AP24/AP48

Digital Audio Processor

OWNER'S MANUAL

Thank you for purchasing our products.
Please read the owner's manual thoroughly prior to using the system.
Please keep the manual for future reference.

INDEX

FUNCTIONS

- 32-bit DSP SHARC process, 48kHz sampling rate, 24-bit AD/DA convert.
- Input processing includes High-cut, Low-cut, 8 PEQ, Noise gate, Gain, Mute, Phase, Delay, Link and so on.
- Output processing includes crossover, 9 PEQ, Gain, Mute, Compressor/ Limiter, Phase, Delay, Link and so on.
- Adjustable PEQ frequency, Gain and bandwidth; we can choose style: PEAK, H-SHELF, L-SHELF, Low cut, High cut。
- Every input and output can do matrix assign flexibly, and all the input and output channel name can be changed.
- The style of all High-cut ,Low-cut filter and Distributor unit: Butterworth, Linkwitz-Riley, Bessel; slope is from -6dB/Oct to -48dB/Oct.
- Adjustable compressor/limiter threshold, ratio, attached time and release time.
- All delay module's delay time can reach over 680ms.
- Pre settings can copy for every single channel, every channel can do link adjust.
- Inside single generator(pink, white noise and 20-20K sine wave, amplitude adjustable).
- Front panel has level indicator for input/output, USB pot, RS232, 485 control at rear panel. One-key online made the operation more convenient.
- 30 user preset, device parameter and single preset file can save and recall separately. Maximal 250 units can be link together via ID settings. Password protection function for high level applications.

FRONT PANEL

① Input Level Indicators

   5-segment high precision LED show the situation of current input channel's level.

② Input Edit Keys

   Press to enter into relevant channel, parameters will show on the edit key and LCD.

③ Input Mute Keys

   Mute channel by pressing and exit by pressing again.

④ Parameter edit keys

   Choose all the system menu/input parameter/output parameter, exit by pressing "exit" key.

⑤ LCD

   Show all the related operation parameter and status of current operation.

⑥ Parameter Edit Knob

   Edit the whole menu and parameter setting confirm by press.

⑦ Output Level Indicators

4-segment high precision LED and1 compressor signal LED shows the status of output level and compressor on current channel.

⑧ Output Mute Keys

Mute channel by pressing and exit by pressing again.

⑨ Output Edit Keys

Press to enter into relevant channel edit status parameter will show on the edit, Key and LCD.

⑩ USB

Used to connect with PC and center-control equipment, remote control.

REAR PANEL
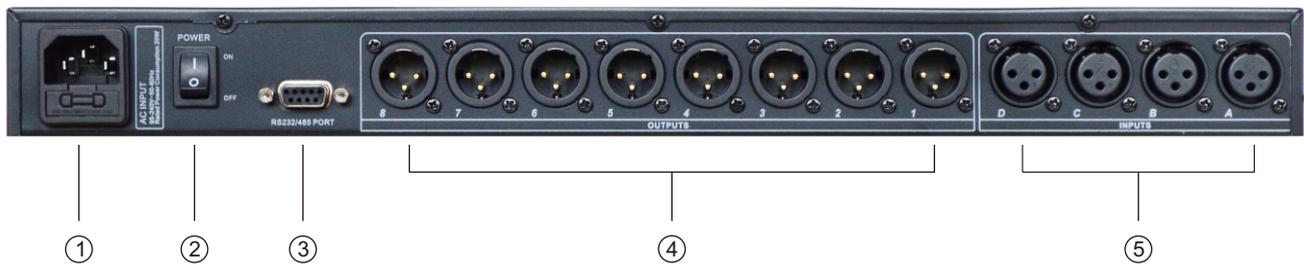
① Power Socket

The voltage is 95V-240V.

② Power on/off Switch

③ RS232/485 interface

Center-control by RS232, cascade control by RS485.

④ Output interface

Male XLR balanced output 1-8.

⑤ Signal input interface

Female XLR balanced input A-D.

