USBMIX6

Six Channel Mic-Inst-Line Mixer - Computer Interface

Project Series

User's Manual

▲ A R T

APPLIED RESEARCH AND TECHNOLOGY
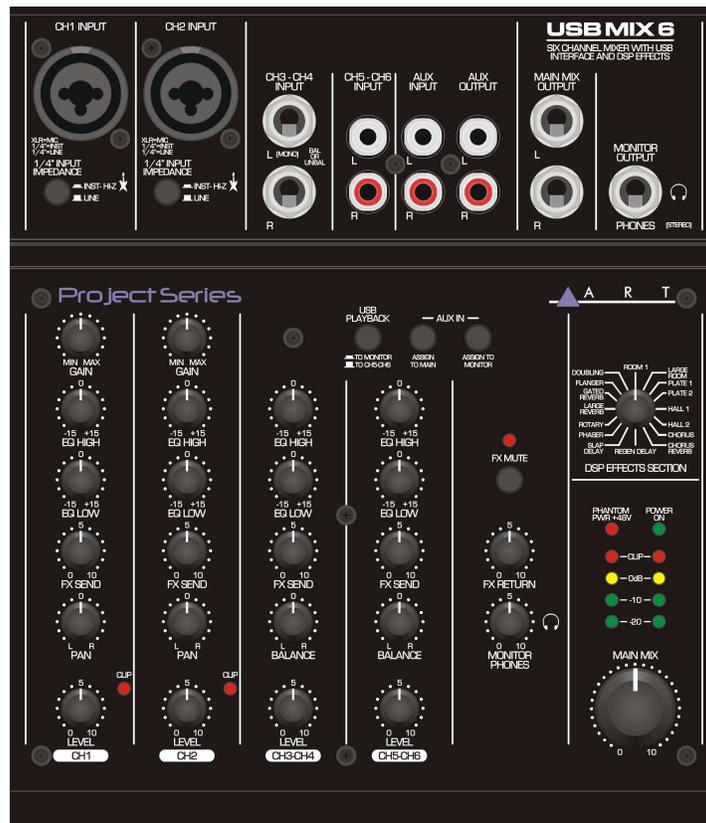
IMPORTANT SAFETY INSTRUCTIONS - READ FIRST

This symbol, wherever it appears, alerts you to the presence of uninsulated dangerous voltages inside the enclosure that may be sufficient to constitute a risk of shock.

This symbol, wherever it appears, alerts you to important operating and maintenance instructions in the accompanying literature. Please read the manual.

Read instructions

Retain these safety and operating instructions for future reference. Heed all warnings printed here and on the equipment. Follow the operating instructions printed in this user guide.

Do not open

There are no user serviceable parts inside. Refer any service work to qualified technical personnel only.

Power sources

Only connect the unit to mains power of the type described in this user guide or marked on the rear panel. The power source must provide a good ground connection.

Power supply

Use the external power supply for your local mains supply as provided with the equipment. If the provided external supply does not fit into you outlet consult your service agent. Route the external power cord so that it is not likely to be walked on, stretched or pinched by items placed upon or against.

Grounding

Do not defeat the grounding and polarization means of the power cord plug. Do not remove or tamper with the ground connection on the power cord.

Moisture

To reduce the risk of fire or electrical shock, do not expose the unit to rain, moisture or use in damp or wet conditions. Do not place container of liquid on it, which may spill into any openings

Heat

Do not locate the unit in a place close to excessive heat or direct sunlight, as this could be a fire hazard. Locate the unit away from any equipment, which produces heat such as: power supplies, power amplifiers and heaters.

Environment

Protect from excessive dirt, dust, heat, and vibration when operating and storing. Avoid tobacco ash, drink spillage and smoke especially that associated with smoke machines.

Handling

Protect the controls from damage during transit. Use adequate padding if you need to ship the unit. To avoid injury to yourself or damage to the equipment take care when lifting, moving or carrying the unit.

