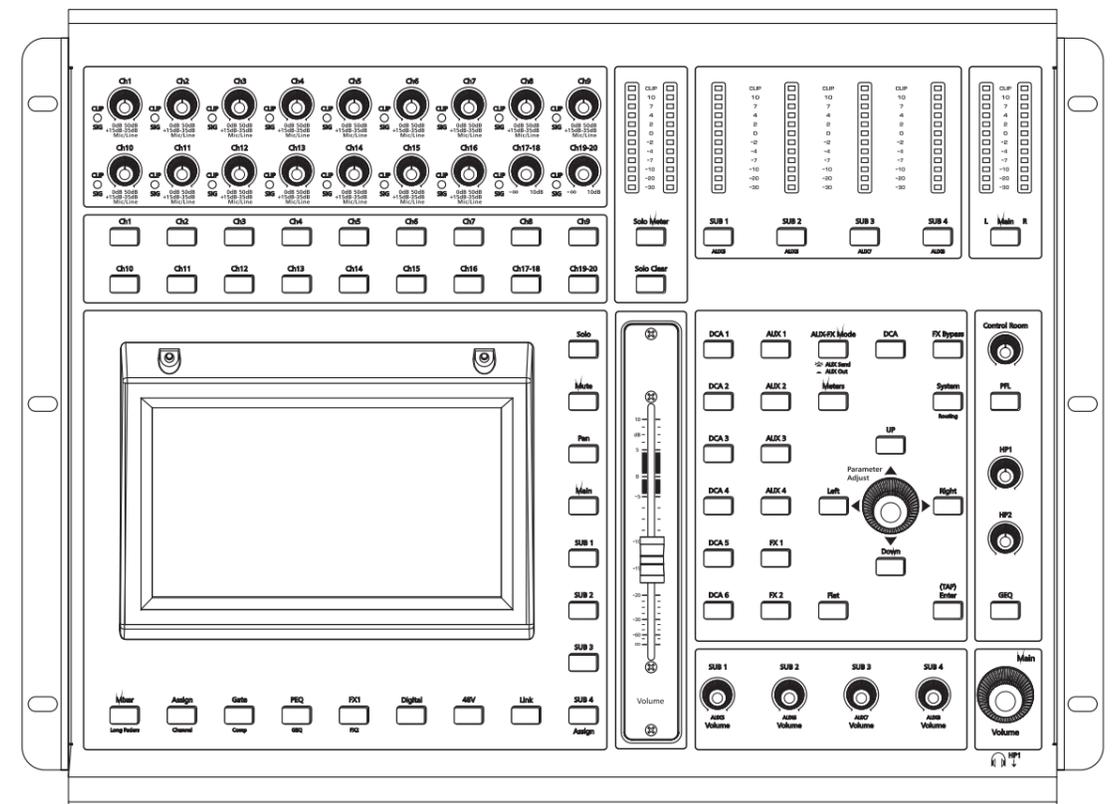


# itC

## User's Manual

### TS-20PD-4

16 mic preamplifiers with dedicated trim control









# 8

## Technical information

### Specification

Microphone input	Electronically balanced
Frequency Response to direct Output	20Hz~20KHz at 0dBu $\pm$ 1.5dB
Distortion (THD&N) to Main Output	<0.01% at 0dBu 1KHz
SNR (Signal to Noise Ratio)	104dB
Maximum Input Level	+22dBu
Phantom Power(+/-3V)	+48VDC
Line inputs	Unbalanced
Frequency Response to direct Output	20Hz~20KHz at 0dBu $\pm$ 1.5dB
Distortion (THD&N) to Main Output	<0.01% at 0dBu 1KHz
Gain	-15dBu~+35dBu
Maximum Input Level (Gain at 0dBu)	+20dBu
AUX1~2 inputs	Balanced (2 stereo pair)
Frequency Response to Main Output	20Hz~20KHz at +4dBu $\pm$ 1.5dB
Distortion (THD&N) to Main Output	<0.01% at 0dBu 1KHz
Gain	- $\infty$ to +10dBu
Maximum Input Level	+22dBu
USB	
Frequency Response to Main Output	20Hz~20KHz at +4dBu $\pm$ 1.5dB
Distortion(THD&N) to Main Output	<0.01% at 0dBu 1KHz
Gain	- $\infty$ to +10dBu
Maximum Input Level	+22dBu
Main Outputs	
Maximum Output Level	+20dBu
AUX1~4 Outputs	
Maximum Output Level	+20dBu
SUB1~4 Outputs	
Maximum Output Level	+20dBu
Tape Outputs	
Maximum Output Level	+14dBu
Control Room Outputs	
Maximum Output Level	+20dBu
PHONE OUT	
HP1/HP2 Level	+20dBu
System Crosstalk	
Input to Output(at +4dBu 1KHz)	-83dBu
Adjacent Channels(at +4dBu 1KHz)	-82dBu
Noise(Bus noise)	-84dBu
Noise Gate	
Threshold Range	-84dBu - 0dB
Attack time	0.5mS ~ 200mS
Relesae time	5mS~2S
Compressor	
Threshold Range	-30dBu +20dB
Attack time	10mS ~ 150mS
Relesae time	10mS~1S
Ratio	1:1 to 24:1
Gain	0dBu - +24dB
EQ	
Low (LowPass or LowShelf)	21Hz~19.2KHz +/- 24dB
Low Mid	21Hz~19.2KHz +/- 24dB
High Mid	21Hz~19.2KHz +/- 24dB
High(HighPass or HighShelf)	21Hz~19.2KHz +/- 24dB
Digital Audio	
ADC Dynamic Range	114dB
DAC Dynamic Range	114dB
Internal Processor	32-bit , floating point
ADC,DAC bit depth	24bit
Impedances	
Microphone input	1.4K
Channel Isert return	2.5K
All other inputs	10K or greater
Tape out	1K
All other output	120
operating free-air temperature range	0~40
storage temperature range	-20 ~60

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# 1

## Introduction

Thank you for purchasing the TOPP PRO TS-20PD-4 digital mixer. With 20 line-level inputs, 16 microphone preamplifiers and playback engine; processing with 31-band GEQ, compressor, gate, delay, polarity; DSP effects; aux buses; subgroups; sensitive LED metering; load/save/copy mixer setting; remote control, USB in and more, the TS-20PD-4 helps you creating a wonderful show. It is easy to operate though it has powerful function. We suggest that you use this manual to familiarize yourself with the features and applications for your TS-20PD-4 before using.

# 2

## Summary of Features

- ; 16 microphone preamplifiers with dedicated trim control
- ; 20 line-level inputs
- ; 4 Aux sends and 4 subgroups, or 8 Aux sends
- ; 2 internal FX
- ; 1 stereo main out
- ; All channels Control Room outputs
- ; 2 headphones output
- ; USB Stereo recording
- ; 100mm precision motor fader
- ; 7 inch color LCD touch screen for graphical view and setup
- ; 24-bit/48KHz sampling rate
- ; Program, save, load & copy functions
- ; Digital noise gate
- ; Digital compressor/limiter
- ; Digital 4-band full parametric EQ
- ; PAN
- ; Phase reverse
- ; Time delay
- ; 6 DCA for Digital Control Audio or MUTE
- ; Lock and unlock function
- ; Change the password
- ; Remote Control: Ethernet or USB
- ; iPad App 20.4i editor for wireless control
- ; Expand socket for option module: Multi-track USB audio recording module or CobraNet module or Dante module etc

## Useful data

Please write your serial number here for future reference.

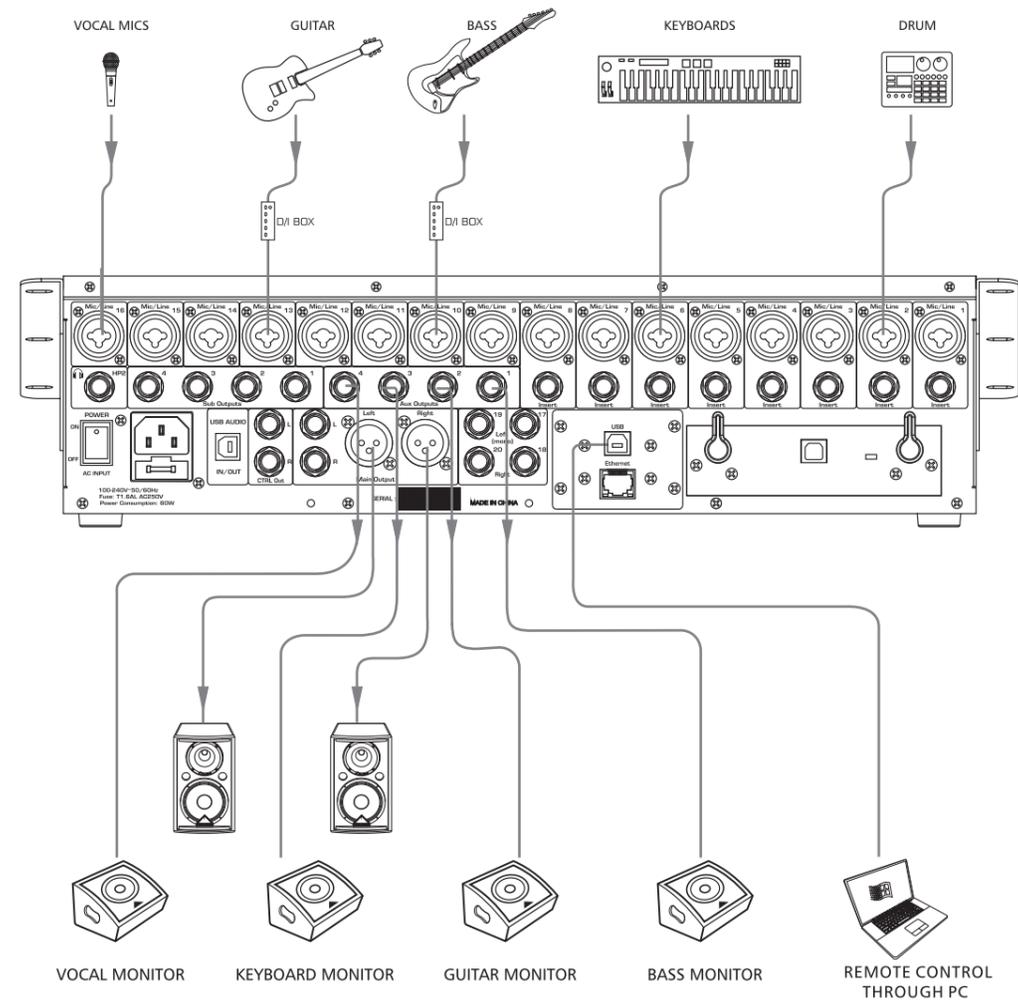
Serial Number:

Date of purchase:

Purchased at:

## Hookup Diagram

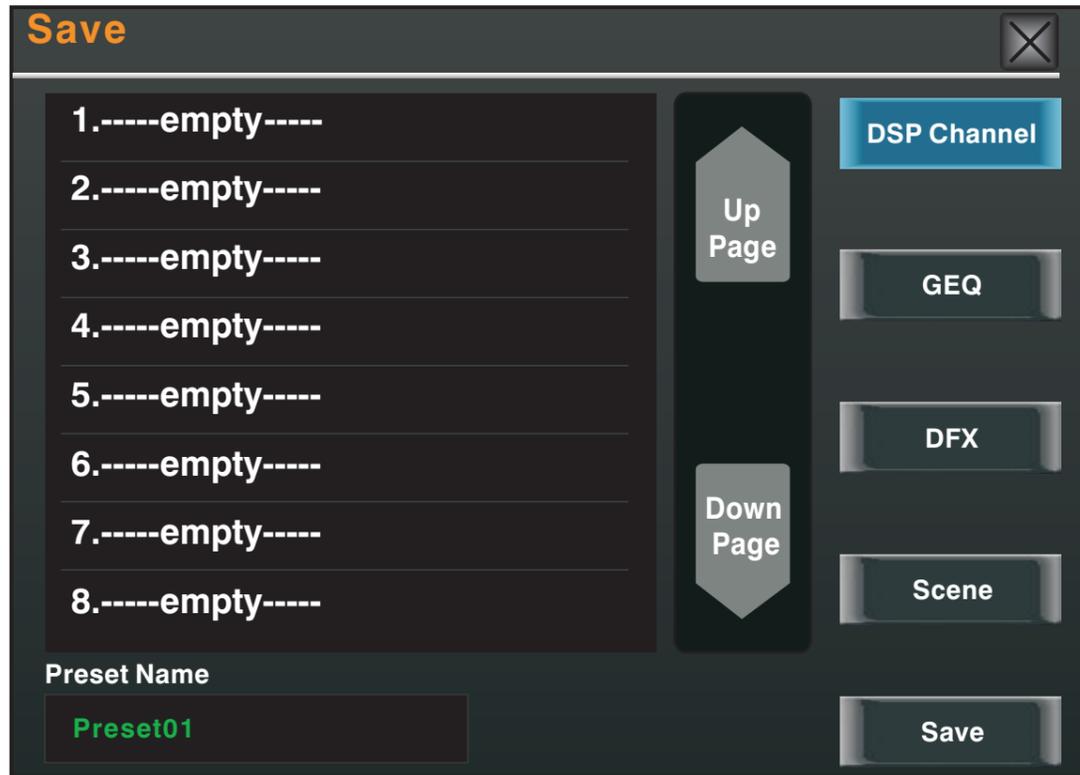
# 7



# 3

# 6 DSP Control

6.18 Save interface



Press this button to save the selected channel's and bus's DSP channel setting as DSP presetting for future use. On the screen you can touch to save preset of DSP Channel, GEQ, DFX, Scene. Please do as the instruction that is shown on the LCD display.

**Preset Name**

Preset01

Preset name in the box is editable here. Touch the box, virtual keyboard will come up, then type the name you want to give to this preset, after finish, don't forget to touch Save control and save your settings.

# Software Update

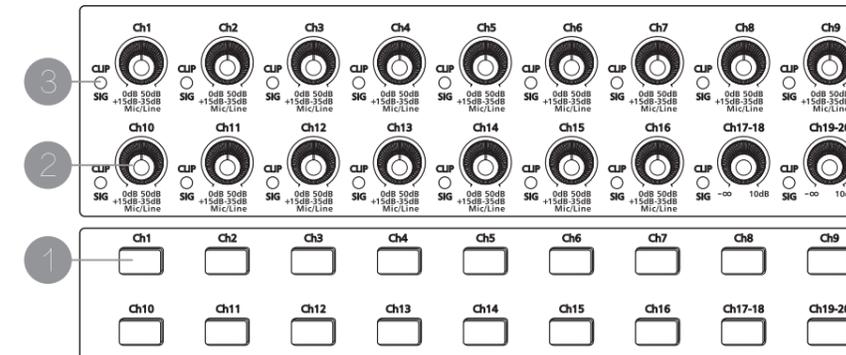
We will always update the TS-20PD-4 software, please download the latest version from below sites: [www.seikaku.hk](http://www.seikaku.hk).

Since function of TS-20PD-4 will also change when you update the software, this manual can help you familiar with the basic function, for the precision, please refer to the real TS-20PD-4 digital mixer.

Note: When you update the firmware, all the parameters you had saved in the mixer may be destroyed.

# Control

5.1 Function buttons and knobs

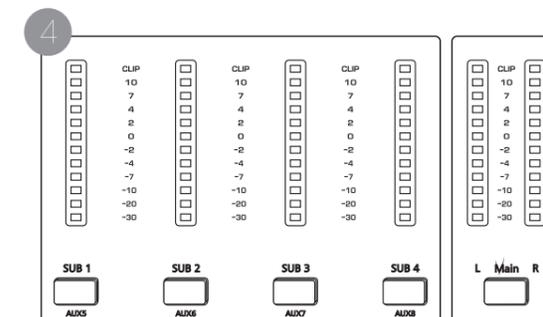


1. Main input channel select buttons  
There are 18 select buttons Ch1-20 as you can see on the panel. Press this button will route its channel to add DSP setting and assign its output. It will illuminate as has been pressed and enabled. In DCA window, you can select group channels by this button.

