

S12 Manual

LIVE MIXER WITH DSP EFFECTS + USB



1. Safety Instructions

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this item near water.
6. Clean only with dry cloth.
7. Do not block any of the ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves or other items (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized plug. The wide blade is provided for your safety. If the provided plug does not fit into the item or the mains socket, consult an electrician for replacement.
10. Protect the power cord from being walked on or pinched particularly at plug, convenience receptacles, and point where they exit from the item.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with a cart, stand, tripod, bracket or table specified by the manufacturer, or sold with the item. When a cart is used, use caution when moving the cart/item combination to avoid injury.
13. Unplug this item during lighting storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the item has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the item, the item has been exposed to rain or moisture, does not operate normally, or has been dropped (note: accidental or cosmetic damage is not covered by the items 12 month warranty)
15. Please keep the unit in a safe environment.
16. Do not store anything on top of the item.



CAUTION
RISK OF
ELECTRIC SHOCK



To reduce the risk of electric shock, do not remove any cover. No user-serviceable parts inside. Refer servicing to qualified personnel only.



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



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

2. Control Elements and Connectors

This chapter describes the various control elements of your mixing console.
All controls, switches and connectors will be discussed in detail.

2.1 Mono channels

2.1.1 Microphone and line inputs

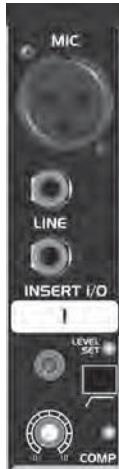


Fig. 2.1: Connectors and controls of mic/line inputs

MIC

Each mono input channel offers a balanced microphone input via the XLR connector and also features switchable +48 V phantom power supply for condenser microphones. The studio grade preamps provide undistorted and noise-free gain as is typically known only from costly outboard preamps.

- ◊ Please mute your playback system before you activate the phantom power supply to prevent switch-on thumps being directed to your loudspeakers. Please also note the instructions in chapter 2.5 "Rear view of M12DSP".

LINE IN

Each mono input also features a balanced line input on a 6.3mm connector. Unbalanced devices (mono jacks) can also be connected to these inputs.

- ◊ Please remember that you can only use either the microphone or the line input of a channel at any one time. You can never use both simultaneously!

INSERT

Insert points enable the processing of a signal with dynamic processors or equalizers. They are sourced pre-fader, pre-EQ and pre-aux send. Unlike reverb or other effects devices, whose signals are usually added to the dry signal, dynamic processors are most effective on the complete signal. In this case, aux send paths are a less-than-perfect solution. It is better to interrupt the signal path and insert a dynamic processor and/or equalizer. After processing, the signal is routed back to the console at precisely the same point it left. However, the channel signal path is interrupted only if a plug is inserted into the corresponding jack (stereo phone plug: tip = signal output; ring = return input). All mono input channels are equipped with inserts.

Inserts can also be used as pre-EQ direct outputs, without interrupting the signal path. To this end, you will need a cable fitted with mono phone plugs on the tape machine or effects device end, and a bridged stereo phone plug on the console side (tip and ring connected).

LOW CUT

The mono channels of the mixing consoles have a high-slope LOW CUT filter for eliminating unwanted, low-frequency signal components (80 Hz, 18 dB/octave).

GAIN

Use the GAIN control to adjust the input gain. This control should always be turned fully counter-clockwise whenever you connect or disconnect a signal source to one of the inputs.

The scale has 2 different value ranges: the first value range (+10 to +60 dB) refers to the MIC input and shows the amplification for the signals fed in there.

The second value range (+10 to -40 dB) refers to the line input and shows its sensitivity. The settings for equipment with standard line-level signals (-10 dBV or +4 dBu) look like this: While the GAIN control is turned all the way down, connect your equipment. Set the GAIN control to the external devices' standard output level. If that unit has an output signal level display, it should show 0 dB during signal peaks. For +4 dBu, turn up GAIN slightly, for -10 dBV a bit more. Tweaking is done using the LEVEL SET LED.

LEVEL SET

This LED lights up when the optimum operating signal level is achieved. During normal use, this LED should only light up during signal peaks.

