

# the t.mix

## 16.4 Mixer



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20.11.2018, ID: 433542

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# 1 General information

This manual contains important instructions for the safe operation of the unit. Read and follow the safety instructions and all other instructions. Keep the manual for future reference. Make sure that it is available to all those using the device. If you sell the unit please make sure that the buyer also receives this manual.

Our products are subject to a process of continuous development. Thus, they are subject to change.

## 1.1 Further information

On our website ([www.thomann.de](http://www.thomann.de)) you will find lots of further information and details on the following points:

Download	This manual is also available as PDF file for you to download.
Keyword search	Use the search function in the electronic version to find the topics of interest for you quickly.
Online guides	Our online guides provide detailed information on technical basics and terms.
Personal consultation	For personal consultation please contact our technical hotline.
Service	If you have any problems with the device the customer service will gladly assist you.

## 1.2 Notational conventions

This manual uses the following notational conventions:



### Letterings

The letterings for connectors and controls are marked by square brackets and italics.

**Examples:** *[VOLUME]* control, *[Mono]* button.

## 1.3 Symbols and signal words

In this section you will find an overview of the meaning of symbols and signal words that are used in this manual.

Signal word	Meaning
<b>DANGER!</b>	This combination of symbol and signal word indicates an immediate dangerous situation that will result in death or serious injury if it is not avoided.
<b>NOTICE!</b>	This combination of symbol and signal word indicates a possible dangerous situation that can result in material and environmental damage if it is not avoided.
Warning signs	Type of danger
	Warning – high-voltage.
	Warning – danger zone.

## 2 Safety instructions

### Intended use

This device is intended to be used for amplification, mixing and playback of signals from musical instruments and microphones. Use the device only as described in this user manual. Any other use or use under other operating conditions is considered to be improper and may result in personal injury or property damage. No liability will be assumed for damages resulting from improper use.

This device may be used only by persons with sufficient physical, sensorial, and intellectual abilities and having corresponding knowledge and experience. Other persons may use this device only if they are supervised or instructed by a person who is responsible for their safety.

### Safety



#### **DANGER!**

##### **Danger for children**

Ensure that plastic bags, packaging, etc. are disposed of properly and are not within reach of babies and young children. Choking hazard!

Ensure that children do not detach any small parts (e.g. knobs or the like) from the unit. They could swallow the pieces and choke!

Never let children unattended use electrical devices.



#### **DANGER!**

##### **Electric shock caused by high voltages inside**

Within the device there are areas where high voltages may be present. Never remove any covers.

There are no user-serviceable parts inside.

Do not use the device if covers, protectors or optical components are missing or damaged.



#### **DANGER!**

##### **Electric shock caused by short-circuit**

Always use proper ready-made insulated mains cabling (power cord) with a protective contact plug. Do not modify the mains cable or the plug. Failure to do so could result in electric shock/death or fire. If in doubt, seek advice from a registered electrician.



#### **NOTICE!**

##### **Risk of fire**

Do not block areas of ventilation. Do not install the device near any direct heat source. Keep the device away from naked flames.



**NOTICE!**

**Operating conditions**

This device has been designed for indoor use only. To prevent damage, never expose the device to any liquid or moisture. Avoid direct sunlight, heavy dirt, and strong vibrations.



**NOTICE!**

**Power supply**

Before connecting the device, ensure that the input voltage (AC outlet) matches the voltage rating of the device and that the AC outlet is protected by a residual current circuit breaker. Failure to do so could result in damage to the device and possibly injure the user.

Unplug the device before electrical storms occur and when it is unused for long periods of time to reduce the risk of electric shock or fire.

### 3 Features

- 10 microphone inputs with separate volume and tone controls, each as XLR and 1/4" phone sockets
- 16 line inputs with separate volume and tone controls, 10 of which as XLR and 1/4" phone sockets, and 6 as 1/4" phone sockets
- Line output /stereo, XLR chassis plug)
- Control room output (stereo, as 1/4" phone socket)
- Headphones output (stereo, as 1/4" phone socket)
- 2 AUX outputs (1/4" phone sockets)
- Phantom power switchable
- Digital signal processor with comprehensive setting options and internal effects module
- Controlled via the buttons and display on the device or via the local network (LAN, external router is required)
- Solid metal housing, 19" rack mountable (3 RU)



## 4 Installation



### NOTICE!

#### Danger of short circuit

Switching on phantom power will damage the device if unbalanced XLR cables are connected.