2. Main input channel knobs  
; The knob Ch1-16 control the gain level of the channel's input.  
*Note: It is very important to properly set the level of the input gain to minimize noise and avoid overload distortion.*  
; The knob Ch17-20 control input level of the channels.

3. Main input signal clip indication  
These LEDs beside input channel knobs indicate the input level of Channel1-20.

4. LED meters  
The LED meters show the signal status, including the output level.



# 5 Control

; SUB1-4 or AUX5-8 & Main  
Indicate the output level of SUB1-4 or AUX5-8 & Main. Please be aware only SUB1-4 and Main button engaged can light the corresponding meters.

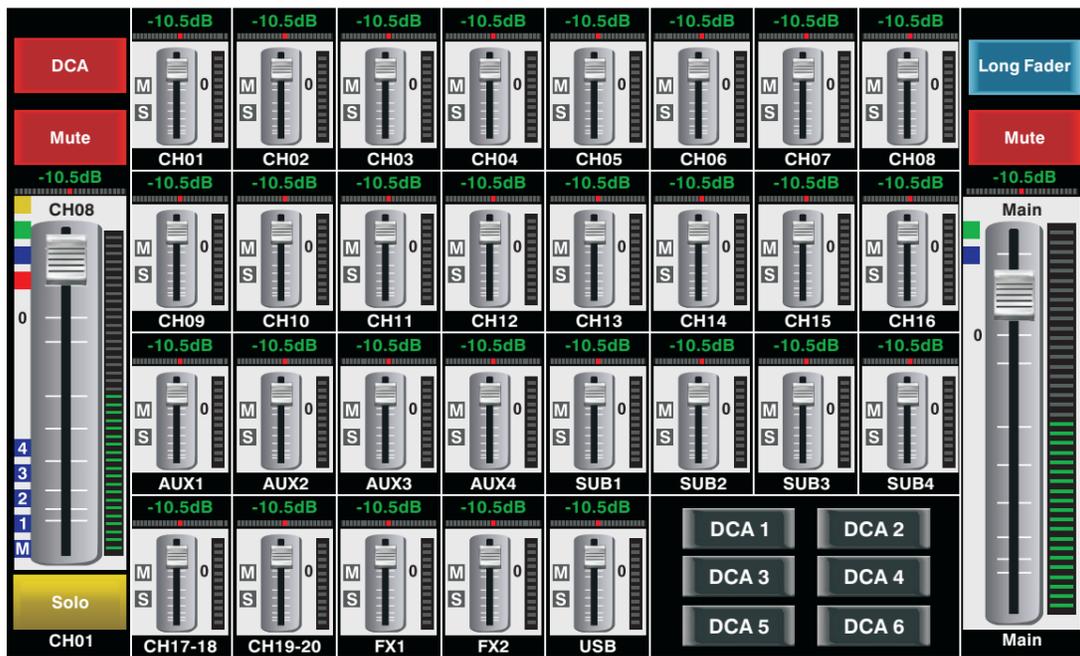
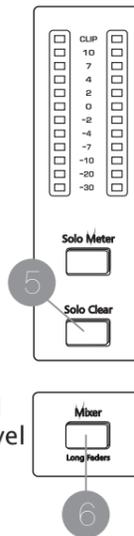
; SUB1-4 or AUX5-8 button  
When the buttons are off, the meters above them won't light, while illuminated can light the meters.

; Solo/Main meters  
Indicate the output level of Solo/Main.  
; Solo Meter button  
When the button is off, meters above it indicate output level of main, while illuminated indicate output level of Solo.

5. Solo clear button  
Press this button to clear the solo function for all of the soloed buses or channels.

6. Mixer/Long Faders button  
Press this button twice, it will switch between Mixer and Long Faders function.

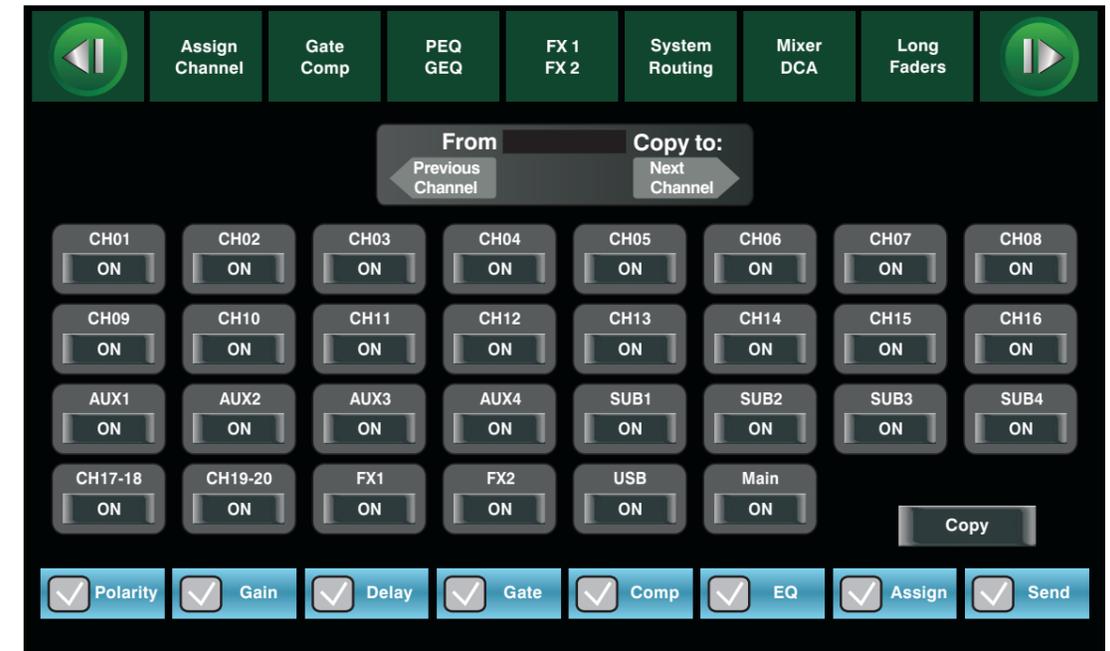
; Mixer  
Press this button, you will see mixer page on LCD screen, where you can control all the input and output channels' level, solo and mute, as well as DCA group level control, the window is as below.  
For the detail operation, please refer to the introduction in section 6.



# DSP Control

# 6

## 6.17 Copy interface



**CH01 ON** Select a channel or bus that you want to copy its settings onto other channels, then press Copy button, you can see the selected channel or bus will flash. Touch OFF of other channel or bus, it will turn to ON and the background will illuminate red, which means you are ready to copy.

**From CH01 Copy to:** This will show current channel that will be copied to other channels or buses. Touch Previous Channel or Next Channel to select.



Touch above controls, the hook mark will come up, which means you have selected the controls and ready to copy their parameters to other channels or buses. The default setting is select all.

**Copy** Then touch Copy control to complete your operation.

In the process of operation, please keep an eye to the LCD screen display.

# 6 DSP Control



This items show names of preset, when you select a preset, its name will show on the bottom box, then touch Load control on the right corner of the screen to load the selected preset to corresponding controls.



Touch UP Page to go to previous item page. Touch Down Page to go to next item page.



Touch anyone of these controls, the corresponding background will illuminate, you can load preset of selected controls.

Touch Delete to delete current selected item's preset, touch Load to load current selected item's preset.



The preset can be recalled to the same channel with exactly the same DSP setting and other setting like Solo, Mute, Post..., but with the channel's own DSP setting if recall to other channels. For example, if you select Channel 6 and save the setting as scene preset 6. If you select the Channel 6 and press the Load button to load the scene preset 6, then, the Channel 6 will be exactly same as the scene preset 6. But if you choose other channel like Channel 7, the DSP setting will be same as the Channel 7 and other settings will be same as preset 6.

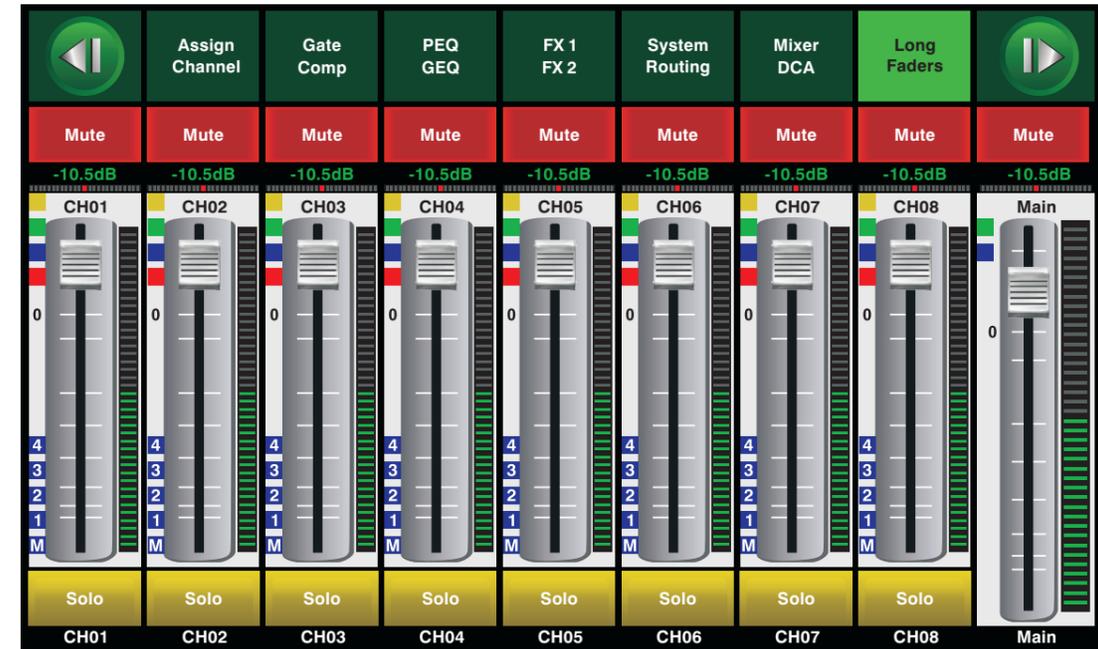
# 5 Control

; Long Faders

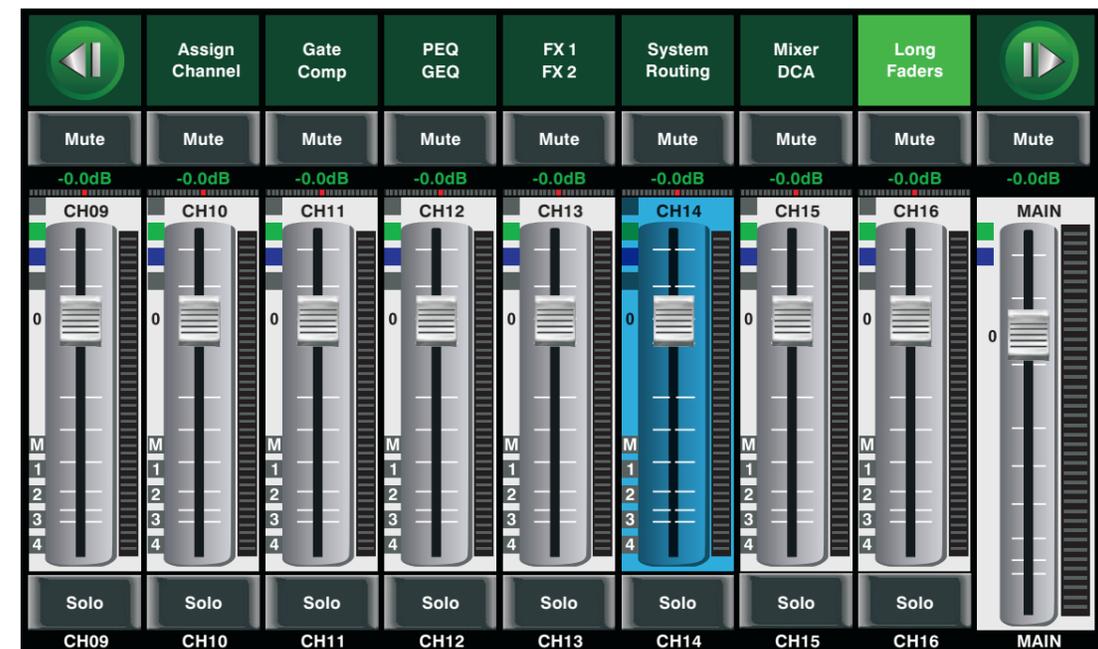
Press this button again, you will see Long Faders page on LCD screen, where you can control all the input and output channels' level, solo, mute, pan and rename the channel, as below pictures show.

For the detail operation, please refer to the introduction in section 5.

