

Professional PC Audio Interface for USB

User Manual



made in germany

Scope of delivery

- PUC unit
- USB cable, "A/B" type
- User Manual
- 4 self-adhesive bumper feet *
- additional datasheets in case of special versions

Before using this unit, please make sure to read the safety instructions on page 10

* Give your PUC a more firm stand by mounting the self-adhesive bumper feet. Take them off the protection sheet and place them evenly spread on the bottom side, close to the outer edge.



Connection

Yellowtec PUC is designed to operate as an Audio Converter at a USB port of your PC. PUC draws its power supply from the PC USB port. External supply is not needed, therefore a power input connector is not provided.

Connecting cable

Please use the enclosed USB cable.

If you want to use another cable, make sure it meets USB specifications.

("A/B" type cable, compatible with USB 1.1 oder higher, max. lenght 5mtr)

PC connection, direct

Connect the USB socket on the PUC front panel with a standard USB port of your PC using the USB cable provided.

(PC USB port compatible with USB 1.1 oder higher and "A" type socket.)

PC connection, via USB hub

Connect the USB socket on the PUC front panel with a USB port of your USB hub using the USB cable provided.

(Hub compatible with USB 1.1 oder higher and "A" type socket.)

In most cases you will need a hub with its own power supply ("self-powered").

Note: A standard USB port can deliver current up to 500mA. Hubs without power supply consume a small amount of that current for active signal processing and distribute the rest among the outgoing USB ports. This may result in a lack of power when running a PUC on such a port.

In this case use a self-powered hub that can deliver up to 400mA on each outgoing port.

Audio ports

PUC provides analogue and digital audio ports.

The analogue ports are in the professional studio format and deliver superb audio quality. The electronically balanced input and output circuitry can supply levels up to +18dBu without loss when operated unbalanced. International and german level standards are available.

In the digital domain high quality S/PDIF input and output ports with SRA (Sample Rate Auto Sensing) are provided.

As a special version PUC is available with transformer balanced AES/EBU ports*.

* particular specifications apply, see "technical data"

PUC automatically selects the audio source.

If a digital audio signal is present at the digital input, this input will be selected. (Only condition: the input signal must be in a format that PUC identifies as convertible.) Otherwise the analogue inputs are selected.

The outputs, digital and analogue, are simultaneously active.

The headphones output with its own driver circuitry enables you to monitor audio signals processed by PUC without the need of additional equipment.

Audio Options

Via GPI (control input ports) you can select 3 functions:

1. ZLM (Zero Latency Monitoring). When active, the analogue input signal is added (via summing amp) to the analogue output signal. This function allows you to monitor the input signal without latency time caused by audio processing in a PC.
2. BYP (Digital Bypass). Hereby you switch a digital input signal directly to the digital output. Audio data coming from the PC are cut out.
3. INT LVL (International Level). When active, PUC is set up for international analogue Level standards: i.e. ref. Lvl. +4dBu / max. Lvl. +18dBu.

Note:

Maximum Level in the analogue domain refers to 0dBFS in the digital domain.

In normal operation mode 0dBFS refers to +15dBu, thus -9dBFS refers to +6dBu (german standard).

With "INT LVL" active, 0dBFS refers to +18dBu, thus +4dBu refers to -14dBFS (common international standard).

Installation for MS Windows Users

When you connect PUC to your PC it will be automatically identified and installed. During this procedure Windows will show dialogues like:

... new hardware found ... USB Audio Codec ... USB audio device ... is being installed ...
... the new hardware has been successfully installed and can be used ...

All drivers required belong to the standard Windows operating system. If, out of any reason, a driver is missing on your PC, you are prompted to insert your Windows CD, so the driver can be reinstalled.

Previously active soundcard setups will be automatically deactivated.

PUC is a real Plug 'n Play device.

You do not need any special driver to run PUC on your PC.

