: NC (unconnected)
2: TC (data output)
3: RX (data input)
4: NC (unconnected)
5: GROUND
6: NC (unconnected)
7: NC (unconnected)
8: NC (unconnected)
9: NC (unconnected)

NOTE: The automatic video tracking system VTS-1000 must be connected to the master unit.

RS interface Technical parameters:
baud rate: 115200
data bit : 8
stop bit : 1
verification - bit : NONE

EXTERNAL CONTROL（RS-232）

Pin connections:

1: CH1 IN   6: CH2 IN
2: CH3 IN   7: CH4 IN
3: CH1 OUT   8: CH2 OUT
4: CH3 OUT   9: CH4 OUT
5: GROUND

The logic functions of the WAM-400 expand the mixer's range of installation and control options.

Control Input (IN): This microphone will be mute when its channel receives low level from external control; this microphone will open when its channel receives high level from external control.

Control Output (OUT): When this microphone is opened, its channel transmits high level; when this microphone is mute, its channel transmit low level.

11 Specifications

WAM-400 Mixer

Main Frame Size: EIA STANDARD 1U
Receiving Channel: 4 Channel
Power supply: DC 12V / 12W
Maximum current: 1A
Frequency Reliability: 0.005%
Carrier Frequency Range: UHF 554MHz~936MHz
Band Width: 64MHz
Modulation Mode: FM
Sensitivity: 5dBuV, S/N>60dB at 25 deviation
Max.Deviation Range : ±45 KHz
Distortion: <0.9%@1KHz
Frequency Response: 65~16KHz ±3dB
S/N: 100dB
Audio Output: RCA Jack (X2);6.3mm Jack (X1); XLR (X1)
Audio Input t: RCA Jack (X2)
Communication Port: RS-232 (X2)
Recording Output Level: LINE Output - 10dBV
Balanced Output Level: LINE Output - 10dBV
Audio Input Leve: ILINE Input- 10Dbv
Dimension (mm): 410mm(W)x43mm(H)x206mm(D)
Weight: Approximately 2.5kg

UH-200 Handheld Microphone

Carrier Frequency Range: UHF 554MHz~936MHz
Oscillation: PLL synthesized
Harmonic radiation: <-50dBm
Bandwidth:
        Band HF: 139MHz(797Mhz~936MHZ)
        Band AD: 134MHz(662MHz~796MHz)
        Band EJ: 97MHz(554MHz~651MHz)
Max.Deviation Range: ±45KHz
Microphone Element: Cardioid Dynamic / Cardioid Condenser
RF Power Output:10mW/40mW
Battery: AA X 2
Current Consumption: 110mA (typical)
Battery Current / Life: Approximately 8 hours
Dimension: 52(Φ) X 255 (L)
Weight: 285g (w/o battery)

UB-200 Boundary Microphone

Element: Fixed-charge back plate, permanently polarized condenser
Polar Pattern: Half-cardioid (cardioid in hemisphere above mounting surface)
Carrier Frequency Range:UHF 554MHz~936MHz
Band Width:
        Band HF: 139MHz(797Mhz~936MHZ)
        Band AD: 134MHz(662MHz~796MHz)
        Band EJ: 97MHz(554MHz~651MHz)
Modulation Mode: FM
Frequency Response: 50-17,000 Hz
Max.Deviation Range: ±45 KHz
Current Consumption: 110mA ±10mA（typical）
RF Power Output: 13mW
Dynamic Range (Typical): > 90 dB,1 kHz at Max SPL
Battery: AA X 2
Battery Current / Life: Approximately 10 hours
Dimension (mm): 110mm(W)x440mm(H)x110mm(D)
Weight: 505g（w/o battery）

UT-200 Body-pack Transmitter

Ccarrier Frequency Range: UHF 554MHz~936MHz
Oscillation: PLL synthesized
Harmonic radiation: <-63dBm
Bandwidth:
        Band HF: 139MHz(797 MHz~936 MHZ)
        Band AD: 134MHz(662 MHz~796 MHz)
        Band EJ: 97MHz(554MHz~651 MHz)
Max.Deviation Range: ±45KHz
Input Connector: 4-pin mini-XLR connector
RF Power Output: 10mW
Battery: AA X 2
Current Consumption:100mA (typical)
Battery Current / Life: Approximately 10 hours
Dimension: 84(H) X 66(W) X 23(D)
Weight: 116g

UD-200 Conferencing Microphone

Carrier Frequency Range: UHF 554MHz~936MHz
Oscillation: PLL synthesized
Harmonic radiation: <-50dBm
Bandwidth:
        Band HF: 139MHz(797Mhz~936MHZ)
        Band AD: 134MHz(662MHz~796MHz)
        Band EJ: 97MHz(554MHz~651MHz)
Max.Deviation Range: ±45KHz
RF Power Output: 13mW
Battery: AA X 2
Current Consumption: 105mA, typical
Battery Current / Life: Approximately 10 hours
Dimension: 340mm, 420mm
Weight: 830g (w/o battery)