- Page of input channel 1-8

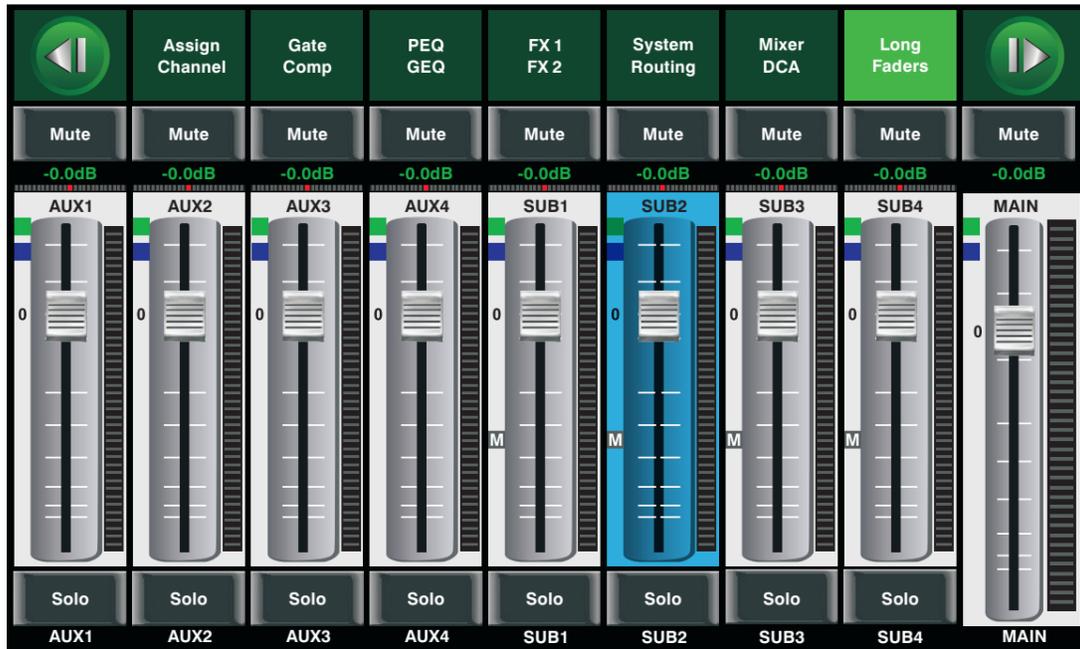


- Page of input channel 9-16

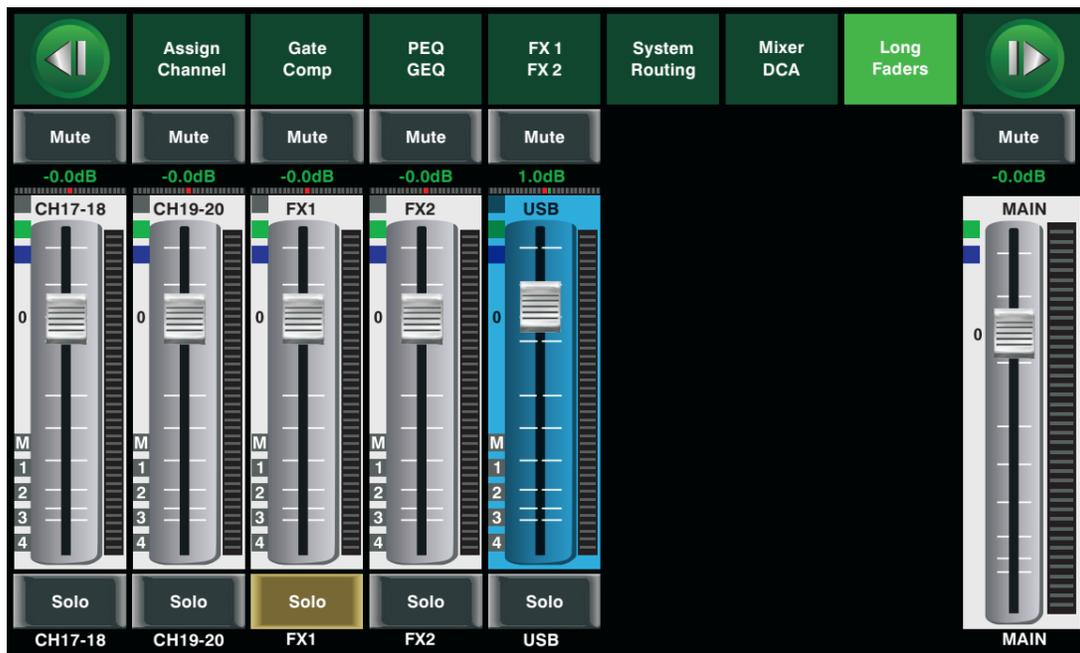


# 5 Control

- Page of output channel AUX1-4/SUB1-4



- Page of input channel 17-20/FX1-2/USB



# 6 DSP Control

**Load** **Copy** **Save** Touch Load, Copy or Save to realize corresponding function.

**Select** Touch this control in this area to enter page of corresponding channel.

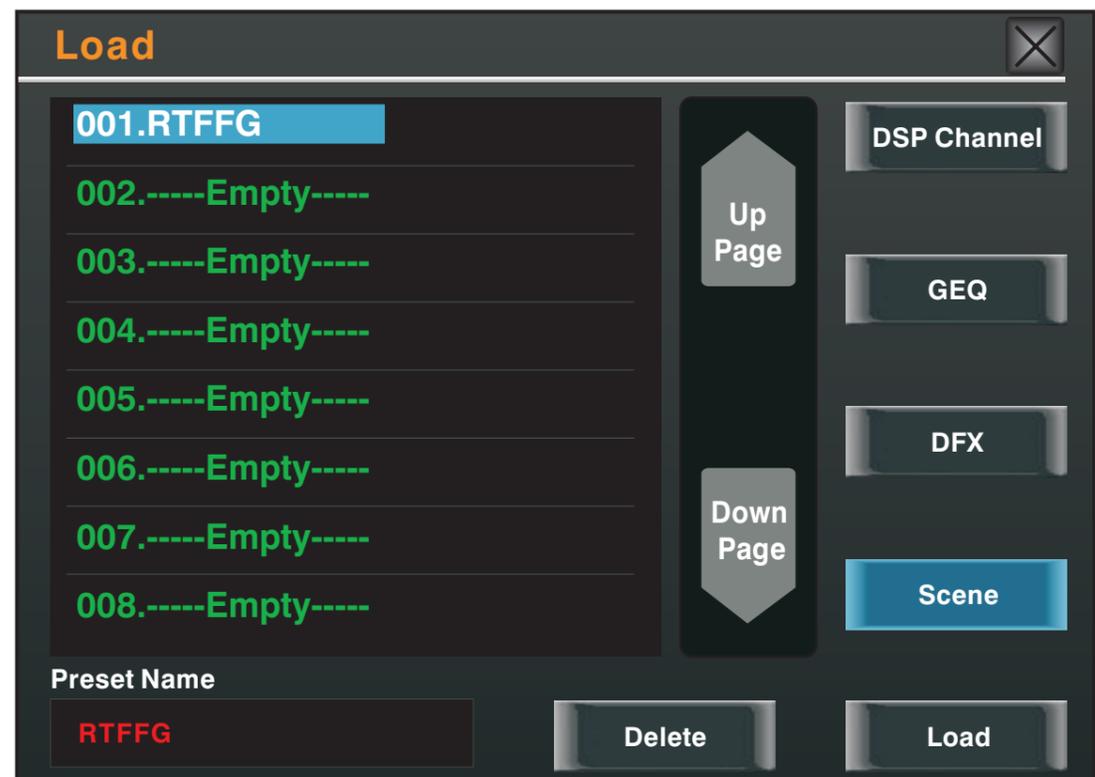
**ON** **Default** Touch ON/OFF switch, it will illuminate and enable the GEQ function.

Compare with ON in other page, the different is that even you don't turn on it, the GEQ parameter is adjustable, but won't function. Text Default in the box shows preset of GEQ. You can change it by loading another parameter setting.

The GEQ settings can be saved as preset for future use by pressing the Save button and following instruction that is shown on the LCD display. Please notice that the assign state will not be saved when one GEQ setting is saved as preset. The preset can be recalled by pressing the Load button and deleted by pressing the Flat EQ button after it has been chosen. Please notice the instruction that is shown on the LCD display. Please take section of DSP Load, Save, Copy as reference.

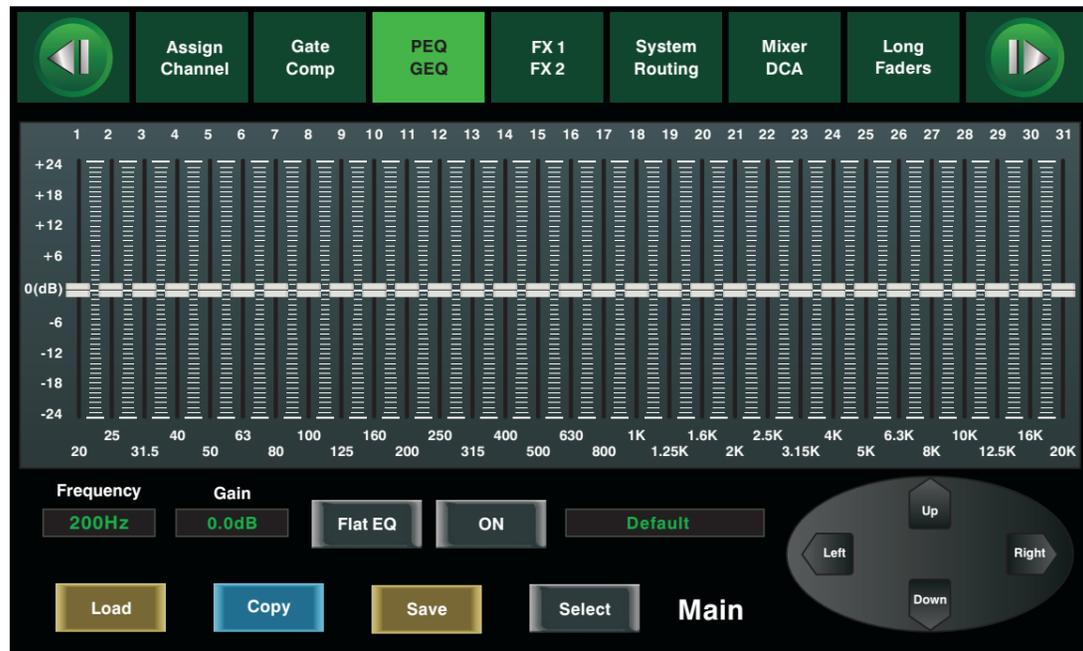
## 6.16 Load interface

In this interface you can load Scene, Effect, GEQ or DSP channel setting too. The chosen preset can be deleted by pressing Delete. Please notice the instruction that is shown on the LCD display.

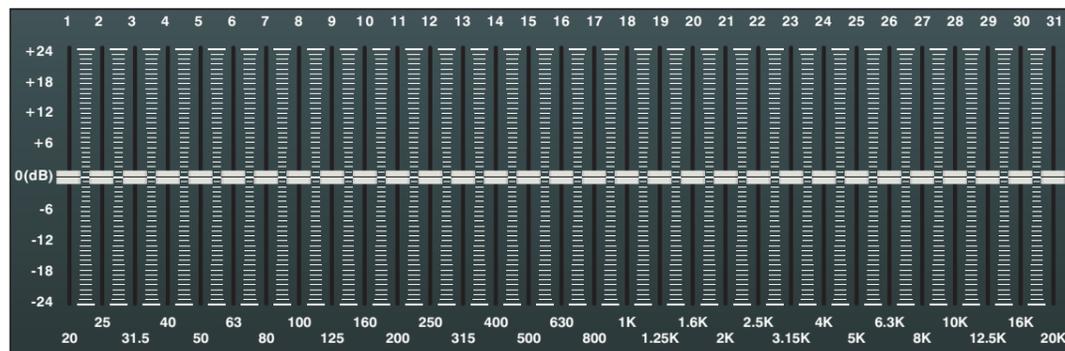


# 6 DSP Control

## 6.15 GEQ interface



The TS-20PD-4 features MAIN Stereo, SUB Mono and AUX Mono, 31-band, 1/3 octave graphic EQs. The 31 bands range from 20Hz to 20 KHz. There is 1 MAIN Stereo GEQ, 4 SUB Mono GEQs and 4 AUX Mono GEQs in 24-bit/48 kHz sample rate.



In this screen, you can adjust gain at every specific frequency. The EQ number, Frequency and Gain value which you are adjusting will be shown on the LCD below the graphic curve. Please follow the instruction that is shown on the LCD display to adjust the value.

**Flat EQ** The Flat EQ button can help you set the whole 31 bands to be default setting.

**Frequency** **Gain**  
200Hz 0.0dB The box can show the frequency and gain that you are adjusting.

Touch Left or Right to select frequency, while touch Up or Down to fine adjust gain of selected frequency.

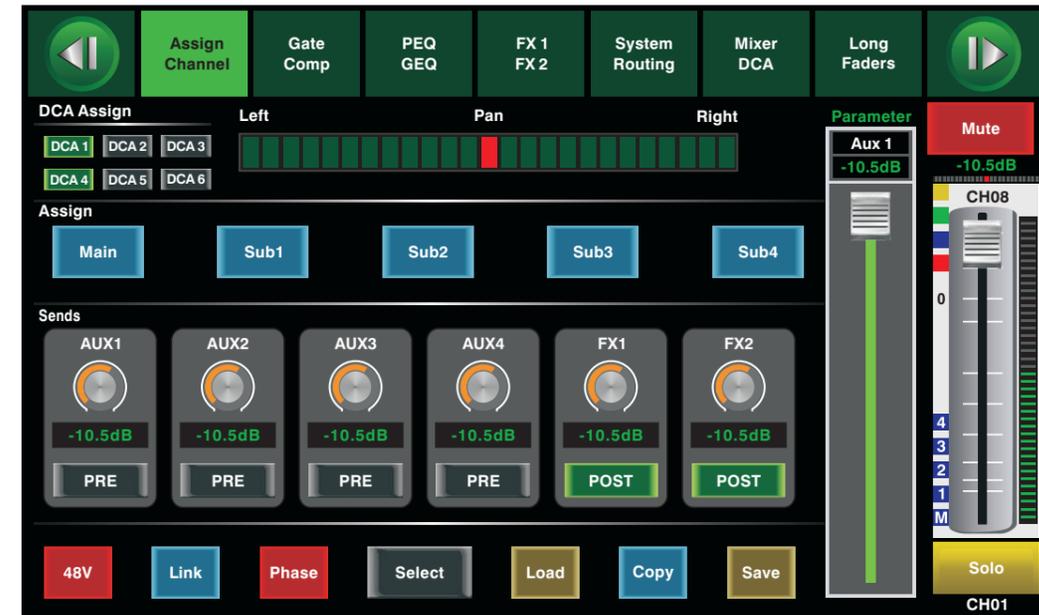
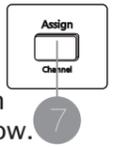


# 5 Control

## 7. Assign/Channel button

Press this button twice, it will switch between Assign and Channel function.

; Press this button to enter assign page, signal from a selected input channel can be assigned to Main, AUX1-4, Sub1-4 or AUX5-8 and FX1-2. The window is as below. For the detail operation, please refer to introduction in section 6.

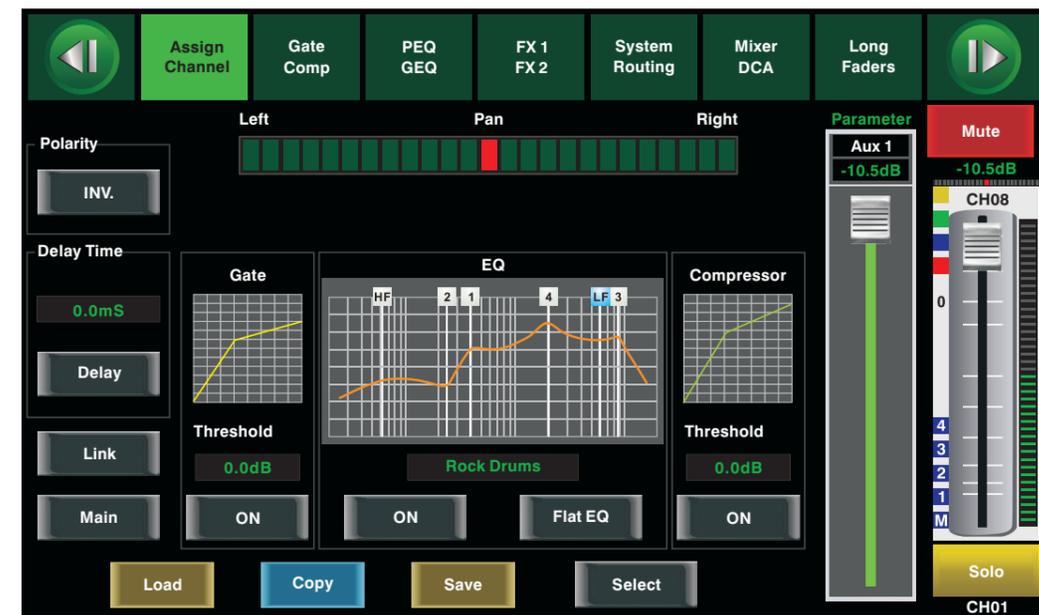


## ; Channel

Press this button again, you will see Channel page on LCD screen. It gives you a preview of other function such as Polarity, Delay, Link, Assign, Gate, EQ, Compressor etc.

You can also adjust corresponding parameters that show on the screen. But for Gate here, you can only adjust threshold; For Compressor, you can only adjust threshold; For EQ, you can adjust nothing here.

For the detail operation, please refer to introduction in section 6.



# 5 Control

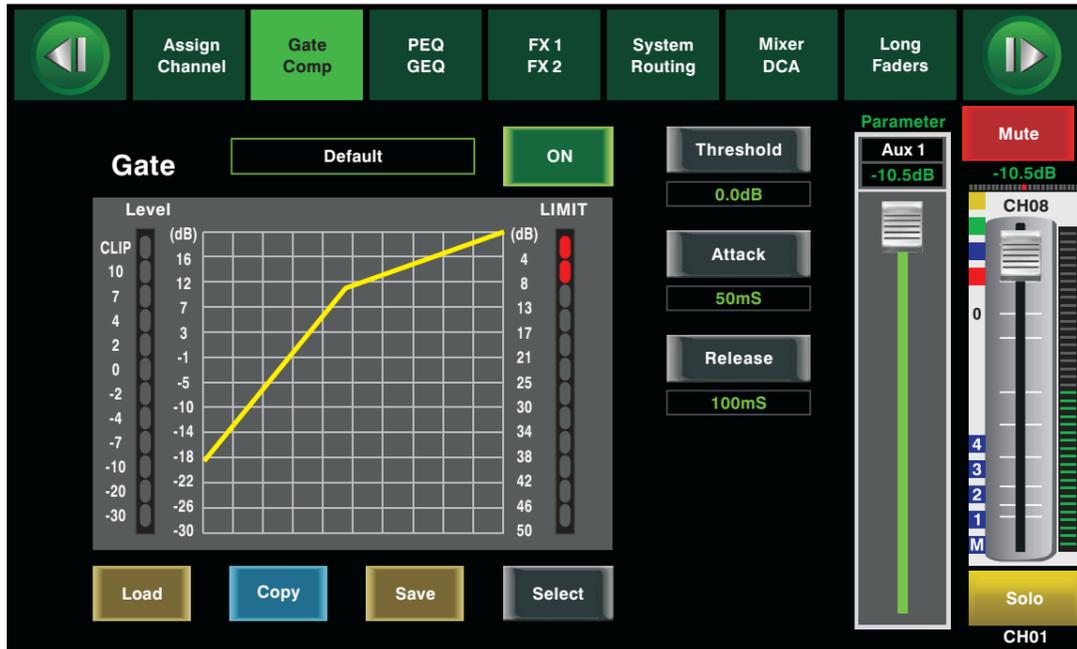
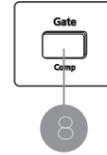
## 8. Gate/Comp button

Press this button twice, it will switch between Gate and COMP function.

