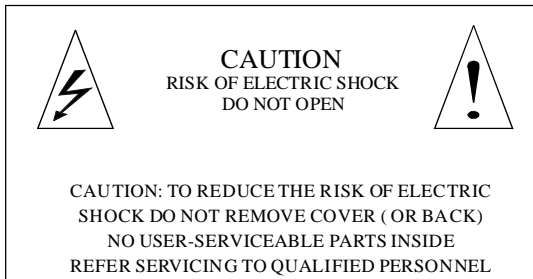


DS428

4 INPUT/8 OUTPUT DIGITAL LOUDSPEAKER MANAGEMENT

INSTRUCTION MANUAL



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



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



IMPORTANT SAFETY INSTRUCTION

Please see below basic protection proceeding before using:

1. Please read all the safety instruction before using the product.
2. This product must be earthed. If it should be malfunction or break down, grounding provides a path of least resistance for electric current to reduce risk of electric shock.

This product is equipped with a cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into an appropriate outlet that is properly installed and earthed in accordance with all local codes and ordinance.

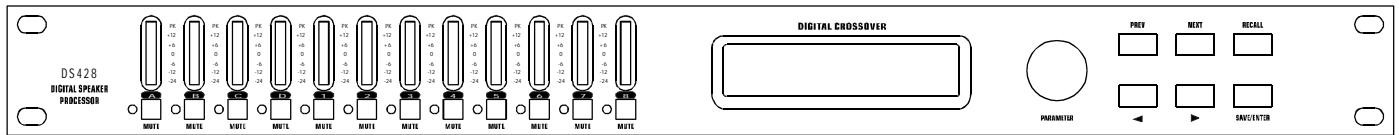
DANGER- Improper connection of the equipment-grounding conductor can result in a risk of electric shock. Check with a qualified electrician or serviceman if you are in doubt as to whether the product is properly grounded. Do not modify the plug provided with the product - if it will not fit the outlet, have a proper outlet installed by a qualified electrician.

3. To reduce the risk of injury, close supervision is necessary when the product is used near children.
4. Do not use this product near water-for example, near a bathtub, washbowl, kitchen sink, in wet basement or near a swimming pool or the lake.
5. This product may be capable of producing sound levels that cloud cause permanent hearing loss. Do not operate for a long period of time at high volume level or at a level that is uncomfortable. If you experience any hearing loss or ringing in the ears, you should consult an audiologist.
6. This product should be located so that its location or position does not interfere with its proper ventilation.
7. This product should be located away from heat sources such as radiators, heat registers or other products that produce heat.
8. The product should be connected to a power supply only of the type described on the operation instructions or as marked on the product.
9. This product may be equipped with a polarized line plug (one blade wider than the other). This is a safety feature. If you are unable to insert the plug into the outlet, contact an electrician to replace your obsolete outlet. Do not defeat the safety purpose of the plug.
10. The power-supply cord of the product should be unplugged from the outlet when left unused for a long period of time. When unplugging the power-supply cord, do not pull on the cord, but grasp it by the plug.
11. Care should be taken so that object do not fall and liquid are not spilled into the enclosure through opening.
12. The product should be serviced by qualified service personnel when:
 - A. The power-supply cord or the plug has been damaged; or
 - B. Objects have been fallen, or liquid has been spilled into the product; or
 - C. The product has been exposed to rain; or
 - D. The product does not appear to operate normally or exhibits a marked change in performance; or
 - E. The product has been dropped or the enclosure damaged..
13. Do not attempt to service the product beyond that described in the user-maintenance instructions. All other servicing should be referred to qualified service personnel.

14 **WARNING-** Do not place objects on the product's power cord or place it in a position where anyone could trip over, walk on or roll anything over it. Do not allow the product to rest on or to be installed over power cords of any type. Improper installations of this type create the possibility of fire hazard and/or personal injury.