OPERATION GUIDANCE

| Below status after power on:	
SOUNDKING AP48 VERSION 1.0	Power on, show brand, model and version.
Soundking AP48 F00 Default Preset	After self-check, show brand, model and current user preset.
Press UTIL key, enter below setting status	
ID Number Select ID: 1	Press UTIL key one time, enter ID number setting: the ID number of the units, should be different when cas cade connection, the setting scale is1-254. (If cas cade connection units are over 16 or long distance, a loaded 120 ohms resistance should be parallel connected by RS 485.
Unit unlock Password 1234	Press DOWN key one time, enter password setting: users can choose all the words or numbers to set the password they want, the initial password is "1234".

LOCK Select OFF	Press DOWN key two times, enter password memory setting way. OFF mains that password does not memory. It can operate the panel follow-up afterunlocking the passesword at first time. ON mains that password memory. It always needs to unlock the password when open the unit every time.
In Source Select ANALOG INPUT	Press DOWN key three times, enter signal source selection: pink noise, white noise and sine wave 20Hz-20kHz.
Copy CH select InA ► InB	Press DOWN key four times, enter copy channel selection: input or output channel can copy freely.
LCD DISPLAY TIME 10 Second	Press DOWN key five times, enter delay unit setting: ms, m, ft can be chosen.
Press RECALL/SAVE key, enter below setting status	
Load preset F00 Default Preset	Press RECALL key, enter preset transfer. Users can transfer the saved Settings U01-U30 and the initial setting F00.
Store preset U01 Default Preset	Press SAVE key, enter preset save. Users can save the adjust status in U01-U30. Attention that the F00 factory preset can't save.
Press INPUT EDIT enter the settings as follows	
GAIN INA -60.0dB	Default preferred option is gain the scale is -60dB-+12dB.
PEQ:1 INA G: 0.0 FREQ: 50.7 BY Q: 3.00 TYPE: PEAK □	Press DOWN key one time enter PEQ parameter setting PEQ current filter number Is 8 ,the scale of "F" is 20Hz-20kHz, "Q" is 0.4-128, "G" is -12dB - +12dB, the style of filter are Peak, Low-shelf, High-shelf, Low-cut, High-cut, Allpass1, Allpass2, Bypass(ON/OFF).
HI & LOW - PASS INA HP: 19.6 BYPASS LP: 20K15 BYPASS	Press DOWN key two times enter low-high pass parameter setting, the scale of the "HP" is 20Hz -20kHz, "LP" is 20Hz -20kHz, 3 different slanting rate for low/ high pass filter Butterworth, Bessel, Linkwitz−Riley, Slanting rate is -6dB--48dB.
DELAY INA 0.000ms 0.000m 0.000ft	Press DOWN key three times, enter delay parameter setting: the scale is 0-680mS, 0-234m, 0-769ft.
PHASE INA 0: ☑ 180: □	Press DOWN key four times, enter phasic adjust setting, adjustment scale is (0/180).
IN-LINK INA A: ☑ B: □ C: □ D: □	Press DOWN key five times, enter linking adjustment selection: If the current channel is INA, you can choose INB, INC, IND channel to adjust parameter simultaneously, together.
Press OUTPUT EDIT enter the settings as follow	
GAIN OUT1 +0.0dB	Default preferred option is gain, the scale is- 60dB--12dB.

