OPERATION INSTRUCTION

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Multi functional Digital Speaker Processor

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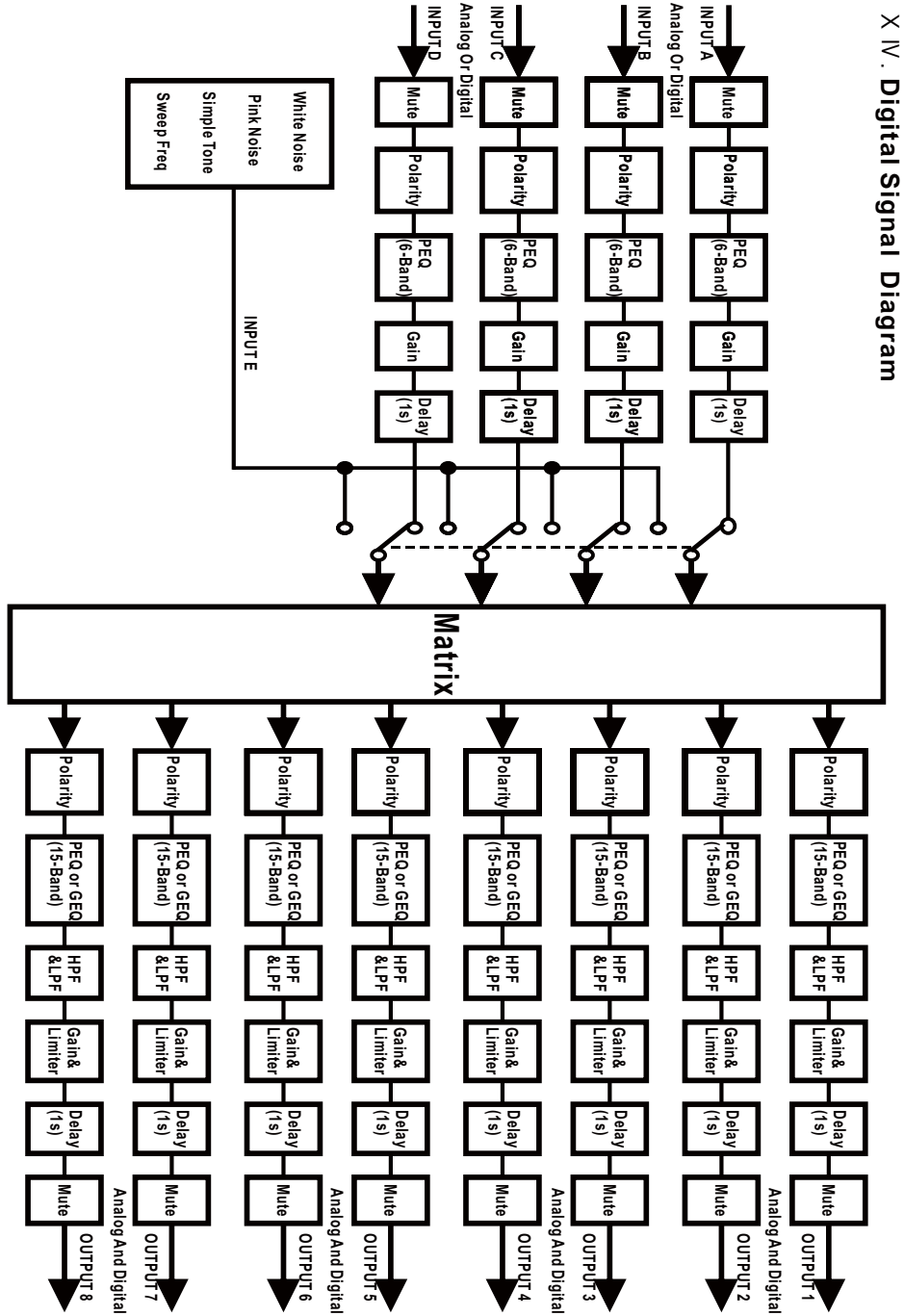
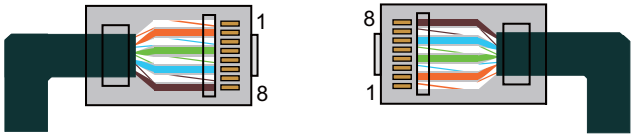
Ⅹ Ⅳ. Digital Signal Diagram



XIII. Wiring Methods

1. RS485 transmission line: The making procedure of RS485 transmission line: First of all, prepare the necessary materials and tools. Only fully understand these materials and tools then you can make the your required transmission lines. The making procedure of RS485 transmission line is the same as the ordinary transmission line. The tools and materials required include: twisted pair, RJ-45 crystal head, strip off line grips, twisted pair special line pressing clamp etc (Though RS485 transmission line can reach 1500 m, different materials and different wiring method will make a great difference on the wire transmission distance).

About the making of RS485 line, here explain the wiring way as follows:



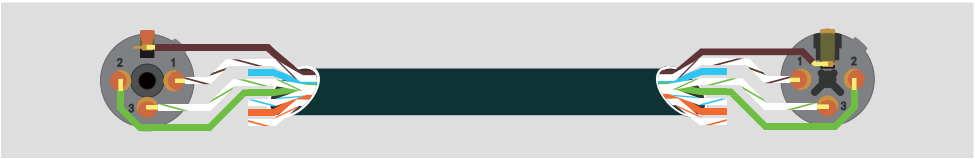
1. Orange white 2. Orange 3. Blue white 4. Green 5. Green White 6. Blue 7. Brown white 8. Brown

This is the standard wiring method of 568B .Twisted pair is consist by different colors of 4 pairs 8 polishing components. Every two woven together to a core cable in certain rules. When you use it as a common network cable, we use two pairs (1, 2, 6, 7) actually. But we use another pair (4, 5) here. Only connect 4 and 5 into a group for a twisted pair (the connection of 568B need the green pair, other number's connection can connect optional). Only in this way, signal transmission can achieve minimum interference, farthest distance.

Shielded twisted pair is coated by a layer of shielding metal film. The resistance to interference is better, but the applied conditions are a little limited. If not using the shielded twisted pair, the resistance to interference will be stronger than the unshielded twisted pair. Shielded twisted pair shielding can only effect under the properly grounded case of two sides in the cable with shielding device. Therefore, the system should be all shielding devices. Including cable, socket, crystal head and distribution frame. At the same time the buildings should have good ground system. In fact, it is difficult to ground perfectly in practical construction. So the shielding layer become the largest source of interference. It's performance is worse than the unshielded twisted pair UT. Unless there is any special need, we only use unshielded twisted pair in the integrated wiring system

2. AES/EBU transmission line: The making procedure of AES/EBU transmission line :First of all ,prepare the necessary materials and tools. First we will introduce these simple materials and tools. Making AES/EBU transmission line can use professional 110Ω digital audio transmission lines. The price of it will be more expensive. So we suggest you select the six or seven kind of unshielded twisted pair. The tools and materials required include: six or seven kind of unshielded twisted-pair cable, XLR male, XLR female, strip off line grips, electric iron, solder wire (different materials and different wiring method will make a great difference on the wire transmission distance).

About the making of AES/EBU transmission line , here will explain the wiring way as follows:



Twisted pair is consisted by the different colors of 4 pairs 8 core cable. Every two woven together to a core cable in certain rules. As RS485, selecting green for the actual effective transmission lines. Green connect to second feet (cannon seat has labeled).White and green connect the another feet of 3 feet and the shell foot is connecting optional. You can also refer the above connection diagram. Brown connect to the shell and white brown connect 1 foot. Only in this way, signal transmission can achieve minimum interference, farthest distance.