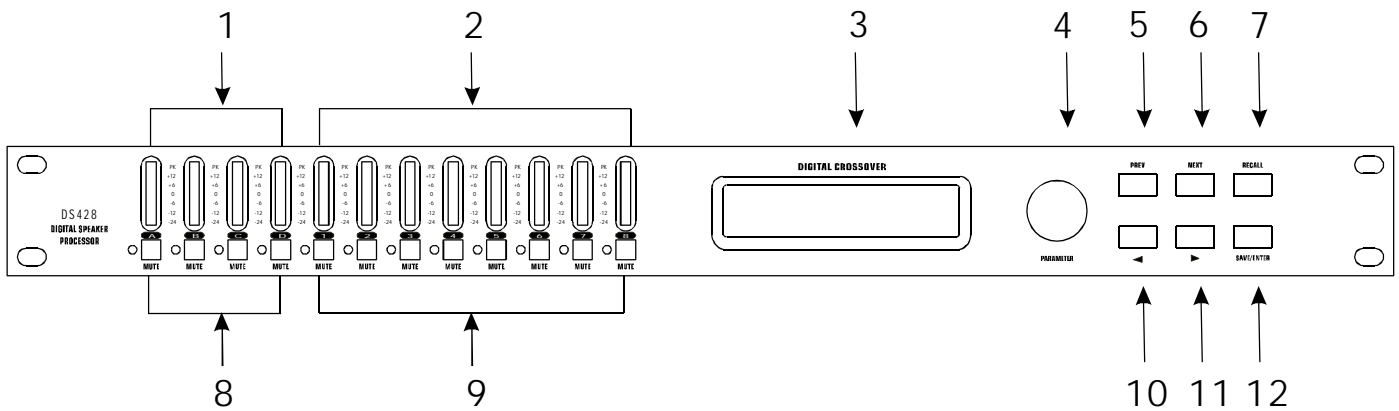
SAVE THESE INSTRUCTIONS

FEATURES



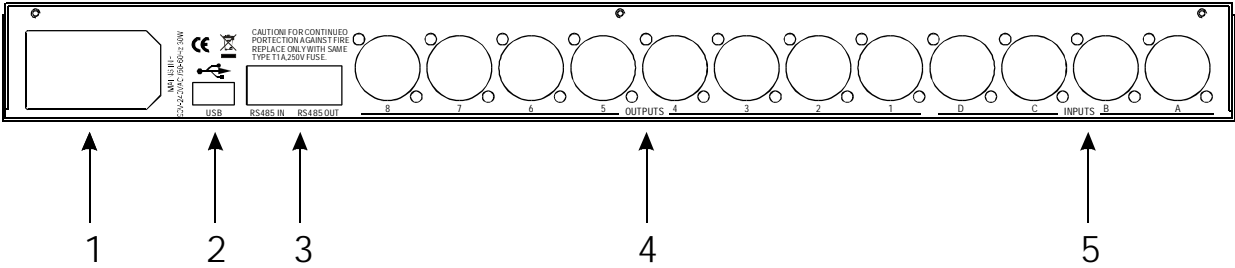
- ☆ 24-bit Dual DSP technology, high functional AKM AD AK5392.
- ☆ 4 Inputs / 8 Outputs multi-kinds of crossover mode for flexible configuration.
- ☆ Crossover slope of 12dB, 18dB, 24dB or 48dB per octave, filter type Butterworth, Linkwitz-Riley or Bessel
- ☆ 6 bands EQ every input, 4 bands EQ every output, Parametric, L-Shelf, H-Shelf.
- ☆ Parametric EQ: Full bandwidth, 1/64 to 4.0 octave range.
- ☆ Every input delay time up to 682.52ms, every output delay time up to 21.31ms.
- ☆ Polarity reverse control on each output.
- ☆ Every output channel all have limiter, threshold, ratio, attack time and release time for flexible configuration.
- ☆ Friendly user interface, USB.
- ☆ 2X20 LCD backlit.
- ☆ 12X7 band input and output level meter.
- ☆ Switch power supply: 90~250V

FRONT PANEL



1. Seven band input meter.
2. Seven band output meter.
3. 2X20 character LCD, to indicate all kinds of parameter.
4. PARAMETER with PUSH
PUSH Key to switch the main menu.
Rotate PARAMETER to adjust parameter value, password character and program name and so on.
5. PREV: switch sub-menu, change password letter position and so on.
6. NEXT: switch sub-munu,change password letter position and so on.
7. RECALL: recall program and quit the menu.
8. Input MUTE: the left meter will lighten when input mute
9. Output MUTE: the left meter will lighten when output mute.
10. ◀ Key: switch the option and change parameter value.
11. ▶ Key: switch the option and change parameter value.
12. SAVE/ENTER: save program and confirm key

REAR PANEL



- 1 Power Jack
- 2 USB interface, PC control interface
- 3 RS485 interface
- 4 Eight channel XLR output terminal
- 5 Four channel XLR input terminal

1. Input channel parameter setting

IN:A
Gain = 0.0dB

INPUT GAIN

Gain range is -40dB~12dB, step is 0.1dB.

Use PARAMETER、◀ or ▶ key to change parameter value.

When use PARAMETER to change parameter value, step is 0.1dB.

when use ◀ or ▶ key to change parameter value, step is 5.0dB。

On the front panel there is input MUTE key to mute quickly.