COMPRESSOR

Each mono channel features a built-in compressor which lowers the dynamic range of the signal and increases its perceived loudness. The loud peaks are squashed down and the quiet sections are boosted.

Turn the COMP knob clockwise to add more compression effect. The adjacent LED with light when the effect is engaged.

2.1.2 Equalizer

All mono input channels include a 3-band equalizer. All bands provide boost or cut of up to 15 dB. In the central position, the equalizer is inactive.

The circuitry of the British EQs is based on the technology used in the best-known top-of-the-line consoles and providing a warm sound without any unwanted side effects. The result are extremely musical equalizers which, unlike simple equalizers, cause no side effects such as phase shifting or bandwidth limitation, even with extreme gain settings of ±15 dB.



Fig. 2.2: The equalizer of the input channels

The upper (HIGH) and the lower band (LOW) are shelving filters that increase or decrease all frequencies above or below their cut-off frequency. The cut-off frequencies of the upper and lower band are 12 kHz and 80 Hz respectively. The mid band is configured as a peak filter with a center frequency of 2.5 kHz. Unlike shelving filters, the peak filter processes a frequency range that extends upwards and downwards around its middle frequency.

2.1.3 Aux sends (MON and FX)



Fig. 2.3: The AUX SEND controls in the channel strips

Aux sends take signals via a control from one or more channels and sum these signals to a so-called bus. This bus signal is sent to an aux send connector and then routed, for example, to an active monitor speaker or an external effects device. The return from an external effects device can then be brought back into the console via the aux return connectors.

For situations that require effects processing, the aux sends are usually switched post-fader so that the effects volume in a channel corresponds to the position of the channel fader. If this were not the case, the effects signal of the channel would remain audible even when the fader is turned to zero.

When setting up a monitor mix, the aux sends are generally switched to pre-fader; i.e. they operate independently of the position of the channel fader.

Both aux sends are mono, are sourced after the equalizer and offer up to +15 dB gain.

- ◊ If you press the MUTE switch of the respective channel, aux sends and returns (MON and FX) are not being muted.

MON

In the M12DSP, aux send 1 (MON) is wired pre-fader and is thus particularly suitable for setting up monitor mixes.

FX

The aux send labeled FX is for feeding external effects devices and is thus set up to be post-fader.

In the M12DSP, the FX send is routed directly to the built-in effects processor. To make sure that the effects processor receives an input signal, you shouldn't turn this control all the way to the left (-oo). Don't have the FX MUTE switch pressed, and you should also not have the FX SEND fader pulled down.

2.1.4 Pan, mute switch and channel fader



Fig. 2.4: Channel fader and additional control elements

PAN

The PAN control determines the position of the channel signal within the stereo image. This control features a constant-power characteristic, which means the signal is always maintained at a constant level, irrespective of position in the stereo panorama.

MUTE

Use the MUTE switch to mute the channel. This means that the channel signal is no longer present in the main mix. However, the aux sends (MON and FX) remain active.

MUTE LED

The MUTE LED indicates that the relevant channel is muted.

CLIP LED

The CLIP LED lights up when the input signal is driven too high. In this case, lower apparent frequency increase on the channel EQ to avoid distortion. For example, lower the mids and the highs somewhat to emphasize the bass. If you don't wish to change the EQ settings under any circumstances, try lowering the GAIN control somewhat (counterclockwise).

If you inserted an external effects processor via the insert connector (e.g. a dynamic processor), then you should also control its output signal level. It should not be higher than its input signal level (0 dB).

The channel fader determines the level of the channel signal in the main mix.

- ◊ Attention: Since the aux path for the effect processor is connected post-fader, the channel fader has to be turned up in order to get this channel's signal to the effects processor!

2.2 Stereo channels

2.2.1 Channel inputs

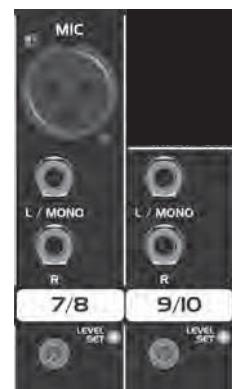


Fig. 2.5: Stereo channel inputs

Each stereo channel features two line-level inputs on 1/4" connectors for left and right channels. Channels 9/10 and 11/12 can also be used in mono if you only use the connector labeled "L."