Servicing

Switch off the equipment and unplug the power cord immediately if it is exposed to moisture, spilled liquid or the power cord or plug becomes damaged during a lightning storm or if smoke odor or noise is noted. Refer servicing to qualified technical personnel only.
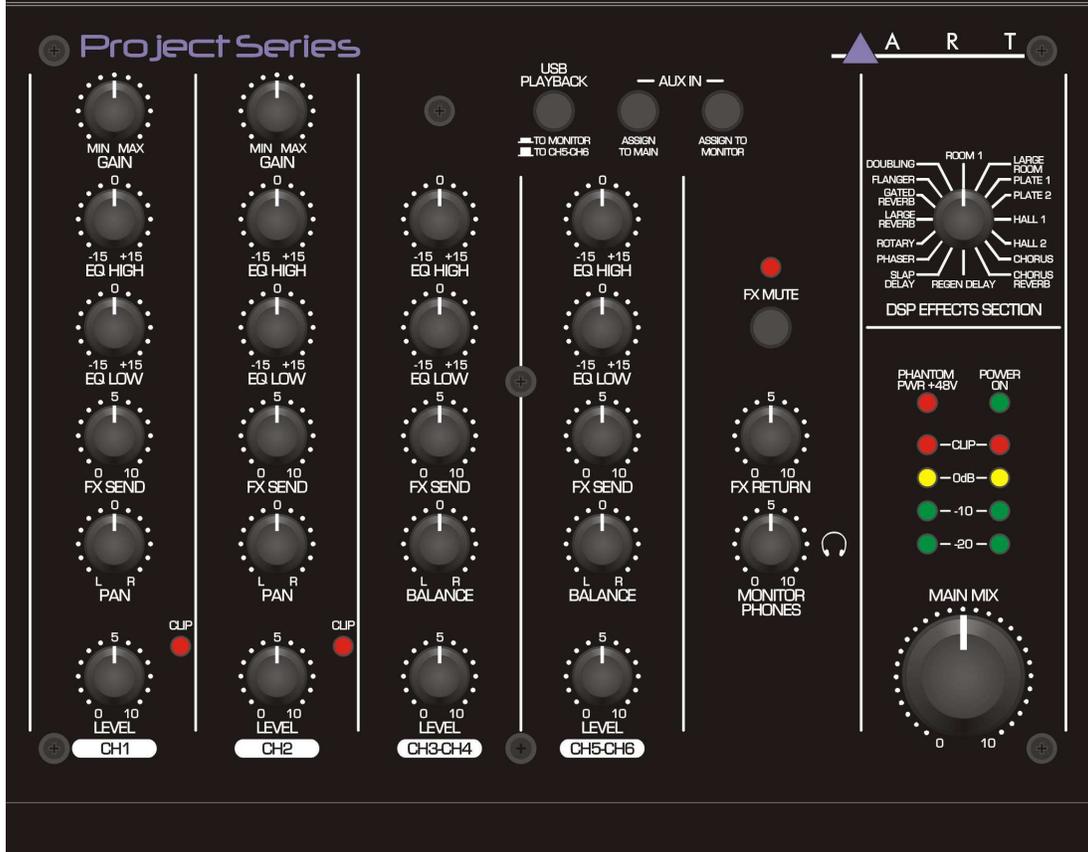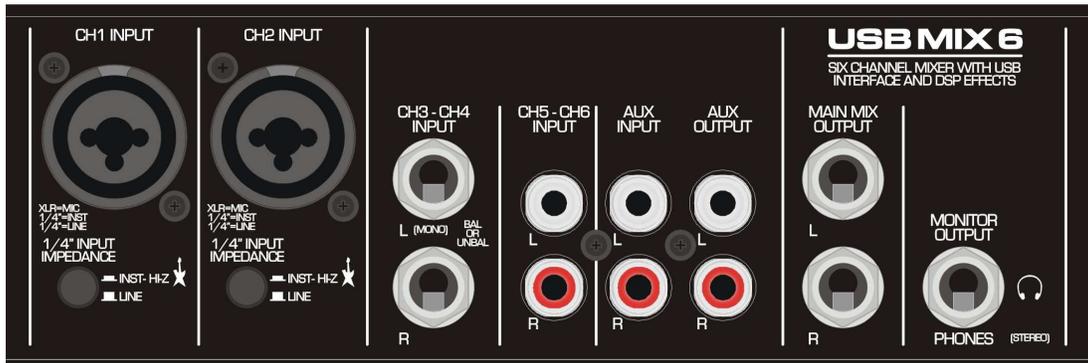
Installation

Install the unit in accordance with the instruction printed in the user guide.

INTRODUCTION

The ART **USBMIX6** Microphone, Instrument, and Line Mixer / Computer Interface is a compact versatile audio interface for your computer that converts analog signals from a variety of audio sources to a digital audio. The built-in low latency stereo digital effects add to the versatility. It can also be used as a standalone mixer through the main mix outputs. The **USBMIX6** provides a great starting point for personal home studio recording or for anyone wanting to do mobile location recording. Use the **USBMIX6** to record podcasts, capture your latest idea for a song, make voiceovers for your home movies, or record a jam with a friend - whenever and wherever your creativity takes you!