Press NEXT key to enter input delay sub-menu.

Press PREV key to enter copy input data sub-menu.

Press PARAMETER key to switch channel.

IN:A DELAY 145.87ms
50.24m 164.83ft

INPUT DELAY

Every input delay time up to 682.52ms, step is 21us.

Delay use three units of ms, m, ft to show.

Use PARAMETER、◀ or ▶ key to change parameter value.

When use PARAMETER to change parameter value, step is 21us.

when use ◀ or ▶ key to change parameter value, step is 5.20ms.

Press NEXT key to enter input EQ sub-menu.

Press PREV key to enter input gain sub-menu.

Press PARAMETER key to switch channel.

IN:A EQ→ON F:1-PEQ
0.0dB 1000Hz 1.00

INPUT EQ

Each input channel has six selectable EQ filters.

It may set EQ switch of each input channel.

EQ type has PEQ, LS1(Low-Shelf 6dB),LS2(Low-Shelf 12dB),

HS1(High-Shelf 6dB),HS2(High-Shelf 12dB).

EQ gain range is -30dB~15dB, step is 0.1dB.

PEQ frequency range is 19.7Hz~20kHz, Low-Shelf frequency range

is 19.7Hz~2kHz, High-Shelf frequency range is 3886Hz~21.9kHz.

PEQ bandwidth range is 0.016Oct~4.000Oct.

Use PARAMETER to adjust current option parameter.

Press NEXT key to enter copy input data sub-menu.

Press PREV key to enter input delay sub-menu.

Press ◀ or ▶ key to switch on-off、type、filter、gain、frequency

and bandwidth option. Arrow key indicate current option

Press PARAMETER key to switch channel.

OPERATION

Copy Input A
to Input: B

COPY INPUT DATA

Rotate PARAMETER to change target input channel number.
Press <NEXT> to enter into the input gain sub -menu.
Press <PREV> to enter into the-input EQ sub- menu.
Press the PARAMETER to switch the channel.

2.Output channel parameter setting

Op1 Gain 0.0dB
Phase:[+] Source:A

OUTPUT GAIN

Output gain range is -40dB~12dB, step is 0.1dB.
Use +, - to indicate Phase.
Input Source may set for A,B,C,D,A+B,C+D,ALL,OFF.
Front panel has output MUTE to mute rapidly.
Press NEXT key to enter output delay sub-menu.
Press PREV key to enter copy output data sub-menu.
Press ◀ and ▶ key to switch gain, phase and input source and so on option. Arrow key indicator current option.
Press PARAMETER key to switch channel.

Op1 DELAY 16.10ms
5.54m 18.19ft

OUTPUT DELAY

Every output channel delay up to 21.31ms, step is 21us.
Delay use three units of ms, m, ft to show.
Use PARAMETER, ◀ and ▶ key to change delay value.
When use PARAMETER to adjust delay value, step is 21us.
When use ◀ and ▶ key to adjust delay value, step is 5.20ms.
Press NEXT key to enter output EQ sub-menu.
Press PREV key to enter output gain sub-menu.
Press PARAMETER key to switch channel.

Op1 EQ→ON F:1-PEQ
0.0dB 1000Hz 1.00

OUTPUT EQ

Each output channel has four selectable EQ filters.
It may set EQ switch of each output channel.
EQ type has PEQ, LS1(Low-Shelf 6dB),LS2(Low-Shelf 12dB),
HS1(High-Shelf 6dB) and HS2(High-Shelf 12dB).
EQ gain range is -30dB~15dB,step is 0.1dB.
PEQ frequency range is 19.7Hz~20kHz, Low-Shelf frequency
range is 19.7Hz~2kHz, High-Shelf frequency is 3886Hz~21.9kHz.
PEQ bandwidth range is 0.016Oct~4.000Oct.

Press NEXT key to enter output high-pass sub-menu.
Press PREV key to enter output delay sub-menu.
Press ◀ and ▶ key to switch gain, phase and input source and so on option. Arrow indicate current option.
Press PARAMETER key to switch channel.

Op1 HighPassFilter
→19.7Hz 24dB Linkwiz

OUTPUT HIGH-PASS FILTER

Filter frequency range is 19.7Hz~21.9kHz.
Filter type has 12dB Butterworth,12dB Bessel,12dB Linkwitz,18dB Butterworth,18dB Bessel,24dB Butterworth,24dB Bessel,24dB Linkwitz,48dB Butterworth,48dB Bessel,48dB Linkwitz.