PEQ: 1 OUT1 G:0.0 FREQ:40.2 BY Q:3.00 YPTE: PEAK ☐	Press DOWN key one time, enter PEQ PARAMETER SETTING: "PEQ" current number is 9, the scale of "F" is 20Hz-20kHz, "Q" is 0. 4-128 "G" is -12dB - +12dB, the style of filter are Peak, Low-shelf, High-shelf, High-cut, Low-cut, Allpass1, Allpass2, Bypass(ON/OFF).
HI&LOW-PASS OUT1 HP: 19.6 BYPASS LP: 20K15 BYPASS	Press DOWN key two times, enter low-high pass parameter setting: the scale of "HP" is 20Hz-20kHz, "LP" is 20Hz- 20kHz, 3 different slanting rate for low/high pass filter：Butterworth, Bessel, Linkwitz−Riley, Slanting rate is -6dB--48dB.
MATRIX OUT1 A:☑ B:☐ C:☐ D:☐	Press DOWN key three times, enter matrix setting, all the output channel can choose one or several input signal freely.
DELAY OUT1 0.000ms 0.000m 0.000ft	Press DOWN key four times,enter delay parameter setting: the scale is 0-680 mS, 0-234m, 0-769ft .
PHASE OUT1 0: ☑ 180: ☐	Press DOWN key five times, enter phase parameter setting: the scale is °0/180°.
COMPRESSOR OUT1 TH:+20.0 RAT:1.0 AT: 50ms REL: 500ms	Press DOWN key six times, enter compressor setting: the scale of threshold is -60dB ~+20dB, startup time is 1-999ms, attached time is 10-3000ms, ratio is 1:1, 1:10-LIMIT..
OUTLINK OUT1 1:☑ 2:☐ 3:☐ 4:☐ 5:☐ 6:☐ 7:☐ 8:☐	Press DOWN key seven times, enter linking adjustment: select the corresponding channel can adjust the parameters.

PC SOFTWARE ONLINE SPECIFICATION

Notice: User manual, PC software are on the attached CD, due to the software upgrades time by time, Please do control your DSP processor ONLY by this CD!

USB connection steps

DSP Processor

USB cord

PC or Laptop
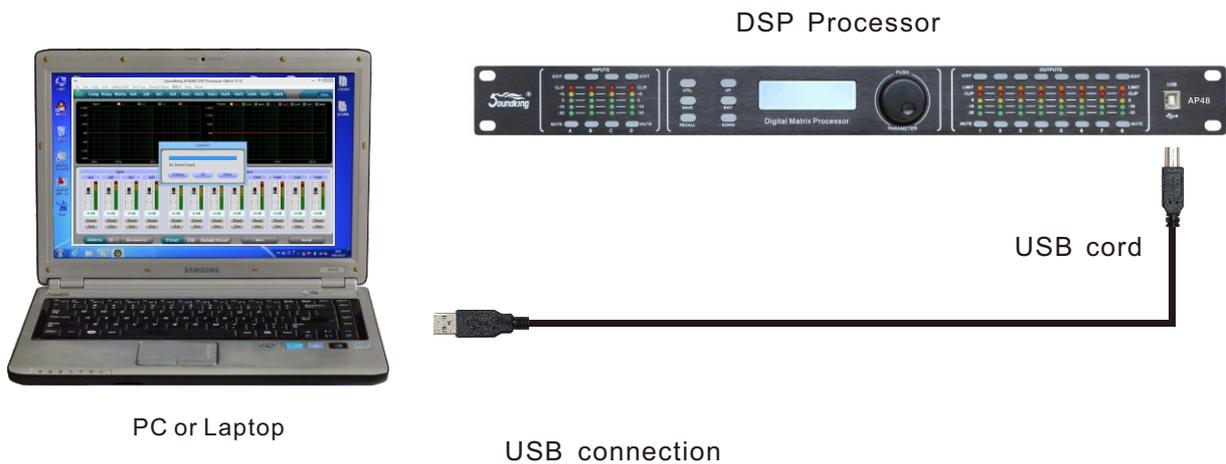
USB connection

1, Click the PC software on the CD, press next step to continue according to the instruction until Finish setup, then exit.

2, Connect the processor to the computer by USB, after turning on the device, the computer will searching new hardware automatically, during setup new hardware there will show the. Warnings: hardware setup success and can be used.