Key Features Include

- Powered by a 15vac external power supply, USB interface needed when used with a computer

- CH1 and 2 Microphone (balanced XLR) inputs or instrument (unbalanced ¼-inch TS) inputs with switchable impedances

- Switchable low noise +48V phantom power for microphones

- Balance ¼-inch TRS inputs for stereo or mono line-level sources on CH3-4

- ¼-inch TRS output jacks work with balanced or unbalanced lines

- Unbalanced RCA inputs Ch5-6

- Stereo ¼-inch TRS headphone jack with independent level control for output monitoring

- Independent controls for both sets of inputs, main output, and headphone monitor

- Red LED signal/clip indicator for Ch1-2, overall gain shown on LED meter display

- Switchable assignment of USB playback to channels 5 and 6 or monitor

- USB 2.0 compliant

- No special drivers needed with most modern versions of Windows, Mac OS, and Linux

- USB cable, AC supply, and Audacity recording software included

- Rugged steel case

Rear Panel

USB TO PC

15V AC
500mA

EXTERNAL
POWER

ON
POWER
I
O

ON
PHANTOM
POWER
I
0

SERIAL NUMBER

DATE CODE

www.artproaudio.com
Designed and Developed in the USA by Applied Research & Technology
Made in China

FC CE

Front Panel

CH1 INPUT

CH2 INPUT

CH3 - CH4
INPUT

CH5 - CH6
INPUT

AUX
INPUT

AUX
OUTPUT

USB MIX 6
SIX CHANNEL MIXER WITH USB
INTERFACE AND DSP EFFECTS

MAIN MIX
OUTPUT

MONITOR
OUTPUT

XLR=MIC
1/4"=INST
1/4"=LINE
1/4" INPUT
IMPEDANCE

INST- HI-Z
LINE

XLR=MIC
1/4"=INST
1/4"=LINE
1/4" INPUT
IMPEDANCE

INST- HI-Z
LINE

L (MONO)

BAL
OR
UNBAL

R

L

R

L

R

L

R

L

R

L

R

PHONES (STEREO)

Project Series

A R T

MIN MAX
GAIN

MIN MAX
GAIN

USB
PLAYBACK

AUX IN

TO MONITOR
TO CH5-CH6

ASSIGN
TO MAIN

ASSIGN TO
MONITOR

DOUBLING
FLANGER
GATED
REVERB
LARGE
REVERB
ROTARY
PHASER
SLAP
DELAY

ROOM 1

REGEN DELAY

LARGE
ROOM
PLATE 1
PLATE 2
HALL 1
HALL 2
CHORUS
CHORUS
REVERB

0
-15 +15
EQ HIGH

0
-15 +15
EQ HIGH

0
-15 +15
EQ HIGH

0
-15 +15
EQ HIGH

0
-15 +15
EQ LOW

0
-15 +15
EQ LOW

0
-15 +15
EQ LOW

0
-15 +15
EQ LOW

FX MUTE

DSP EFFECTS SECTION

5
0 10
FX SEND

5
0 10
FX SEND

5
0 10
FX SEND

5
0 10
FX SEND

5
0 10
FX RETURN

PHANTOM
PWR +48V

POWER
ON

CLIP

0dB

-10

-20

L R
PAN

L R
PAN

L R
BALANCE

L R
BALANCE

5
0 10
MONITOR
PHONES

MAIN MIX

5
0 10
LEVEL
CH1

CLIP

5
0 10
LEVEL
CH2

CLIP

5
0 10
LEVEL
CH3-CH4

5
0 10
LEVEL
CH5-CH6

0 10

OPERATION AND CONNECTIONS

Phantom Power switch (+48 V) for the XLR jack of channels CH 1 and CH 2.

Power mains switch of the mixer.

Power supply jack for the connection of the power supply adapter, provided.

USB jack (type B) for the connection to a computer: it can be used both as an audio output (output of the sum signal) and as an audio input (feed-thru audio data for reproduction via channel CH 5/6).

Combo Input (combined jack XLR, balanced / ¼-inch jack unbalanced) for channel CH 1 and channel CH 2, for connection of a microphone via an XLR plug or an audio source with line signal level via a ¼-inch jack.

Instrument/Line Impedance switch, for channel CH 1 and channel CH 2: engage the switch when an electric guitar or an electric bass with passive audio pick-up has been connected to the ¼-inch jack.