Only turn on phantom power when exclusively balanced XLR cables are connected.

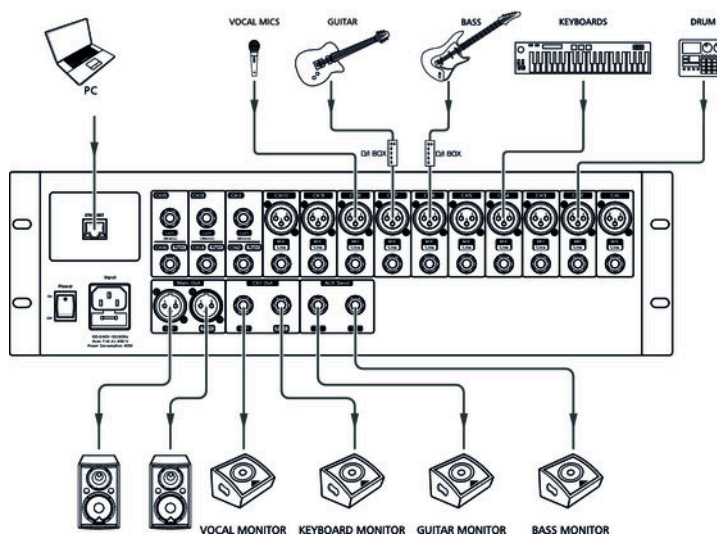
Unpack and carefully check that there is no transportation damage before using the unit. Keep the equipment packaging. To fully protect the device against vibration, dust and moisture during transportation or storage use the original packaging or your own packaging material suitable for transport or storage, respectively.

Create all connections while the device is off. Use the shortest possible high-quality cables for all connections. Take care when running the cables to prevent tripping hazards.

### Rack mounting

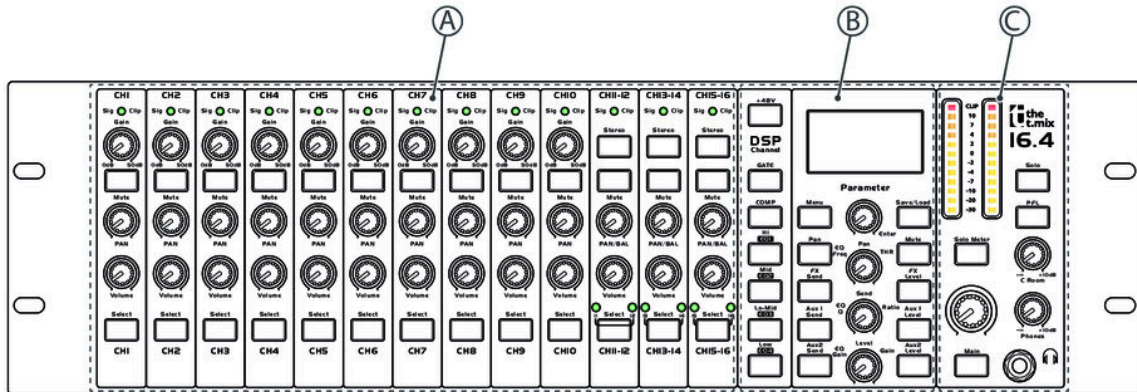
The unit has been designed for rack mounting in a standard 19-inch rack; it occupies three rack units.