Thank you for choosing our Multi functional Digital Speaker Processor. You choose our products, it fully shows that your professional prospective of this products. It must be the high quality sound with the perfect design idea, world's top components and first-class production technology.

In order for your better understanding and use of this product, please read this manual carefully.

I. Cautions

Warning:

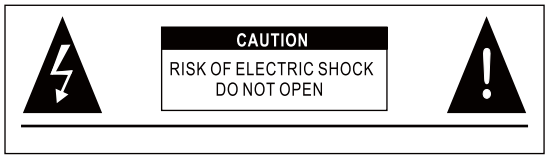
To prevent the short circuit, keep off any place of humidity.

Power off the device immediately in case of water damage and find the right technician for reparation. Don't open the device yourself unless by the authorized technician.

When flashes the exclamation Mark, the device is also with high voltage and the alert should be on.

When flashes the arrowhead signal, the device is with high voltage.

Please do not touch the device for any reason.



II. Features

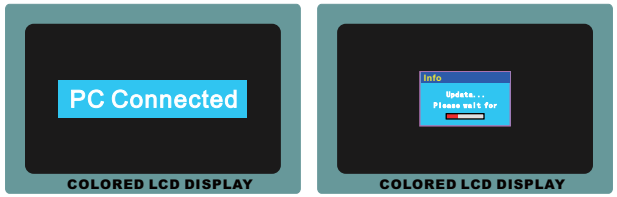
- Five in one Multi function product, combine processor, signal generator , ADC, DAC and optical transmitter
- 192KHz Sampling Frequency, 32-bit DSP Processor, 24-bit A/D and D/A converter.
- USB and RS485 Connector are available. 250pcs of the devices can be connected together via RS485 and it can be remote controlled far from 1500m.
- You can operate the functions via the front panels directly.
- 30 kinds of programs can be stored into the device.
- The device can be locked through setting password by “System” key on the panel , it can prevent the destruction of the working state of the machine.
- Each Input Channel comes with independent 6-Bands Parametric EQ. Each output Channels comes with independent 15-Bands Parametric EQ.
- 4.3” Color LCD is applied with Pixels of 480*272 PCS of RGB
- 12-Bands LED Digital Level Meter can tell you the status of Input ,Output and Edit
- Delay ,Phase Control and Mute setting are all available in each Input and Output channel. The delay is mostly up to 1000ms. For Delay ,ms, m or ft can be displayed together.
- Signal Generator
- Password Function
- Matrix and Mute in Channels can be controlled through connecting Central Console and the device by USB and Rs485
- Required resolutions:>=1279*790

III. SPECIFICATION

Input Channel & Socket	Analog 4 CHs Female XLR; Digital, 2 Digital Coaxial Ins or 2 OPT Ins or 2 AES Ins
Output Channel & Socket	Analog 8 CHs Male XLR ; Digital, 4 Digital Coaxial Outs and 4 OPT Outs and 4 AES Outs
Impedance	Input balance : 20KΩ Output Balance : 100Ω
PC Com Port	1 USB Com Port on front panel, 2 RS485 Com Port on back panel(RJ-45)
CMRR	>70dB(1KHz)
Input Range	≤+20dBu
Frequency Response	15Hz-25KHz(-0.3dB)
S/N R	>110dB
THD	<0.01% OUTPUT=0dBu/1KHz
Crosstalk of Channels	>80dB(1KHz)
Functions of Input Channels	
Input Delay	Each channel has Independent Delay Control , step over 21us@<10ms; step over:1ms@>10ms
Input EQ	Each Input Channel has 6 Bands Parametric EQ Central Frequency Point:20Hz-20KHz, 239 frequency points totally,Band Width:0.01oct-3oct, step over is 0.01oct Gain:-20dB to +20dB, ste pover is 0.1dB
Noise Gate	Each Channel has independent Noise Gate Control from: -120dBu to-40dBu
Input Gain	Each Channel has independent Gain Control from -60dB to +12dB,Step distance:0. 1dB
Others	Each channel has Independent Mute Control , Same Phase + or reversed Phase -
Functions of Output Channels	
Output Selection	Each Output Channel can choose any Input Channel or group
Output Polarity	Each Channel has independent Gain Control from-30dBto+12dB, Step distance0.1dB
Output Delay	Each channel has Independent Delay Control , step over 21us@<10ms;step over:1ms@>10ms
Crossover	Each Channel can be set up LPF and HPF independently. Adjustable Parameters: Filter Types (Linkwitz-Riley/Bessel/Butterworth)Frequency Turning Point:20Hz-20KHz, 239 Frequency Points Decay of Slope:12dB/oct, 18dB/oct, 24dB/oct,48dB/oct
Limiter Setup	Each Channel can be set up limiter independently. Adjustable Parameters: Threshold Value:-20dBu-+20dBu step over:0.1dBu@starting time:0.3ms-200ms step over<1ms @0.1ms, step over>1ms@1ms Release:50ms-500ms@Step 1ms
Output EQ	Each Output Channel can be set up 15 Bands EQ. Both EQ Modes, PEQ&GEQ, are available. When set as PEQ , the adjustable paremeters :LO-EQ1 (bass boost or low cut), H1-EQ15 (High Boost or High Damp) are the frequency points adjustable filter, S-dB can choose 6dB/oct or 12dB/oct Gain:-40dB-+20dB ,Stepover:0.1dB,others are 13Bands Parametric EQ. Central Frequency Point:20Hz-20KHz, 239 frequency points totally. Band Width:0.01oct-3oct,stepover is 0.01oct When set as GEQ, the functions are the same as when set as PEQ, Only Fixed frequency.
Others	Each channel has Independent Mute Control , Same Phase + or reversed Phase -
Signal generator	White/Pink Noise Generator: Output Level:-60dBu to 12dBu @ Step, 0.1dBu Simple Tone Generator: Output Level:-60dBu to 12dBu @ Step, 0.1dBu,step distance:1Hz Sweeping Frequency: Output Level:-60dBu to 12dBu @ Step, 0.1dBu,Sweeping time: 2s-30s
Processor	192KHz Sampling Frequency, 32-bit DSP Processor, 32-bit A/D and D/A converter
Display	4.3" Color Liquid Crystal Display ,480*272 PCS of RGB Pixels,12-Bands LED Digital Level Meter can tell you the status of Input ,Output, Mute and Edit
Net Weight	AC 110V/220V 50Hz/60Hz ≤40W
Shipping Dimension	1PC: 482×232×88/605×310×150 (mm) (W×D×H)
Gross Weight	1PC: 5. 4/6. 5 (kg)