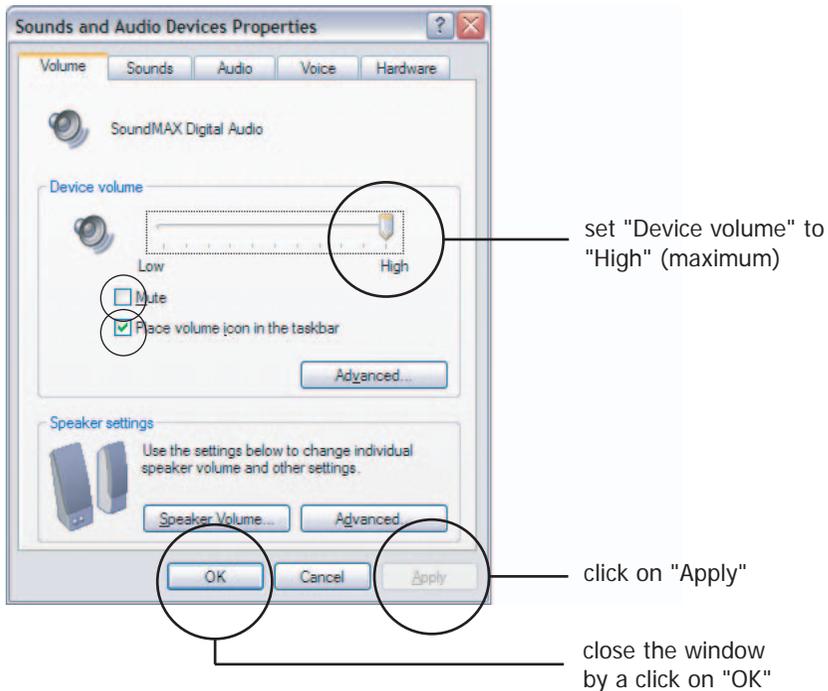
The only setting, that we recommend, concerns the audio playback volume of Windows (described in the following). This setting will assure, that PUC output levels in playback mode meet professional studio standards.

Note:

Driver installation and settings are stored by Windows separately for each USB port. When you run PUC on another USB port of your PC later, the installation routine described above will come up again. In this case we recommend to redo the setting described in the following as well.

Settings using Windows XP

Open "Sounds and Audio Devices Properties" (in the "Control Panels" folder).
Select the register card "Volume" and set the control of "Device volume" to "High".



The controller "Device volume" is the master volume control for sound playback. This controller can also be accessed by selecting the register card "Audio" followed by a mouse-click on the "Volume" button in the playback range. Though it may be labelled different there, the controller that can be identified as master volume control is functionally identical with the one described above.

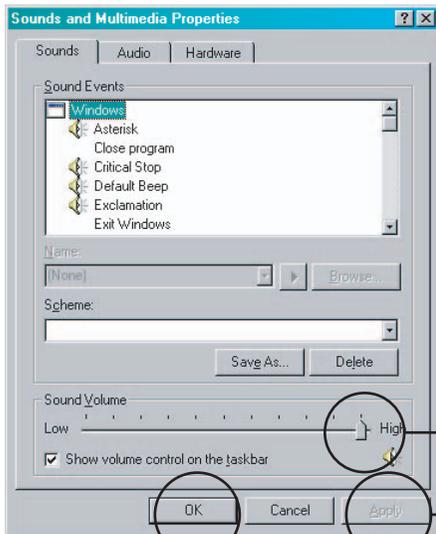
One more possibility to access the controller is from the Windows "Taskbar". You can activate this option in the adequate checkbox shown above. If you do so, please be concerned about the possibility of unintended faulty operation. Selecting the Checkbox "Mute" will cut sound playback completely.

Note:

The Windows driver for PUC is labelled "USB Audio CODEC". It does not provide settings for recording level. PUC itself is referred to as "USB audio device" by Windows.

Settings using Windows 2000

Open "Sounds and Multimedia Properties" (in the "Control Panels" folder).
Select the register card "Sounds" and set the control of "Sound Volume" to "High".



set "Sound Volume" to
"High" (maximum)

click on "Apply"

close the window
by a click on "OK"

The controller "Sound Volume" is the master volume control for sound playback.

This controller can also be accessed by selecting the register card "Audio" followed by a mouse-click on the "Volume" button in the playback range. Though it may be labelled different there, the controller that can be identified as master volume control is functionally identical with the one described above. Selecting the Checkbox "Mute" will cut sound playback completely.

One more possibility to access the controller is from the Windows "Taskbar". You can activate this option in the adequate checkbox shown above. If you do so, please be concerned about the possibility of unintended faulty operation.

Note:

The Windows driver for PUC is labelled "USB Audio CODEC". It does not provide settings for recording level.

PUC itself is referred to as "USB audio device" by Windows.