3, Open PC controlling software, PC software will find USB and connect device, after that the on-Line key change into green at the top right corner and show "Online" , you can operate the Processor by controlling software, Click "Online" button before exit.
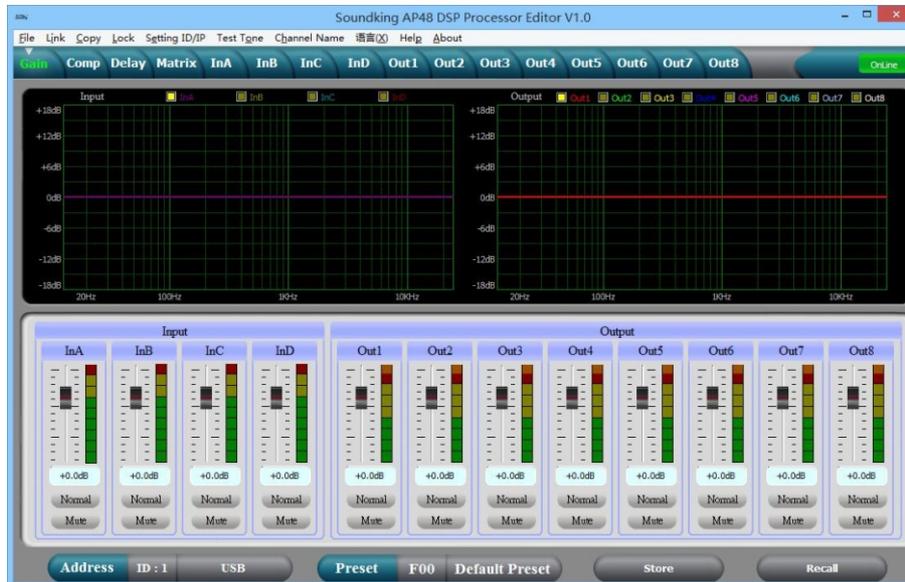
PC SOFTWARE INTERFACE SPECIFICATIONS

THE FIRST: VOLUME CONTROL INTERFACE

1, Menu

File	Open and save preset parameter, the whole date upload to the computer and download to the device.
Link	Input and output channels can be set freely to adjust all of the parameters.
Copy	Parameter copy freely between the input and Output channels.
Lock	Setting password of the panel to ensure the safety of the device.
Setting ID	To cascade control more than 255 device by setting different ID.
Test Tone	Buid-in signal generator, outputting pink noise, white noise and sine wave.
Channel Name	The whole channel name are revisable.
Language	Chinese and English menu is switchable.
Help	RS232 control protocol codes for reference.

2, Spectrum Area:
   You can choose PEQ and phase freely which show the input andoutput channels.
3, The Volume Control Area:
   Gain, Phase, Mute control for all input & output channels.
4, Preset Operation Area:
   Save or convert preset parameter and show current preset parameter status.