Type	CH_A	CH_B	CH_C	CH_D	CH_1	CH_2	CH_3	CH_4	CH_5	CH_6	CH_7	CH_8
Name	A	B	C	D	1	2	3	4	5	6	7	8
Mute	On	On	On	On	On	On	On	On	On	On	On	On
Gain	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB
NoiseGate	-80dBu	-80dBu	-80dBu	-80dBu								
Polarity	-	-	-	-	-	-	-	-	-	-	-	-
Delay	0.000ms	0.000ms	0.000ms	0.000ms	0.000ms	0.000ms	0.000ms	0.000ms	0.000ms	0.000ms	0.000ms	0.000ms
EQ1 Type	PEQ	PEQ	PEQ	PEQ	Lo_Shf	Lo_Shf	Lo_Shf	Lo_Shf	Lo_Shf	Lo_Shf	Lo_Shf	Lo_Shf
EQ1 Gain	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB
EQ1 FQCY	20Hz	20Hz	20Hz	20Hz	25Hz	25Hz	25Hz	25Hz	25Hz	25Hz	25Hz	25Hz
EQ1 BW	0.30oct	0.30oct	0.30oct	0.30oct	6dB/oct	6dB/oct	6dB/oct	6dB/oct	6dB/oct	6dB/oct	6dB/oct	6dB/oct
EQ2 Type	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ
EQ2 Gain	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB
EQ2 FQCY	80Hz	80Hz	80Hz	80Hz	40Hz	40Hz	40Hz	40Hz	40Hz	40Hz	40Hz	40Hz
EQ2 BW	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct
EQ3 Type	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ
EQ3 Gain	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB
EQ3 FQCY	317Hz	317Hz	317Hz	317Hz	63Hz	63Hz	63Hz	63Hz	63Hz	63Hz	63Hz	63Hz
EQ3 BW	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct
EQ4 Type	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ
EQ4 Gain	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB
EQ4 FQCY	1092Hz	1092Hz	1092Hz	1092Hz	100Hz	100Hz	100Hz	100Hz	100Hz	100Hz	100Hz	100Hz
EQ4 BW	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct
EQ5 Type	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ
EQ5 Gain	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB
EQ5 FQCY	5024Hz	5024Hz	5024Hz	5024Hz	160Hz	160Hz	160Hz	160Hz	160Hz	160Hz	160Hz	160Hz
EQ5 BW	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct
EQ6 Type	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ
EQ6 Gain	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB
EQ6 FQCY	20000Hz	20000Hz	20000Hz	20000Hz	250Hz	250Hz	250Hz	250Hz	250Hz	250Hz	250Hz	250Hz
EQ6 BW	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct
EQ7 Type					PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ
EQ7 Gain					0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB
EQ7 FQCY					400Hz	400Hz	400Hz	400Hz	400Hz	400Hz	400Hz	400Hz
EQ7 BW					0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct
EQ8 Type					PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ
EQ8 Gain					0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB
EQ8 FQCY					630Hz	630Hz	630Hz	630Hz	630Hz	630Hz	630Hz	630Hz
EQ8 BW					0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct
EQ9 Type					PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ
EQ9 Gain					0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB
EQ9 FQCY					1000Hz	1000Hz	1000Hz	1000Hz	1000Hz	1000Hz	1000Hz	1000Hz
EQ9 BW					0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct
EQ10 Type					PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ
EQ10 Gain					0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB
EQ10 FQCY					1600Hz	1600Hz	1600Hz	1600Hz	1600Hz	1600Hz	1600Hz	1600Hz
EQ10 BW					0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct
EQ11 Type					PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ
EQ11 Gain					0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB
EQ11 FQCY					2500Hz	2500Hz	2500Hz	2500Hz	2500Hz	2500Hz	2500Hz	2500Hz
EQ11 BW					0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct
EQ12 Type					PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ
EQ12 Gain					0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB
EQ12 FQCY					4000Hz	4000Hz	4000Hz	4000Hz	4000Hz	4000Hz	4000Hz	4000Hz
EQ12 BW					0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct
EQ13 Type					PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ
EQ13 Gain					0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB
EQ13 FQCY					6300Hz	6300Hz	6300Hz	6300Hz	6300Hz	6300Hz	6300Hz	6300Hz
EQ13 BW					0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct
EQ14 Type					PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ	PEQ
EQ14 Gain					0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB
EQ14 FQCY					10000Hz	10000Hz	10000Hz	10000Hz	10000Hz	10000Hz	10000Hz	10000Hz
EQ14 BW					0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct	0.30oct
EQ15 Type					Hi_Shf	Hi_Shf	Hi_Shf	Hi_Shf	Hi_Shf	Hi_Shf	Hi_Shf	Hi_Shf
EQ15 Gain					0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB	0.0dB
EQ15 FQCY					16000Hz	16000Hz	16000Hz	16000Hz	16000Hz	16000Hz	16000Hz	16000Hz
EQ15 BW					6dB/oct	6dB/oct	6dB/oct	6dB/oct	6dB/oct	6dB/oct	6dB/oct	6dB/oct
Src CHA					On	On	On	On	On	On	On	On
Src CHB					Off	Off	Off	Off	Off	Off	Off	Off
Src CHC					Off	Off	Off	Off	Off	Off	Off	Off
Src CHD					Off	Off	Off	Off	Off	Off	Off	Off
XMode_Lo					BTWorth	BTWorth	BTWorth	BTWorth	BTWorth	BTWorth	BTWorth	BTWorth
XFQCY_Lo					20000Hz	20000Hz	20000Hz	20000Hz	20000Hz	20000Hz	20000Hz	20000Hz
XSLope_Lo					12dB/oct	12dB/oct	12dB/oct	12dB/oct	12dB/oct	12dB/oct	12dB/oct	12dB/oct
XMode_Hi					BTWorth	BTWorth	BTWorth	BTWorth	BTWorth	BTWorth	BTWorth	BTWorth
XFQCY_Hi					20Hz	20Hz	20Hz	20Hz	20Hz	20Hz	20Hz	20Hz
XSLope_Hi					12dB/oct	12dB/oct	12dB/oct	12dB/oct	12dB/oct	12dB/oct	12dB/oct	12dB/oct
Threshold					OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Attack					50ms	50ms	50ms	50ms	50ms	50ms	50ms	50ms
Release					500ms	500ms	500ms	500ms	500ms	500ms	500ms	500ms

When the PC was connected, the interface will show like the left diagram. If it's disconnected, the interface will show like the right diagram.

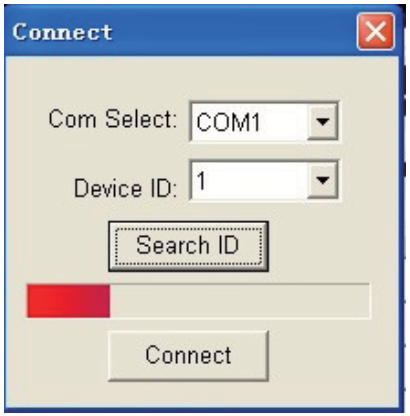


XI. The solution of disconnection and connection errors

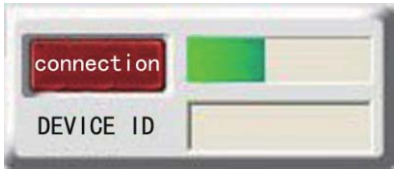
When your PC and other USB port are in used, it will show the other port number at the same time. For example, when the mouse connects to the USB port, you can check the mouse USB port number. Please note do not select the wrong port number.

"Device ID" option is to select the device ID,

If you don't know the device ID , you can check in the equipment. Or you can click on "search ID" option and you can search all the device ID connected to PC automatically.



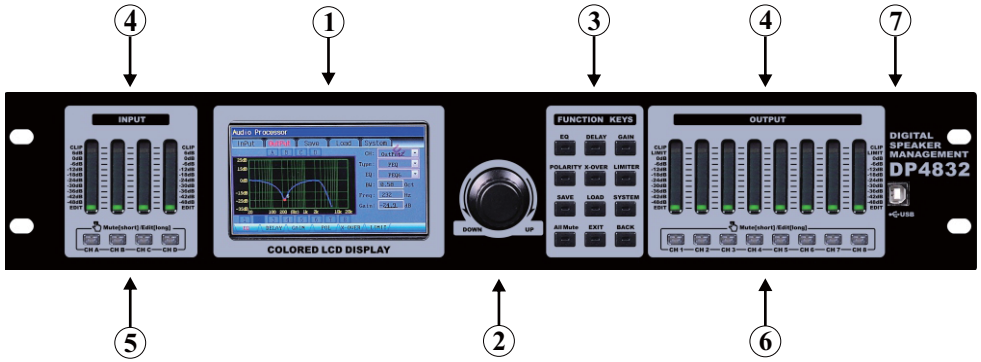
After complete selecting, click OK. If the circuit connection is normal, it will disappear in a few seconds. At the same time, the color slips will complete at the same time.