Use PARAMETER to adjust current option parameter value.
Press NEXT key to enter output low pass sub-menu.
Press PREV key to enter output EQ sub-menu.
Press ◀ and ▶ key to switch frequency and slope and so on option.
Arrow indicate current option.
Press PARAMETER key to switch channel.

Op1 LowPassFilter
→16k0Hz 24dB Linkwiz

OUTPUT LOW PASS FILTER

Filter frequency range is 19.7Hz~21.9kHz,OFF.
Filter type is 12dB Butterworth,12dB Bessel,12dB Linkwitz,18dB Butterworth,18dB Bessel,24dB Butterworth,24dB Bessel,24dB Linkwitz,48dB Butterworth,48dB Bessel,48dB Linkwitz.

Use PARAMETER to adjust current option parameter value.
Press NEXT key to enter output limiter sub-menu.
Press PREV key to enter output high pass sub-menu.
Press ◀ and ▶ key to switch frequency and slope and so on option.
Arrow indicate current option.
Press PARAMETER key to switch channel.

Op1 LIMITER → 0dBu
Inf A.5ms R100ms

OUTPUT LIMITER

Limiter threshold value range is -20dBu~20dBu, step is 1dBu.
Limiter ratio parameter has 1.2:1,1.5:1,2:1,3:1,4:1,6:1,10:1,20:1,Infinite.
Limiter attack time parameter has 0.5ms/dB,1ms/dB,2ms/dB,5ms/dB,10ms/dB,20ms/dB,50ms/dB.
Limiter release time parameter has 10ms/dB,20ms/dB,50ms/dB,100ms/dB,200ms/dB,500ms/dB,1sec/dB.
Use PARAMETER to adjust current option parameter value.
Press NEXT key to enter copy output data sub-menu.

OPERATION

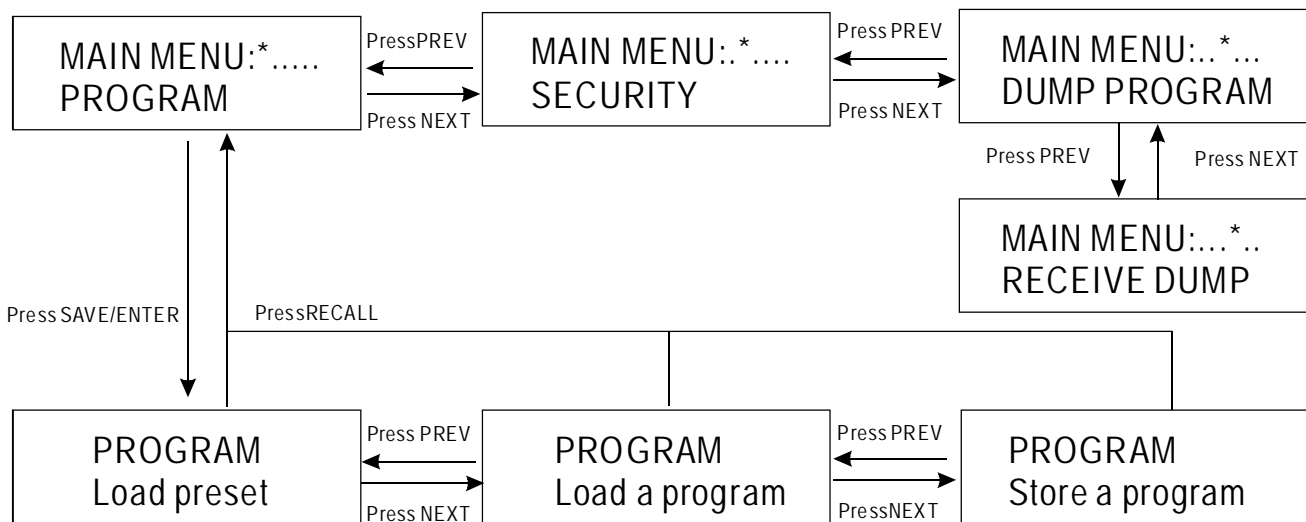
Press PREV key to enter output low pass sub-menu.
 Press ◀ and ▶ key to switch limiter threshold, limiter ratio, attack time and release time and so on option.
 Arrow indicate current option.
 Press PARAMETER key to switch channel.

COPY OUTPUT DATA

Copy Output 1
to Output:2

Rotate PARAMETER to change target output channel number.
 Press <NEXT> to enter into the output gain sub -menu.
 Press <PREV> to enter into the output EQ sub- menu.
 Press the PARAMETER to switch the channel.