Working with application software

Adapting analogue level standards

Depending on its GPI settings PUC can handle maximum levels of +15dBu resp. +18dBu at the analogue inputs and outputs. This is related to the specified reference levels of +6dBu resp. +4dBu only by the settings (default or user) of your application software.

If PUC is operated in delivery status (+15dBu max. level), your application software needs to be set in the way that reference level is 9dB lower than maximum level. This complies to german studio standards.

If you operate your PUC with the GPI "INT LVL" activated (i.e. +18dBu max. level), your application software needs to be set in the way that reference level is 14dB lower than maximum level (i.e. +4dBu). This complies to common international studio standards.

see also page 4: Audio Options

Adapting digital audio formats

Audio format settings of your application software must correspond to the format of the audio signal that is fed into the digital input of your PUC. These are basic settings, e.g.

- sample rate (e.g. 32kHz, 44.1kHz, 48kHz)
- resolution (be concerned: PUC max. 16bit)
- mono/stereo

Multichannel operation

It is possible to set up multichannel systems with several PUCs. In theory the maximum number of channels depends on USB data thruput. But in practice it depends on the interaction of all system components like PC hardware, operation system, application software.

Note: In theory it is possible to transfer more than 16 stereo audio signals simultaneously via USB 1.1

Copy Protection (SCMS)

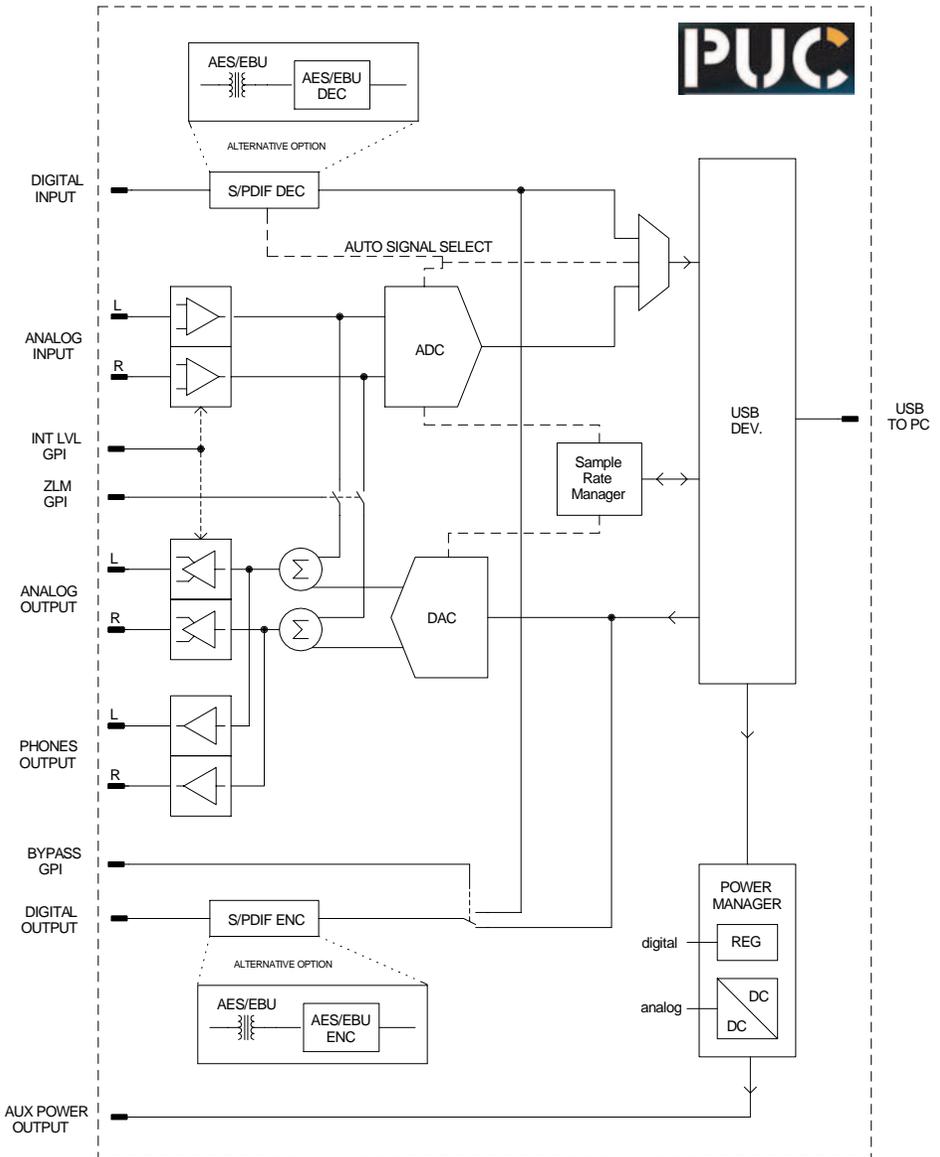
PUC provides SCMS ("Serial Copy Management System"), which restricts the copying of audio data in the digital S/PDIF format.