XII. Parameters report

Data report will display the edit state in time. If you load a group of empty program, it will show the factory default data. The following is a factory default data report.

IV. Front Panel's Functions Introduction



Function Diagram of Front Panel

1.LCD screen

4.3" color LCD is applied with pixels of 480*272pcs of RGB. Display the operation interface and menu information

2. Digital encoder

(1) Clockwise rotation: Parameter increases, Clockwise rotation the menu

(2) Counterclockwise rotation: Parameter decreases, Counterclockwise rotation the menu

(3) One-touch press: enter or confirm; (4) Long press: Special confirm

3. Function selection/Auxiliary editing key

(1) EQ: EQ setup; (2) DELAY: Delay setup; (3) GAIN: Gain setup;

(4) POLARITY: Polarity setup; (5) X-OVER: Crossover setup; (6) LIMITER: Compression setup;

(7) LOAD: Load advanced setup; (8) SYSTEM: System related information; (9) SAVE: Save setup information;

(10) ALL Mute: Mute setup (11) EXIT: Exit setup; (12) BACK: Delete or back;

(1), (2), (3), (4) Function select key of both input and output; (5), (6) special select key of output;

(7), (8), (9) System function key;

(10) One-touch press edit mute of all the channels, Long press edit cancel mute of all the channels.

(11), (12) Auxiliary editor key。

4. LED indicator

12 level of LED display input/output precise digital numbers and edit state level

(1) CLIP (cutting wave) display. When the signal distort, this light is in(red);

(2) LIMIT (amplitude LIMIT) display. When signal exceeds the users setting, this light is in(yellow);

(3) From -30 to 6 dB of the 9-LED level display (green);

(4) EDIT (edit) indicator light (yellow).Display channel object of operation interface.

5. Input mute/edit key

(1) Short press: Mute/not mute switch. When it's mute, this button light is in (red);

(2) Long press: Enter the input EDIT function interface. EDIT indicator light. The associated output channel" EDIT" exhibit of indicator flashing.

6. Output mute/edit key

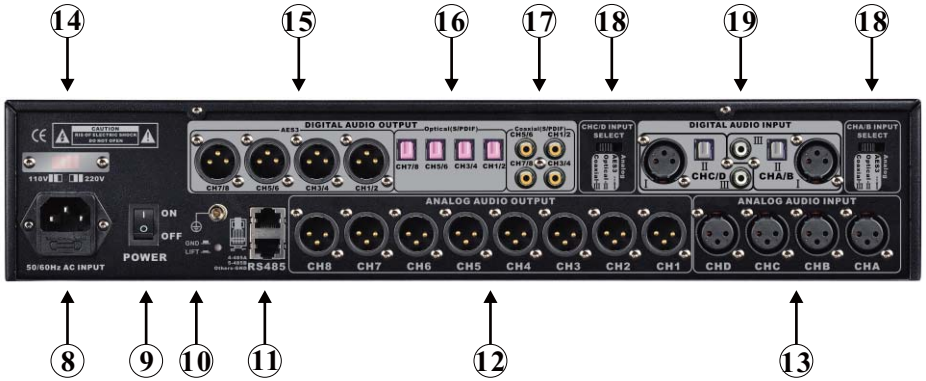
(1) Short press: Mute/no mute switch.When it's mute, this button light is in (red);

(2) Long press: Enter the output EDIT function interface, EDIT indicator light. The associated input channel" EDIT" exhibit of indicator flashing.

7. USB interface and the PC communication interface

Through adjusting the PC software interface to relative parameters. All the parameters can be adjusted. It is more convenient to operate and display directly.

V. Rear Panel's Functions Introduction



Schematic diagram of back panel

8. AC power input socket

According to the power switch gear indicator, access to the corresponding AC input voltage.

9. Power switch

Turn on the power switch and input voltage. Then press the switch, it can work normally.

10. Grounding column and grounding switch

The column is the common ground of the device. Built in switch is the system ground/floating switch.

11. RS485 port

Available to connect the network cable to RS485 port (can maximum connected to250 devices). Then select one of the device RS485 port, use USB cable transfer to 485 line or 232 line transfer to 485 line then connect to the PC. It can remote control all connected devices. The furthest distance can up to 1500 meters.. And through it can connect the Central control system.

12. Output channel (Analog)

Eight output channels. It remarks the logo by CH1-CH8.Such as 1 st channel, 2nd channels... 8 th channels.

13. Input channel (Analog)

Four input channels. It remark the logo by CHA ~ CHD. Such as A channel, B channel... D channel.

14. The power transfer switch

Select the corresponding input voltage gear, 110 V or 220 V AC voltage.

15. AES/EBU output (Digital)

It can transmit two channels digital audio data and the relevant control information. It provides two channels of audio data, balance or differential connection. The three core microphone shield cable using XLR (cannon) connector's parameters is 110 Ω impedance. (It can transmit the data in a 100m long distance without balancing.

16. Optical fiber output (Digital)

It provides two channels audio data by using the S/PDIF format .The advantage of optical fiber connection mode is that it can make electrical isolation and prevent digital noise through the ground transmission. It can improve the DAC S/NR and need to consider the interface levels and impedance problem. The weakness is the signal will be easy to cause serious jitter after two conversions. The common material of optical fiber is plastic, glass, quartz. Quartz fiber performance is the best.

Fiber classification: from the core outer layer refractive index distribution to a step-index fiber (optical zigzag forward) and gradient type optical fiber (optical curved forward); from the light transmission mode to a multimode optical fiber (core thick) and single-mode fiber (core wire is thinner, allowing only a patterns of light through, dispersion, loss of small, can be far transmission distance); from the material to a plastic optical fiber (very cheap), glass fiber (relatively cheap) and quartz fiber (price is expensive, small loss).

Fiber bend radius and the external diameter of the optical cable and optical cable material: plastic optical fiber dynamic bending radius is 10 times the cable diameter, static bending radius is 20times of cable diameter; glass fiber and quartz optical fiber dynamic bend radius is 12.5 times of cable diameter, static bending radius is 25times of cable diameter. So don't bend optical fiber line, so as not to block the transmission of optical signals.

X. Connection operation method

1. The single connection

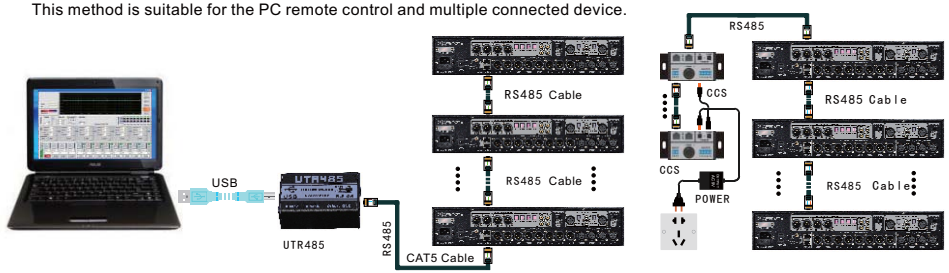
First, switch on the device. After the device switch on completely, connect the PC USB port to the device panel USB port with the USB cable as following diagram.

This method is suitable for the PC close control single device.

2. Multiple device connection

First, switch on the device. After the device switch on completely, connect the PC USB port through URT 485 transfer to the device panel USB port with the USB cable. Also can be directly through the central control system ,what is connected to control multiple devices.

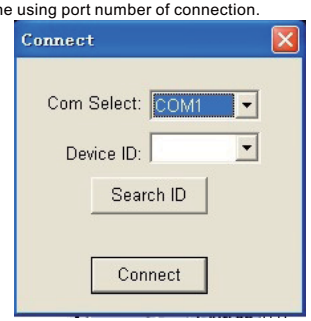
This method is suitable for the PC remote control and multiple connected device.