3. Main menu switch operation

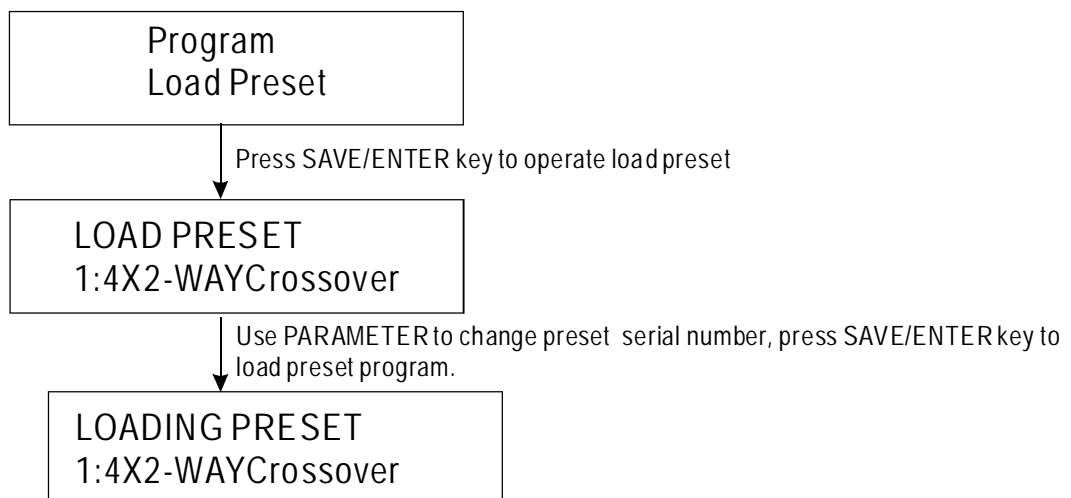


4. Program management

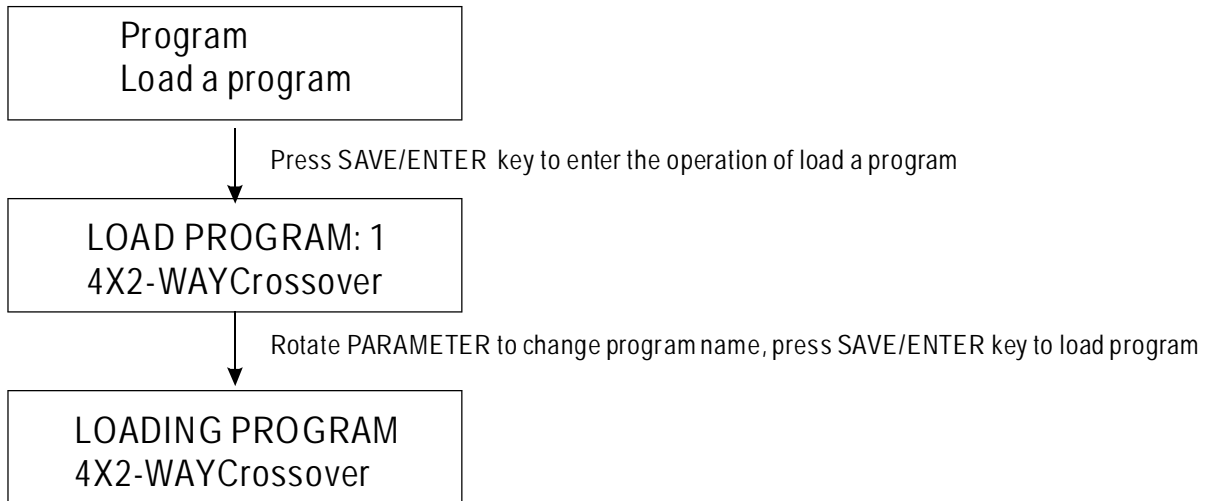
Program management includes below sub-menu:
 Load Preset mode Load a program Store a program

4.1 Load preset mode

Ten preset crossover mode, input source of preset mode and crossover setting refer to appendix preset mode input source and crossover parameter sheet.

