



# Xonar Essence STU

*Hi-Fi USB DAC (Digital-to-Analog Converter)*



**User manual**

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# Introduction

Xonar Essence STU USB DAC is ASUS Xonar's innovative response to the world-wide trend of PC Hi-Fi. With PC audiophile's number growing fast according to the convenience and high resolution of digitalized audio contents, Xonar Essence product line is committed to provide solution for their needs to enjoy extreme high-fidelity music with any PC.

Xonar Essence STU grants any PC audiophiles or PC audiophiles-to-be the best solution to enjoy their music with extreme clearness, details, and hassle-free controls that help to re-discover one's music collection.


## Package contents

This package should contain the following:

- ASUS Xonar Essence STU Hi-Fi USB DAC x1
- USB cable ('B-A' type) x1
- Power cord x1 (Some versions may have 2 power cords for different countries)
- Power adaptor x1
- User manual x1
- Installation driver CD x1
- Product Stand x1

# Safety Information

For your own safety please read the following important safety instructions carefully before attempting to connect this unit to the mains power supply. They will also enable you to get the best performance from and prolong the life of the unit.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean machine surface with a cloth (no any detergent applied).
7. Do not block any 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 apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use with only the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over. 
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as the power-supply adaptor having been damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

## Wet Location

Apparatus shall not be exposed to dripping or splashing and that no objects filled with liquids, such as vases, shall be placed on the apparatus.

## Outdoor Use

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**Warning!** To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

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## Disconnect Device - The Main Plug or an Appliance Coupler

The mains plug or an appliance coupler is used as the disconnect device for disconnection from the mains, the disconnect device shall remain readily operable.

# Driver installation

After connecting ASUS Xonar Essence STU with your computer by the bundled USB cable, you need to install the device driver that enables the Xonar Essence STU to work with Windows operating system.



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**NOTES:**

- The driver is only needed when you connect ASUS Xonar Essence STU with PC/NB.
  - The version and content of the support CD are subject to change without notice.
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To install the device driver:

1. Insert the ASUS Xonar Essence STU support CD into your optical drive. If Autorun is enabled, the ASUS Xonar Essence STU driver screen appears automatically. Go to step 4. If Autorun is not enabled in your computer, perform step 2.
2. Click **My Computer** on your desktop and double-click the optical drive icon.
3. Double-click the **setup.exe** icon located on the optical drive.
4. Follow the on-screen instructions to complete the installation. Read the **END USER LICENSE AGREEMENT** in the process and make sure that you understand and accept it before continuing the installation.
5. When the installation finishes, you may be prompted to restart your computer. You can choose to restart the computer later if desired.

## System requirements

To ensure a successful installation of the ASUS Xonar Essence STU USB DAC, your computer must meet the following requirements:

- IBM compatible PC with one USB2.0 (or higher) compatible port for the USB audio device
- Microsoft® Windows® 8 (32/64bit)/ Windows® 7 (32/64bit)/ Windows® XP (32/64bit)/ MCE2005, and **Mac 10.6x OS**
- Intel® Pentium® 4 1.4GHz or AMD Athlon 1400 CPU or faster CPU
- 256 MB DRAM system memory
- 60 MB available HDD space for driver installation package
- CD-ROM drive (or DVD-ROM drive) for software installation
- High-quality headphones or powered analog speakers to enjoy the ultra-high fidelity sound of the card

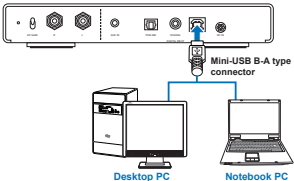
# Functionality

## 1. USB DAC ( Digital-to-Analog Convertor)

Clear, detailed, life-like sound for your digital music collection in PC/NB, with all the connection(XLR, RCA) you need for end devices.

Steps:

- Connect PC/NB with an USB cable
- Need to install driver in your PC/NB to work
- Select "USB" in front panel as the input source



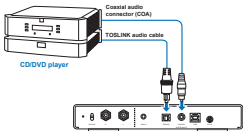


## 2. Stand alone DAC

With S/PDIF in and input select, it also serves as an independent DAC which connects with digital inputs such as CD audio source and then plays to the end devices.