### Connection options



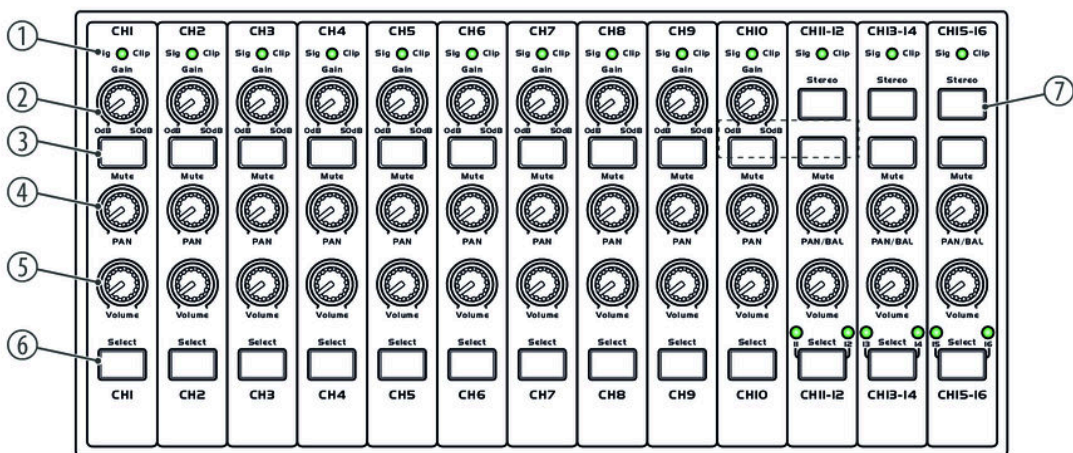
## 5 Connections and controls

### Overview



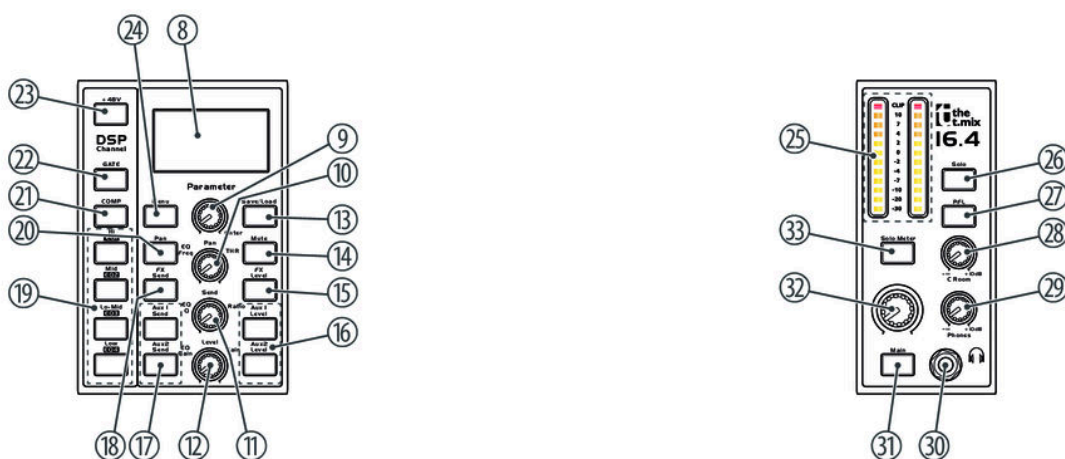
A	Input settings
B	Tone and signal processing settings
C	Output settings

### Input settings



1	<i>[Sig / Clip]</i> The LED lights up green if there is a signal on the corresponding input (signal level > -30 dB). The LED lights up red if the signal level is too high and distortion results from overload (signal level > +15 dB). In this case, reduce the signal level using the <i>[Gain]</i> control.
2	<i>[Gain]</i> Adjusts the input signal to the device's processing level. The set value is shown in the display.
3	<i>[Mute]</i> Mutes or unmutes the respective channel. If it is muted, the button lights up red and the corresponding field in the display is highlighted.
4	<i>[PAN]</i> For mono channels, the control determines in what ratio the signal of the respective channel is distributed in the left and right channel of the output. For paired stereo channels, the control functions as a balance control. The set value is shown in the display.
5	<i>[Volume]</i> Control to adjust the volume of the respective channel. The set value is shown in the display.
6	<i>[Select]</i> Selects the respective channel for setting the tone control and assigning the outputs. The input channels 11...16 can be selected separately from each if they are not paired as stereo channels. To do this, press <i>[Select]</i> multiple times. The LEDs above the button show which of the two input channels has been selected.
7	<i>[Stereo]</i> The input channels 11+12, 13+14 and 15+16 can each be paired as stereo channels. If the pairing has been switched on, the button lights up blue.