; Gate

Noise gate attenuates signals that below the threshold and allows signals to pass through only when they are above a threshold setting. The window is as below.

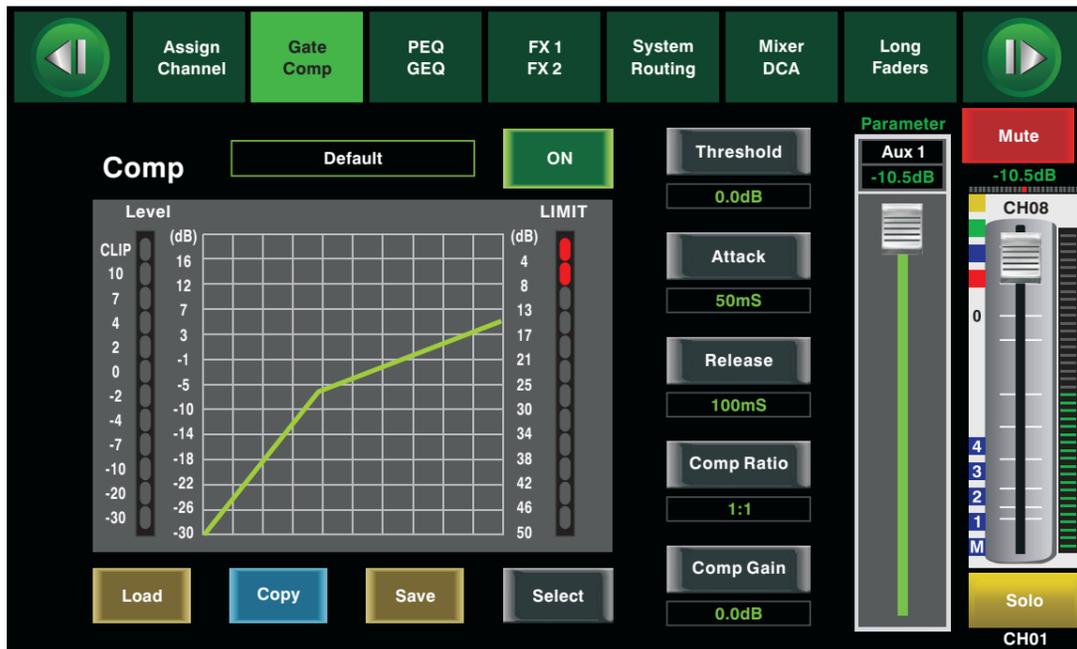
For the detail operation, please refer to introduction in section 6.



; COMP

A compressor reduces the level of an audio signal if its amplitude exceeds a certain threshold. The window is as below.

For the detail operation, please refer to introduction in section 6.



# 6 DSP Control



Touch this icon to select solo mode to be PFL or not, it will illuminate synchronously with PFL button once enabled. For the detail of PFL, please refer to corresponding introduction in section 5.



Default setting restores all the settings you have made to default.



This icon determines the page display to you when you turn on the mixer. Touch Long Fader, you will see Long Fader page first, while select Mixer Mode will show you Mixer page first.



At the lower right corner, you can see instruction of the DSP firmware.



Touch this icon to switch between SUB1-4 mode and AUX 5-8 mode, please note messages on the screen when operation. For the detail function of this button, please refer to Assign introduction in section 6.3.



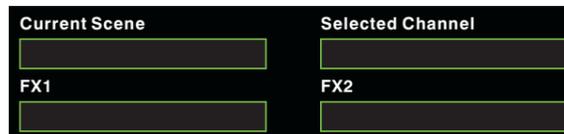
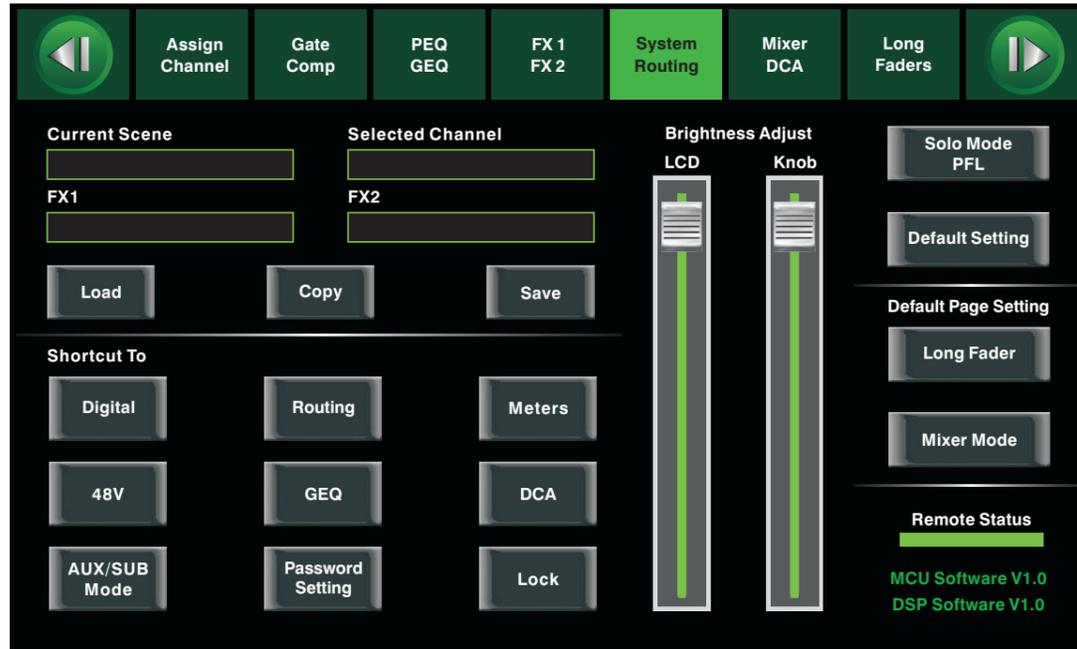
Touch this button to lock the system. Once locked, you must input your password to unlock it. Default password is "1111". Super password is "T20i", which means you can tap it to unlock your TS-20PD-4 every time you forget your password. Please note messages on the screen when operation.



Touch this button to change password of the system. Input an old password and a new password. The system will save the new one as current password. Please note messages on the screen when operation.

# 6 DSP Control

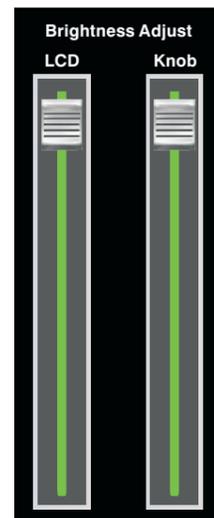
## 6.14 System interface



Text in these box show current corresponding preset you have saved.



Touch these icons to enter corresponding page.



User can touch screen of Brightness Adjust to adjust LCD and Knob bright. The setting will be saved and updated automatically.

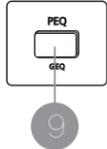
# 5 Control

## 9. EQ button

Press this button twice, it will switch between PEQ and GEQ function ; PEQ

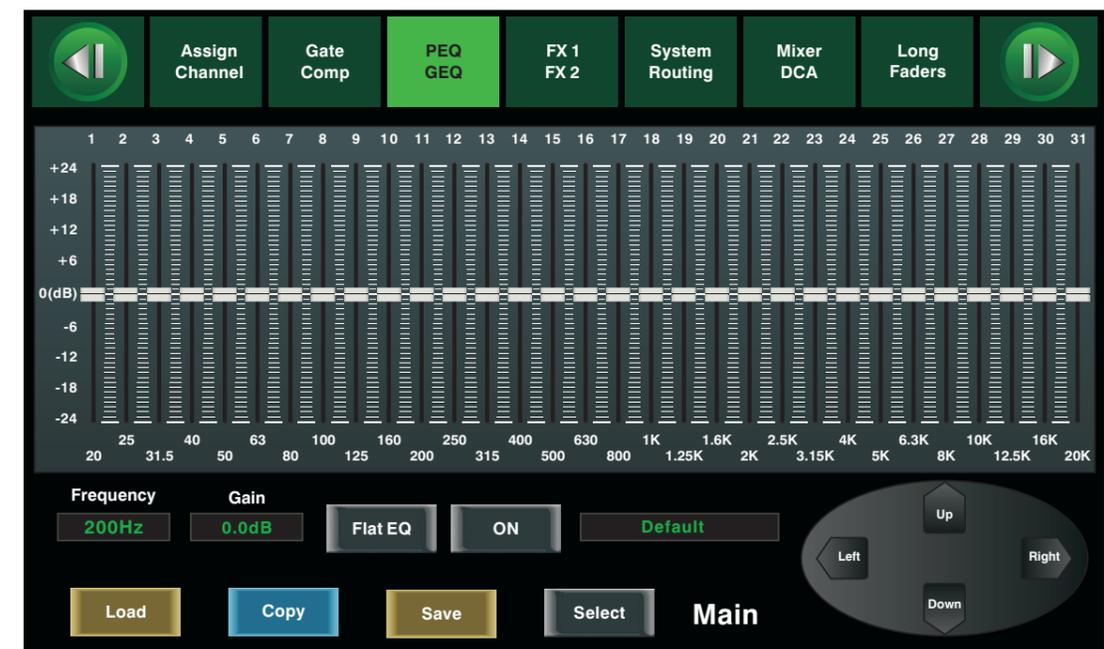
An equalizer is a filter that allows you to adjust the level of frequency in the range of 20Hz-20KHz. The window is as below.

For the detail operation, please refer to introduction in section 6.



; GEQ

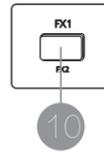
In GEQ page you can set the 31-band EQ. The window is as below. For the detail operation, please refer to introduction in section 6.



# 5 Control

## 10. FX1-2 button

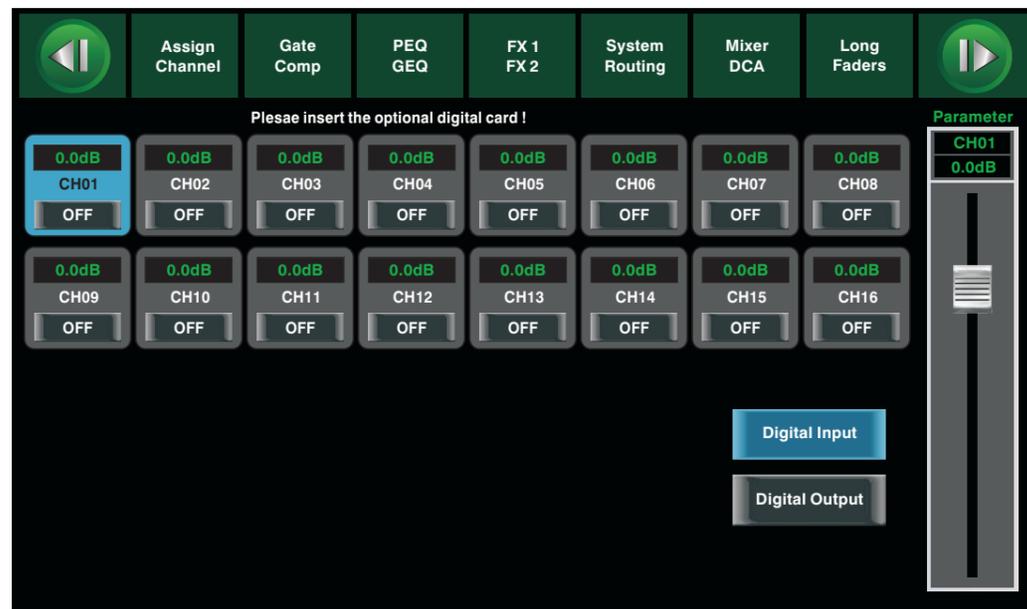
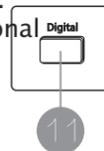
Press this button twice, it will switch between FX1 and FX2 function. This page can show and editor the setting of internal effects. Each of the FX owns 12 program effects. The window is as below. For the detail operation, please refer to introduction in section 6.



## 11. Digital In/Out button

Press this button twice, it will switch between Digital In and Digital Out function. This button engages and disengages the digital channel when you have an optional input/output module inserted.

; Digital In  
The button will illuminate to indicate that current channel has been selected as digital input. The window is as below. For the detail operation, please refer to introduction in section 6.



# 6 DSP Control

## 6.13 Routing interface

You can select input channels of Main 1-20, FX1-2 and USB in and route them to output channels of Main 1-20, Sub 1-4, Aux 1-4 and FX1-2. For example, below window shows Aux 1 routing function. In this page, you can route input channels in LCD screen to Aux1 output. In Main routing page, channel level can not be adjusted, but channel level in Sub, Aux and FX pages are adjustable. As the function of this button will be a little bit different in different control please notice the notes that are shown on the LCD screen when operating.



Touch it to route input channel 1 to output AUX1 as an example. Please rotate Parameter Adjust knob or slide long fader on the screen to change selected channel's audio level.

Touch PRE on the screen, it will switch to POST, and the background will illuminate. The selected channel will derive its signals from all channels post-fader. If the button has not been pressed and not illuminate, by default, the selected channel will derive its signal from all channels pre-fader and all unaffected by the sending channel's fader position.

This icon is a switch to change all channels to be POST or PRE. If the selected channel was linked, they will change synchronous in this page when you adjust them.

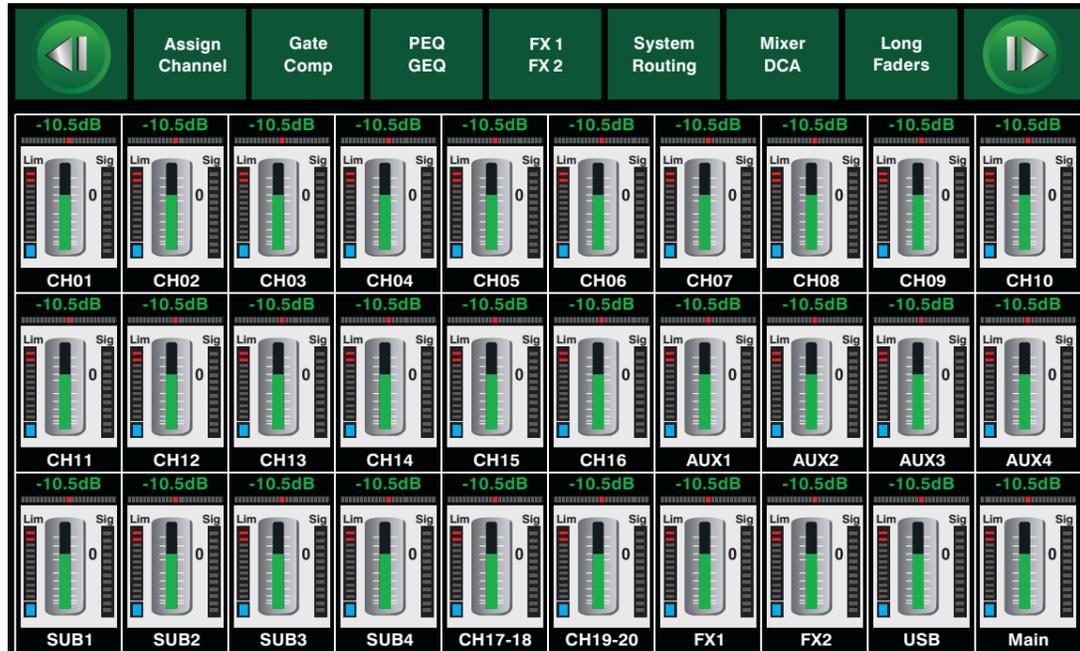
Slide the fader or rotate Parameter Adjust knob to adjust level of selected input channel.