THE SECOND : COMPRESSOR INTERFACE
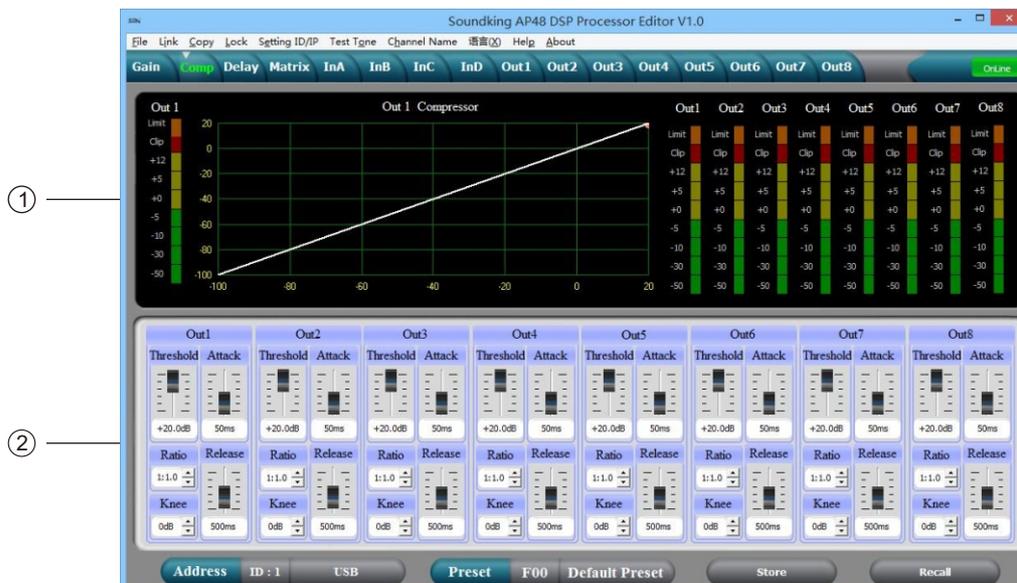
1, Show compression status, level indicators and impression status of all channels.
2, Set the whole compression parameters for output channel, the compression range is -60dB–+20dB, rate is 1:1, 1:10, LIMIT, start time is: 0-200ms, recovery time is 0-999ms.
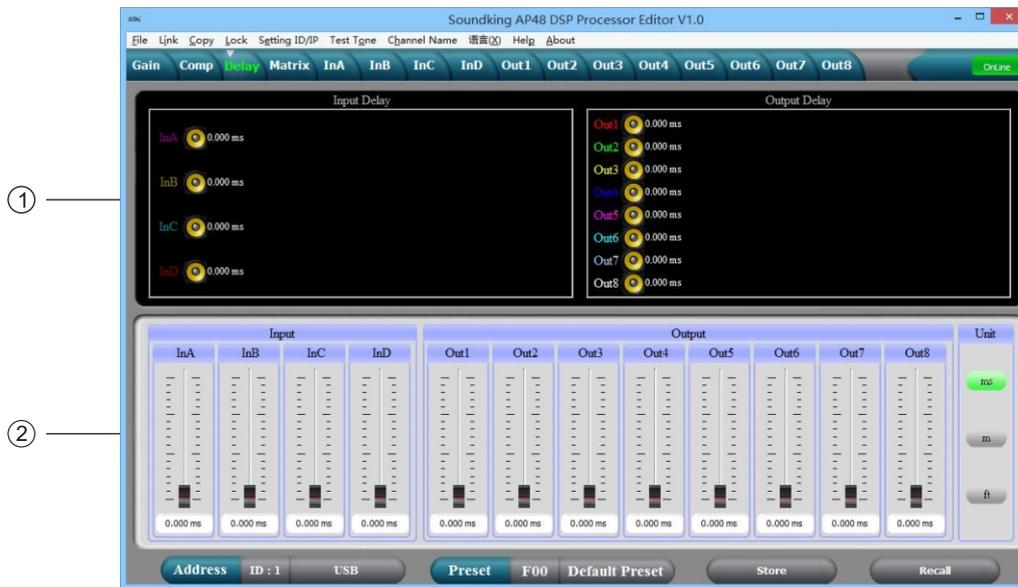
THE FIFTH: INPUT INTERFACE

1, Display the current channel PEQ curve graph, can change each PEQ point frequency and gain through the mouse, and also can change the high/low cut frequency point.

2, Adjustable Gain, Mute, Q , Frequency, Type of all PEQ, Bypass key is optional, we can choose PEQ style: Balance, High-shelf, Low-shelf, High-cut, Low-cu.

3, The Gain, Q, Frequency of PEQ can be adjusted by putter, and can be controlled by pressing the UP, DOWN, LEFT, RIGHT key on the keyboard.

4, Low-cut frequency 20HZ-20KHZ is adjustable, you can choose slope rate: Butterworth, Bessel, Linkwitz-Riley, the scale is: -6dB-- -48dB.

5, High-cut frequency 20HZ-20KHZ is adjustable, you can choose slope rate : Butterworth, Bessel, Linkwitz-Riley, the scale is: -6dB-- -48dB.

6, The Gain, Mute, Phase of the input channel can control separately, as same as the level display Light.

THE SIXTH: OUTPUT INTERFACE

1, Display the current channel PEQ curve graph, can change each PEQ point frequency and gain through the mouse, and also can change the high/low cut frequency point.

2, Adjustable Gain, Mute, Q , Frequency, Type of all PEQ, Bypass key is optional, we can choose PEQ style: Balance, High-shelf, Low-shelf, High-cut, Low-cut.

