

# SC SERIES

## Digital System Processor

### OPERATING MANUAL AND USER GUIDE

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# IMPORTANT WARNINGS & SAFETY INSTRUCTIONS

1. Read these instructions
2. Follow all instructions
3. Keep these instructions
4. Heed all warnings
5. Do not use this apparatus near water
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of a polarised or grounding plug. A polarised plug has two blades with one wider than the other. A grounding plug has two blades and a third grounding blade. The wide blade or the third blade is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched, particularly at the plug, receptacle and or the point where it exits from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Only use a stand, tripod, bracket or rack specified by the manufacturer, or sold with the apparatus. When a rack is used, use caution when moving the rack and apparatus combination to avoid tip-over or injury.




13. Unplug the apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified personnel. Servicing is required when the apparatus has been damaged in any way including but not limited to power supply cord or plug damage, liquid ingress, foreign objects in the chassis, exposure to rain/moisture or impact damage. In addition the unit must be serviced when you experience any abnormal operation.
15. CAUTION: These servicing instructions are for use by qualified service personnel only. To reduce the risk of electric shock, do not attempt to perform any servicing other than that contained in the operating instructions unless you are qualified to do so. In addition opening the casing will result in your warranty becoming null and void.
16. Do not install this apparatus in a confined space such as a book case or similar unit. Good ventilation should be maintained around the apparatus. Any vents, air-inlets or fans should not be obstructed by objects such as paper, table-cloths, curtains etc.
17. WARNING: To reduce the risk of fire or electric shock, do not expose the apparatus to rain or moisture. The apparatus should not be exposed to dripping or splashing and objects filled with liquids, such as vases, should not be placed on the apparatus.
18. WARNING: The mains plug/appliance coupler is used as a disconnect device, the disconnect device shall remain readily operable.



19. The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of non-insulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock.
  - Warning: To reduce the risk of electric shock, do not remove the cover (or back) as there are no user-serviceable parts inside. Refer servicing to qualified personnel.
  - The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance instructions in the literature accompanying the appliance.
20.  (Protective earthing terminal) The apparatus should be connected to a mains socket outlet with a protective earthing connection.



21.  Correct Disposal of this product. This marking indicates that this product should not be disposed with other household wastes throughout the EU. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use local return and collection systems or contact the retailer where the product was purchased. They can take this product for safe environmentally friendly recycling.

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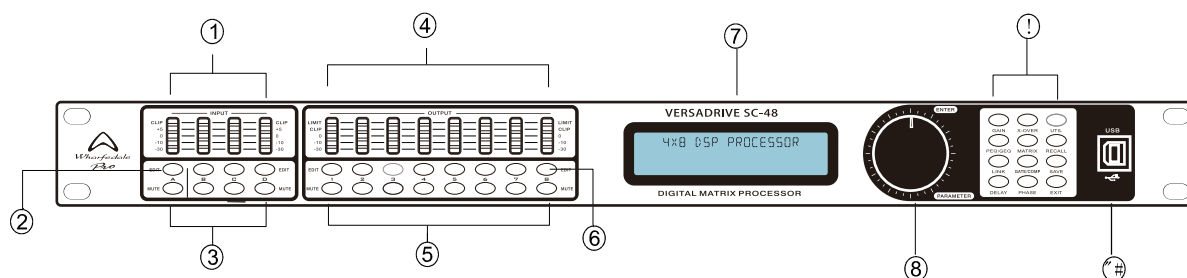
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## FUNCTIONS