3.The controlling software connection method

When you open application program files on the PC, it will pop-up the main interface .Click the "connect" button.

When opening dialog box, "Serial Selection" is the option of selecting the USB cable to insert a PC USB Port. You can search the port number in the computer management of equipment (the device manager will show in the "Prolific USB-to-Serial Comm Port" .The port number after the bracket is the using port number of connection.

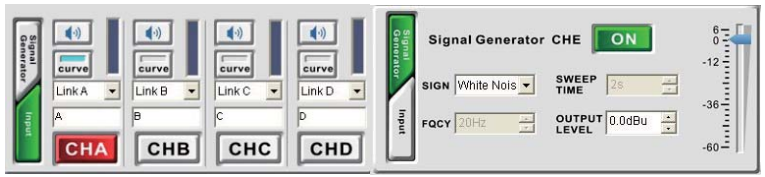


d. Connection Zone

For connecting to the equipment, ID display, program name display.

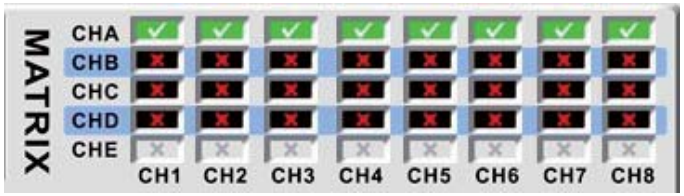
e. Input Edit and Select Zone

This section is for switching the input channels(as the diagram CHA,CHB,CHC,CHD, or the signal generator as the right diagram). You can amend the label information（A,B,C,D）on the PC.



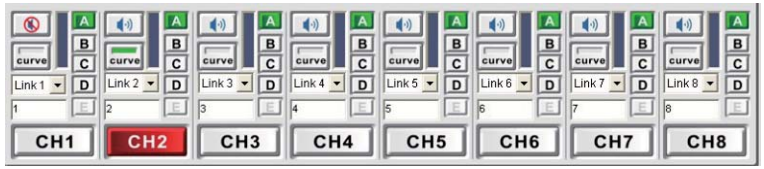
f. Matrix Zone

For selecting output channel audio . The green show as open, black show as close. And CHE is the signal generator audio source.



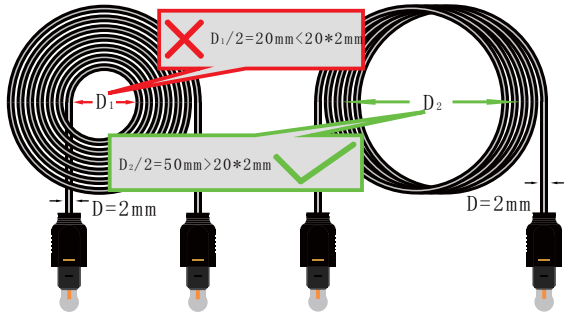
g. Output Edit and Select Zone

This section is for switching parameters between output channels.(As following diagram CH1、CH2、CH3、CH4、CH5、CH、CH7、CH8).You can amend the label information（1、2、3、4、5、6、7、8）on the PC.



h. Other Parameters Zone

Specific parameters show as following: gain, delay, Polarity, noise gate(Input only) 、frequency(Output only),compression/limit(Output only).



Be careful the direction of the optical fiber interface.

17. Coaxial output (Digital)

It provides two channels audio data by using the S/PDIF format .It is the most popular digital interface type of current market. The wire impedance is 75 Ω.

18. Input signal select switch

One switch can control two channels. Channel A and B divide into one group, channel C and D divide into one group. Other group can select analog, AES, optical fiber or coaxial signal independently.

19. Input channel (Digital)

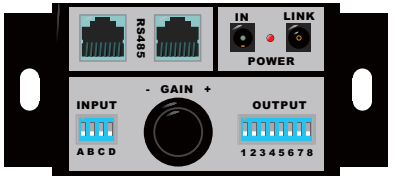
Two stereo inputs, 3 kinds of different digital input signal source socket. Please note that signal type can only select one of four (analog, AES, optical fiber, coaxial). Also you can select signal type through the "Input signal selecting switch ".

Ⅵ. URT485 Converter & Central control system

USB to RS485 Converter

- USB supply power without external power supply.
- RS485 comes with two lines half-duplex communication
- USB physical interface comes with the standard USB socket and the RS-485 comes with the standard CAT5 Cable
- Provide both Power and Signal Indicators
- Aluminum metal shell, light (65*40*25mm)
- It can work under most of the Operating Systems including the windows
- Connection Methods: USB to PC host. RS-485 end use 485 equipment connect to RJ45 type cable.RJ45 cable plug (crystal head) produce according to the Parallel lines connections. For more details, please refer to" Ⅹ Ⅲ. Wiring

Central control system, the central control system of our company's digital audio equipment for centralized control. It is applied to the multimedia classrooms, multi-purpose conference room, command and control center, intelligent home, users can use switch and encoder to control the equipment, the main features are as follows:



Central control

- Can realize a control multiple devices, can also be a device connected many center control;
- Can be arbitrarily adjusted one or several channel gain;
- Through the RS485 interface, convenient connection, long distance transmission, signal stability;

Ⅶ. Function setup introduction

1. Device power on

Insert the proper power supply, select the corresponding input source (analog, optical fiber, AES, coaxial).Switch on the power, the system will initialize. The initialization interface show as following diagram.

COLORED LCD DISPLAY

COLORED LCD DISPLAY

After the system initialize into the main interface. The interface show as following diagram. Enter the main interface, the system operation was allowed.

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The interface allows on-line operation, input/output channels edit, system setup, Program load and save (rotate the encoder on the interface directly is invalid), it shows the running program number and program name.

Before editing the input channels, first introduce operation method here: 1、A long press on the interface button can enter editing. After entering editing, you can press again(long press or short press)function key of the EQ", "DELAY", "GAIN", "POLARITY"(Output can press on "X-OVER", "LIMITER"),or press the function key "BACK" on the interface then return to main interface. Then press the rotating encoder to select the proper parameter interface. Press the encoder confirm operation; 2、You can press function key "SAVE", "LOAD", "SYSTEM" on the main interface; 3、Non interface can press "EXIT" return to the main interface.

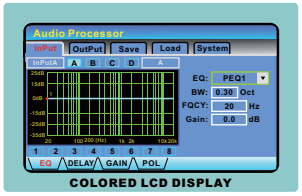
2. Input function setup

Input function key contains four key corresponding to 4 channels: CHA to CHD, short and long press is available.

(1) Short press: Mute/not mute switch. When it's mute, the button light is in red. When it's not mute, the red light stops.

(2) Long press: Can enter into the input function edit interface. When the system enter into the menu select interface, click the confirm button and rotate encoder then you can amend the parameters.

a. Input "EQ ": Long press on the above button ⑤of the button diagram. (corresponding to"CHA" button, the enter into the input channel interface, if you rotate the encoding switch ,you can select other main interface such as: output interface, save interface, load interface and system interface), then click "EQ" button to enter to the input channel A setting(the enter method is the same as channel A, here "CHA" is an example), display interface as below.