3, The Gain, Q, Frequency of PEQ can be adjusted by putter, and can be controlled by pressing the UP, DOWN, LEFT, RIGHT key on the keyboard.

4, Low-cut frequency 20HZ-20KHZ is adjustable, you can choose slope rate: Butterworth, Bessel, Linkwitz-Riley, the scale is:-6dB-- -48dB

5, High-cut frequency 20HZ-20KHZ is adjustable, you can choose slope rate : Butterworth, Bessel, Linkwitz-Riley, the scale is:-6dB-- -48dB.

6, The Gain, Mute, Phase of the output channel can control separately, as same as the level display light.

SPECIFICATION

System Specification	Frequency Response	20Hz~20kHz, +/-0.3dBu
	Dynamic Range	>110 dBu
	Distortion（THD）	≤0. 01% at 1kHz（0dBu）
	Cross-talk	>70dBu 20Hz~20kHz
	C.M.R.R	>75dBu 1kHz
Input Section	Type	Balanced XLR
	Max. Input Level	+15dBu
	Impedance	≥8kΩ
Output Section	Type	Balanced XLR
	Max. Output Level	+15dBu
	Impedance	≤50Ω
Digital Processing	24-bit sigma - delta A/D, D/A convert	
	32 bit DSP, 48kHz Sampling Rates	
Display	Dot matrix screen display current Parameters and all Setting	
Power Supply	AC~95V-250V 50/60Hz	
Dimension（LxWxH）	48.2x20.5x4.4CM	
Weight	2. 3kg	

ACCESSORIES

1, CD (Include PC software and user's manual).

2, One USB cord.

3, One electrical cord.

REAR PANEL CONTROL PORT CONNECTION

1, RS232 connection port: Central control and connect to PC through RS232 port.

The 2PIN is: TXD, 3PIN is:RXD, 5PIN is: GND

RS232/USB CONVERTER

PC or laptop

2, RS485 cascade contro port: Parallel connect several devices by RS485, you can choose different ID to cascade control separately.

PC or laptop

(1), Connect several devices by cascading 7PIN and 8PIN of the RS232 port, connect the computer through
(2), RS485 converted RS232 switch, Cascade controllable several devices after setting the different ID.