- 96kHz sampling rate, 40-bit DSP processor, 24-bit AD/DA convertor.
- Input processing includes Gain, Mute, Link, High-cut, Low-cut, Noise gate, 8PEQ, 31 segment graphic equalizer, Phase, Delay.
- Output processing includes Crossover, 9PEQ, Gain, Mute, Compressor/Limiter, Phase, Delay, Link.
- Every input and output can do matrix assign freely.
- Adjustable PEQ frequency, Gain and Bandwidth, the gain step is 0.1dB, we can choose style: Peak, H-shelf, L-shelf, LP-6dB, LP-12dB, HP-6dB, HP-12dB, ALLPASS1, ALLPASS2.
- The style of all High-cut, Low-cut filter and Distributor Unit: Butterworth, Linkwitz- Riley, Bessel, Slope is-6dB/oct ~-48dB/oct.
- Adjustable compressor/limiter threshold, soft knee, ratio, attack time and release time. Noise gate's threshold, hold time, attack time and release time can be adjustment.
- The parameters of input and output adjusting are linkable, revisable input and output channels.
- All delay module's delay time can reach over 680ms the step is: 0.021ms.
- Parameter setting of each channel can copy freely, build-in signal generator.
- Input and Output on the front panel are equipped with 5-segment high precision level indicators, key indicators, security protection function.
- 32 user preset, 1 factory preset, device parameter and single preset file can save in computer; it also can download from computer and save in the device. The device itself can store multiple preset parameters and recall freely. With PC software, one-key online made the operation more convenient.
- USB and RS232 controlling ports, Online remote control and 255 units linkable through Rs485, and also can realize wired and wireless connection controlled in long distant through port.

## 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, Output Level Indicators  
4-segment high precision LED and 1 compressor signal LED shows the status of output level and compressor on current channel.
- 5, Output Mute Keys  
Mute channel by pressing and exit by pressing again.
- 6, Output Edit Keys  
Press to enter into relevant channel edit status parameter will show on the edit, Key and LCD.

7, LCD

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

8, Parameter Edit Knob

Edit the whole menu and parameter setting confirm by press.

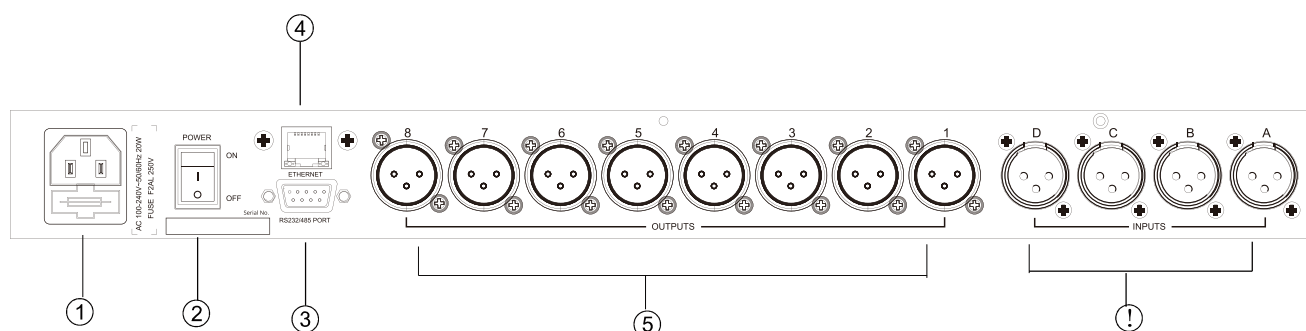
9, Parameter edit keys

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

10, USB

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

**REAR PANEL**



1, Power Socket

The voltage is 95V-250V.

2, Power on/off Switch

3, RS232/485 interface

Center-control by RS232, cascade control by RS485.

4, Ethernet control interface, achieve long-distance control by wire or WIFI

5, Output interface

Male XLR balanced output 1-8.

6, Signal input interface

Female XLR balanced input A-D.

**OPERATION GUIDANCE**

Below status after power on:	
<pre>!!!!!!!"#\$%&amp;!!!!'()* !!!!!!+,-./01-20!3.4</pre>	Power on, show brand, model and version.
<pre>!!!!!!!!!!!!!"#\$%&amp; 56 ( 7 0/- 8 2 3. 0: 09</pre>	After self-check, show brand, model and current user preset.
	Press UTIL key, enter below setting status
<pre>ID Number Select ID 1</pre>	Press the first 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.