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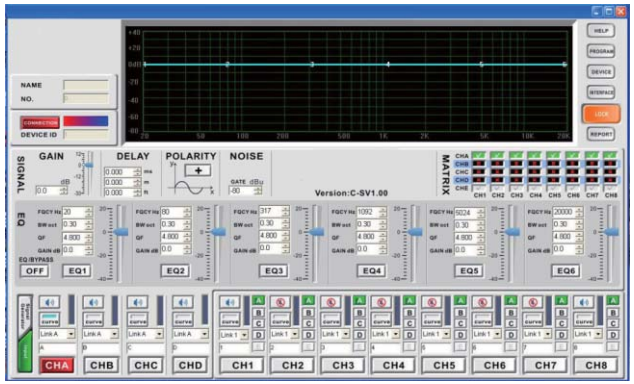
The red upper and lower left on the interface shows the current editing screen display. Above diagram shows the "EQ" interface of "INPUT"(Input have 4 interface, others like "DELAY" "GAIN" "POL",you can select by the function key. Or press "BACK"on "EQ" then select by the rotating encoder).

Ⅷ. Software interface introduction

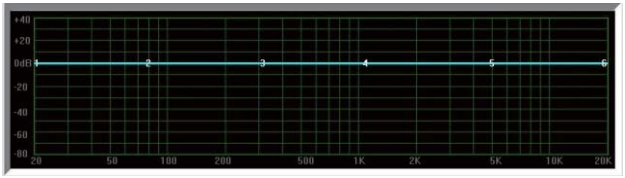
There are two types of PC software. This is for the green one; you don't need to install direct programs and common installation packages. Only double click program running (.exe suffix documents) and install according the information. After completely installation, operating programs show as following interface.



Notice: On-line operation need to install the USB drive of the enclosing CD ram. For the specific installation methods, please refer to the manual or software help menu.

a. Display Zone

Input and output equalizer parameters and frequency parameters will show clearly and directly on the interface. You can also amend the parameters with the mouse in this section.



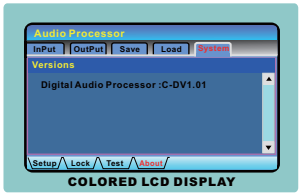
b. Equalizer Parameters Zone

Input 6 level parametric equalizer (can amend the numbers of frequency point, gain, bandwidth and Q value). Output 15 level equalizers (a high-key, a low-key, 13 period parametric equalizer).You can select the equalizing mode (under GEQ mode, frequency fixed value joint regulation).

c. Menu Zone

For program load, parameters view, help, start device setting options

d.Version : Press directly on the panel key as the above diagram③"SYSTEM" button. Then confirm with the encoder and rotate encoding switch select "About" to confirm enter into the version information. Or press the "SYSTEM" key many times (the pressing times are related to the operation before exit "SYSTEM" menu interface).The display interface show as following diagram.

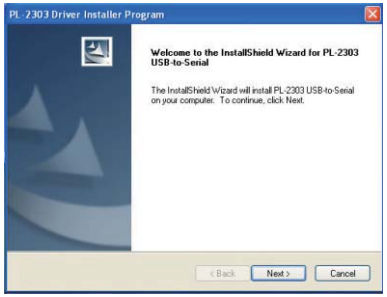


Version is related to the PC software and equipment software links. If the connection problems appear, please check the version number of the supplier or manufacturer.

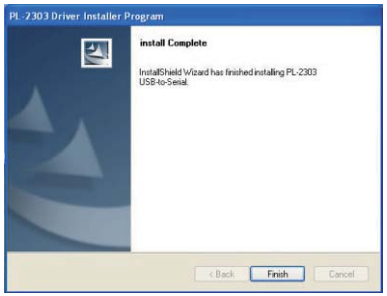
IX. USB drive installation

Search in the CD and click "PL2303_Prolific_DriverInstaller_v130. Exe", as following diagram.

After clicking, it will pop-up the following program interface.

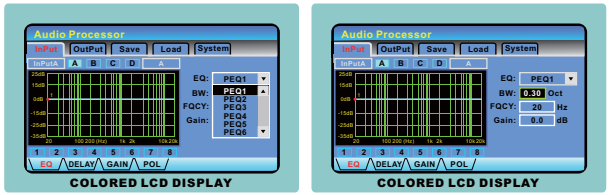


Click on the "next" until the installation is completed;

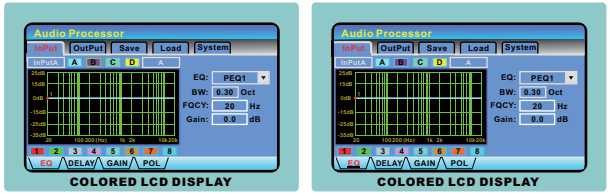


Click on the ″Finish″and finish the software installation.

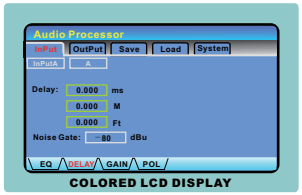
In the input "EQ" interface, you can edit any one of the bandwidth of six equalizers (0.01 Oct 3.00 Oct, step distance for 0.01 Oct), frequency point (20 Hz-20 KHz, step distance for 1 Hz), gain (40 dB-20 dB, step distance for 0.1 dB),as the following diagram.



The green frame shows the selected parameters. Press on the encoder switch then you can edit.(some pop-up the menu, others display the black white words.

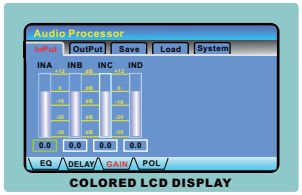


b.Input "Delay" : Long press on the above button ⑤ of the button diagram. (corresponding to"CHA" button, then enter into the input channel interface, if you rotate the encoding switch can select other main interface such as: output interface, save interface, load interface and system interface), then click "Delay" button to enter to the input channel "Delay" menu. (Or selecting input main interface then rotate the encoder switch of " DELAY "to confirm " DELAY "menu)setting.



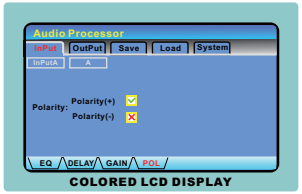
After enter into input "DELAY" interface, you can edit input channel DELAY and noise gate. Delay have three different units (ms, m and feet) to display parameters. DELAY time range: 0-1000 ms, step distance: < 10 ms ,step distance for 0.021 ms, ⩾10ms step distance for 1ms; Noise gate range: from -40 dBu to -120 dBu, 1 dBu step distance.

c.Input "GAIN": Long press on the above button ⑤ of the button diagram. (corresponding to "CHA" button, then enter into the input channel interface, if you rotate the encoding switch can select other main interface such as: output interface, save interface, load interface and system interface), then click "EQ" button to enter to the input channel A, press on the " GAIN "function keys to enter the input channel" GAIN "menu (Or after confirming enter the main menu then rotate the encoder select " GAIN " and edit)setting.



After enter into input "GAIN" interface, you can edit the input channel GAIN. Confirm directly (press on the encoder switch) or rotate it then you can amend the gain of that channel.

d. Input " Polarity " : Long press on the above button ⑤ of the diagram. (corresponding to"CHA" button, then enter to select the input channel interface, if you rotate the encoding switch can select other main interface such as: output interface, save interface, load interface and system interface), then click "EQ"button to enter to the input channel A, press on the " POLARITY "function keys to enter the input channel" POLARITY "menu (Or after confirming enter the main menu then rotate the encoder select " POLARITY " and edit)setting.



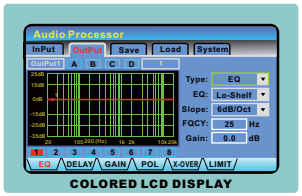
3. Output function setup

Output function key include eight keys to corresponding to 8 channels: CH1, CH2, CH3, CH5 CH4, CH7, CH8 short and long press is available.

(1) Short press: Mute/not mute switch. When it's mute, the button light is in red. When it's not mute, the red light stops.