Both channels 5/6 and 7/8 feature an additional balanced XLR input for microphones with available +48 V phantom power.

effects device in order to process the FX bus' master signal. Once an effects mix is created, the processed signal can then be routed from the effects device outputs back into the AUX RETURN connectors.

- ◊ If the connected effects processor receives no input signal, the FX MUTE switch is probably pressed and/or the FX SEND control is too low. This also goes for the built-in effects processor.
- ◊ Adjust your external effects processor to 100% wet (effects signal only), because the effects signal is added to the main mix along with the "dry" channel signals.

2.3.3 Aux return connectors



Fig. 2.8: Aux return connectors

AUX RETURN 1

The AUX RETURN 1 connectors generally serve as the return path for the effects mix generated using the FX send. This is where you connect the output signal of the external effects device. If only the left connector is used, the aux return 1 automatically operates in mono.

- ◊ You can also use these connectors as additional line inputs.

AUX RETURN 2

The AUX RETURN 2 connectors are used exactly the same way as the AUX RETURN 1 connectors. If these connectors already function as additional inputs, you can route the effects signal back into the console via a different stereo channel, with the added benefit that the channel EQ can be used to adjust the frequency response of the effects return signal.

- ◊ In this instance, the FX control of the channel being used as an effects return should be turned fully counter-clockwise, otherwise feedback problems can occur!

2.3.4 2TK/USB return channel, voice canceller and connection socket



Fig. 2.9: 2TK/USB return channel

This channel, intended especially for connecting stereo signal sources (CD players, DAT recorders or even sound cards) features a particularly practical feature: the VOICE CANCELLER.

VOICE CANCELLER

Here, you have a filter circuitry that lets you almost entirely remove the vocal portion of a recording. The filter is constructed in such a way that voice frequencies are targeted without majorly affecting the rest of the signal. Additionally, the filter seizes only the middle of the stereo image, exactly where the vocals are typically located.

Possible applications for the Voice Canceller are obvious: you can very simply stage background music for Karaoke events. Of course, you can also do this at home or at your rehearsal room before you hit the stage. Singers with their own band can practice singing difficult parts using a complete playback from a tape player or a CD, thus minimizing rehearsal time.

STANDBY

If the STANDBY switch is pressed, all input channels with a mic connector (XLR connector) are muted. During breaks or stage conversion, you can prevent noise from entering the sound system via the microphones. Such noise can in the worst-case scenario even irreparably damage loudspeaker membranes. The cool thing about this is that the main mix faders can remain open, so that you can play music from a CD at the same time. Similarly, the faders for the muted channels can also remain in their position.

To bring in other sound sources, you can use the 2TK/USB inputs, stereo input channels 9 to 12 and the aux return inputs.

2TK/USB MUTE

Using this switch, the input signal from the 2TK/USB inputs is muted.

2TK/USB RET(URN)

This stereo fader assigns the input signal from the 2TK/USB inputs into the main mix.

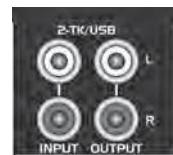


Fig. 2.10: 2-track connectors

2TK/USB INPUT

Twin RCA connectors are provided for connecting a stereo playback machine, sub-mixer or any stereo line input to be added into the main mix.

If a PC/Mac computer is connected via the rear USB connection, the digital audio from the host computer is converted and fed into the 2TK input in the same way as if connected to the RCA inputs. Overall level of 2TK or USB input in the main mix is governed by the 2TK/USB RTN fader.

2TK/USB OUTPUT

Twin RCA connectors are provided for feeding the main mix output to a recording device or monitoring amplifier. If a PC/Mac computer is connected via the rear USB connection, a copy of the main mix is converted to digital format and fed out to the host computer for processing and/or recording.

2.3.5 Main mix, main out connectors and headphone connector

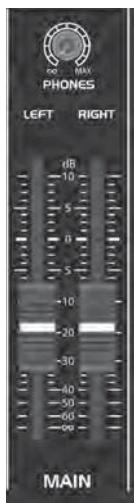


Fig. 2.11: Main mix fader

MAIN MIX

Use the high-precision quality faders to control the output level of the main mix.