# 6 DSP Control

## 6.12 Meters interface

This page gives you an overall review of all input and output channels and buses' meters status,



This icon indicates current channel's fader position, "0" is zero dB position.

**-10.5dB** The number above it shows level of current channel.

This icon is pan indication.

This icon on the left shows LIMITER/COMP meters.

The blue square below is Gate indicator, when the Gate activate, it lights yellow color.

This icon on the right shows the actual input signal level activity.

# Control

# 5

; Digital Out

The button will illuminate to indicate that current channel has been selected as digital output. The window is as below.

For the detail operation, please refer to introduction in section 6.



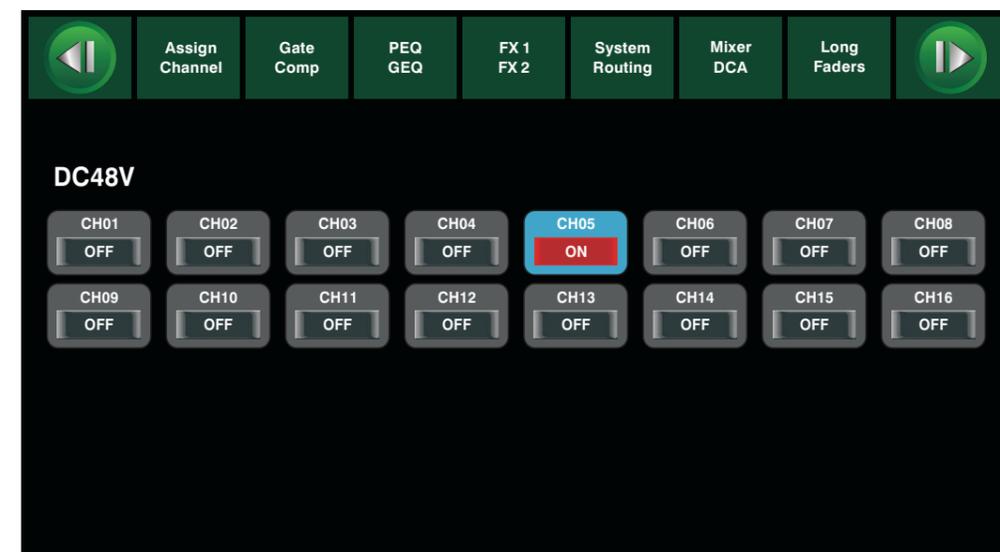
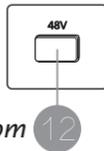
When the button illuminated, please pay attention to which channel is Digital Input and which channel is Digital Output during operation.

## 12. 48V Phantom button

Every microphone input equips with an individual phantom power which is controlled by the 48V phantom power button. When you want to turn on phantom power of some channel, the screen will show warning to ask you and make sure. It will illuminate when phantom power is activated.

Please notice that only the condenser microphone needs phantom power.

*Note: Please do not supply phantom power to any device which do not need phantom power otherwise the device and T20 may be damaged.*



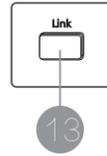
# 5 Control

## 13. Link button

Input channels, aux buses, and subgroups can be linked as a stereo pair. It will illuminate if the stereo link button has been pressed and enabled. The stereo pairs are predefined and cannot be changed. They are as follows:

- Channels 1 and 2      Channels 13 and 14
- Channels 3 and 4      Channels 15 and 16
- Channels 5 and 6      Aux 1 and Aux 2
- Channels 7 and 8      Aux 3 and Aux 4
- Channels 9 and 10    Subgroups 1 and 2 or Aux 5 and Aux 6
- Channels 11 and 12   Subgroups 3 and 4 or Aux 7 and Aux 8

A stereo link can be enabled when either channel in the pair is selected by pressing the Link button. When the Link button is illuminated which indicates the Stereo Link function enabled, all DSP setting, subgroup assignments, solo status and main assignments are passed to the other channel in the pair.



; Link & DCA: After link, the channels can also be grouped to DCA as stereo channel, but not able to cancel the link in DCA. On the contrary, if the channel has been grouped to DCA, it can not link at all, but its paired channel can link.

For example, channel 5 is linked with channel 6, then both channel 5 and 6 can be grouped to DCA. But if channel 5 has been grouped to DCA first, it can not link to channel 6, but channel 6 can link to channel 5.

; Link & Routing: The two linked channels can route as stereo channel, while routed channels can also link later.

Please note that this is a nondestructive passing, the other channel's previous setting will be restored after the Link button is disengaged. For example, when Channel 6 has been selected, then press Stereo Link button, all of Channel 6's setting will be copied onto Channel 5. The Channel 5's own setting will restore after the Link button has been disengaged.

## 14. Solo button

Press this button will send its channels or buses to the control room outputs. It will illuminate as has been pressed and enabled.

## 15. Mute button

Press this button will mute selected channel and all of its assigned outputs. It will illuminate when the button has been pressed and enabled.

## 16. Pan button

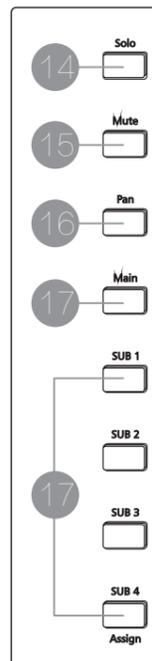
Press this button to select the Pan function, then rotate Parameter Adjust encoder to control signal level from left to right for the selected input or output bus. If you have adjusted a channel pan, please just touch 2 times on the screen and make it back to the centre position. The LCD display shows the setting in real time. If two channels have been linked as stereo pair, the LCD display will automatically change to stereo pan.

## 17. Main & SUB1-4 buttons

The selected channel can be assigned to SUB group outputs 1-4 and Main Outputs by pressing the corresponding button. But if SUB mode is switched to AUX mode, the SUB1-4 button can not active.

The main 20 inputs, USB In, and FX1-2 can be assigned to any or all of the output Subgroups, Aux Sends and the main outputs.

Subgroups can only be assigned to the main outs. The 4 aux sends cannot be assigned to a subgroup or to the main outputs.



# DSP Control

# 6

## DCA 1

Press one of DCA1-6 on the panel or touch it on the screen, the button will illuminate, which means now you can select one or several channels to the group as above window.

## Group

Text under DCA1-6 controls show the preset of DCA settings, you can load a preset directly by pressing Load button, for the detail operation, please refer to the DSP Load section.



Touch channels that you want to assign to...DCA2, for example. The selected channels background will illuminate.

## DCA Set

After you selected channels, the DCA Set control is flash, now press it on screen to save the group. Repeat the same way to assign other groups. Each group can repeat selecting any channel. For example, channel 3 can be assigned to DCA1, DCA2, etc.

After selecting, the page will return to Mixer mode automatically, in which page you can operate selected group. You can slide fader on the left of screen to increase or decrease the channel fader levels (not volume) in proportion at the same time, or by rotating the corresponding knob to control the level.

## DCA Clear

Press DCA clear, you can see indication on the screen, a warning will come up, then select "yes" to clear channels that assigned to current group.

## System

## Long Fader

## Back To Previous

Touch these icons to enter corresponding page.



# 5 Control

## 21. DCA1-6 buttons

Press these buttons to select which channels you want to be assigned to the group.

## 22. AUX1-4 select buttons

This button function is similar to input channel select buttons. Press this button will route its channel to add DSP setting and assign its output. It will illuminate as has been pressed and enabled. In DCA window, you can select group channels by this button.

## 23. FX1-2 select buttons

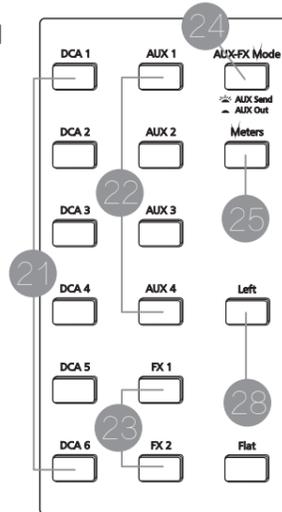
This button function is also similar to input channel select buttons and AUX1-4 select buttons. For the details, please refer to point 22 or 1.

## 24. AUX-FX Mode button

Press this button, it will illuminate as has been enabled. Signal from 20 main input channels will be assigned to AUX1-4 or AUX5-8(SUB1-4) and FX1-2, you can rotate the Parameter Adjust knob to adjust signal's level. When the button is OFF, it is AUX/FX Out function, which means the AUX1-8 and FX1-2 will not be enabled in Assign status.

## 25. Meters button

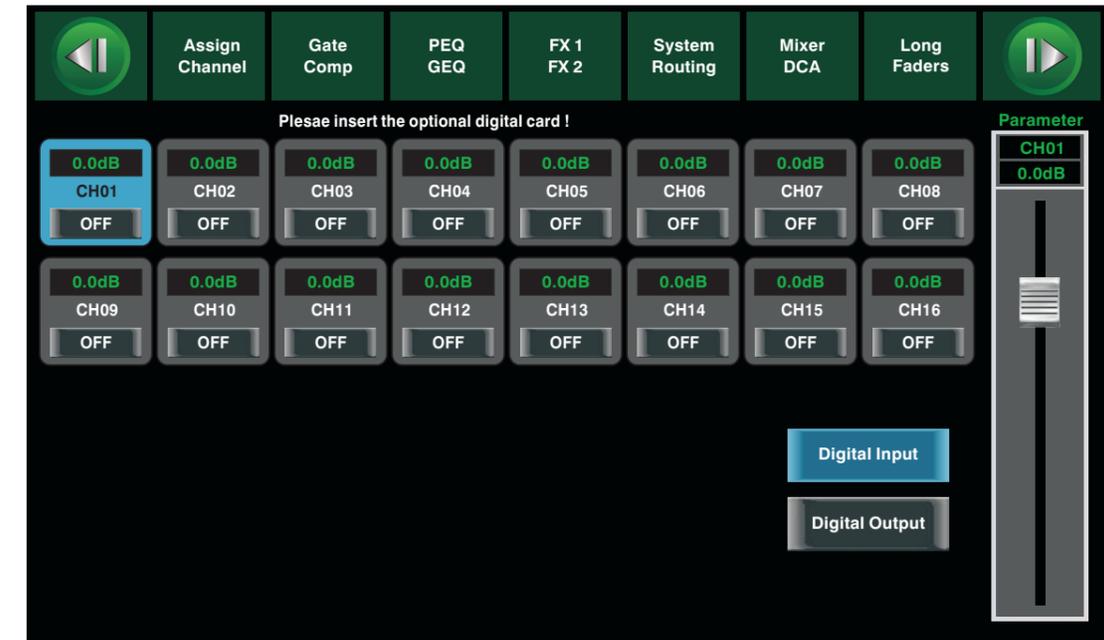
Press this button to enter meters check page, as below picture show, for the details, please refer to corresponding introduction in section 6.



# 6 DSP Control

## 6.9 Digital Input interface

Only channel 1-16 are given digital input. You can select which channels input from option module, and which channels input from analog. The screen will give clues if no digital card inserted in, and the Digital in function can not be enabled either.



Touch this icon to switch between Digital Input and Digital Output page.



This symbol enables you to choose digital input channels, touch the switch OFF, it will turn to ON and illuminate, which means this selected channel can input digital signal.



When you choose a digital assign channel, you can adjust its input level by sliding this long fader on the screen or by rotating Parameter Adjust knob on the panel.

# 6 DSP Control

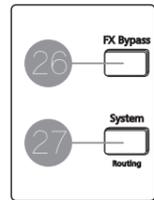
The TS-20PD-4 includes 12 kinds of adjustable effects which can help to realize the effect that you want to show your audience.

NO.	Preset	Description	Parameter
1	Hall	Simulate an acoustic space of the sound	Pre Delay; Decay; Room Size; Hi Damp; Efx Out; Dry out
2	Room	Simulate a studio room with many early reflections	Pre Delay; Decay; Room Size; Hi Damp; Efx Out; Dry Out
3	Plate	Simulate the transducer's sound like classic bright vocal plate	Pre Delay; Decay; Room Size; Hi Damp; Efx Out; Dry out
4	Delay	Reproduce the sound input on the output after a lapse of time	Time; Decay; Hi Damp; Efx Out; Dry Out
5	Stdelay	Recreate the input sound on the stereo output with different time	L Time; R time; L Decay; R Decay; Hi Damp; Efx Out; Dry Out
6	Tremolo	Simulate the sound effect by repeating the same note or different notes alternately and quickly	Feed Back; Depth; ModFreq; Efx Out; Dry Out
7	Flanger	Simulate to play with another person carrying out the same notes on the same instrument	Feed Back; Depth; ModFreq; Efx Out; Dry Out
8	Chorus	Recreate the illusion of more than one instrument from a single instrument sound	Feed Back; Depth; ModFreq; Efx Out; Dry Out
9	DelayRev	Delay with room effect	Pre Delay; Rev Decay; Room Size; Rev Hi; Rev Out; Echo Time; Echo Hi; Echo F.B; Echo out; Dry Out
10	StDelayRev	Stereo Delay with room effect	Pre Delay; Rev Decay; Room Size; Rev Hi; Rev Out; L Time; R Time; L Decay; R Decay; Echo Hi; Echo Out; Dry Out
11	FlangerRev	Stereo chorus and large room reverb	Pre Delay; Rev Decay; Room Size; Rev Hi; Rev Out; ModF.B; ModDepth; ModFreq; Mod Out; Dry Out
12	ChorusRev	Simulate the sound effect achieved by rotating horn speakers and a bass cylinder	Pre Delay; Rev Decay; Room Size; Rev Hi; Rev Out; ModF.B; ModDepth; ModFreq; ModOut; Dry Out

# 5 Control

## 26. FX Bypass button

This button is for FX function, when press it, effects of FX1-2 will be mute synchronously, which is similar to MUTE button.



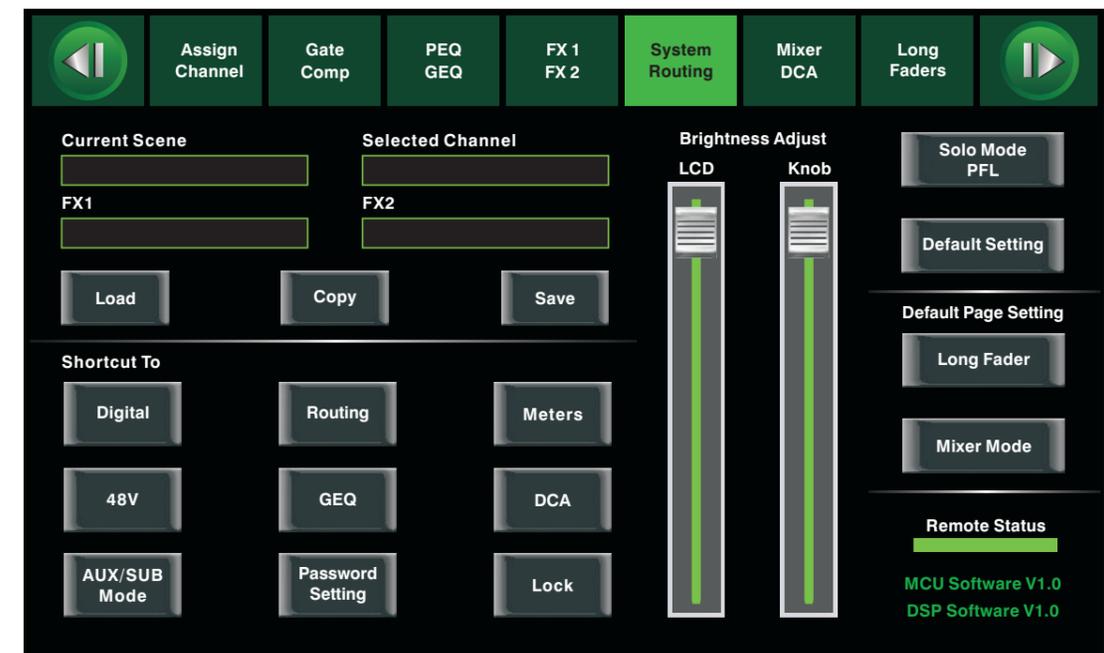
## 27. System/Routing button

Press this button twice, it will switch between System and Routing function.