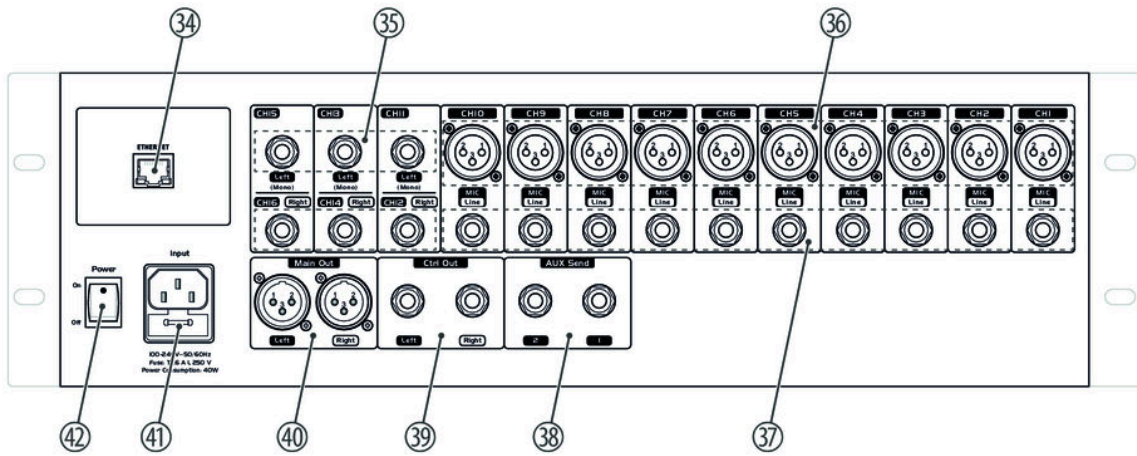
**Tone, signal processing and output settings**



8	Display
9	<i>[Parameter]</i> Control for selecting the channel or navigating the menu. Pressing the control opens a menu item or confirms a setting.
10	<i>[EQ Freq / Pan / THR]</i> Depending on the menu item that has just been selected, either sets the centre frequencies of the equalizer, the position in the stereo field or the threshold for the noise gate and compressor.
11	<i>[EQ Q / Send / Ratio]</i> Depending on the menu item that has just been selected, either sets the filter quality (Q) of the equalizer, the signal level for the outputs <i>[AUX Send 1]</i> and <i>[AUX Send 2]</i> or the ratio of the compressor.
12	<i>[EQ Gain / Level / Gain]</i> Depending on the menu item that has just been selected, either sets boost/cut (Gain) of the equalizer, the volume of the channel or the makeup gain of the compressor.
13	<i>[Save/Load]</i> Saves or loads the presets
14	<i>[Mute]</i> Temporarily mutes or unmutes a selected bus (Main, FX, Aux1, Aux2). If it is muted, the button lights up red and the corresponding field in the display is highlighted.
15	<i>[FX Level]</i> Selects the output FX for setting the volume ( <i>[EQ Gain / Level / Gain]</i> control), balance ( <i>[EQ Freq / Pan / THR]</i> control), compressor and equalizer, and for muting ( <i>[Mute]</i> button).
16	<i>[Aux1 Level], [Aux2 Level]</i> Selects the bus Aux1 or Aux2 for setting the volume ( <i>[EQ Gain / Level / Gain]</i> control), balance ( <i>[EQ Freq / Pan / THR]</i> control), compressor and equalizer, and for muting ( <i>[Mute]</i> button).
17	<i>[Aux1 Send], [Aux2 Send]</i> Opens the menu for selecting and setting the level of the input channels for the output <i>[AUX Send 1]</i> or <i>[AUX Send 2]</i> . Use the <i>[Parameter]</i> control to select the input channel and set the level using the <i>[EQ Q / Send / Ratio]</i> control.
18	<i>[FX Send]</i> Opens the menu for selecting and setting the level of the input channels for the bus FX. Use the <i>[Parameter]</i> control to select the input channel and set the level using the <i>[EQ Q / Send / Ratio]</i> control.
19	<i>[Hi / EQ1], [Mid / EQ2], [Lo-Mid / EQ3], [Low / EQ4]</i> Opens the menu for selecting the characteristic values of the four parametric equalizers for the input channel or bus that has just been selected
20	<i>[Pan]</i> Selects in sequence the buses Aux1, Aux2 and FX for setting the volume ( <i>[EQ Gain / Level / Gain]</i> control), balance ( <i>[EQ Freq / Pan / THR]</i> control), compressor and equalizer, and for muting ( <i>[Mute]</i> button).
21	<i>[COMP]</i> Opens the menu for selecting the characteristic values of the compressor for the input channel or bus that has just been selected.