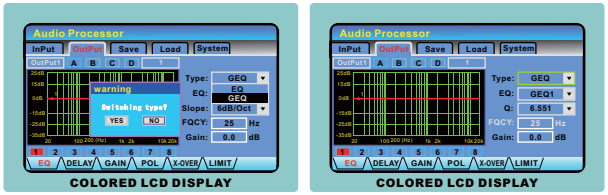
(2) Long press: Can enter into the output function edit interface. When the system enter to the menu select interface, click the confirm button and rotate encoder then you can amend the parameters.

a. Output " EQ " : Long press on the above button ⑥ of the diagram. (corresponding to "CH1" button, then enter to select the output channel interface, if you rotate encoding switch can select other main interface such as: output interface, save interface, load interface and system interface), then click "EQ" button to enter to the output "EQ" interface (the enter method is the same as CH1, as"CH1"), display interface as below.



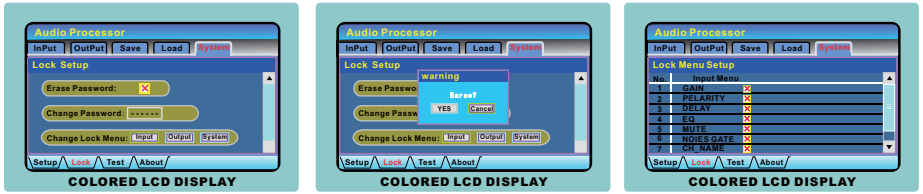
The red upper and lower left on the interface shows the current editing screen display. Above diagram shows the "EQ" interface of "OUTPUT"(output have 6 interfaces, others like "DELAY" "GAIN" "POL" “X-OVER” “LIMIT” ,you can select by the function key. Or press "BACK"on "EQ" then select by the rotating encoder).

On the Output "EQ" interface, you can edit any one of the bandwidth of 15 equalizers (0.01 Oct 3.00 Oct, step distance for 0.01 Oct ,and two of them in high low-key can only select two kinds of slope the 6 dB/Oct and 12 dB/Oct), frequency point (20 Hz-20 KHz, step distance for 1 Hz), gain (40 dB-20 dB, step distance for 0.1 dB).Different from inputs, select the EQ of output are available.(The parametric equalizer type of EQ, fixed frequency GEQ), as the following diagram.

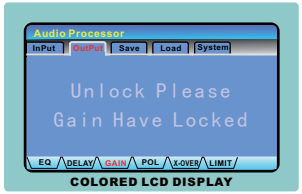


The dialog box pop-up in the diagram required the safety operation of user(as the operation data is irreversible).After selecting GEQ, the gray equalizer frequency point is invalid to adjust. Edit any of the Q value of 15 equalizer (4.233, 5.336, 6.551 optional), gain (40 dB-20 dB, step distance for 0.1dB).

After setting the password, it will enter into the related lock menu (as following left diagram).You can change the password, erase the password, lock the option menu. Without verification when you change your password. Erasing the password means cancel the lock; Change the Lock option (Change Lock Menu) after opening then enter into the option Lock Menu as the following right diagram.



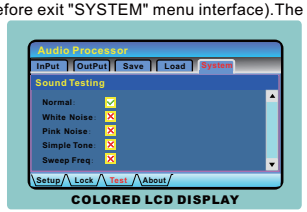
A cross show unlock. A tick show lock. After locking , corresponding option can be operated. Some corresponding menu interface blank and suggest (As CH1).If you want to operate this option, please enter the "SYSTEM" and cancel the corresponding lock option.



Function lock info: Above “Function Lock” only change in the current data, it is not saving in the device and software; When you load the data to this group, it will be changed by the load data. When you select”√” ,it means the data has locked. It can not be changed. And the function parameters and state can not be read in the current data group; When the data was saving, ”Function Lock” information will be saved automatically in this data. When you load the data next time, the setting and locked function can not be kept unlock. The data group has not named in the device is the default factory data. All functions is not locked. If you load the default factory data to he current group, all the function lock will keep “unlock”; If you lock any item in the “Function Lock” or lock the function, the report of the PC interface will lock at the same time.

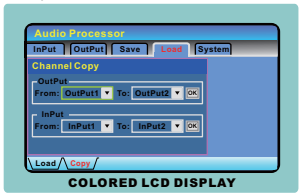
System info: Above “System Lock “content will save in the device. It will not be changed by loading data; If you select from item 1to item ;the operation is limited both in the PC software and device; If you select item 6 and 7,it only lock the related button operation on the device panel; When you save the data, “System Lock” information will not be saved in the data group.

c. Audio Test : Press directly on the panel key as the above diagram③"SYSTEM" button. Then confirm with encoder. Then rotate the encoding switch and select "Test" to confirm. And enter into audio Test or press many times on "SYSTEM" key (the pressing times are related to the operation before exit "SYSTEM" menu interface).The display interface show as following diagram.



After the system start default close all signal generator, white noise can be selected in audio testing interface (white noise generator: gain:-60 dB-+ 6 dB, step distance for 0.1 dB);pink noise (pink noise generator: gain:-60 dB-+ 6 dB, step distance for 0.1 dB), mono frequency point sound (pure tone generator: gain:-60 dB-+ 6 dB, step distance of 0.1 dB gain, frequency for 1 Hz step distance), sweep frequency sound (sweep frequency mode: gain:-60 dB-+ 6 dB, step distance for 0.1 dB, cycle: 2 s-30 s).

b. Channel copy: Press directly on the panel "LOAD" button as the above diagram ③. Then confirm with the encoder and select "Copy". Then rotate the encoding switch and select "Copy" to confirm. And enter into channel copy or press many times on " LOAD " key (the pressing times are related to the operation before exit " LOAD " menu interface).The display interface show as following diagram.



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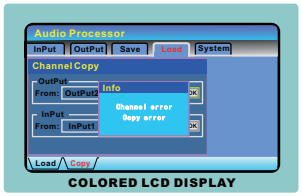
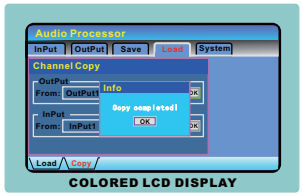
Selecting the copied channel and copy amended channel: After confirm with the encoding switch shows it was copied. When the copy channel and copied channel in the same channel ,it will have a error information. As the right diagram, when the channel was copied completed, the information will appear. As the below right diagram, please press ok.



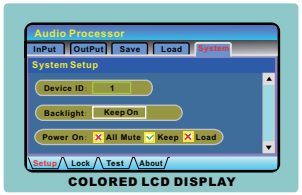
COLORED LCD DISPLAY



COLORED LCD DISPLAY

6.System

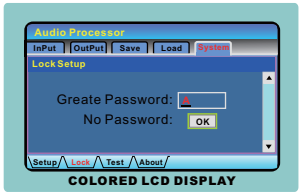
a. SYSTEM setup: Press directly on the panel "SYSTEM" button as the above diagram ③. Then confirm with the encoder and select "Setup". Then rotate the encoding switch and select "SYSTEM" to confirm. And enter into channel setup or press many times on "SYSTEM" key (the pressing times are related to the operation before exit "SYSTEM" menu interface).The display interface show as following diagram.



COLORED LCD DISPLAY

The parameters of the system Setup: Device ID number (From 0 to 250, when connect to the PC, it must correspond to the ID number. Through the 485 port on the back panel, you can connect to any piece of device of the 250 different devices); A backlight can be selected to often open (Keep On) and 60s no operation energy saving black screen. Power on the device set to Mute (All Mute), before shutdown the device set to Mute Settings (Keep State),Power on the device loading program 1 (Load).