; System

Press this button to go to System page, as well as show and edit parameters of the system, as below picture show.

For the detail operation, please refer to the introduction in section 6.



# 5 Control

; Routing

Press this button again, user can select one or several channels in below windows to assign the signal to corresponding outputs.  
For the detail operation, please refer to introduction in section 6.

- Page of routing input channels to AUX1 (the same with AUX2-4)



- Page of routing input channels to MAIN



# 6 DSP Control



This is a high-pass filter. It can pass higher frequencies. When set to its lowest position, the filter is off.

Type indicates the filter's type that you selected, different type means different shape and different filter frequency range.



This is a low-pass filter. It can pass lower frequencies. When set to its highest position, the filter is off.

Type indicates the filter's type that you selected, different type means different shape and different filter frequency range.

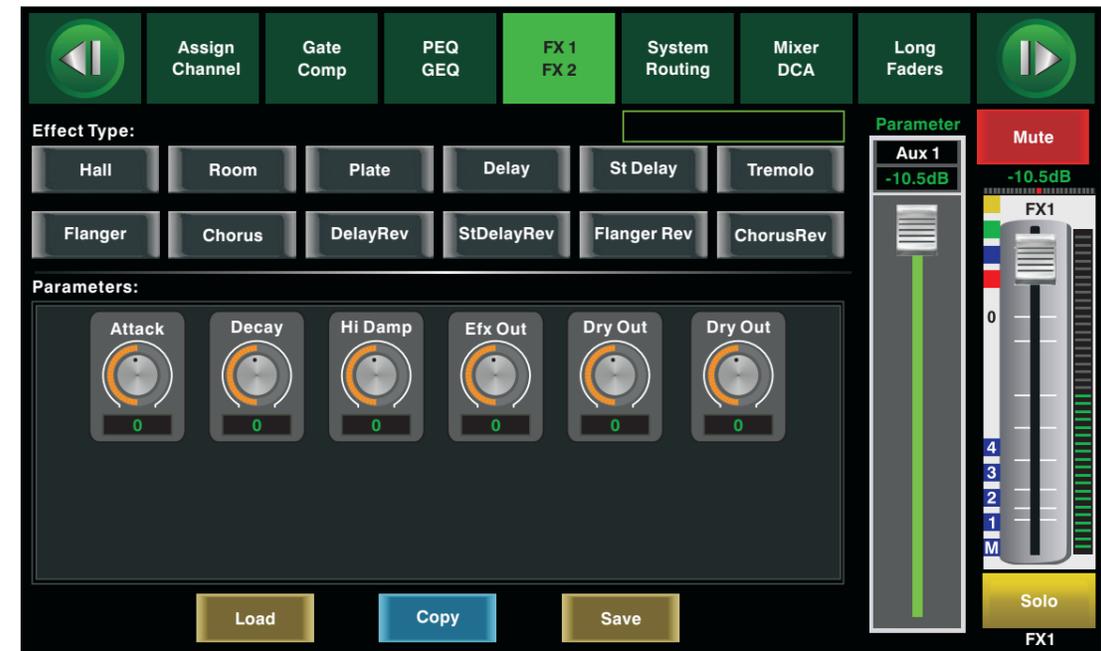
	Frequency	Q	Gain	Type
EQ1	200Hz	3.0	0.0dB	
EQ2	1.0KHz	3.0	0.0dB	
EQ3	5.0KHz	3.0	0.0dB	
EQ4	10.0KHz	3.0	0.0dB	

Touch EQ1 to set its Frequency, Q and Gain parameters separately, touch Type to change the filter to high-pass, low-pass or band-pass filter, the same as EQ2, EQ3 and EQ4. You can see the waveform on the screen.

Note: you can also rename the selected channel by long pressing CHXX.

## 6.8 FX1-2 interface

The setting values of FX1-2 can be saved as preset for future use by simply touching the Save button and following the instruction that is shown on the LCD display.



Touch anyone of these controls to adjust parameter of the effects by rotating Parameter Adjust knob or slide fader on the right of LCD screen.



Touch this control to mute current FX effect.

# 6 DSP Control

## 6.7 EQ interface



**OFF** Touch the switch to engage or disengage the equalizer for the selected channel. It will illuminate to indicate that the equalizer has been touched and enabled. The LCD display shows the EQ setting in real time. Its parameters can adjust by sliding the curve on the screen directly or using up & left & down & right key to choose the function that you want to modify and use the Parameter Adjust knob to set the value. Please notice that only if the EQ button has been enabled can its parameters be adjusted. The equalizer is available for all input and output buses.

**Flat EQ** Touch it, a dialog box saying "Are you sure to flat the EQ?" will prompt to check with you, if you click "yes", all the setting values in this page will restore to default, while choose "no" can keep your settings.

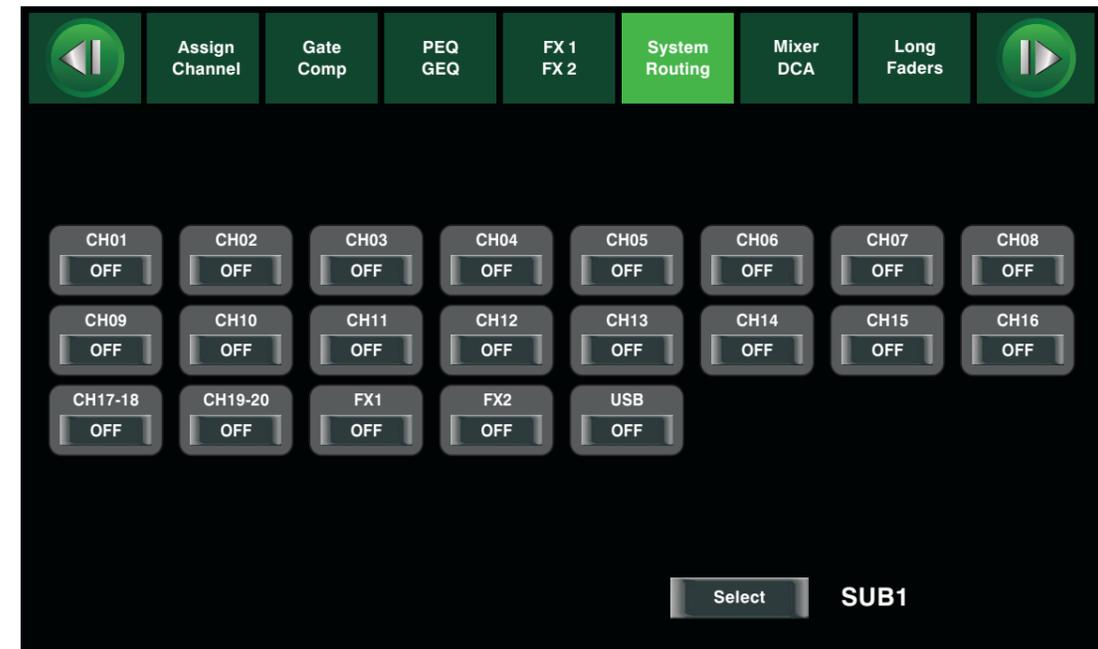
**Frequency** Touch it to set the center frequency of the equalizer's Low/Low-mid/High-mid/ High band separately. The center frequency is the middle of the pass-band between the lower and upper cutoff frequencies which define the limits of the band. The center frequency can be set from 20Hz to 20K Hz.

**Q** Touch it to set the Q for the Low/Low-mid/High-mid/High band separately. The Q is the ratio of the center frequency to the bandwidth. If the center frequency is constant, the bandwidth is inversely proportional to the Q, which means that if you raise the Q, the bandwidth will be narrowed. It can be adjusted from 0.4 to 24.

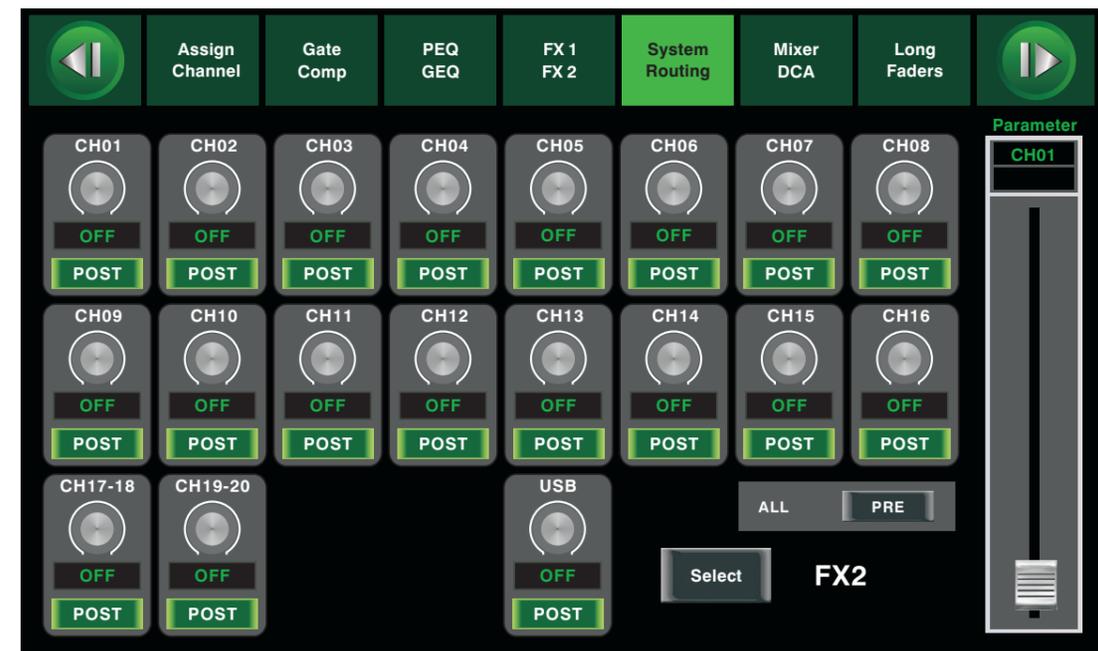
**Gain** Touch it to set the gain cut or boost at the center frequency for the Low/Low-mid/ High-mid/High band separately. It can be set from -24 to +24 dB.

# 5 Control

## -Page of routing input channels to SUB1 (the same with SUB 2-3)



## - Page of routing input channels to FX1 (the same with FX2)

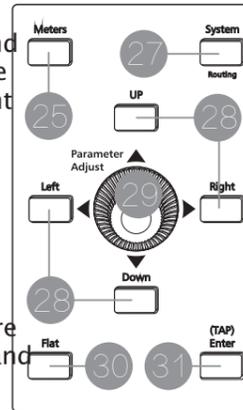


# 5 Control

## 28. UP &Left &Down &Right button

These buttons move the cursor around the display page, or select and delete parameters and options. Sometimes, Up button function is the same as Left button, while Down button function is the same as Right button. But in GEQ, Up and Down adjust gain level, while Left and Right adjust frequency.

As the function of this button will be a little bit different in different function, please notice the notes that are shown on the screen when operating.



## 29. Parameter Adjust knob

This Encoder adjusts the parameter values of selected control that are shown on the LCD display. Turning it clockwise increases the value and counterclockwise decreases the value.

As the function of this button will be a little bit different in different function, please notice the notes that are shown on the screen when operating.

## 30. Flat button

Press this button, you can see warning on the screen, select yes to return all the settings to default, only in the page that you can set some values can this button function, such as Gate, EQ, Comp and GEQ.

As the function of this button will be a little bit different in different function, please notice the notes that are shown on the screen when operating

## 31. Enter(TAP) button

This button can activate as two types of function.

; Enter: Confirm the edited parameter values.

When there is a confirmation message jump out on the screen, press Enter button to answer "yes".

; TAP: In the FX1 and FX2 page, it will switch to TAP function, you can use this button to enter a delay time in tempo with the music being played.

As the function of this button will be a little bit different in different function, please notice the notes that are shown on the screen when operating.

## 32. Control Room knob

This knob controls the overall output level for control room.

## 33. PFL button

The default setting for the Solo bus is After-Fader Listen (AFL); by pressing PFL, Pre-Fader Listening is enabled. In either mode, press Solo on any channel or bus to route that channel to the Solo bus and has no effect on the main or subgroup mixes.

## 34. HP1-2 knob

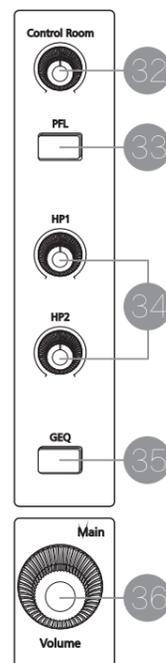
These knobs control the overall output level for headphones.

## 35. GEQ

This button is the same as EQ when you press it twice, please refer to point 9 for basic introduction.

## 36. Main control knob

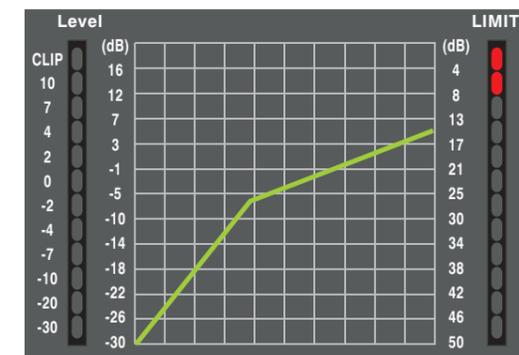
This knob here controls the overall output level for main channel.



# 6

## DSP Control

- Comp Gain** 0.0dB  
Touch it to set the gain of the compressor for the selected channel or bus. Generally, when compressing signal, the decreasing of gain will cause whole level attenuation. This Gain control can recover the lost level and re-adjust volume that compressed before. The Gain can be set from 0 dB (no gain adjusted) to +24 dB.
- Threshold** 0.0dB  
Touch it to set the compressor threshold for the selected channel. If the amplitude of an audio signal exceeds a certain threshold, the compressor will reduce the level of this signal. The threshold can be set from -30 to 20 dB.
- Attack** 50mS  
Touch it to set the compressor's attack setting for the selected channel. The attack setting is the period when the compressor is decreasing gain to reach the level that is determined by the ratio. You can set the attack from 10 to 150 milliseconds.
- Release** 100mS  
Touch it to set the compressor for the selected channel. Release sets the length of time the compressor takes to return to its normal gain once the signal level drops below the threshold. Release can be set from 10 to 1,000 milliseconds.
- Comp Ratio** 1:1  
Touch it to set the compression ratio for the selected channel. The ratio determines the amount of gain reduction. For example, a ratio of 4:1 means that if input level is 4 dB over the threshold, the output signal level will be 1 dB over the threshold. The ratio can be set from 10:1 to 1:1 until limit.



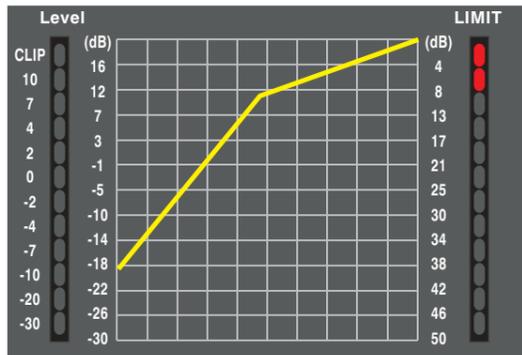
The compressor grid shows level setting of threshold in real time. Meter on the left indicates the input signal's level activity. Meter on the right indicates degree of compressor.