Manual IP Setting 192.168.1.101	Press the second time, enter IP address setting: factory default is 192.168.1.101 , users can set different IP address for each device for different applications.
Unit Lock Password 1234	Press the third time, enter password setting: users can choose all the words or numbers to set the password they want, the initial password is 1234.
Input Source Select Analog Input	Press the fourth time, enter signal source selection: pink noise, white noise and sine wave 20Hz-20kHz.
Copy channel select InA ► InB	Press the fifth time, enter copy channel selection: input or output channel can copy freely.
Delay Units Select ms	Press the sixth time, 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-U20 and the initial setting F00.
Store preset U01 Default Preset	Press SAVE key, enter preset save. Users can save the adjust status in U01-U20.
Press INPUT EDIT enter the settings as follows	
INA GAIN -60.0dB	Default preferred option is gain the scale is -60dB-+12dB.
PEQ:1 F: 50.7 Q:3.00 G: 0.0dB PEAK ON	Press PEQ/GEQ 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).
GEQ:1 Freq: 20.0Hz GAIN: 50.0dB	Press the second time "PEQ/GEQ" key, enter Graphic Equalizer parameter setting interface: 31 GEQ in each input channel. Freq adjustment scale is 20Hz-20kHz, GAIN adjustment scale is -12dB---+12dB.
INLINK A: ✓ B: X C: X ID: X	Press "LINK", enter linking adjustment selection: If the current channel is INA, you can choose INB, INC, IND channel to adjust parameter simultaneously, together.
INA DELAY 0.000ms	Press "DELAY", enter delay parameter setting: the scale is 0-680mS, 0-234m, 0-766ft.
HP: 19.6 BYPASS LP: 20K15 BYPASS	Press "X-OVER" 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.
GATE T: -90.0 HT: 100 AT: 1ms RT: 100ms	Press "COMP/GATE" key, enter Input channel noise gate parameter interface: noise gate threshold "T" scale is -90-0dB, hold time "HT" adjustment scale is 10-999ms, attached time "AT" scale is 1-999ms, release time "RT" scale is 10-3000ms.
INA PHASE 0	Press "PHASE", enter phasic adjust setting, adjustment scale is (0/180).

Press OUTPUT EDIT enter the settings as follow	
OUT1 GAIN            +0.0dB	Default preferred option is gain, the scale is- 60dB--12dB.
PEQ: 1 F: 40.2 Q: 3.00 G: 0.0dB      PEAK ON	Press "PEQ", 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).
OUTLINK 1:√ 2:X 3:X 4:X 5:X 6:X 7:X 8:X	Press "LINK", enter linking adjustment selection: if the current channel is "OUT1", you can choose OUT2, OUT3, OUT4, OUT5, OUT6, OUT7, OUT8 channel to adjust parameter simultaneously.
OUT1 DEALY          0.000ms	Press "DELAY" enter delay parameter setting: the scale is 0-680mS, 0-234m, 0-766ft .
HP: 19.6      BYPASS LP: 20K15    BYPASS	Press "X-OVER" 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.
OUT1 MATRIX SELECT A:√ B:X C:X D:X	Press "MATRIX" enter matrix setting, all the output channel can choose one or several input signal freely.
OUT1 A: +0.0 B: +0.0 MIX C: +0.0 D: +0.0	Press the second time "MATRIX" key, enter matrix route output gain interface: factory default is 0dB, adjustment scale is -60dB-0dB.
COMP TH: +20.0 R: 1.0 K: 0dB A: 50 RT: 1500	Press "COMP/GATE" enter compressor setting: the scale of threshold is -60dB~ +12dB, startup time is 1-999ms, attached time is 10-3000ms, ratio is 1:1, 1:10-LIMIT.
LIMIT TH: +20.0dB AT: 50ms RT: 500ms	Press the second time "COMP/GATE" key enter peak limiter parameter interface: threshold "T" adjustment scale is -90dB-+20dB, attached time "AT" adjustment scale is 1-999ms, release time "RT" adjustment scale is 10-3000ms.
OUT1 PHASE            0	Press "PHASE" enter phase parameter setting: the scale is 0/180.





- 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 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/IP	To cascade control more than 254 device by setting different ID, Setting ID/IP address for Long- distance and wireless WIFI control.
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 and output channels.

#### 3, The Volume Control Area:

Gain, Phase, Mute control for all input & output channels.