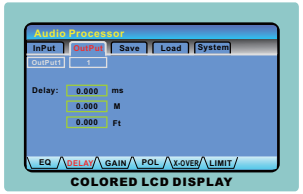
b. Function Lock: Press directly on the panel "SYSTEM" button as the above diagram ③. Then confirm with the encoder and select "Lock". Then rotate the encoding switch and select "SYSTEM" to confirm. Or press many times on "SYSTEM" key (the pressing times are related to the operation before exit "SYSTEM" menu interface).The display interface show as following diagram.



COLORED LCD DISPLAY

Function Lock has 6 numbers passwords. It includes Case Sensitivity letters, Numbers. Please remember the password. Or you have to return the device back into the factory for keep it unlock or contact to the supplier if you forget the password.

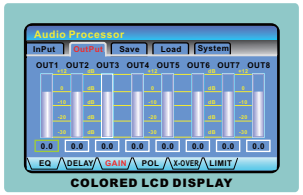
b. Output " Delay " : Long press on the above button ⑥ of the diagram. (corresponding to "CH1"button, then enter to select the output channel interface, if you rotate encoding switch can select other main interface such as: output interface, save interface, load interface and system interface), then click "Delay" button to enter to the output channel 1. (Or selecting output main interface then rotate the encoder switch of " DELAY "to confirm " DELAY "menu)setting. The interface show as following diagram.



COLORED LCD DISPLAY

After enter into input "DELAY" interface, you can edit output channel DELAY. Delay have three different units (ms, m and feet) to display parameters. DELAY time range: 0-1000 ms, step distance: < 10 ms step distance for 0.021 ms, ≥10ms step distance for 1ms.

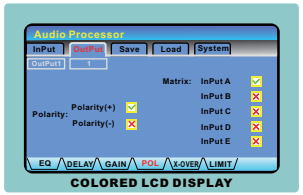
c. Output "GAIN" : Long press on the above button ⑥ of the diagram. (corresponding to"CH1" button, the enter to select the output channel interface, if you rotate the encoding switch can select other main interface such as: output interface, save interface, load interface and system interface), then click "GAIN "button to enter to the output channel 1 (Or after confirming enter the main menu then rotate the encoder select " GAIN " and edit)setting. The interface show as following diagram.



COLORED LCD DISPLAY

After enter into input "GAIN" interface, you can edit the input channel GAIN. Confirm directly(press on the encoder switch)or rotate it then you can amend the parameters of Gain. Gain range: -30-+12, step : 0.1dB

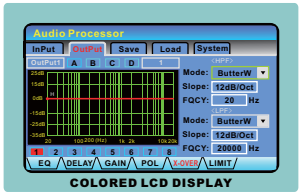
d. Output " Polarity " : Long press on the above button ⑥ of the diagram. (corresponding to"CH1" button, then enter to select the output channel interface, if you rotate the encoding switch can select other main interface such as: output interface, save interface, load interface and system interface), then click" POLARITY "button to enter to the output channel 1 (Or after confirming enter the main menu then rotate the encoder select " POLARITY " and edit)setting. The interface show as following diagram.



COLORED LCD DISPLAY

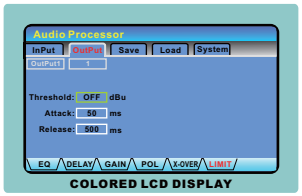
After enter the output "Polarity" interface, output channel polarity and matrix can be edited. Polarity can be adjusted its positive and negative. The matrix is the audio source. "CHE" is the signal generator. In the usual case, it cannot be opened. When you select to use the signal matrix, it will open "CHE" and other audio source will close automatically.

e. Output " X-OVER ": Long press on the above button ⑥ of the diagram. (corresponding to"CH1" button, then enter to select the output channel interface, if you rotate the encoding switch can select other main interface such as: output interface, save interface, load interface and system interface), then click "X-OVER" button to enter to the output channel 1(Or pressing on the "X-OVER" function keys to enter the output channel" Frequency "menu). The interface show as following diagram.



After enter into output "X-OVER" interface, the frequency parameters can be set in this channels. High and low pass in the main parameters :Frequency point mode Butter Worth, Bessel, Lin-Ril optional, slope 12 dB/Oct, 24 dB/Oct, 30 dB/Oct, 36 dB/Oct, 42 dB/Oct, 48 dB/Oct optional, frequency range: 20 Hz-20 KHz, step distance for 1 Hz.

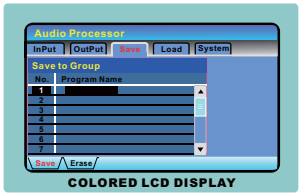
f.Output " LIMITER " : Long press the above button ⑥ of the button diagram. (corresponding to "CH1" button, the enter to select the output channel interface, if you rotate the encoding switch can select other main interface such as: output interface, save interface, load interface and system interface), then click LIMITER" button to enter to the output channel 1 (Or after confirming enter the main menu then rotate the encoder select "LIMIT" and edit)setting. The interface show as following diagram.



After entering output "LIMIT" interface, compression level can be edited (range:-40 dBu to 20 dBu, step distance: 0.1 dBu), response time (range: 0.3 ms to 200 ms, step distance: < 1 ms step distance for 0.1 ms, 1 step distance for 1 ms) and release time (range: 50 ms to 5000 ms, step distance for 1 ms).

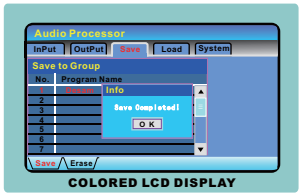
4. The program save and erase

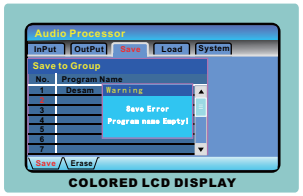
a.Program save: Press directly on the panel "SAVE" button as the above diagram ③. Then confirm with the encoder and select "SAVE". Then save the program or press many times on "SAVE" key (the pressing times are related to the operation before exit "SAVE" menu interface).The display interface show as following diagram.



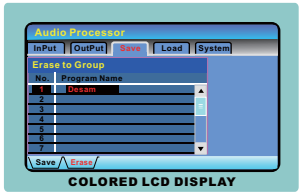
Select the saving position of the program. Confirm with the encoder and save the name of the program(Through rotate and short press encoder switch edit the name of the program "BACK" button, long press on the encoder shows program name completed. The program name allow Numbers, case sensitivity of English characters.

After long press and fill the file name, it will pop-up a completed saving dialog box as the following diagram. Please click ok. (Note: the program name cannot be empty or Spaces or it will show as the diagram.

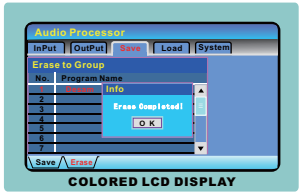




b. Program erase: Press directly on the panel "SAVE" button as the above diagram ③. Then confirm with the encoder and select "Erase". Then rotate the encoding switch and select "SAVE" to confirm. Or press many times on "SAVE" key (the pressing times are related to the operation before exit "SAVE" menu interface).The display interface show as following diagram.

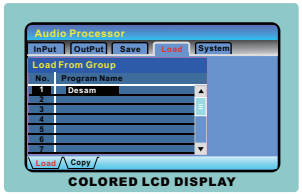


Select the position to save the erase program. After confirming with the encoder, and the program will be erased. Then the program will be empty. Default program data is the factory data. Please check the detail report of the factory data. When the program erase completed, it will appear information. Please press ok. As the following diagram.



5. Program Load and channel copy

a. Program load: Press directly on the panel "LOAD" button as the above diagram ③. Then confirm with the encoder and select "LOAD". Then rotate the encoding switch and select "LOAD" to confirm. Or press many times on "LOAD" key (the pressing times are related to the operation before exit "LOAD" menu interface).The display interface show as following diagram.



Select the loading position of the program. After confirming with the encoder, the program will be loaded. Then it will display information. As the following diagram.