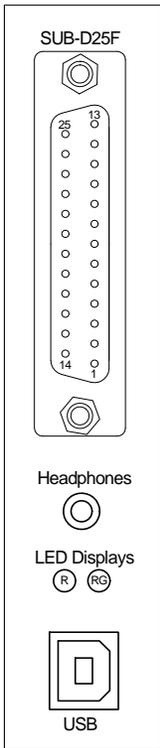
Original audio data with copy protection (active "copy bit") can only be copied once in the digital S/PDIF format. If this copy is fed to a device with SCMS, it will not be accepted. According to RIAA conventions all consumer digital audio recorders are equipped with SCMS (MiniDisc, CD-R Audio, DAT, etc.).

PUC will switch over to the analogue inputs when a copy of protected audio material is fed to its S/PDIF input. In this case use the analogue audio format.

Audio data played back through PUC is marked as original audio data with copy protection.

BLOCKDIAGRAMM





Digital Audio Input

Standard: S/PDIF	Signal	Pin 14
	Shield	Pin 2
Optional: AES/EBU	Signal+	Pin 14
	Signal-	Pin 2
	Shield	Pin 15

Digital Audio Output

Standard: S/PDIF	Signal	Pin 3
	Shield	Pin 16
Optional: AES/EBU	Signal+	Pin 3
	Signal-	Pin 16
	Shield	Pin 15

Analog Audio Input

Left Channel	Signal+	Pin 25
	Signal-	Pin 13
	Shield	Pin 12
Right Channel	Signal+	Pin 24
	Signal-	Pin 11
	Shield	Pin 12

Analog Audio Output

Left Channel	Signal+	Pin 9
	Signal-	Pin 21
	Shield	Pin 22
Right Channel	Signal+	Pin 10
	Signal-	Pin 23
	Shield	Pin 22

Sub-D

GPI

ZLM	Zero Latency Mon.	Pin 18
BYPASS	Dig. Bypass	Pin 17
INT LVL	International Level	Pin 5

active when connected to dig 0V, non active when left open or connected to +5V. Do not exceed 0V ... +5V!

Aux Power Out

digital +5V/max. 40mA	Pin 6
digital 0V	Pin 19
analog +15V/max. 10mA	Pin 20
analog -15V/max. 10mA	Pin 7
analog 0V	Pin 8

No short-circuit protection provided on AUX POWER OUT!

Ground Input/Frontpanel Sub-D Pin 1

Headphones 3,5mm Jack Connector

Left Channel	Tip
Right Channel	Ring
analog 0V	Case

LED Displays

Type RG lights red - USB initialisation process
 Type RG lights green - normal operation
 Type R lights red - analog ZLM and/or digital Bypass active

USB Connector

"B"-Type, USB 1.1, Power Supply via USB

TECHNICAL DATA

- Full USB 1.1 Compliance; compatible to MS Windows 98 (2nd ed.)/2000/ME/XP, Mac OS 9 or higher
- Power Supply via USB, less than 400mA typ.
- USB Asynchronous Mode for Record / USB Adaptive Mode for Playback
- Copy Management for S/PDIF Input and Output; SCMS (Serial Copy Management System)
- Stereo Analogue Inputs electronically balanced with Ref. Level +6dBu / max. Level +15dBu via GPI switchable to Ref. Level +4dBu / max. Level +18dBu / Input impedance 20KOhm
- Stereo Analogue Outputs electronically balanced with Ref. Lvl. +6dBu / max. Level +15dBu via GPI switchable to Ref. Lvl. +4dBu / max. Level +18dBu / Load > 600 Ohm
- Stereo Headphones Output max. Level +20dBu (unloaded) Impedance 300 Ohm, Load > 600 Ohm
- Stereo Digital Audio Input and Output in the S/PDIF format (special version with AES/EBU ports available, particular specifications apply, please refer to datasheet provided with special version)
- 16 Bit Delta Sigma A/D and D/A conversion, supported sample rates A/D 8kHz, 11.025 kHz, 16kHz, 22.05kHz, 32kHz, 44.1kHz, 48kHz, D/A 32kHz, 44.1kHz, 48kHz
- Noise A/D 88dB, D/A 88dB (95dB with AutoMute), 22Hz-22kHz, QPeak, A-weighted, typ.
- GPI (control input ports) max. voltage range: dig. 0V ... +5V / active: 0V / non active: open or +5V
- AUX POWER OUT max. current 10mA, no short-circuit protection provided!
- Dimensions 140mm x 132mm x 27mm, weight approx. 200g