#### 4, Preset Operation Area:

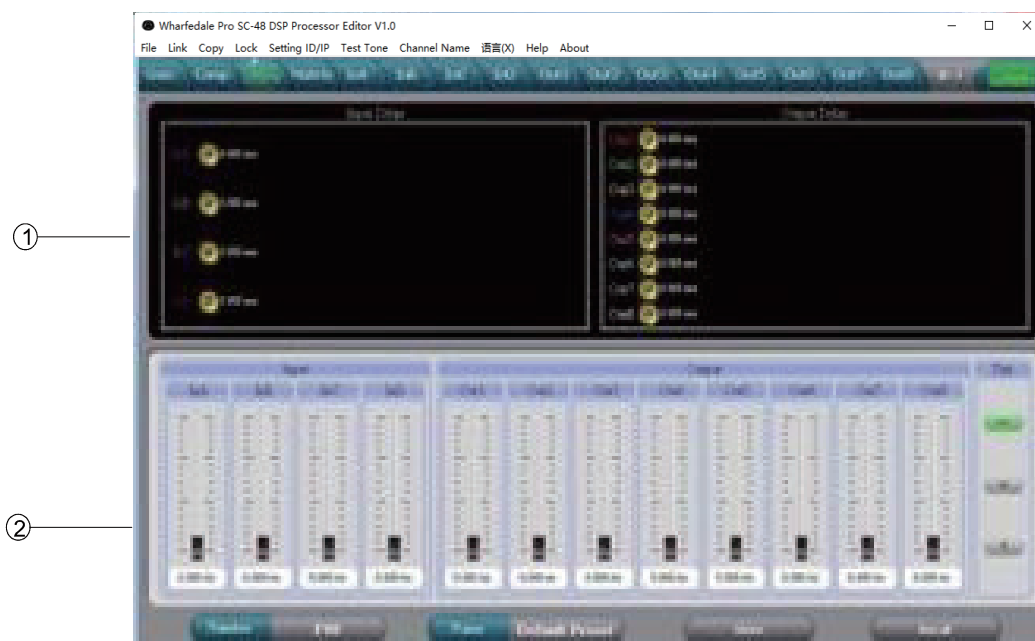
Save or convert preset parameter and show current preset parameter status.

## THE SECOND: NOISE GATE INTERFACE



- 1, display the current noise gate status curve and input channels level indicators.
- 2, all input channels noise gate parameters can be set. Noise gate threshold(-60~0dB), attack time(1~999ms), hold time(10~999ms), release time(10~3000ms) can be adjustable continuously for input.

## THE THIRD: 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, soft knee adjustment is 0dB~+12dB, rate is 1:1, 1:10, LIMIT, start time is: 1-999ms, recovery time is 10-3000ms.

THE FOURTH: LIMIT 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, soft knee adjustment is 0dB-+12dB, rate is 1:1, 1:10, LIMIT, start time is: 1-999ms, recovery time is 10-3000ms.

THE FIFTH: DELAY INTERFACE



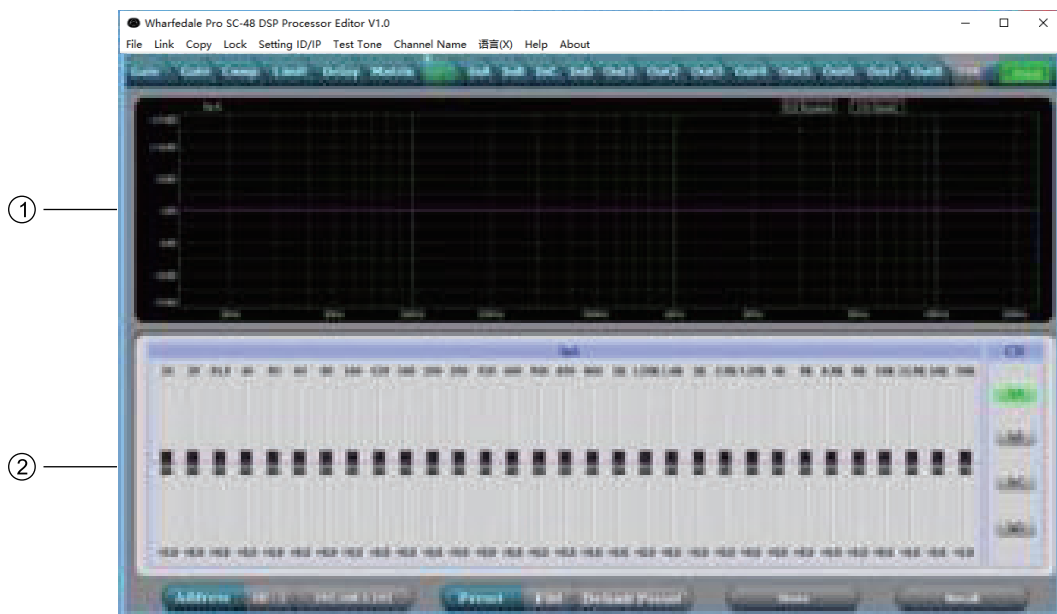
- 1, Show the delay parameter status of all channels.
- 2, Can adjust delay parameter of all channels, the scale is 0-680ms, there are millisecond, meter and feet units for converting.