ID : 1

ID : 2

ID : 3

The 7PIN is: RS485 D+ , 8PIN is: RS485 D- of the RS232 port.
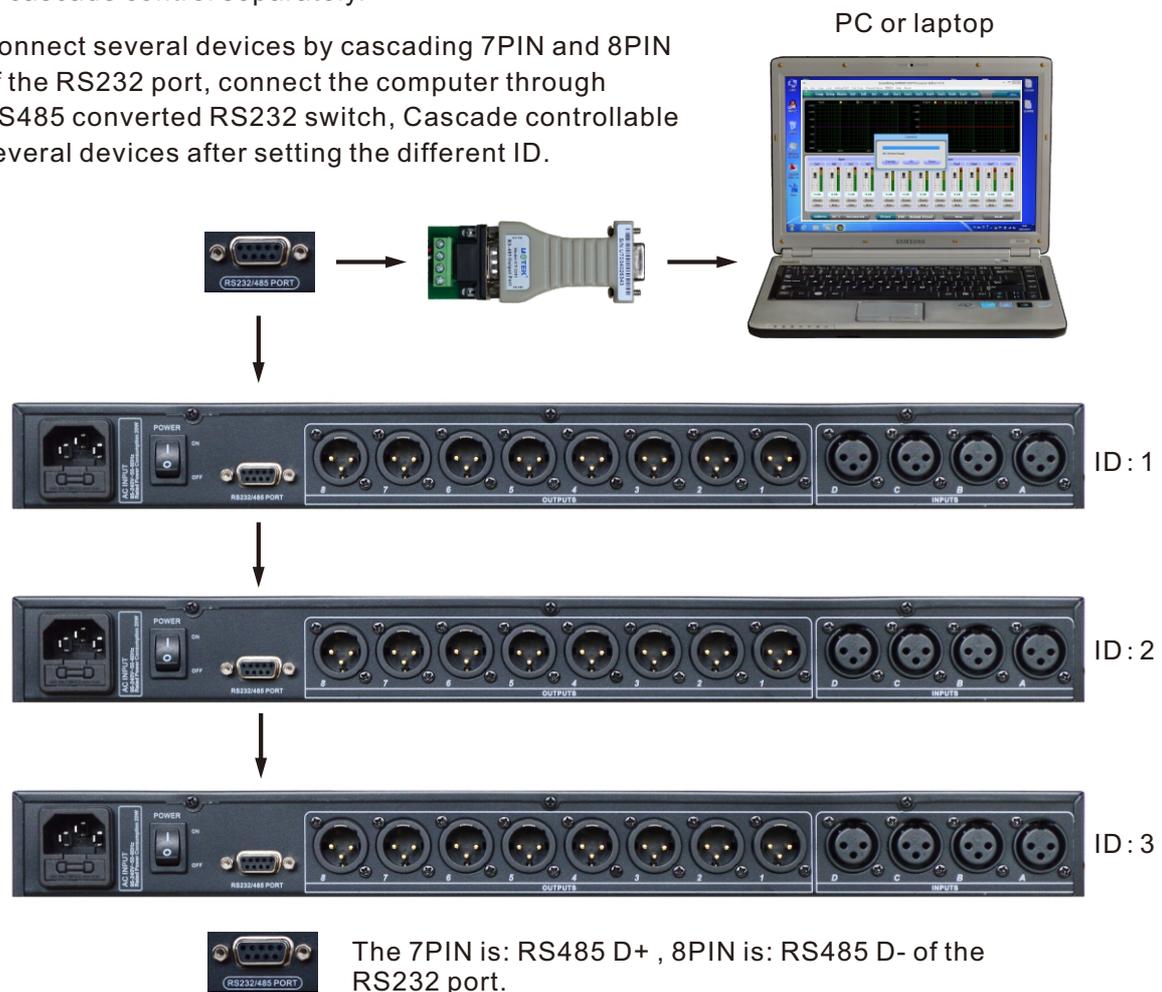
EXTEND REMOTE CONTROL PROTOCOL

1, Control package Format

	0	1	2	3	4	5	6	7	8
	DLE	STX	Device Assress	CMD	Data1	Data2	Date3	STX	DLE
Packet	0x7B	0x7D	1~254	0x41~0x4A	0x??	0x??	0x??	0x7D	0x7B

2, Command Detail

(1) Gain Control(0x41)

	0	1	2	3	4	5	6	7	8
	DLE	STX	Device Assress	CMD	In/Out	Channel	+/-	STX	DLE
Packet	0x7B	0x7D	1~254	0x41	In:0 Out:1	0~3	+:0, -:1	0x7D	0x7B

Example (increase input channel 1 gain): 7B7D01410000007D7B

(2) Mute Control(0x42)

	0	1	2	3	4	5	6	7	8
	DLE	STX	Device Assress	CMD	In/Out	Channel	No/Yes	STX	DLE
Packet	0x7B	0x7D	1~254	0x42	In:0 Out:1	0~3	No:0 Yes:1	0x7D	0x7B

Example (input channel 1 mute): 7B7D01420000017D7B

(3)Load Preset Control(0x43)

	0	1	2	3	4	5	6	7	8
	DLE	STX	Device Assress	CMD	Factory/User	Preset	0x30	STX	DLE
Packet	0x7B	0x7D	1~254	0x43	F:0 U:1	0~31	0	0x7D	0x7B

Example (recall user preset U00):7B7D01430100007D7B

（4）Input Volume Control（0x44）

	0	1	2	3	4	5	6	7	8
	DLE	STX	Device Assress	CMD	Channel	HI-VOL	LO-VOL	STX	DLE
Packet	0x7B	0x7D	1～254	0x44	00～07	0x??	0x??	0x7D	0x7B

Example（InA volume +0. 0dB）：7B7D01440001187D7B

（5）Output Volume Control（0x45）

	0	1	2	3	4	5	6	7	8
	DLE	STX	Device Assress	CMD	Channel	HI-VOL	LO-VOL	STX	DLE
Packet	0x7B	0x7D	1～254	0x45	00～07	0x??	0x??	0x7D	0x7B