**Load** **Copy** **Save** Touch anyone of these controls to enter corresponding page.

**Select** It is the same with that in Assign interface in section 6.3.

Note: you can also rename the selected channel by long pressing **CHXX**.

# 6 DSP Control



The Gate grid shows level setting of threshold in real time. Meter on the left indicates the input signal's level activity.

Touch anyone of these controls to enter corresponding page.



**Select** It is the same with that in Assign interface in section 6.3.

*Note: you can also rename the selected channel by long pressing CHXX.*

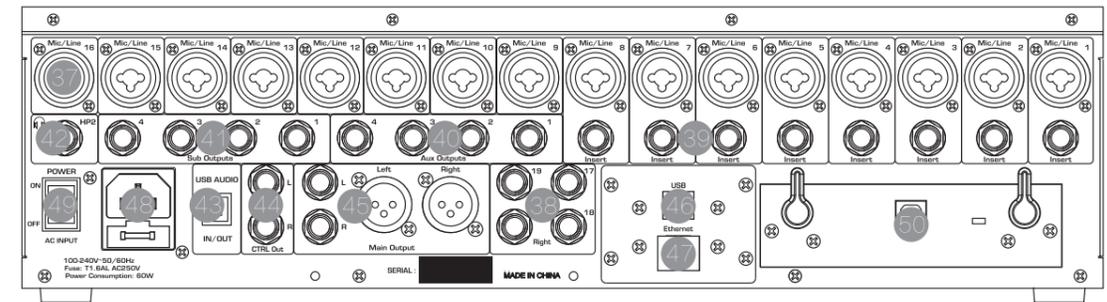
## 6.6 COMP interface

**ON** Touch the switch in this window, you can engage and disengage the Compressor for the selected channel. It will illuminate to indicate that the compressor has been pressed and enabled. The LCD display shows the compressor setting in real time. Its parameters can change by rotating the Parameter Adjust to set the value of Gain, Threshold, Attack, Release & Ratio control directly or using up & left & down & right key to choose the function that you want to modify. Please notice that only if the Compressor button has been enabled can its parameters be adjusted.

- The bar has 3 colors here, which indicate 3 status.
- Grey- the switch is OFF.
- Green- the switch is ON, there is signal input and under compressing, which means it enables the compressor function.
- Red- the switch is ON, but compressor function not enable.

# 5 Control

## 5.2 Rear panel



### 37. Combo Jack

The Combo Jack Inputs integrates Mic and Line in together, insert in the middle hole to get Line in function, while insert in the edge circle to achieve the Mic function.

The TS-20PD-4 equips 16 microphone preamplifiers for use with all types of microphones. The preamplifier has a Class A input buffer which followed by a dual-servo gain stage. This arrangement will bring ultra-low noise and wide gain control which help to boost signals without increasing unwanted background noise.

The line-level input is a 1/4-inch, balanced TRS connector. Each channel of the TS-20PD-4 has a line-level input. The microphone-preamp circuit will be bypassed if the Line-level Input has been engaged.

*Note:* Please notice that there will be a momentary spike in the output when plugging in a microphone or a line-level input device, or turning phantom power on or off. So it should be better to mute or turn down the channel fader before changing connections or turning phantom power on or off.

### 38. Line inputs 17-20

The 17-20 Line Inputs are normally used as effects returns. A line bus can be used to send several channels to an external effects processor and also can be used to return the processed signal to the mixer. The input is balanced stereo. If a mono signal has to be returned to the mix, connect it to the left input, then the right as well as the left side will get the signal.

### 39. Insert

Only channel 1-8 are equipped with insert function, while others are not. The direct-insert point is an unbalanced 1/4-inch connector which can be used to connect external processors. The insert's sending is after the channel's gain control and before the digital bus. But the return goes to the digital bus directly. So if a de-esser has been inserted on the vocalist's channel, the de-esser will get an unprocessed, amplified signal. The processed signal will return to the 20.4's digital bus to add DSP setting and sent through Aux and FX buses...

### 40. Aux Outputs1-4

These are balanced mono outputs for each auxiliary.

### 41. Sub Outputs1-4

These are balanced mono outputs for each subgroup.

### 42. Headphones out HP1 and HP2

They are the headphone's port for monitoring.

### 43. USB AUDIO in/Out

This port is for USB audio input and output.

# 5 Control

## 44. CTRL Out

These are the balanced control-room outputs. The level is controlled by the knob in the Control Room on the top panel.

## 45. Main Output

The TS-20PD-4 features both XLR and TRS main outputs. These outputs are parallel to each other.

## 46. USB connect port

This port is for remote control or firmware update.

## 47. Ethernet connect port

This port is for Ethernet control or firmware update.

## 48. Power Inlet

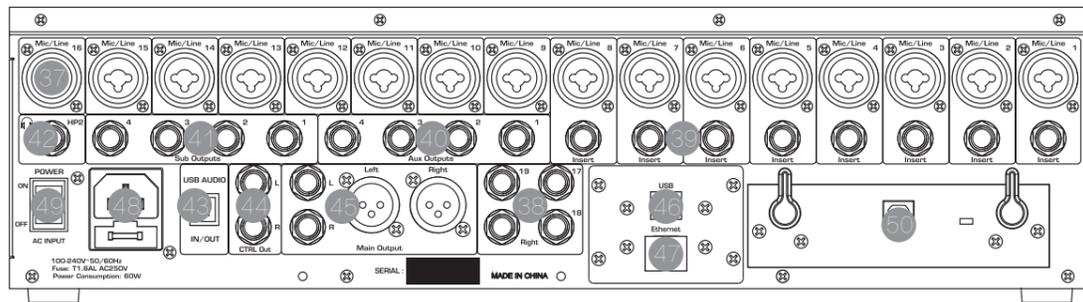
The provided power cable can be plugged in.

## 49. Power Switch

Push the top part of the switch to turn on and the bottom part to turn off.

## 50. Optional module

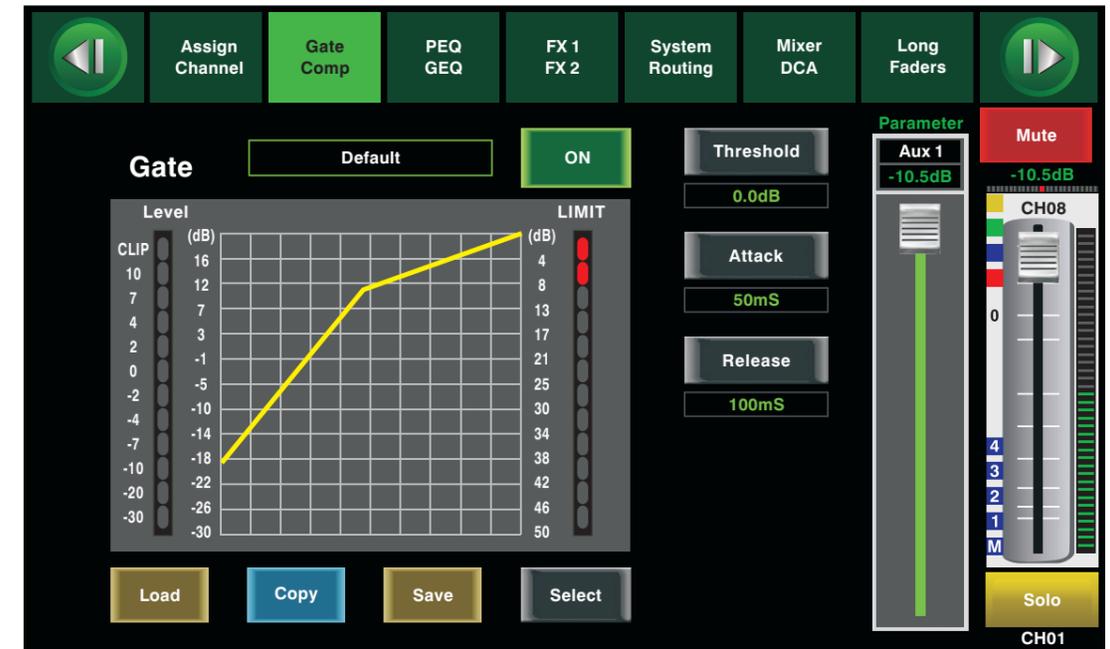
You can choose to add optional module that you want for special function. Please contact with our agency to get information about new modules.



# 6

## DSP Control

### 6.5 Gate interface



**ON** Touch the switch in this window, you can engage and disengage the Gate for the selected channel. It will illuminate to indicate that the Gate has been touched and enabled. The LCD display shows the Gate setting in real time. Its parameters can change by adjusting Threshold, Attack & Release control directly and use the Parameter Adjust knob to set the value. Please notice that only if the Gate control has been enabled can its parameters be adjusted.

The bar has 3 colors here, which indicate 3 status.

- Grey- the switch is OFF.
- Green- the switch is ON, there is signal input and the value is below threshold level, which means it enables the gate function.
- Red- the switch is ON, but gate function not enable.

**Threshold** Touch it to set the level at which the gate will open. It can be set from 0 to -84 dB.  
0.0dB

**Attack** Touch it to set the time for the gate to change from closed to open, much like a fade-in. It can be set from 0.5 to 200 ms.  
50mS

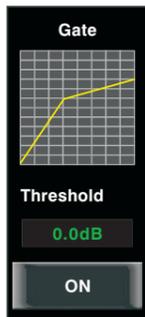
**Release** Touch it to set the amount of time for the gate to go from open to fully close. It can be set from 0.01 to 1 second.  
100mS

*Note: A fast release abruptly cuts off the sound once it has fallen below the threshold, A slower release smoothly changes from open to closed, much like a slow fade out. If the release time is too short a click can be heard when the gate re-opens.*

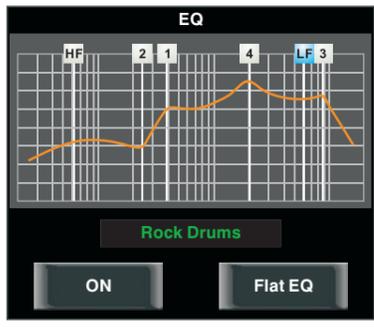
# 6 DSP Control

**Main** Touch this control, it will illuminate as well as the button, signal from a selected channel can be assigned to Main channel, for the details please refer to Assign introduction in section 6.3.

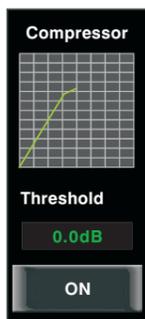
**Gate** Touch the switch ON to enable Gate function, then rotate Parameter Adjust knob or slide long fader on the right LCD screen to adjust value of Threshold, which will show in the middle box. During adjustment, corresponding figure change will show in the Gate grid. In this area, you can touch the grid area to enter Gate page, for the detail of Gate function, please refer to the Gate introduction in section 6.5.



**EQ** Touch the switch ON to enable EQ function, it will illuminate and synchronize with ON/OFF control in EQ page. Please set values in EQ page because it is not adjustable here. This page can only show the values. You can also load a preset, please refer to load introduction section for the detail operation, the loaded state will show in the middle box. Touch Flat EQ to eliminate EQ settings and restore it to default. In this area, you can touch the grid area to enter EQ page, for the detail of EQ function, please refer to the EQ introduction in section 6.7.



**Compressor** Touch the switch to enable Compressor function, then rotate Parameter Adjust knob or slide long fader on the right LCD screen to adjust value of Threshold, which will show in the middle box. During adjustment, corresponding figure change will show in the Compressor grid. In this area, you can touch the grid area to enter COMP page, for the detail of COMP function, please refer to the COMP introduction in section 6.6.



**Load** **Copy** **Save** Touch anyone of these controls to enter corresponding page.

**Select** It is the same with that in Assign interface in section 6.3. *Note: you can also rename the selected channel by long pressing CHXX.*

# DSP Control

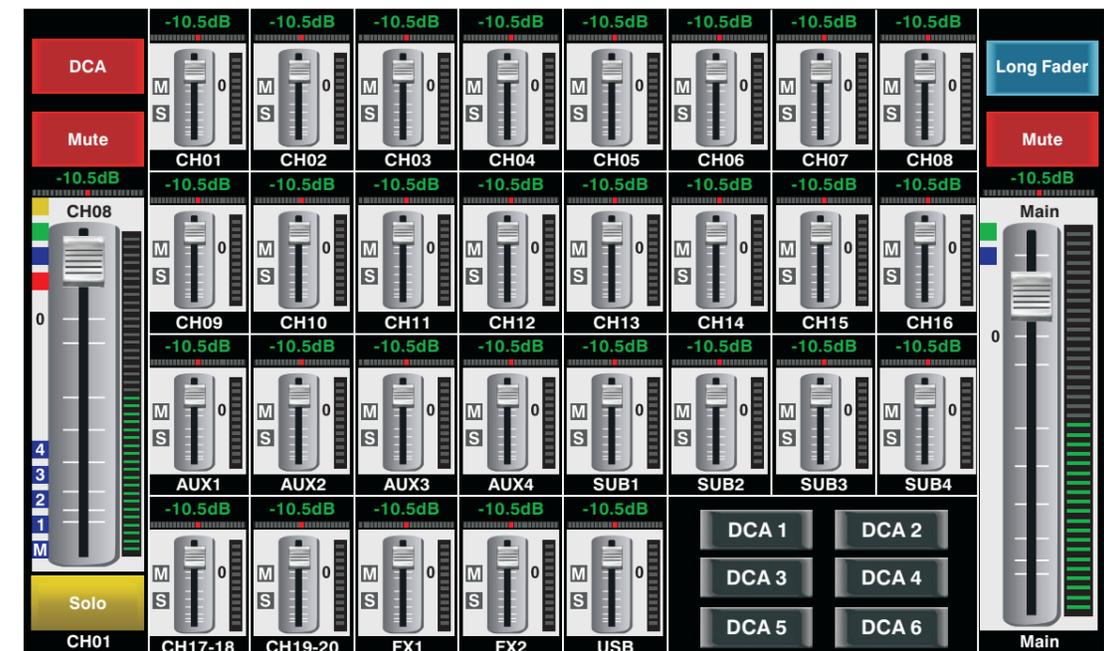
## 6. DSP Control

The DSP control part is the most important part of TS-20PD-4. In this part you can adjust Gate, Compressor, EQ, polarity, panning, delay, link, routing, etc. for the selected channel. Here is the table lists each input/output channel that with DSP function.

BUS	Gate	Compressor	EQ	Polarity	Pan	Delay	Link	Output Assignment
Inputs (CH1-16)	✓	✓	✓	✓	✓	✓	✓	MAIN, SUB Groups 1-4, Aux Sends 1-4, FX 1-2
Inputs (CH17-20)	✓	✓	✓	✓	✓	✓	✗	MAIN, SUB Groups 1-4, Aux Sends 1-4, FX 1-2
Aux Sends 1-4	✓	✓	✓	✓	✗	✓	✓	
FX 1-2	✓	✓	✓	✓	✓	✓	✗	MAIN, SUB Groups 1-4, Aux Sends 1-4
SUB Groups 1-4	✗	✓	✓	✓	✓	✓	✓	MAIN
MAIN Out	✗	✓	✓	✓	✗	✓	✗	

### 6.1 Mixer interface

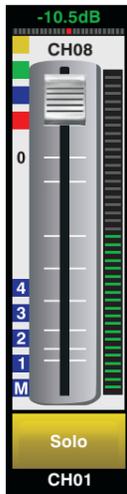
Once you turn on the TS-20PD-4 switch, the Mixer interface will come to your eyes at first if you have presetted, now let's see what you can get in this interface.



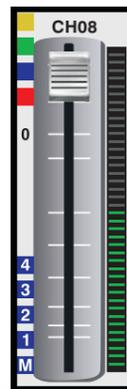
# 6 DSP Control



Touch a channel, for example, CH01, the background and corresponding CH1 button will illuminate synchronously, you can control the output signal level by Parameter Adjust knob.  
 S will illuminate synchronized with Solo button on the panel.  
 M will illuminate synchronized with Mute button on the panel.  
 Meter beside the fader indicates the input signal level activity.