THE SIXTH: MATRIX INTERFACE



- 1, Show connections of the device, users can enter and edit relevant channel by clicking the square , every channel name is revisable.
- 2, All output channels can choose any input channels, and each route channel volume can be set alone.

THE : SEVENTH: GEQ INTERFACE



1. Display current channel GEQ curve status. When mouse pitching on the pushrod, the point of GEQ curve will display the parameters.
2. Adjust the current channel 31 segment graphic equalizer parameter, select INA, INB, INC, IND key on the right can enter different input channel interface.

## THE EIGHTH: INPUT INTERFACE



- 1, Select "Mag" interface, you can adjust the PEQ, High-cut, Low-Cut of the input channel, select "PHASE" interface, you can adjust the current phase channel, also you can choose the non-current PEQ and phase curve to show in sync.
- 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, Phase 180°, Phase 360°.
- 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 NINTH: OUTPUT INTERFACE



1. Select "Mag" interface, you can adjust the PEQ, High-cut, Low-Cut of the output channel, select "PHASE" interface, you can adjust the current phase channel, also you can choose the non-current PEQ and phase curve to show in sync.
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, Phase 180°, Phase 360°.
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
	S/N Ratio	>115 dBu
	Distortion (THD)	<0.005at1kHz (0dBu)
	Cross-talk	<100dB below full scale
Input Section	Type	Balanced XLR
	Max. Input Level	+18dBu
	Impedance	1M/ $\Omega$ Stereo; 500k $\Omega$ /MONO
Output Section	Type	Balanced XLR
	Max. Output Level (bypass)	+20dBu
	Impedance	<500 $\Omega$
Digital Processing	24-bit sigma - delta converters	
	96kHz Sampling Rates	
Display	20x2LCD Display For Parameters Setting And Function Select	
Power Supply	AC~95V-264V FUSE 250VAC/2A FAST	
Dimension (LxWxH)	48x24.5x4.5CM	
Weight	2.88 kg	