Example（Out2 volume -3. 0dB）：7B7D01450100FA7D7B

（6）Get Now Gain(0x48)

	0	1	2	3	4	5	6	7	8
	DLE	STX	Device Assress	CMD	In/Out	Channel	0x30	STX	DLE
Packet	0x7B	0x7D	1～254	0x48	In：0 Out：1	0～3	0	0x7D	0x7B

Example (read input channel 1 gain parameter):7B7D01480000007D7B
MCU Return:0x00～0x90=-60dB～+12dB,0.5dB/Step

（7）Get Now Mute(0x49)

	0	1	2	3	4	5	6	7	8
	DLE	STX	Device Assress	CMD	In/Out	Channel	0x30	STX	DLE
Packet	0x7B	0x7D	1～254	0x49	In：0 Out：1	0～3	0	0x7D	0x7B

Example (read input channel 1 mute parameter):7B7D01490000007D7B
MCU Return：0x00 or 0x01=Un-Mute or Mute

(8) Get Now Preset(0x4A)

	0	1	2	3	4	5	6	7	8
	DLE	STX	Device Assress	CMD	0x30	0x30	0x30	STX	DLE
Packet	0x7B	0x7D	1~254	0x4A	0	0	0	0x7D	0x7B

Example (read preset parameter):7B7D014A0000007D7B

MCU Return：0x00~0x32＝0：F00, 1~32:U00~U31

Communication parameter	Bits per second	115200	Stop bits	1
	Data bits	8	Step	>=20ms
	Parity	None	ID	1

SAFETY INSTRUCTION

PLEASE READ THESE SAFETY MATTERS CAREFULLY BEFORE USE：

• This product must make sure connect to the ground correctly. If it has broken down, to avoid any electric shock, the device power cord and plug both equipped safety ground connection. The power cord should according to the requirement to install and ground connection.
  Warning: Incorrect ground connection might be caused electric shock happen!
  If you have any inquiry about the ground connection, please let qualified people checking it or fix it，do not change it by yourself. If the power plug is unsuitable, you can entrust electrician or professional staff to install the suitable power plug.

• To avoid the risk of injury, please close supervision when using the product near child.

• Please do not use the device at wet place, such as: near bathtub, washbasin, kitchen sink, wet basement or near swimming pool and lake.

• It should not be placed near the device which filled with liquids such as the vase.

• This product should install at draughty place or dry environment.

• The power source type must be match to the operation instruction or the volts type which on the product.

• The product must keep away from heat source, such as: electric heater, electric blanket or other heat source products.

• The product equipped one power cord that complied with safety certification. If you can't insert the power cord into the plug, please contact electrician or professional staff to change the old plug. Attention that should not break the power plug safety device.

• If the product not for operation for a long time. Please pull out the power cord from power plug. Don't drag the power cord

• This product use coupler as a make and break device, should be maintained convenient operation

• Please don't operate the product when following things opened, should call qualified people checking it or fix it:
  A.Power cord damaged.
  B.Objects or liquid get into the product.
  C.The product is sopping with rain.
  D.The product can not operate correctly or show obvious unusual.
  E.The product dropped down, damaged.

• Any inquiries about the product which not mentioned in the user manuals, please contact the eligible electrician or professional staff to repair.

● **Only apply to security use which area below altitude of 2000m.**

● **Only apply to security use which condition except tropical climate.**

Pay attention to the dangerous voltage of the insulation within the products. It may be considerable damage to human body.

Important Notices and Operation Instructions.

CAUTION

To avoid the electric shock, should not open it

Caution: to avoid electric shock, please don't remove the bottom. If it has any problems should not repair it by yourself, please entrust professional staff to repair it.

WARNING:
Please do not let the heavy extrusion or stamp on the power cord, avoid by all pull or distort the power cord.
To avoid the risk of fire or electric shock, please do not use unqualified power cord.