22	<i>[GATE]</i> Opens the menu for selecting the characteristic values of the noise gate for the input or bus FX that has just been selected.
23	<i>[+48V]</i> Opens the menu for selecting turning the phantom power on and off for the input channel that has just been selected. If the phantom power has been switched on, the button lights up red. The phantom power leads to damage to the device if unbalanced cables are connected. Only switch on phantom power while exclusively balanced cables are connected.
24	<i>[Menu]</i> Opens the main menu
25	Level indicator for the <i>[Main Out]</i> output channel or the solo channel that has just been selected. The <i>[Solo Meter]</i> button can be used for switching.
26	<i>[Solo]</i> Assigns the input channel that has just been selected as a solo channel to the control room output.
27	<i>[PFL]</i> Switches the the control room output between the operating modes Pre Fader Listen (PFL) and After Fader Listen (AFL). Then the signal can be hear either like it sounds at the input or like it sounds under the influence of the tone and volume controls.
28	<i>[C Room]</i> Volume control for the control room output
29	<i>[Phones]</i> Volume control for the headphones output
30	Monitor output for headphones, designed as 1/4" phone socket (stereo)
31	<i>[Main]</i> Selects the bus Main for setting the volume ( <i>[EQ Gain / Level / Gain]</i> control), balance ( <i>[EQ Freq / Pan / THR]</i> control), and for muting ( <i>[Mute]</i> button).
32	Volume control for the output channel <i>[Main Out]</i> .
33	<i>[Solo meter]</i> Switches the level indicator (25) between the <i>[Main Out]</i> output channel and the solo channel that is currently active.

## Rear panel



34	<i>[ETHERNET]</i> RJ45 socket for integrating the device into a local network (LAN) or for firmware updates.
35	<i>[CH11]...[CH16]</i> Inputs for signals with line levels, designed as as 1/4" phone sockets (stereo, balanced). If a mono signal is fed in, use the channel marked <i>[LEFT]</i> . These inputs are typically used for signals from effects pedals.
36	<i>[CH1]...[CH10]</i> Inputs for microphone levels, designed as XLR sockets.
37	<i>[CH1]...[CH10]</i> Inputs for signals with line levels, designed as as 1/4" phone sockets (mono, balanced).
38	<i>[AUX Send 1], [AUX Send 2]</i> AUX outputs 1 and 2, designed as as 1/4" phone sockets (mono, balanced)
39	<i>[Ctrl Out Left], [Ctrl Out Right]</i> Control room output, designed with separate 1/4" phone sockets (balanced) for the left and right channel.
40	<i>[Main Out Left], [Main Out Right]</i> Master output for connecting an amplifier or an active speaker box, designed with separate 1/4" phone sockets (balanced) for the left and right channel, designed as XLR chassis sockets.
41	<i>[Input]</i> IEC chassis plug for operating voltage supply with fuse holder. Should the fuse have blown, disconnect the unit from the power supply and replace the fuse with a new fuse of the same type.
42	<i>[Power]</i> Main switch. Turns the device on and off

## 6 Operating

### 6.1 Main menu

Important settings are directly accessible in the main menu.

1. ➤ Press *[Menu]*.
2. ➤ Use the *[Parameter]* control to select, to set values, and to navigate the menu. Pressing the control opens a menu item or confirms a setting.

The table below provides a overview of the available menus.

Menu item	Meaning
'System'	Shows information about the revision status of the hardware and software and makes it possible to reset the device to its delivery state.
'Assign'	Assigns input channels and FX to the possible buses.
'Sends'	Selects the signal path for MAIN.
'Delay'	Opens the settings for the delay time which can be set per channel.
'Invert'	Opens the settings for the inversion of the phase length which can be set per channel.
'Gate/EXP'	Opens the settings for the noise gate which can be switched on per channel.
'COMP'	Opens the settings for the compressor which can be switched on per channel.
'Channel'	Opens the settings for the input channels.
'HPF'	Opens the settings for the high pass filter which can be switched on per channel.
'LPF'	Opens the settings for the low pass filter which can be switched on per channel.
'GEQ'	Opens the settings for the graphic equalizer.
'FX'	Enables the selection of an effect.
'Digi.IN'	No function.
'Digi.OUT'	No function.
'AutoMix'	Switches the automix function on or off.
'Ducker'	Switches the ducker function for the automatic volume cut in one channel on or off.
'FBC'	Switches the feedback killer function on or off.
'Save'	Makes it possible to save the presets.
'Load'	Makes it possible to load the presets.
'Default'	Makes it possible to reset the device to the delivery state.