Fig. 2.12: Main out connectors

MAIN OUT

The **MAIN** outputs carry the MAIN MIX signal and are on balanced XLR connectors with a nominal level of +4 dBu. Depending on how you wish to use your mixer and which gear you own, you can connect the following equipment:

Live PA systems:

A stereo dynamics processor (optional), stereo equalizer (optional) and the stereo power amplifier for full-range loud-speakers with passive crossovers.

If you wish to use multi-way loudspeaker systems without an integrated crossover, you have to use an active crossover and several power amplifiers. Often, limiters are already built into active crossovers.

Active crossovers are implemented directly before the power amplifier, and they divide the frequency range into several segments that are first amplified in the amplifiers and then passed onto the corresponding loudspeakers.

Recording:

For mastering, a stereo compressor can be recommended. Use it to custom-tailor the dynamic characteristics of your signal to the dynamic range of the recording equipment you are using. The signal is in this case passed on from the compressor into the recorder.

PHONES

The PHONES control adjusts the volume of the headphones connected to the PHONES connector.



CAUTION!

- ◊ We would like to draw your attention to the fact that extreme volumes may damage your hearing and/or your headphones or loudspeakers. Turn the MAIN MIX faders and the PHONES control in the main section fully down before you switch on the unit. Always be careful to set the appropriate volume.



Fig. 2.13: PHONES connector.

PHONES connector

You can connect headphones to this 1/4" TRS connector. The connector can also be used for feeding active monitor loudspeakers (or an amplifier) in your control room. For this purpose, the signal is taken directly before it is passed on to the main mix faders.

2.3.6 Level meter and level setting



Fig. 2.14: Level meter

POWER

The blue POWER LED indicates that the device is switched on.

+48 V

The red "+48 V" LED lights up when the phantom power supply is switched on. The phantom power supply is necessary for condenser microphones and is activated using the corresponding switch on the rear of the device.

- ◊ Connect microphones before you switch on the phantom power supply. Please do not connect microphones to the mixer (or the stagebox/wallbox) while the phantom power supply is switched on. In addition, the monitor/PA loudspeakers should be muted before you activate the phantom power supply. After switching on, wait approx. one minute to allow for system stabilization.

LEVEL METER/CLIP

The high-precision level meter accurately displays the appropriate signal level.

LEVEL SETTING:

When recording to a digital device, the recorder's peak meter should not exceed 0 dB. This is because, unlike analog recordings, slightly excessive levels can create unpleasant digital distortion.

When recording to an analog device, the VU meters of the recording machine should reach approx. +3 dB with low-frequency signals (e.g. kick drum). Due to their inertia VU meters tend to display too low a signal level at frequencies above 1 kHz. This is why, for example, a Hi-Hat should only be driven as far as -10 dB. Snare drums should be driven to approx. 0 dB.

- ◊ The peak meters of your M12DSP display the level virtually independent of frequency. A recording level of 0 dB is recommended for all signal types.

2.3.7 USB input/output



Fig. 2.15: USB input/output

The M12DSP mixer line has built-in USB connectivity, allowing stereo signals to be sent to and from the mixer and a computer. The audio sent from the mixer to a computer is identical to the MAIN MIX. Audio being sent to the mixer from a computer can be routed to the main mix with the 2TK/USB TO MAIN button.

Connect the USB type B plug into the USB jack on the mixer, and the other end into a free USB port on your computer.

This system uses generic ASIO drivers. Check for operating system updates if there are any driver issues.

2.4 Graphic 7-band equalizer

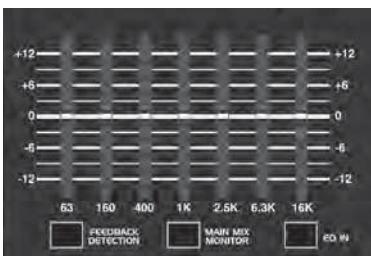


Fig. 2.16: The graphic stereo equalizer

The graphic stereo equalizer allows you to tailor the sound to the room acoustics.

FEEDBACK DETECTION

The switch turns on the Feedback Detection System. It uses the LEDs in the frequency band faders to indicate the critical frequencies. On a per-need basis, lower the frequency range in question somewhat in order to avoid feedback. The graphic stereo equalizer has to be turned on in order to use this function.