Stereo input (¼-inch jack, bal.) for channel CH3/4 for connection of an audio source with line signal level; when connection a mono source, use the Left jack only.

Stereo Input (RCA) for channel CH5/6 for connection of an audio source with line signal level.

Aux Out (RCA) from the mixer to a Stereo Input.

Aux In (RCA) from the mixer to a Stereo Output.

Main Mix Out (¼-inch jack, unbal.) for connection of an amplifier or another unit, e.g. a second mixer.

Monitor/Phones Output (¼-inch jack) for connection of stereo headphones (minimum impedance 8Ohm) for monitoring the sum signal independent of the master control or the signal at the **input Aux In.**

USB Playback switch assigns signal of USB jack to channel CH5/6 or to **Monitor/Phones**.

Assign to Main used to switch the input signal of the input **AUX IN** to the Main Mix output.

Assign to Monitor used to switch the input signal of the input **AUX IN** to the headphone output.

GAIN Control to adjust the input amplification, for channel CH 1 and channel CH 2.

Channel Equalization Equalizer to adjust the high frequencies (HI) and low frequencies (LO), for each input channel.

Effect control, for each input channel, to adjust the effect component for each channel.

Pan Control, for channel CH1 and CH2, to place the mono signal in the stereo field.

Balance Control, for channel CH3/4 and CH 5/6.

Clip LED level peak indication, for channel CH1 and CH2.

Level Control for each input channel.

FX Mute switch, when the button switch engaged, the internal effect processor is muted at its output, and the LED will light up.

Effect Return control to add the effect signal to the sum signal.

Monitor/Phones control the level for the headphones output.

DSP Effects control pot switches to select the effects.

Phantom Power +48V indicator, this lights when the **Phantom Power** switch is set to ON for CH1 and CH2.

Power On   Green indicator LED is illuminated when the mixer is powered up.

Stereo level indicator LED's, the sum signal adjusted with the master control; in case of overload the CLIP LED's light up.

Main Mix control sets the level of the output signal sent via the outputs **MAIN MIX** , **AUX OUT** and the **USB** port.

Applications

This compact audio mixer with USB interface and DSP effect unit is suitable for universal applications, e.g. for audio recording with a the computer. It has four input channels, i.e. 2 x mono, 2 x stereo, for connecting microphones (also phantom-powered) and other audio sources with line signal level (e.g. musical instruments, players). In addition, there are connections for recording and headphones are provided. The mixed stereo signal is sent via ¼-inch jacks and the USB jack. The USB jack can be used at the same time as an input for transferring audio data from the computer to the mixer.

The power connection is made via the supplied AC power adapter.

Setting into Operation

Prior to powering up the unit, the output controls **MONITOR/ PHONES** and **MAIN MIX** should be turned back to "0".

1. As audio sources, microphones and/or audio sources with line signal level (e.g. effect units, musical instruments, players) can be connected to the four input channels.

Mono channels CH1 and CH2:

Combo XLR/¼-inch jack are available as inputs.

Connect microphones to the balanced XLR jack.

For phantom-powered microphones it is possible to activate a 48V phantom power for both XLR jacks together with switch PHANOM POWER. When activated (switch position I   =on) the indication PHANTOM PWR +48V lights up during operation.

Caution! *Do not connect a microphone with unbalanced output via XLR plug; it may be damaged by the phantom power. To prevent switching noise, only activate or deactivate the phantom power .*

Connect mono sources with line level to the unbalanced ¼-inch jacks. It is also possible to directly connect musical instruments with high impedance (electric guitar, electric bass) to these jacks: in this case engage the impedance switch for that channel.

Stereo channels CH3/4 and CH5/6:

Stereo sources with line level may be connected to the ¼-inch jack of channel CH3/4 and to the RCA jacks of channel CH5/6 (L=left channel, R= right channel). The jacks of channel CH3/4 are balanced, however, it is also possible to connect units with an unbalanced output.

For connecting a mono unit to channel CH3/4, use the Left jack only: Then the mono signal is internally sent to the right channel and the left channel.

2. The RCA jacks **Aux** can be used for connection of a stereo recording device.

Connect the replay output of the stereo recording device to the input **AUX IN**;

Connect the recording input of the recording device to the output **AUX OUT**; the output receives the sum signal adjusted with the control **MASTER MIX**

However, the connections may also be used for other units with line signal level, e.g. a reproducer like CD player or MP3 player may be connected to **AUX IN** or an amplifier to **AUX OUT**.