## 6.2 Parametric equalizer

A parametric equalizer with four frequency bands can be switched on for each input channel and each bus.

1. ➤ Press one of the *[Select]* buttons for an input channel or one of the *[FX Level]*, *[Aux1 Level]*, *[Aux2 Level]* or *[Main]* bus selection buttons for a bus.
  - ⇒ The button of the selected input channel or bus lights up blue.
2. ➤ Press *[Hi / EQ1]*, *[Mid / EQ2]*, *[Lo-Mid / EQ3]*, *[Low / EQ4]* to select a frequency band.
  - ⇒ The menu for setting the parameters opens. In the upper left corner, the name of the input channel or bus will appear, and in the the upper right corner the number of the frequency band.
3. ➤ Use the *[Parameter]* control to select, to set values, and to navigate the menu. Pressing the control opens a menu item or confirms a setting.
 

The table below shows the available parameters and their ranges.
4. ➤ To finish the settings, press one of the *[Select]* buttons for an input channel or one of the *[FX Level]*, *[Aux1 Level]*, *[Aux2 Level]* or *[Main]* bus selection buttons for a bus.
  - ⇒ The button of the selected input channel or bus lights up blue.

Option	Selection range	Meaning
'CH01' ... 'Main'		Selects an input channel or bus
'Freq'	'19.7' ... '20.16K'	Frequency Can also be set directly with the <i>[EQ Freq / Pan / THR]</i> control.
'Q'	'0.4' ... '128'	Filter quality Can also be set directly with the <i>[EQ Q / Send / Ratio]</i> control.
'Gain'	'-18' ... '+18'	Boost/Cut Can also be set directly with the <i>[EQ Gain / Level / Gain]</i> control.
'Type'	'Peak', 'Low', 'High'	Filter type
'On', 'Off'		Switches the parametric equalizer on or off for the selected frequency band. After it is switched on, the corresponding button lights up.

## 6.3 Graphic equalizer

A 31-band equalizer can be switched on for the outputs MAIN and AUX.



1. ▶ Press *[Menu]*.
2. ▶ Use the *[Parameter]* control to select the menu item 'GEQ'. Press the *[Parameter]* control.  
⇒ The 'GEQ' menu will open in the display.
3. ▶ Press the *[Main]*, *[Aux1 Level]*, *[Aux2 Level]* to select the output for which you would like to set the graphic equalizer.  
⇒ The channel name will appear in the upper right of the display.
4. ▶ Use the *[Parameter]* control to select the frequency band for which you would like to adjust the settings. Press the *[Parameter]* control.
5. ▶ Use the *[Parameter]* control to set the amplification or attenuation in a range of -24 dB...+24 dB. Press the *[Parameter]* control.
6. ▶ To return the equalizer to its default settings, use the *[Parameter]* control to select the 'Flat' row. Press the *[Parameter]* control. Use the *[Parameter]* control to select the option 'Yes'. Press the *[Parameter]* control.

## 6.4 Compressor

A compressor can be switched on for each input channel and each bus.

1. ➤ Press one of the *[Select]* buttons for an input channel or one of the *[FX Level]*, *[Aux1 Level]*, *[Aux2 Level]* or *[Main]* bus selection buttons for a bus.
  - ⇒ The button of the selected input channel or bus lights up blue.
2. ➤ Press *[COMP]*.
  - ⇒ The menu for setting the parameters opens. The name of the input channel or bus will appear in the upper left corner.
3. ➤ Use the *[Parameter]* control to select, to set values, and to navigate the menu. Pressing the control opens a menu item or confirms a setting.
 