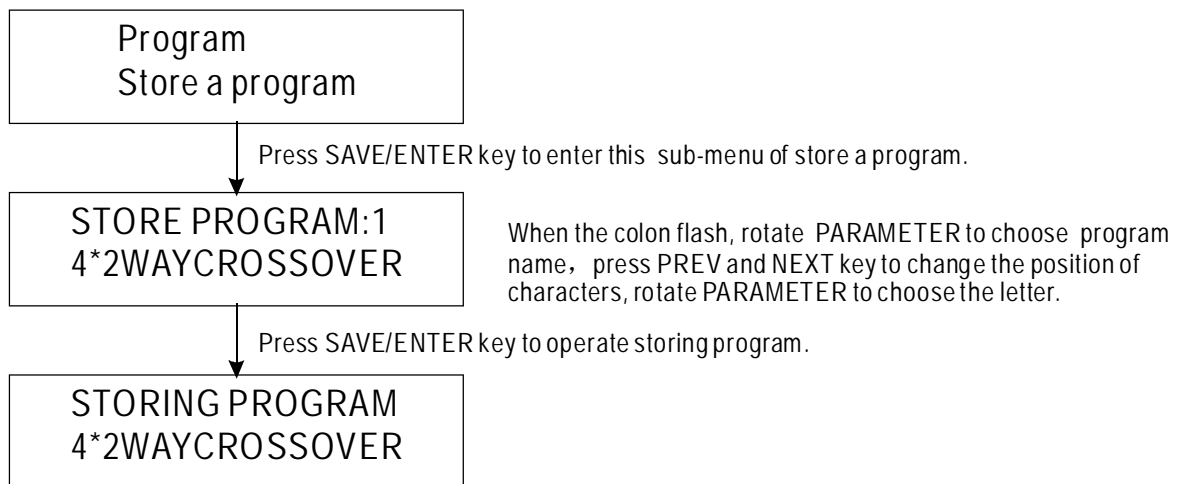


4.2 Loading Program



4.3 Storing program

It may store all parameters of input gain, input delay, input EQ, output gain, output delay, output EQ, output limit and output phase into the program, convenient for the unit to debug. The maximum characters of program name is 20. It can store 30 programs at most.



OPERATION

5. Security Menu

MAIN MENU:.*....
SECURITY

Press SAVE/ENTER key to enter security sub-menu.

Lock Type
1:Modify

Use PARAMETER to set type type, press SAVE/ENTER key to set.

Set Password
[_]

Use PARAMETER to change character, press PREV or NEXT key to change letter position, press SAVE/ENTER key to set password.

LOCKING SYSTEM

5.1 Adding the lock

Four lock types:

- 1:Modify The parameters can be viewed but not change. Mute is active.
 - 2:Modify&View The parameters cannot be viewed or changed. Mute is active.
 - 3:Modify&Mute The parameters can be viewed. Changes and Mute are inactive.
 - 4:Everything Everything is locked.
- Use PARAMETER to choose lock types.
Press SAVE/ENTER button to access the password set page.
Password: four characters. Characters flash point to the position. Use [PREV] and [NEXT] button to change the character position and use PARAMETER to change the letter .Press SAVE/ENTER button to finish the operation of lock, show as “LOCKING SYSTEM” .

5.2 Unlocking

To enter Security menu after adding the lock. It will indicate to enter password.

Password: four characters. Characters flash point to the position. Use [PREV] and [NEXT] button to change the character position and use PARAMETER to change the letter .Press SAVE/ENTER button to finish the operation of entering password. If the password is correct, it show as “UNLOCKING SYSTEM” . If the password is wrong, it shows as “PASSWORD ERROR” , indicating error password.

MAIN MENU:.*....
SECURITY

Press SAVE/ENTER to enter security sub-menu.

Enter Password
[_]

Characters flash point to the positon, Press PREV and NEXT key to change the positon of characters, use PARAMETER to choose the letter, Press SAVE/ENTER to finish the operation of entering password.