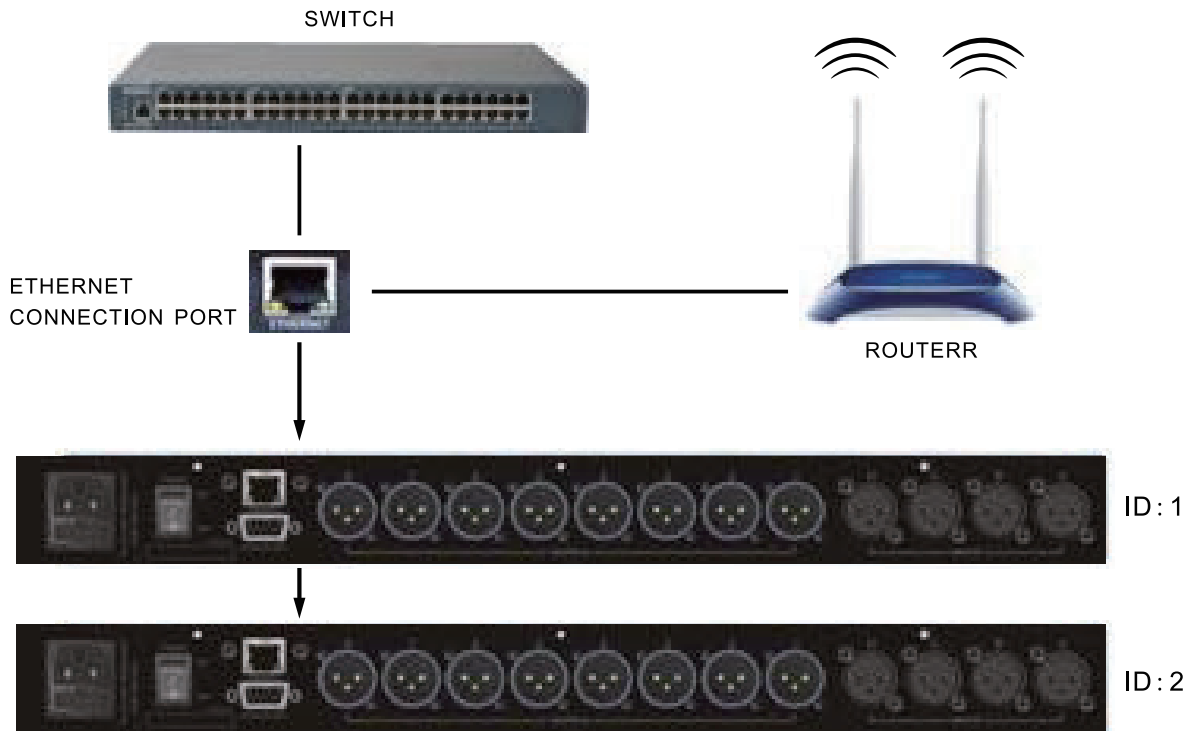
## ACCESSORIES

1. CD (Include PC software and user's manual).
2. One USB cord.
3. One electrical cord.

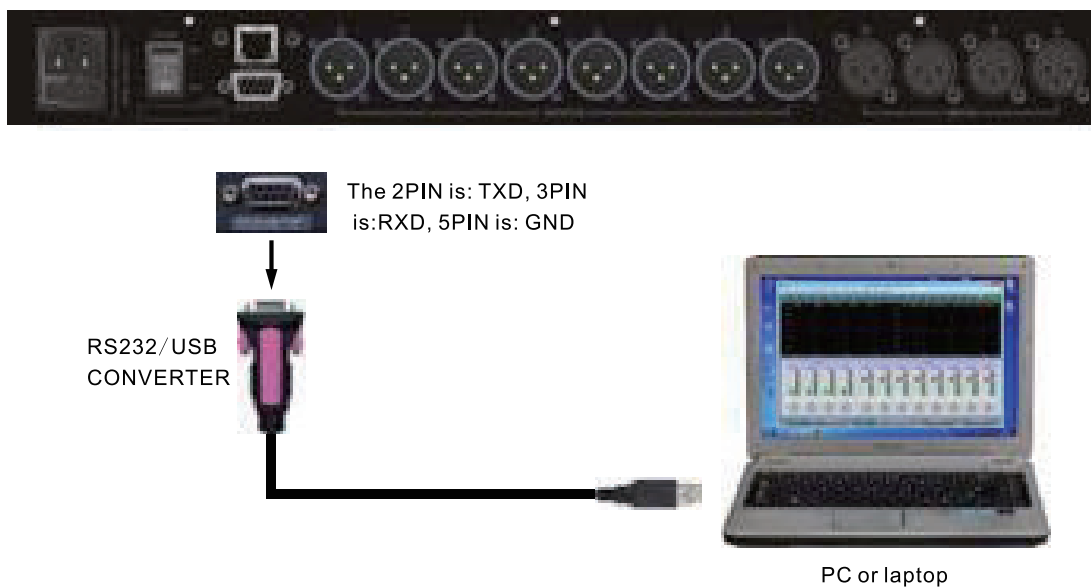


## REAR PANEL CONTROL PORT CONNECTION

- 1, Ethernet connection port: you can choose to connect the computer by wire, connect several devices by switch, or use WIFI by router to control, but need to set different IP address and ID code for each device, or they can't connect successfully due to the IP addresses conflict.