Safety instructions

- Before installation or operation of equipment read all safety instructions warnings and operating instructions.
- Heed all warnings on the equipment.
- Follow the operating instructions.
- Only use the equipment for the purpose and in the way as described in the operating manual.
- Keep operating instructions for future reference.
- Never use the equipment in the immediate vicinity of water. Ensure that water or damp cannot get into the equipment.
- Only install or fit the equipment in accordance with the manufacturers recommendations.
- Ensure adequate ventilation when installing.
- Never use the equipment in places that have temperatures above +40°C or below -10°C .
- Ensure that foreign objects and liquids cannot get into the equipment.
- Only clean the equipment as recommended by the manufacturer.
- In any situation where an incident occurs which could render the equipment unsafe, for example
 - entry of foreign objects or liquids (including water) into the equipment
 - the equipment has been dropped or the casing has been damaged in any way
 - damage to a connection cable
 - any apparent change in performancehave the equipment checked immediately by a person technically qualified to make such checks.
- Never carry out any work on the equipment other than as specified in the operating manual.

Notice of Warranty

The terms and conditions of the Warranty applying to the Product accompanying this Notice of Warranty are found exclusively in the Notice of Warranty. To the extent there is any inconsistency of conflict between the terms and conditions of the Notice of Warranty and the terms and conditions found anywhere else, including the Manual accompanying this Product, the terms and conditions of this Notice of Warranty are superseding and control.

This Warranty covers "the Products", which are defined as the various audio equipment, parts, software and accessories manufactured, sold and/or distributed by Thum + Mahr GmbH (hereinafter "T+M").

With the exception of software-only items, the Products are warranted to be free from defects in material and workmanship for a period of one year from the date of receipt by the end-user. Software-only items are warranted to be free from defects in material and workmanship for a period of 90 days from the date of receipt by the end-user. The terms and conditions of T+M's warranty in effect at the time of shipment shall apply. In order to invoke this Warranty, notice of a warranty claim must be received by T+M within the above-stated warranty period and warranty coverage must be authorized by T+M. Notice of a warranty claim may be made orally by telephoning (+ +49-2173-967300) or in writing sent by facsimile (+ +49-2173-967400) to or by e-mail (support@yellowtec.com). If T+M authorizes the performance of warranty service and if T+M will be performing the warranty service, the defective Product must be delivered, shipping prepaid, to: T+M, Heinrich-Hertz-Str. 1-3, D-40789 Monheim, Germany. If T+M authorizes the performance of warranty service and if it authorizes another entity to perform that warranty service, the Product must be delivered, shipping prepaid, to that entity, whose address will be provided by T+M. T+M (or its designee) at its option will either repair or replace the Product and such action shall be the full extent of T+M's obligation, and buyer's sole remedy, under this Warranty. After the Product is repaired or replaced, T+M (or its designee) will return it to the party that sent the Product and T+M will pay for the cost of shipping. T+M will have no responsibility under this Warranty for any Products subject to: Acts of God, including (without limitation) lightning; improper installation or misuse, including (without limitation) the failure to use telephone and power line surge protection devices; accident; neglect or damage. T+M's dealers are not authorized to assume for T+M any additional obligations or liabilities in connection with the dealers' sale of the Products.

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Limited Warranty Duration

The duration of limited warranty for YELLOWTEC PUC is one year according to the terms and conditions of warranty of the manufacturer (siehe Notice Of Warranty).



www.yellowtec.com
info@yellowtec.com

YELLOWTEC is a brandname of
THUM+MAHR GMBH
Heinrich-Hertz-Strasse 1-3
D-40789 Monheim
Tel. ++49 (0) 2173/967-315
Fax ++49 (0) 2173/967-400
www.thummahr.de