- ◊ Logically, at least one (ideally several) microphone channels have to be open for feedback to occur at all!

Feedback is particularly common when stage monitors ("wedges") are concerned, because monitors project sound in the direction of microphones. Therefore, you can also use the Feedback Detection for monitors by placing the equalizer in the monitor bus (see MAIN MIX/MONITOR).

EQ IN

Use this switch to activate the graphic equalizer. When activated, the fader LEDs will illuminate.

MAIN MIX/MONITOR

This toggles the graphic equalizer between the main mix and the monitor mix. With the switch up (not depressed), the equalizer is active in stereo on the main mix, and inactive on the monitor mix.

When the switch is depressed the equalizer is active in mono on the monitor mix, and inactive on the main mix.

2.5 Rear view



Fig. 2.17: Voltage supply and fuse

FUSE HOLDER/IEC MAINS RECEPTACLE

The console is connected to the mains via the cable supplied, which meets the required safety standards. Blown fuses must only be replaced by fuses of the same type and rating. The mains connection is made via a cable with IEC mains connector. An appropriate mains cable is supplied with the equipment.

POWER

Use the POWER switch to power up the mixing console. The POWER switch should always be in the "Off" position when you are about to connect your unit to the mains.

To disconnect the unit from the mains, pull out the main cord plug. When installing the product, ensure that the plug is easily accessible. If mounting in a rack, ensure that the mains can be easily disconnected by a plug pull or by an all-pole disconnect switch on or near the rack.

- ◊ Attention: The POWER switch does not fully disconnect the unit from the mains. Unplug the power cord completely when the unit is not used for prolonged periods of time.

PHANTOM

The PHANTOM switch activates the phantom power supply for the XLR microphone inputs, which is required to operate condenser microphones. The red +48 V LED lights up when phantom power is on. As a rule, dynamic microphones can still be used with phantom power switched on, provided that they are wired in a balanced configuration. In case of doubt, contact the microphone manufacturer!

- ◊ Connect microphones before you switch on the phantom power supply. Please do not connect microphones to the mixer (or the stagebox/ wallbox) while the phantom power supply is switched on. In addition, the monitor/PA loudspeakers should be muted before you activate the phantom power supply. After switching on, wait approx. one minute to allow for system stabilization.
- ◊ Caution! You must never use unbalanced XLR connectors (PIN 1 and 3 connected) on the MIC input connectors if you want to use the phantom power supply.

3. Digital Effects Processor and Surround Function

3.1 Digital effects processor

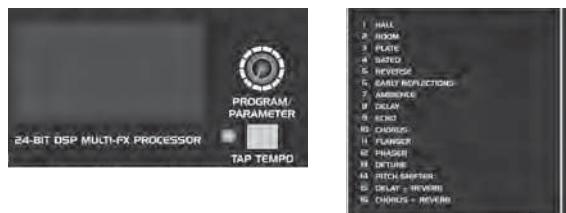


Fig. 3.1: Effects presets overview

24-BIT MULTI-EFFECTS PROCESSOR

Here you can find a list of all presets stored in the multi-effects processor. This built-in effects module produces high-grade standard effects such as reverb, chorus, flanger, delay and various combination effects. The integrated effects module has the advantage of requiring no wiring. This way, the danger of creating ground loops or uneven signal levels is eliminated at the outset, completely simplifying the handling.

These effect presets are designed to be added to dry signals. If you move the FX TO MAIN control, you mix the channel signal (dry) and the effect signal.

This also goes for mixing effects signals with the monitor mix. The main difference is that the mix ratio is adjusted using the FX TO MON control. Of course, a signal has to be fed into the effects processor via the FX control in the channel strip for both applications.



Fig. 3.2: Connection socket for the footswitch

FOOTSWITCH

Connect a standard footswitch to the footswitch connector; use this to switch the effects processor on and off. A flashing dot at the bottom of the display indicates if the effects processor is muted via the footswitch.

- ◊ In chapter 4.2, you will find an illustration showing how to connect your footswitch correctly.