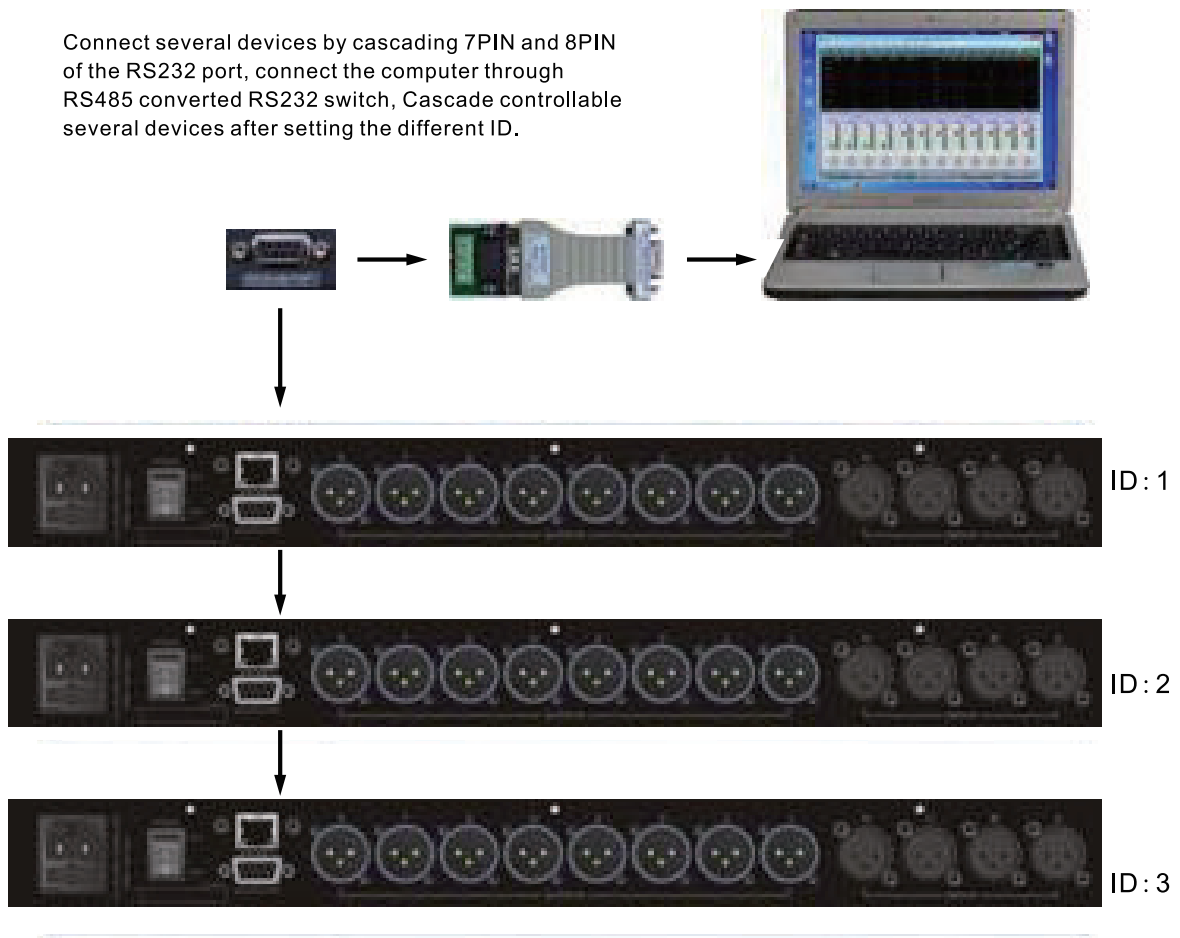
2. RS232 connection port: Central control and connect to PC through RS232 port.



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

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

PC or laptop



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

MCU Return:0x00~0x90=-60dB~+12dB,0.5dB/Step

Example (read input channel 1 gain parameter): 7B7D01480000007D7B

## (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

MCU Return : 0x00 or 0x01=Un-Mute or Mute

Example (read input channel 1 mute parameter): 7B7D01490000007D7B

## (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

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

Example (read preset parameter): 7B7D014A0000007D7B

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

## **WHARFEDALE PRO LIMITED WARRANTY**

Wharfedale Pro products are warranted of manufacturing or material defects for a period of three years from the original date of purchase. In the event of malfunction, contact your authorised Wharfedale Pro dealer or distributor for information.

Please be aware that the warranty details may differ from country to country. Contact your dealer or distributor for information (available at [www.wharfedalepro.com](http://www.wharfedalepro.com)). These terms do not infringe your statutory rights.



### **WHARFEDALE PROFESSIONAL**

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