Steps:

- Connect with other audio resource with S/PDIF input (by Coaxial/Optical cable)
- Select COA (coaxial input) or TOS (optical input) in the front panel as the input source

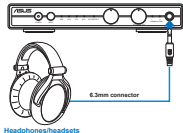


## 3. Headphone amplifier

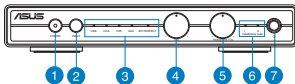
Grants 100% performance of ALL hi-end headphones, even with impedance up to 600ohms, providing extra dynamics and sound details.

Steps:

- Connect with high-quality headphones/headsets

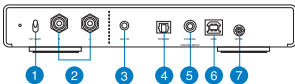


## Front Panel



- 1. Power On/Off**  
Press to turn on and again to turn off.
- 2. Input selection**  
Press to select audio input source: USB, Toslink, Coaxial, or AUX audio input.
- 3. Input selection/Bit perfect indicator**  
The corresponding LED will light up to show which audio source has been selected.
- 4. Speaker volume control**  
The volume control adjusts the output level of unbalanced RCA output.
- 5. Headphone volume control**  
The volume control adjusts the output levels of the headphone jack.
- 6. Headphone Gain indicator**  
The LED will light up based on the selected headphone gain setting.
- 7. Headphone output**  
Connect your high-quality headphones/headsets with 6.3 mm connector. Use a 6.3 mm/3.5 mm connector if your headphones/headsets have 3.5 mm ports.

# Rear Panel



## 1. Headphone Gain Selection

Toggle the switch to change between low or high headphone gain settings.



**NOTE:** If you have a low impedance headset/headphone, please do not switch to high gain setting. When switching between high and low gain settings, please remove the connected headphones/headset before proceeding.

## 2. Unbalanced RCA Output (line-out)

Conventional stereo outputs for connection to the line-level phono/RCA inputs of a speaker.

## 3. Aux In

Connect iDevices such as iPhone, iPod, or iPad into this port.

## 4. Toslink Optical Input

This port is for Toslink Optical Input.

## 5. Coaxial S/PDIF Input

Connect your digital source, such as CD/DVD players or computer with S/PDIF output, to digital input. Use either S/PDIF coaxial or Toslink optical type, each being of equal quality.



**NOTE:** This unit only accepts two-channel LPCM digital audio (e.g. Dolby Digital 2.0). You cannot connect a Dolby Digital 5.1 or a DTS signal as they will not be recognized. If you wish to connect a DVD or similar device, please ensure that the sound output of your player is set to two-channel PCM.

## 6. USB port

Connect a PC via a Type B to Type A USB lead.



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**NOTE:** You need to install the device driver that enables the Xonar Essence STU to work with Windows operating system.

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## 7. Power port (AC in)

Plug the supplied power adapter into the Xonar Essence STU once you have completed all connections.

# Hardware Introduction

1. USB Audio processor: C-Media CM10631A (for USB input)
2. S/PDIF receiver: TI PCM9211 (for digital input)
3. DAC: TI PCM1792A
4. Swappable Op-amps: LME49720 x2
5. Swappable Op-amps: LM4562 x1
6. Swappable Op-amps: OPA2132 x1
7. Film Cap (red ones): WIMA FKP2
8. Op-amps: LM4562 (for Speaker out)
9. Headphone Amplifier: TPA6120A2 (for Headphone out)

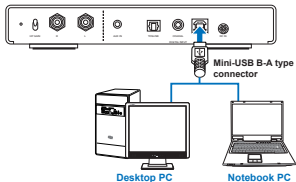
# Connections

## Input

### 1. NB/PC-USB connections



**NOTE:** Do not turn on the machine until all connections have been made.



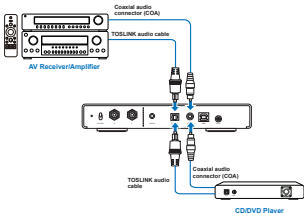
- (1) Connect a USB 'B-A' type lead (as illustrated at left) from the Xonar Essence STU's USB input to one of the USB ports on the PC/NB.
- (2) Turn on the Xonar Essence STU using the front panel On/Off switch and make sure that the USB input is selected (USB LED lit).
- (3) Install the device driver that enables the Xonar Essence STU to work with Windows operating system.