Fig. 3.3: Digital Effects module and XPQ Surround Function control elements

LEVEL

The LED level meter on the effects module should display a sufficiently high level. Take care to ensure that the clip LED only lights up at peak levels. If it is lit constantly, you are overloading the effects processor and this could cause unpleasant distortion. The FX SEND fader determines the level that reaches the effects module.

PROGRAM

You can select the effect preset by turning the PROGRAM control. The display flashes the number of the current preset. To recall the selected preset, press the button; the flashing stops. You can also recall the selected preset using the footswitch.

3.2 surround function

The surround function can be enabled/disabled with the SURROUND TO MAIN switch. This is a built-in effect that widens the stereo width, thus making the sound more lively and transparent. Use the SURROUND control to determine the intensity of this effect.

4. Installation

4.1 Cable connections

You will need a large number of cables for the various connections to and from the console. The following illustrations show the wiring of these cables. Be sure to use only high-grade cables.

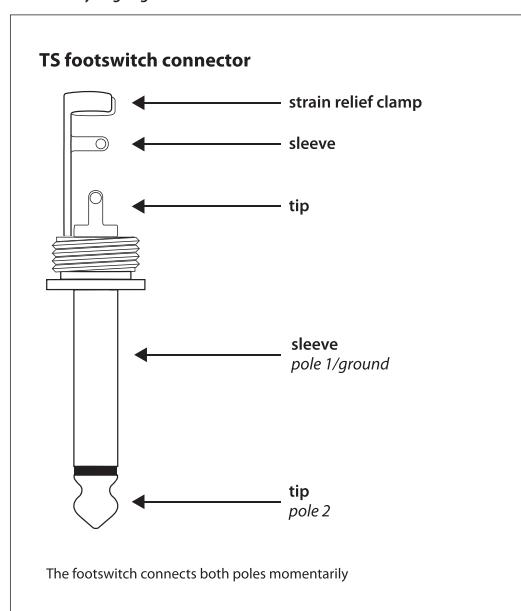


Fig. 4.1: TS footswitch connector

4.1.1 Audio connections

Please use commercial RCA cables to wire the 2-track inputs and outputs.

You can, of course, also connect unbalanced devices to the balanced input/outputs. Use either mono plugs, or ensure that ring and sleeve are bridged inside the stereo plug (or pins 1 & 3 in the case of XLR connectors).

◊ **Caution!** You must never use unbalanced XLR connectors (pins 1 and 3 connected) on the MIC inputs if you intend to use the phantom power supply.