Password correct

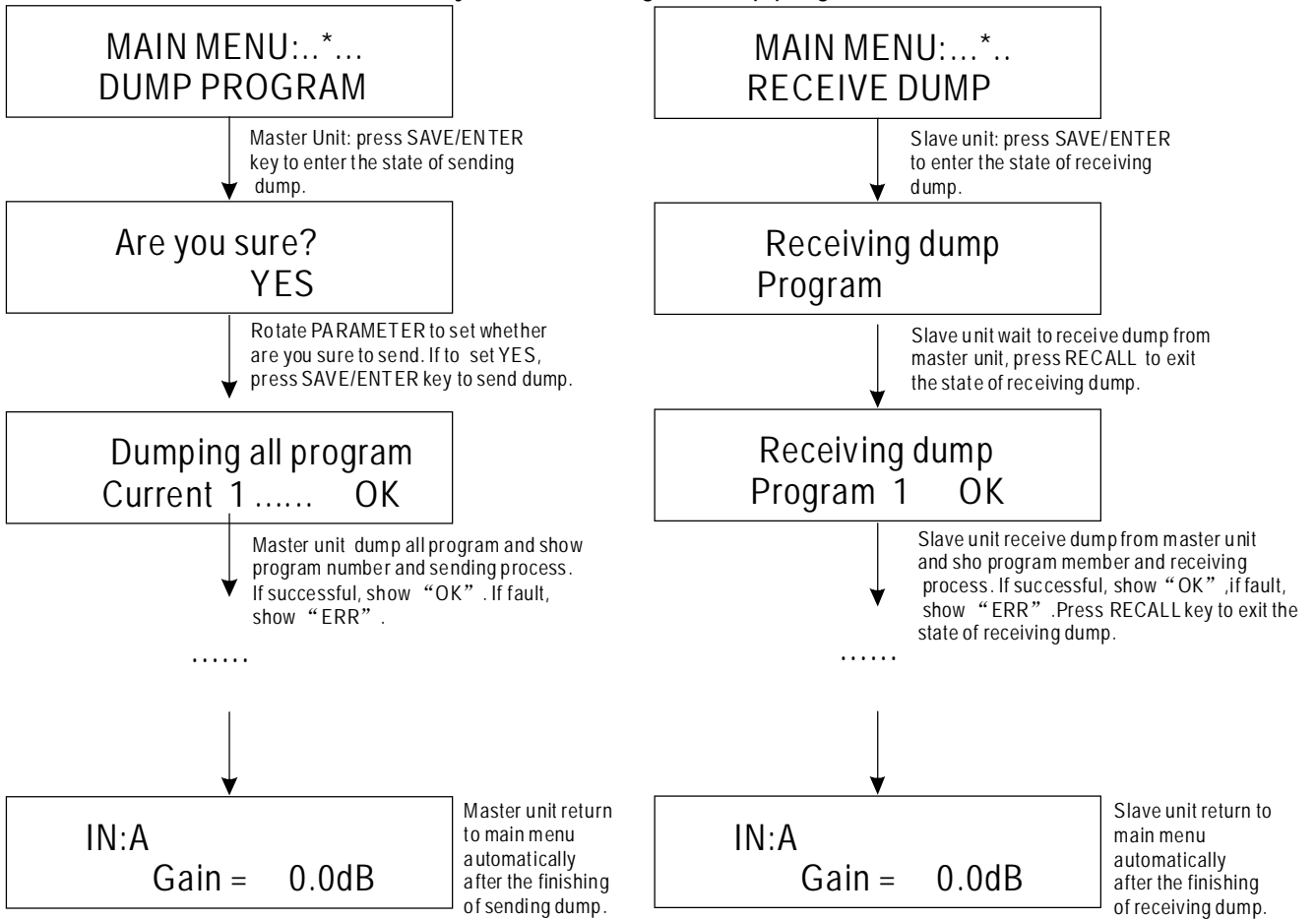
UNLOCKING SYSTEM

Password error

PASSWORD ERROR

6. Program copy

Copy program between all units. Master unit send dump, slave units receive dump sent by master one. Before master unit send dump, you must connect RS485 OUT interface of master unit and RS485 IN interface through network wire. At the same time to set the state of receiving dump for slave units. Master unit will return to main menu automatically after sending all dump programs. Slave units will return to main menu automatically after receiving all dump programs.