3. Connect stereo headphones (impedance ≥8 OHM) to the ¼-inch jack **MONITOR/PHONES**.

4. The sum of the signals are adjusted with the control **MAIN MIX,** the audio is present at the stereo output **MAIN MIX OUT**.

Here e.g. an amplifier or a second mixer may be connected. The ¼-inch jacks are unbalanced

5. For power supply, connect the power adapter provided to the jack 15VAC and to a mains outlet (115VAC or 230VAC).

Note: If the mixer is not used for a long period of time, then disconnect the power adapter from the socket. Even when the mixer is switched off, the power supply unit has a low power consumption.

6. To switch on the mixer, set the POWER switch to position "ON"**.** The power indication POWER ON lights up.

Operation with a computer

When operating the mixer with a computer, either use the audio software supplied with the operating system or an audio software installed additionally. Various programs for audio reproduction/ recording are available on the internet free of charge.

1. Boot up the computer and connect the USB jack to a USB port at the computer via the USB cable provided. The USB interface of the mixer is recognized by the computer as an external unit for audio input and audio output, depending on the operating system e.g. as "USB Audio CODEC". The required drivers (standard drivers of the operating system) are available on the computer.

2. *Note:* If not all drivers required are available on the computer, install them, e.g. via the original CD of the operating system. If necessary, restart the computer after installation.

3. Activate the audio program used and make the necessary adjustments for the audio reproduction via the mixer or audio recording from the mixer.

If no audio recording or audio reproduction is possible, check in the system settings of the computer if the USB interface has been selected for the audio input or audio output.

Hint: If the mixer is connected both to a computer and to any units which are earth ground mains cables (e.g. amplifiers), ground loops may occur due to hum interference. To eliminate them, the mixer can be connected to the respective unit via a ground isolator.

USB COMPUTER SETTINGS

Once the USB connection is made and your computer is on, your computer will power the USB interfaces circuitry over the USB bus and the unit will automatically connect and try to set your computer "Default Audio Device" to be "USB Audio CODEC". Usually the computer will do this automatically whenever a USB device is first connected, but it is sometimes necessary to make the selection manually. The same settings may need to be made in your particular audio application as well (Check your application instructions). These settings should be made while the **USBMIX6** and computer are connected and powered on.

Your computer audio output "Speaker" is now set to be the "USB Audio CODEC" and playback audio is routed to the **USBMIX6**. This must be done while the **USBMIX6** is connected to the computer and powered on. If you prefer, you can have the computer output routed to your computer speakers instead of the **USBMIX6** monitor output jack, by selecting your computer speakers for "OUTPUT" instead of "USB Audio CODEC" in the above setup procedures. After the above settings are made, your computer will automatically reconfigure itself back to these settings every time the **USBMIX6** is reconnected to the computer. Your recording software may also select which inputs or outputs are being used.

Note 1
The **USBMIX6** interface uses the standard "USB Audio CODEC". This driver is built into most modern operating systems, including most current versions of Linux. Since some details of how the audio interface is set vary with different versions of Linux, the setup is beyond the scope of this document. The main key in setup is to look for "USB Audio CODEC" as the recording source or playback monitor output while the **USBMIX6** is connected.

Operation

Mixing audio sources

The following basic steps serve as an aid for a general setup.

1. As a basic setting first

     a. set all control GAIN, EQ, PAN /BAL to mid-position.

     b. Turn all control LEVEL back to "0".

2. To adjust a mono channel to an optimum level, feed an audio signal to the channel and turn up its control LEVEL approximately to mid-position. Adjust the control GAIN of the channel so that the 0 dB LEDs of the level indication shortly light up at passages of highest volume. Then adjust the sound with the controls EQ: High for the high frequencies, Low for low the bass frequencies. As the sound adjustments affect the channel level, readjust the gain adjustment, if necessary.

     a. Then turn the control LEVEL back to the stop and make the same adjustments for the second mono channel.

3. For the sound adjustment of a stereo channel turn the controls LEVEL of the remaining channels back to the stop and turn up the control LEVEL of the respective stereo channel so that the sound can be adjusted in an optimum way with the equalizer controls

4. When all adjustments for level matching and all sound adjustments have been made, mix the signals of the input channels in the desired volume ratio with the LEVEL controls. The CLIP LEDs of the mono channels should not flicker at all or only flicker shortly at signal peaks. If they light up continuously attenuate the volume of the channel.

    a. Always turn the LEVEL controls of the channels not used back to the left stop.