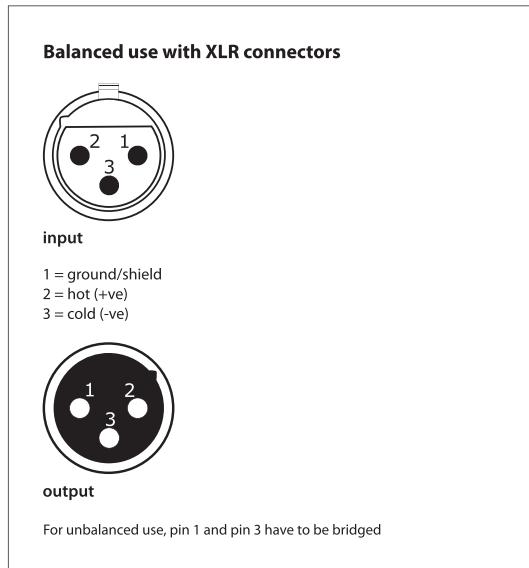


Fig. 4.2: XLR connections

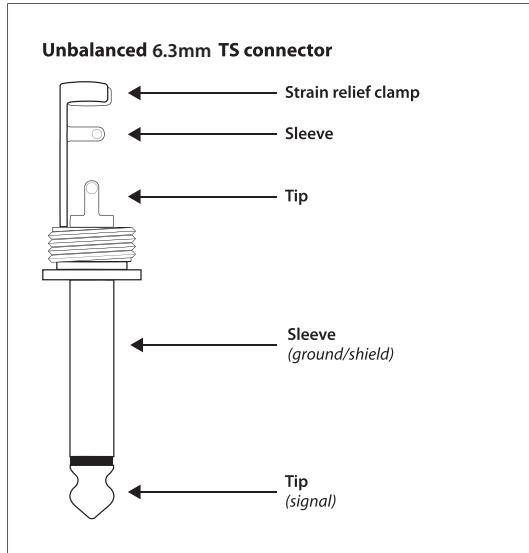


Fig. 4.3: TS connector

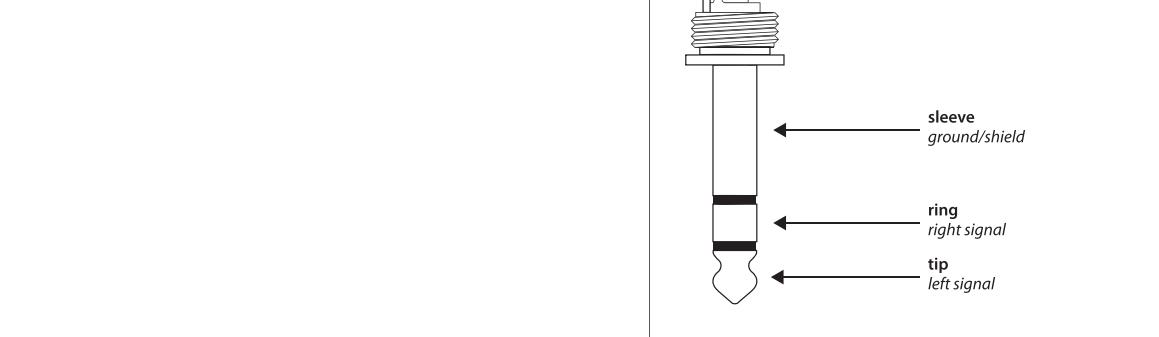


Fig. 4.6: TRS connector for headphones

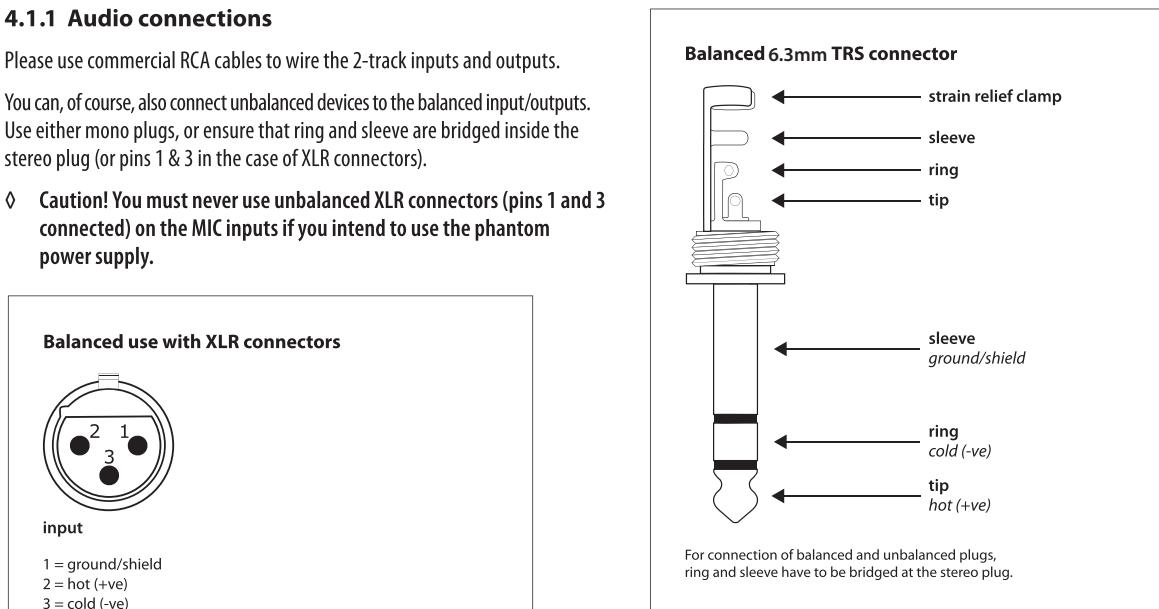


Fig. 4.4: TRS connector

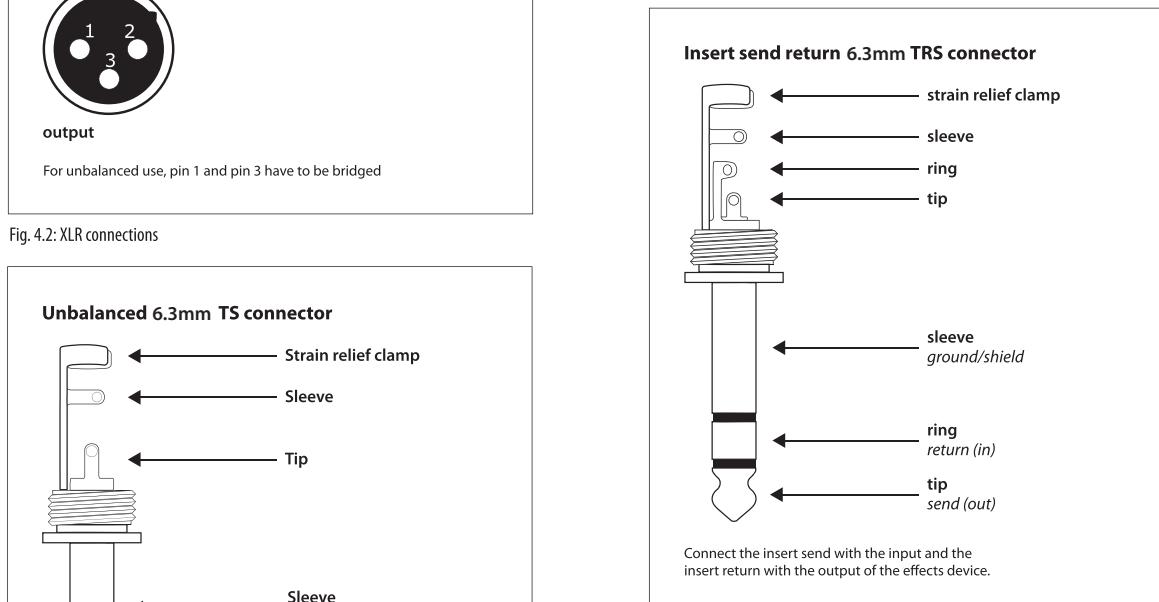


Fig. 4.5: Insert send return TRS connector

5. Features

- 16 effect DSP engine with parameter control
- Integral USB interface for PC/Mac
- Variable compressor per mono channel
- +48V phantom on XLRs (globally switched)
- 75Hz lo-cut filter per mono channel
- Multiple pre/post fade Aux feeds
- PFL/Solo monitoring with separate outputs
- Channel inserts/direct per mono channel
- Stereo return for each Aux feed
- Balanced/unbalanced outputs
- Internal power supply (mains IEC)

6. Specifications

Model no.	M12DSP
Order ref.	170.822
Power consumption	40W
Power supply	110-240Vac 50/60Hz (IEC)
Phantom power	+48V (globally switched to XLR inputs)
Input level : Mic	+22dBu
Input level : Line	+20 dBu
Output level : Line	+28dBu (XLR); +22dBu (jack)
Frequency response	20Hz - 30kHz ($\pm 1\text{dB}$)
Effects	16-programme 24-bit DSP engine
T.H.D.	<0.005% (+14dBu @ 1kHz)
Crosstalk	>89dB @1kHz
S/N ratio	-97dBu (channel fader down)
Low-cut filter	75Hz 18dB/oct (mono inputs)
USB port	Stereo in/out 16-bit, 48kHz
Inputs : Mic/Line	4 or 6 XLR/jack (bal/unbal)
Inputs : Line	2 or 4 mono/stereo jack (bal/unbal)
Inserts	Mono channel inserts/direct (TRS jack)
EQ: High	12kHz shelving $\pm 15\text{dB}$
EQ: Mid	2.5kHz peaking $\pm 15\text{dB}$
Output EQ	7-band graphic with anti-feedback + surround
2-track	L+R RCA in/out + voice canceller
Outputs	Main (XLR)
Dimensions	415 x 118 x 397mm
Weight	4.97kg

Note: Specifications and design are subject to change without notice for purpose of improvement.