Master unit sending dump process

Slave unit receiving dump process

OPERATION

APPENDIX: Preset mode input source and crossover parameter sheet

Preset name	Output	Input source	High-pass frequency	Low-pass frequency
1:4x2-WAYCrossover	OUT1	A	19.7Hz	1000Hz
	OUT2	A	1000Hz	OFF
	OUT3	B	19.7Hz	1000Hz
	OUT4	B	1000Hz	OFF
	OUT5	C	19.7Hz	1000Hz
	OUT6	C	1000Hz	OFF
	OUT7	D	19.7Hz	1000Hz
	OUT8	D	1000Hz	OFF
2:2x3-WAY+2 Aux	OUT1	A	19.7Hz	121.4Hz
	OUT2	A	121.4Hz	2000Hz
	OUT3	A	2000Hz	OFF
	OUT4	B	19.7Hz	121.4Hz
	OUT5	B	121.4Hz	2000Hz
	OUT6	B	2000Hz	OFF
	OUT7	C	OFF	OFF
	OUT8	D	OFF	OFF
3:2x3-WAY+mono Sub	OUT1	A	35.1Hz	153Hz
	OUT2	A	153Hz	2000Hz
	OUT3	A	2000Hz	OFF
	OUT4	B	35.1Hz	153Hz
	OUT5	B	153Hz	2000Hz
	OUT6	B	2000Hz	OFF
	OUT7	A+B	OFF	81.1Hz
	OUT8	A+B	OFF	81.1Hz
4:2x4-WAY X-over	OUT1	A	OFF	81.1Hz
	OUT2	A	81.1Hz	408.5Hz
	OUT3	A	408.5Hz	2000Hz
	OUT4	A	2000Hz	OFF
	OUT5	B	OFF	81.1Hz
	OUT6	B	81.1Hz	408.5Hz
	OUT7	B	408.5Hz	2000Hz
	OUT8	B	2000Hz	OFF
5:1x5-WAY+3 Aux	OUT1	A	OFF	40.5Hz
	OUT2	A	40.5Hz	153Hz
	OUT3	A	153Hz	1000Hz
	OUT4	A	1000Hz	3084Hz
	OUT5	A	3084Hz	OFF
	OUT6	B	OFF	OFF
	OUT7	C	OFF	OFF
	OUT8	D	OFF	OFF
6:Mono Distri	OUT1	ALL	OFF	OFF
	OUT2	ALL	OFF	OFF
	OUT3	ALL	OFF	OFF
	OUT4	ALL	OFF	OFF
	OUT5	ALL	OFF	OFF
	OUT6	ALL	OFF	OFF
	OUT7	ALL	OFF	OFF
	OUT8	ALL	OFF	OFF
7:Ste. Distri	OUT1	A+B	OFF	OFF
	OUT2	C+D	OFF	OFF
	OUT3	A+B	OFF	OFF
	OUT4	C+D	OFF	OFF
	OUT5	A+B	OFF	OFF
	OUT6	C+D	OFF	OFF
	OUT7	A+B	OFF	OFF
	OUT8	C+D	OFF	OFF

OPERATION

Preset name	Output	Input source	High-pass frequency	Low-pass frequency
8:LCR + mono Sub	OUT1	A	99.2Hz	OFF
	OUT2	B	99.2Hz	OFF
	OUT3	C	99.2Hz	OFF
	OUT4	D	99.2Hz	OFF
	OUT5	ALL	OFF	99.2Hz
	OUT6	ALL	OFF	99.2Hz
	OUT7	ALL	OFF	99.2Hz
	OUT8	ALL	OFF	99.2Hz
9:4x4 Processor	OUT1	A	OFF	OFF
	OUT2	B	OFF	OFF
	OUT3	C	OFF	OFF
	OUT4	D	OFF	OFF
	OUT5	OFF	OFF	OFF
	OUT6	OFF	OFF	OFF
	OUT7	OFF	OFF	OFF
	OUT8	OFF	OFF	OFF
10:Muted all	OUT1	OFF	OFF	OFF
	OUT2	OFF	OFF	OFF
	OUT3	OFF	OFF	OFF
	OUT4	OFF	OFF	OFF
	OUT5	OFF	OFF	OFF
	OUT6	OFF	OFF	OFF
	OUT7	OFF	OFF	OFF
	OUT8	OFF	OFF	OFF

SPECIFICATION

Input impedance	8K Ω
Maxium input electrical level	4Vrms
Input CMRR	55dB
Input XLR	DY-08
Sampling rate	48KHz
Output impedance	150 Ω
Maxium output electrical level	2Vrms
Output XLR	DY-09
Input gain	-40.0dB~12.0dB,step:0.1dB
Output gain	-40.0dB~12.0dB,step:0.1dB
Input delay	682.52ms,step: 21us。
Output delay	21.31ms, step: 21us
EQ number	6 EQ every input channel, 4 EQ every output channel
EQ type	Parametric,L-Shelf 6dB,L-Shelf 12dB, H-Shelf 6dB,H-Shelf 12dB
EQ gain	-30dB~15dB,step: 0.1dB
EQ frequency	19.7Hz~21.9kHz
PEQ bandwidth	0.016~4.000Oct
Crossover filter	
Frequency	19.7Hz~21.9kHz,OFF
Slope	12,18,24,48dB
Type	Butterworth, Bessel, Linkwitz
Limiter	
Limiter threhold	-20dBu~20dBu,step: 1dBu
Limiter radio	1.2/1,1.5/1,2/1,3/1,4/1,6/1,10/1,20/1,Infinite
Attack time	0.5,1,2,5,10,20,50ms/dB
Release time	10,20,50,100,200,500ms/dB,1sec/dB
Performance	
Frequency response	0~20KHz(± 0.1 dB)
Dynamic range	102dB
Separate degree	100dB
THD	0.003%(1KHz,1Vrms)
Dimension	
Weight	3.6KG
Power	AC90V~250V,50~60Hz
Fuss	1A,AC250V
Watt	30W