The table below shows the available parameters and their ranges.
4. ➤ To finish the settings, press one of the *[Select]* buttons for an input channel or one of the *[FX Level]*, *[Aux1 Level]*, *[Aux2 Level]* or *[Main]* bus selection buttons for a bus.
  - ⇒ The button of the selected input channel or bus lights up blue.

Option	Selection range	Meaning
'CH01' ... 'Main'		Selects an input channel or bus
'Thres'	'-30dB' ... '20dB'	Threshold Can also be set directly with the <i>[EQ Freq / Pan / THR]</i> control.
'Attack'	'10ms' ... '150ms'	Attack time
'Release'	'10ms' ... '1.0s'	Release time
'Ratio'	'1.0:1' ... 'Limit'	Ratio Can also be set directly with the <i>[EQ Q / Send / Ratio]</i> control.
'Gain'	'0.0dB' ... '+24dB'	Gain Can also be set directly with the <i>[EQ Gain / Level / Gain]</i> control.
'On', 'Off'		Switches the compressor on or off. After it is switched on, the corresponding button lights up.

## 6.5 Noise Gate

A noise gate can be switched on for each input channel and the bus FX.

1. ➤ Press one of the *[Select]* buttons for an input channel or the *[FX Level]* bus selection button.
  - ⇒ The button of the selected input channel or bus lights up blue.
2. ➤ Press *[GATE]*.
  - ⇒ The menu for setting the parameters opens. The name of the input channel or bus will appear in the upper left corner.
3. ➤ Use the *[Parameter]* control to select, to set values, and to navigate the menu. Pressing the control opens a menu item or confirms a setting.
 

The table below shows the available parameters and their ranges.
4. ➤ To finish the settings, press one of the *[Select]* buttons for an input channel or one of the *[FX Level]*, *[Aux1 Level]*, *[Aux2 Level]* or *[Main]* bus selection buttons for a bus.
  - ⇒ The button of the selected input channel or bus lights up blue.

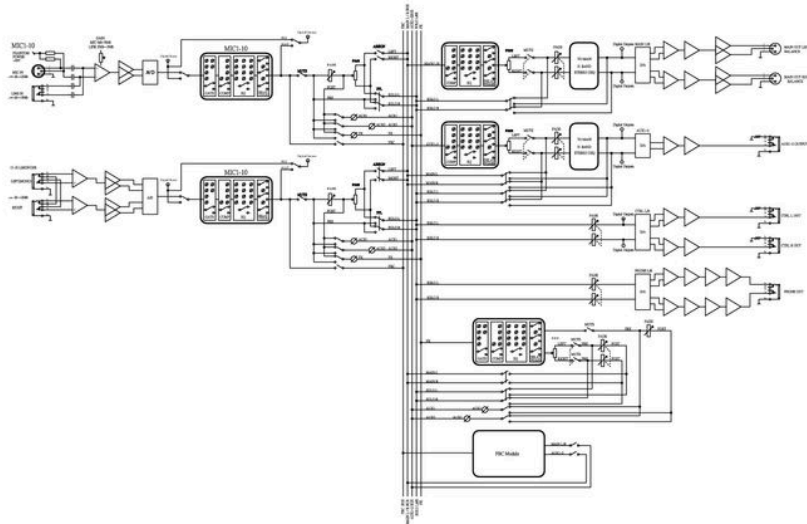
Option	Selection range	Meaning
'CH01' ... 'Main'		Selects an input channel or bus
'Thres'	'-84dB' ... '20dB'	Threshold Can also be set directly with the <i>[EQ Freq / Pan / THR]</i> control.
'Attack'	'0.5ms' ... '200ms'	Attack time
'Release'	'10ms' ... '1.0s'	Release time
'Ratio'	'1.0:1' ... 'Limit'	Ratio Can also be set directly with the <i>[EQ Q / Send / Ratio]</i> control.
'On', 'Off'		Switches the noise gate on or off. After it is switched on, the corresponding button lights up.