#### NOTES:

- The PC's previous audio output device should now be temporarily disabled and the Xonar Essence STU becomes the default audio playback device for the PC/NB. This can be confirmed in the Control Panel's Sounds, Speech and Audio Devices properties window under the Volume tab.
- If you wish to disconnect your Xonar Essence STU and return to using your previous soundcard, etc., simply disconnect it or switch off the power on the front panel. If the PC fails to disable the Xonar Essence STU and automatically re-enable your default soundcard, you can manually disable the Xonar Essence STU in the hardware device manager. To do this, navigate to the Device Manager (click Start — Control Panel — (Vista: Performance and Maintenance —) System — Hardware — Device Manager in Windows XP). Scroll down the device manager window and expand the heading Sound, Video and Game Controllers to display a list of the connected devices. Click on this description to highlight in blue and then click on the Disable icon at the top of the window. A warning message will appear: "Disabling this device will cause it to stop functioning. Do you really want to disable it?" Click Yes to disable the Xonar Essence STU. The previous audio playback device will now be re-instated by Windows.

## 2. Digital audio input connections



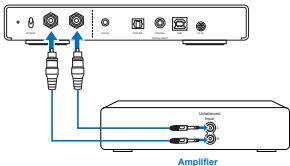
- (1) Connect your digital source (ex. CD/DVD players or some PC/NB with SPDIF output) to Digital Input. Either S/P DIF Coaxial or Toslink optical types can be used, each being of equal quality.



**NOTE:** Both Coaxial and Toslink Inputs can be used to connect and run equipment at the same time.

## Output

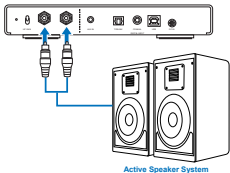
### 1. With Amplifier and Passive Speaker System



- (1) Connect the unbalanced input of an amplifier to the unbalanced (RCA/Phono) output of the Xonar Essence STU.
- (2) Connect the amplifier to a Passive Speaker System.

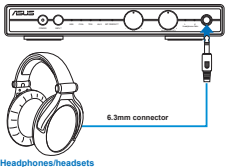


## 2. With Active Speaker directly



- (1) Connect Xonar Essence STU with a set of active speakers directly.

## 3. With Headphone/Headset



- (1) Connect Xonar Essence STU with high-quality headphones/headsets directly.

# Specifications

Items	Description
<b>Audio Performance</b>	
Output Signal-to-Noise Ratio (A-Weighted):	Line Out: 120dB Headphone: 117dB
Output Total Harmonic Distortion + Noise at 1kHz@-3dB (A-Weighted):	Line Out: -108dB Headphone: -101dB
Output Full-Scale Voltage	Line Out: 2Vrms Headphone: 7Vrms
Frequency Response (-3dB, 24-bit/192kHz output):	<10Hz to 48kHz
<b>Bus Compatibility</b>	
USB	USB 2.0 High speed
S/PDIF	IEC 61937
<b>Main Chipset</b>	
Audio Processor	C-Media CM6831A
S/PDIF Receiver	PCM9211
D-A Converter for Analog Inputs	TI PCM1792A
<b>OP Amp</b>	
Balanced / Un-balanced IV	LME49720
Balanced / Un-balanced LFP	LM4562
Headphone	TPA6120A2
<b>Output impedance</b>	
Line out	100 ohm
Headphone out	10 ohm
<b>Clock</b>	
Crystal clock	12MHz
Oscillator	45.1584MHz (for 44.1KHz sample rate)

*continued on the next page*

# Specifications

Sample Rate and Resolution	
Analog Playback Sample Rate and Resolution	44.1K/48K/88.2K/96K/176.4K/192KHz @ 16/24bit
Power consumption (Max)	12W
I/O Ports	
Output Jack:	Line Out (Dual RCA)
	6.3mm Jack headphone output
	Metal with plated gold, black housing
Input Jack:	USB jack
	Coaxial / Toslink jack
	AUX in phone jack
	Metal with plated gold, black housing
Power Input Jack:	DC in 12V
Volume controller	Balanced Output: Taper A Potentiometer
	Headphone Output: Taper A Potentiometer
Power input range	AC 90~264V
LED Indicator	
One color LED	Ø3mm Lamp LED White color
Button	
Push Button	2-pin Tact switch
Accessories	
Accessories	Power cord x1
	Power adaptor x1
	USB cable x1
	Product Stand x1
	6.3mm to 3.5mm adaptor x1
	User manual x1
	Installation driver CD x1

\* Specifications are subject to change without notice.