This long fader can control level of all input and output channels in this screen, but for one selected channel at one time, all its control will change synchronized with the selected channel.



Slide the fader, you can increase or decrease corresponding channel's level.

Meter beside the fader indicates signal activity.

**-10.5dB** The number indicates current channel level.

The pan icon shows real pan of selected channel audio signal, press Pan button on the panel and rotate Parameter Adjust knob to adjust it.

**Solo** Touch the icon to monitor selected channel audio signal, it will illuminate synchronized with Solo button on the panel.

**Mute** Touch the icon to silence selected channel audio signal, it will illuminate synchronized with Mute button on the panel.

**CH01** This letter shows the real current channel. You can also rename the channel. Touch it and hold for a while, a virtual key will come into your vision, as below picture show. Now please tap the keyboard and give a new name to this channel as you like.

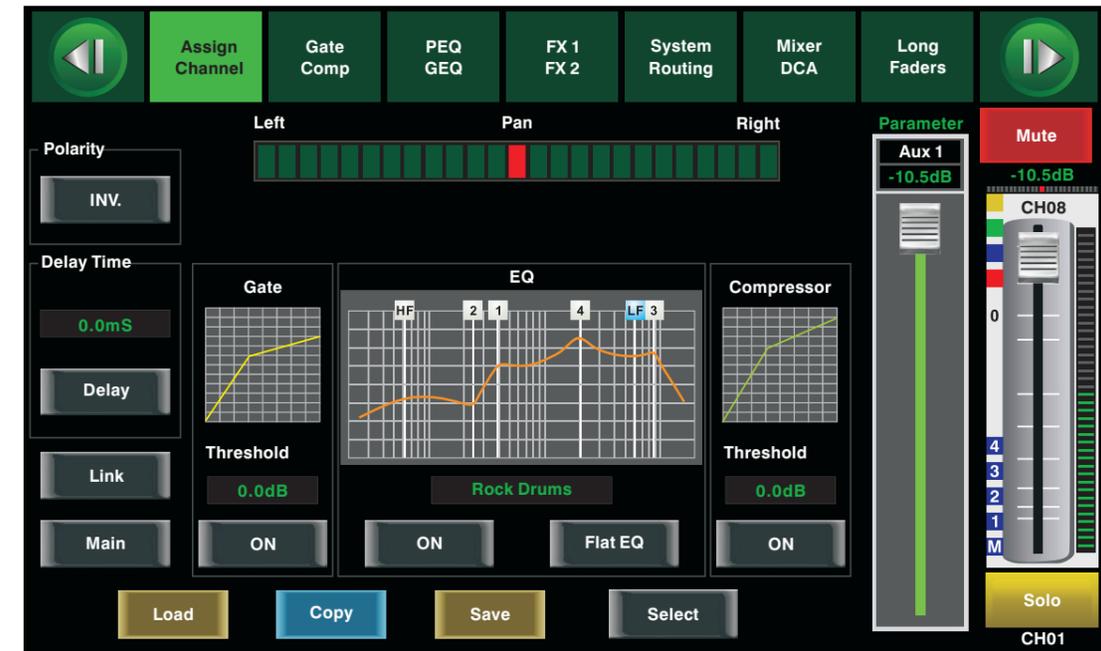


# DSP Control



Touch AUX5-8(SUB1-4) and FX1-2 on the LCD screen to assign input channel audio to these channels or buses. To adjust output level of the channel audio, you can rotate Parameter Adjust knob on the panel.  
 For other icon functions in this page, they are the same with those in SUB1-4 mode.

## 6.4 Channel interface



**Polarity** Touch it in Polarity to invert the phase of the selected channel's signal (to alter the phase by 180°). If the phase reverse is active the button will illuminate. The LCD display shows the phase reverse setting in real time. The Polarity control can be used to correct audio signals which are out of phase as well as to cancel/reinforce each other.

**Delay** Touch it in Delay Time can engage and disengage the delay for the selected channel. It will illuminate to indicate that the delay has been pressed and enabled. The LCD display shows the delay time in real time. It can be set 300ms at 48K Hz. Please notice that only if the Delay button has been enabled can its parameter be adjusted.

**0.0mS** When Delay icon is engaged, touch it in Delay Time and rotate the Parameter Adjust knob can control the selected channel's delay time.

**Link** Touch it, the function is the same as Link button.

# 6 DSP Control



Touch pan left or right to change signal's balance effect, it can be adjusted by Parameter Adjust knob on the panel when

pan button is on.

If you have adjusted a channel pan, please just touch 2 times on the screen and make it back to the centre position.

For the details please refer to the Pan introduction in section 5.



These icons indicates which DCA group does current channel been grouped. For example, if current channel has been grouped to DCA1 and DCA4, the background of DCA1 and DCA4 will illuminate.



Touch anyone of these controls to enter corresponding page.



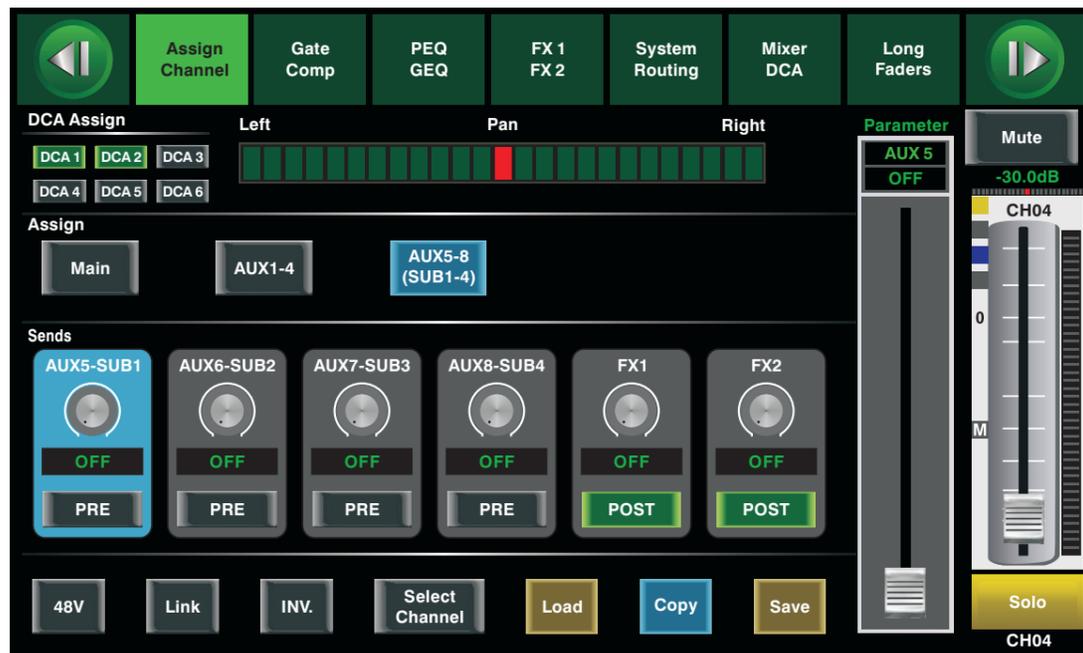
Touch it, the background and Link button will illuminate synchronously, and current channel will link to its pair channel, the button will illuminate then.



Touch Select icon here, all input channels will display to you. Please follow the indication on the LCD screen to operate.

For different input channels, the function and output assignments are different, please notice indication on the screen.

When switch Sub1-4 mode to AUX 5-8 mode, the corresponding page is as below picture show, this function enable output assignments to be more.



# DSP Control

# 6



This shortcut give you a convenience to operation channels that grouped by DCA1-6. For example, when you touch DCA2, its background will illuminate synchronized with DCA2 button on the panel. All channels you have grouped to DCA2 will also illuminate, now you can adjust motor fader and Parameter Adjust knob on panel or long fader on the screen

to adjust level.

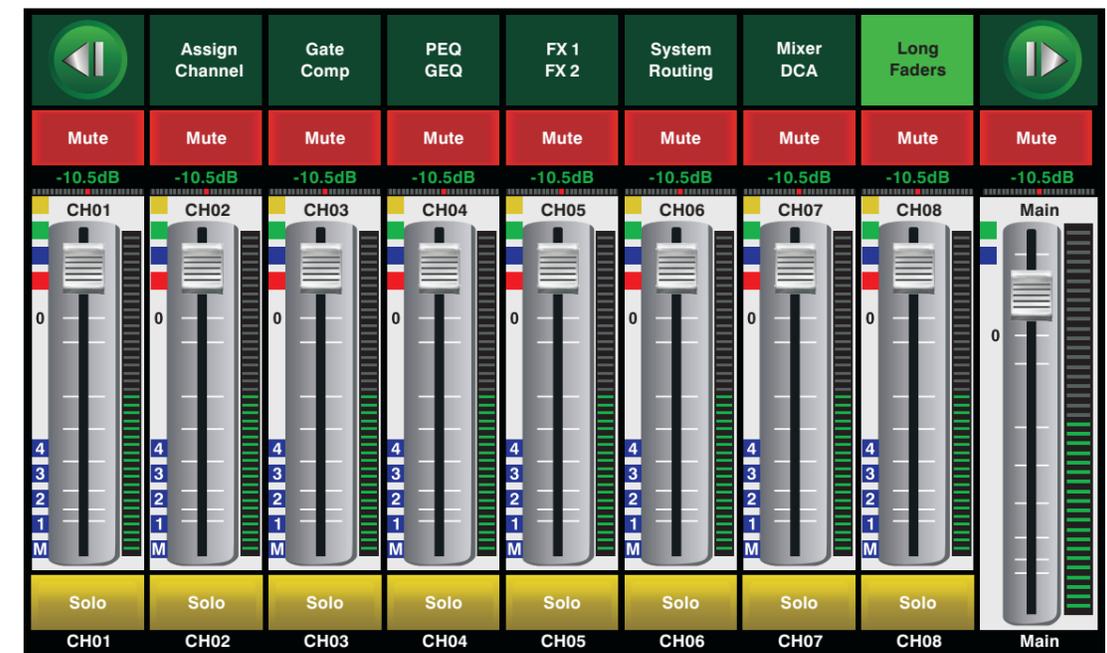
But if you didn't group DCA2 before, then you touch DCA2 icon here, a hint will prompt says " The DCA group is not defined! "

For their detail functions, please refer to the DCA introduce section 6.10.



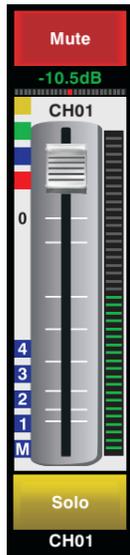
Touch them to enter the corresponding interface as you like. You can also select them by buttons on the panel, they appear here just to provide an extra entrance for you. For their detail functions, please refer to the corresponding introduce section.

## 6.2 Long Faders interface



Touch this icon to switch channels and enter corresponding Long Faders page, in which you can adjust channels' basic function like pan, solo, mute, level and rename the channel, etc.

# 6 DSP Control

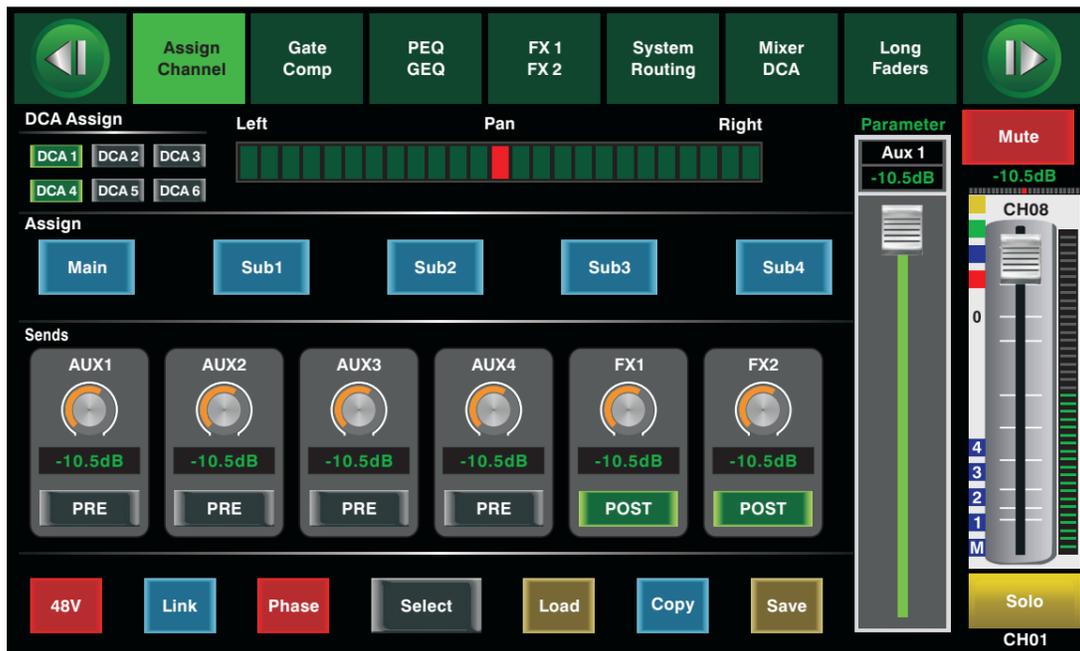


Functions on this icon (like mute, level number, pan, long fader, solo and channel name) are the same with that in Mixer interface.

- 4 M and number 1-4 indicate the assign status. For example, if you assign current channel to SUB1, the background of number 1 will illuminate. Similarly, if you assign to main, M will illuminate.
- 3
- 2
- 1
- M

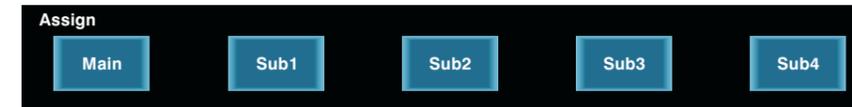
### 6.3 Assign interface

The 20 main inputs and internal FX returns can be assigned to any or all of the subgroup outputs, Aux sends and main outputs. In this page, Sub1-4 and AUX5-8 can switch to each other by touching a switch icon in System page. First, let's see the Sub1-4 mode as below picture show.



# DSP Control

# 6



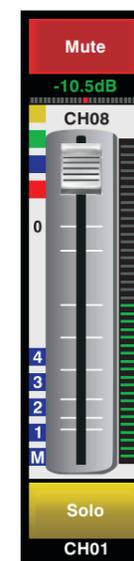
Touch Main & Sub1-4 on the LCD screen or corresponding button on the panel to assign input channel audio to these channels or buses. They will illuminate synchronizing with buttons in Assign area on the panel after pressed. To adjust output level of the channel audio, you can rotate Parameter Adjust knob or corresponding Main or Sub1-4 knobs on the right corner of the panel.



Touch AUX1-4 and FX1-2 on the LCD screen or press corresponding button on the panel to assign input channel audio to these channels or buses. To adjust output level of the channel audio, you can rotate Parameter Adjust knob on the panel.

Touch PRE on the screen, it will switch to POST, the AUX & FX send will derive its signals from all channels post-fader. If the icon has not been pressed and not illuminate, by default, the AUX & FX Send will derive its signal from all channels pre-fader and all unaffected by the sending channel's fader position.

In a word, touch PRE and switch it to POST, then you can adjust its level by sliding fader. Otherwise, the fader wouldn't function on level adjustment.



Slide the fader to change selected input channel audio. The fader function is the same with Fader on the panel, which can control input signal's level, they will change synchronously.

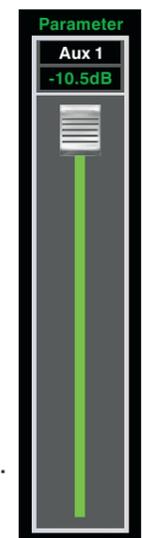
Meter beside it indicates the signal level activity.

Pan above fader indicates value of pan setting.

Solo can monitor selected channel audio.

Mute can silence selected channel audio.

Long press CH01 can rename the selected channel.



Adjust this parameter to change selected output channel audio. This fader function is the same with Parameter Adjust knob, they will change synchronously.