5. For the mono channels place the mono signals in the stereo sound with the PAN controls and adjust the stereo balance for the stereo channel with the Balance controls.

6. To switch the signal of the input AUX IN, e.g. reproductions of MP3's or CD, to the sum signal, press the button ASSIGN TO MAIN. To feed the AUX IN signal only to the sum, turn the LEVEL controls of the input channels back to the stop.

    a. **Note:** If a recording made via the output AUX OUT is reproduced via the input AUX IN at the same time, the button ASSIGN TO MAIN must not be pressed otherwise feedback will occur.

7. Adjust the desired overall volume with the control MASTER. Then observe the level indication. In general, an optimum control is obtained at 0dB. However, if the output level of the mixer is too high for the following unit, the sum signal must be adjusted to a correspond to the lower level. If the red overload LEDs CLIP light up, turn back the master control and/or individual channel level controls accordingly.

Adding an effect

1. Turn up the effect level control **FX RETURN** approximately to mid-position so that the following effect adjustments can be heard.

2. Select one of 16 effects available with the rotary switch **DSP EFFECT SELECTION**.

DSP Effects: Position 1. is at 12 O'clock, rotating the pot clockwise.

1. ROOM	10. SLAP/DELAY
2. LARGE ROOM	11. PHASER
3. PLATE1	12. ROTARY
4. PLATE2	13. LARGE REVERB
5. HALL1	14. GATED REVERB
6. HALL2	15. FLANGER
7. CHORUS	16. DOUBLING
8. CHORUS/REVERB	
9. REGEN/DELAY	

3. Adjust the desired effect component for each channel with the controls **FX SEND**.

4. Add the effect signal in the desired intensity to the signal sum with the effect level **control FX RETURN**.

SPECIFICATIONS

Input Connections	XLR balanced / ¼-inch unbalanced "Combo" jack (Ch1&2 inputs) ¼-inch balanced or unbalanced (Ch3-Ch4 inputs) RCA unbalanced (Ch5-Ch6) RCA Tape loop In Left and Right
Output Connections	¼-inch TRS balanced (Main Mix outputs) ¼-inch TRS stereo (Monitor output) RCA Tape loop Out Left and Right
Input Impedance	240k Ohms (Inst-HiZ), 20k Ohms (Line) (Ch1-Ch2, Ch3-Ch4 ¼-inch inputs) (Ch5-Ch6 RCA inputs) >4k Ohms (Ch1-Ch2 XLR input)
Output Impedance	<1k Ohms (balanced¼-inch), <500 Ohms (unbalanced ¼-inch) <500 Ohms (unbalanced RCA) 100 Ohms (Monitor output)
Frequency Response	0 Hz – 20 kHz (+0, -1 dB)
THD	<0.01% @ 1 kHz
CMRR	>60dB typical
Phase Response	All connections are phase coherent
Signal to Noise Ratio	90dB typical (Ref 0dBu)
Equivalent Input Noise	120dBu typical (XLR bal, max gain), -125dBu typical (¼-inch & RCA)
Maximum Input Level	+4dBu (XLR input), +20dBu (¼-inch input), 18dBu (RAC)
Maximum Output Level	+20dBu (Main Mix, AUX outputs), +20dBu (Monitor)

Maximum Gain

(In to Main Out)	+54dB (XLR), +39dB (¼-inch) (CH1&CH2) +10dB (¼-inch) (Ch3-Ch4) +11dB (RCA) (Ch5-Ch6)
(In to USB)	+44dB (XLR), +30dB (¼-inch unbal) (CH1&CH2) +0dB (¼-inch) (Ch3-Ch4) +6dB (RCA) (Ch5-Ch6) +8dB (RCA) (AUX IN L&R)
(USB to Out)	+14dB (Main Mix), +14dB (Monitor)
Phantom Power	selectable, +48V DC, filtered, current limited
A/D-D/A	16 Bit, 44.1 kHz or 48 kHz, USB selectable from computer 0.4 ms A/D latency @ 44.1 kHz
Computer Interface Chassis Type	USB Class compliant plug-and-play Mac and PC interface All steel black finish
Power Requirements	15VAC @ <500 mA (external) (Adaptor Included)
Dimensions (HWD)	1.9" x 7.4" x 8.5" 47mm x 186mm x 215mm
Weight	3.24 lbs. (1.47 kg) with power supply and USB cable

Note: 0 dBu = 0.775Vrms

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USB Mix6   184-5004-101

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