## 7 Technical specifications

Input level (Mic/Line)	XLR connections (balanced): max. +20 dBu
	1/4" phone socket (unbalanced): max. +20 dBu
Input impedance	Mic: 6.8 k $\Omega$
	Line: 75 k $\Omega$
	Stereo: 27 k $\Omega$
Total harmonic distortion (THD)	< 0.03 %1 kHz
Frequency range	20 Hz...20 kHz, 0 dBu $\pm$ 1.5 dB
Signal-to-noise ratio	108 dB
Gain	[AUX Send 1], [AUX Send 2]: $-\infty$ ...+10 dBu
	Line: -20...+30 dBu
Output level	max. +20 dBu
Output impedance	240 $\Omega$
Phantom power	48 V $\pm$ 3 V
Noise Gate	Threshold: -84...+20 dBu
	Attack: 0.5 ms...200 ms
	Release: 10 ms...1 s
Compressor	Threshold: -30...+20 dBu
	Attack: 10 ms...150 ms
	Release: 10 ms...1 s
	Compression: 1:1...10:1
	Gain: 0 dBu...+24 dB
Equalizer	Bass (low pass or low shelf): 21 Hz...19.2 kHz, $\pm$ 24 dB
	Low mids: 21 Hz...19.2 kHz, $\pm$ 24 dB
	High mids: 21 Hz...19.2 kHz, $\pm$ 24 dB
	Treble: 21 Hz...19.2 kHz, $\pm$ 24 dB
Digital signal processing	Analogue-to-digital converter: 114 dB, Resolution: 24 bit
	Digital-to-analogue converter: 114 dB, Resolution: 24 bit
	Internal processor: 32 bit, floating point
Operating supply voltage	100 – 240 V $\sim$ 50/60 Hz
Fuse	5 mm $\times$ 20 mm, 1,6 A, 250 V, slow-blow

Dimensions (W × H × D)	484 mm × 140 mm (3 HE) × 300 mm
Weight	6.98 kg

**Block diagram**



## 8 Plug and connection assignment

### Introduction

This chapter will help you select the right cables and plugs to connect your valuable equipment in such a way that a perfect sound experience is ensured.

Please note these advices, because especially in 'Sound & Light' caution is indicated: Even if a plug fits into the socket, an incorrect connection may result in a destroyed power amp, a short circuit or 'just' in poor transmission quality!

### Balanced and unbalanced transmission

Unbalanced transmission is mainly used in semi-professional environment and in hifi use. Instrument cables with two conductors (one core plus shielding) are typical representatives of the unbalanced transmission. One conductor is ground and shielding while the signal is transmitted through the core.

Unbalanced transmission is susceptible to electromagnetic interference, especially at low levels, such as microphone signals and when using long cables.

In a professional environment, therefore, the balanced transmission is preferred, because this enables an undisturbed transmission of signals over long distances. In addition to the conductors 'Ground' and 'Signal', in a balanced transmission a second core is added. This also transfers the signal, but phase-shifted by 180°.

Since the interference affects both cores equally, by subtracting the phase-shifted signals, the interfering signal is completely neutralized. The result is a pure signal without any noise interference.

### 1/4" TS phone plug (mono, unbalanced)



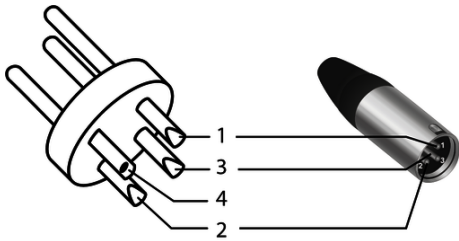
1	Signal
2	Ground, shielding

### 1/4" TRS phone plug (mono, balanced)



1	Signal (in phase, +)
2	Signal (out of phase, -)
3	Ground

**XLR plug (balanced)**



1	Ground, shielding
2	Signal (in phase, +)
3	Signal (out of phase, -)
4	Shielding on plug housing (option)

## 9 Protecting the environment

### Disposal of the packaging material



For the transport and protective packaging, environmentally friendly materials have been chosen that can be supplied to normal recycling.

Ensure that plastic bags, packaging, etc. are properly disposed of.

Do not just dispose of these materials with your normal household waste, but make sure that they are collected for recycling. Please follow the notes and markings on the packaging.

### Disposal of your old device



This product is subject to the European Waste Electrical and Electronic Equipment Directive (WEEE) in its currently valid version. Do not dispose with your normal household waste.

Dispose of this device through an approved waste disposal firm or through your local waste facility. When discarding the device, comply with the rules and regulations that apply in your country. If in doubt, consult your local waste disposal facility.









