



User's Guide



The UCON CX conforms the following standards:
EN 55022: 1998 + A1: 2000 + A2: 2003; class A
EN 55024: 1998 + A1: 2000 + A2: 2003; class A

In order for an installation of this product maintain compliance with the limits of a class A device, shielded audio cables must be used, not longer than 50 cm. Attention: This is a device of the class A and can cause interference to radio or television reception within the residential area. The user is encouraged to try to correct the interference by suitable measures.

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Hardware Design by MARIAN

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Welcome

Congratulations and thank you very much that you decided for a product of MARIAN. Your decision was placed on one of the most innovative and powerful sound systems ever created. We proudly present to you: the UCON CX.

On minimal space this high quality device combines plenty of functions, which will give you almost unlimited possibilities of working with digital and analog audio signals.

The UCON CX is not just simply a recording system with many professional connections in high resolution audio quality of 24 bit and 96 kHz – once installed it will upgrade your computer to a mighty 32 channel mixing device.

As a professional music producer but also as a hobby musician you repeatedly encounter new challenges. It's all about capturing musical ideas quickly and easily, but also about letting musicians not wait too long until a recording can start. The intuitive user interface of the UCON Mixer is to help you mastering all thinkable recording- and playback situations. You need latency-free headphone mixes for your musicians? You demand full control of pan regulation, mute- and solo functions? You want to quickly switch between different mixer setups? – The UCON Mixer offers all of that in a so far unreached simplicity and flexibility.

But that's not all. In order to enable a completely free and creative handling on assigning audio signals, we have given the Mixer an Output Control to its side. With this, all audio signals, from an input of the UCON, a playback signal of a software or the 3 stereo sums, can be routed freely to the different physical outputs of the UCON. This way you avoid burdensome cable replugging and save on investing in a patch bay. Because: all configurations can be made with a simply mouse click and of course be saved equally fast.

While developing the UCON CX we have especially taken care on a robust and solid construction of the unit, so you get the full delight of the mobility of your new recording partner. Thanks to the comfortable USB port, the UCON quickly finds connection to your computer or notebook and is prepared perfectly for the hard demands of daily studio work and also for

spontaneous producing “on the road”. No matter if you want to record one single microphone or a complete band with up to 16 signals simultaneously – all channels are available any time - in full resolution. The high-developed driver structure supporting all commonly used interfaces guarantees stress-free and reliable operation, also in full-time use.

Take your time to also go through the next pages of this manual. Besides the helpful installation- and setup explanations, it offers many valuable hints on how you can use the Mixer and the Output Control effectively and profitably. If you run in on technical terms while reading, which are unknown to you, the glossary at the end of this manual will helpfully serve you for their clearance.

Now, we do wish you lots of success in your work with the UCON CX. We hope it will bring you just as much fun, as we had during the development.

Your MARIAN Team

Features

Your UCON CX comes with a lot of great functions. Here you can find a small list of properties and capabilities.

- ✓ 4 high-quality microphone connectors with pre-amplification; usable as Hi-Z instrument inputs (guitar; bass);
- ✓ Connection of up to 8 analog line signals (e.g. keyboards, sound expander and many more)
- ✓ 8 analog line outputs
- ✓ Stereo headphone output with separate volume control
- ✓ dedicated stereo mix output
- ✓ All analog inputs with automatic level adjustment for balanced and unbalanced signals
- ✓ Comfortable level control of the inputs and level regulation of the outputs remote controlled via the computer
- ✓ 1 stereo digital I/O S/PDIF format for digital devices (e.g. CD-Player; DAT-Recorder)
- ✓ 8 channel digital I/O ADAT format
- ✓ 1 MIDI in; 2 MIDI out
- ✓ Fast MIDI data transmission through MIDI stream optimizing
- ✓ Free-configurable MIDI filter
- ✓ 32 channel DSP Mixer; hardware-based; latency-free
- ✓ Flexible and extensive mix-, monitor- and routing possibilities
- ✓ DAT-marker support
- ✓ Wordclock/Superclock input with switchable termination
- ✓ Synchronization as clock master (output of internal clock on S/PDIF or ADAT)
- ✓ Synchronization as clock slave (using external clock on wordclock-, superclock-, S/PDIF- or ADAT input)
- ✓ “stand alone”-mode as 8 channel I/O ADAT AD/DA converter
- ✓ highly-developed multi-client driver for Windows™ XP: MME, ASIO 2.0, GSIF, WDM-Audio, DirectSound

Installation

In the quickstart guide you will find all important installation steps graphically listed. If you encounter problems while installing, please consult our support service. In the appendix you can find different ways of how to contact the support service.

Scope of Supply

After opening the package of the UCON CX, please check if the following components are to be found completely and undamaged.

- ✓ 1 x UCON CX
- ✓ 1 x UCON CX power plug
- ✓ 1 x USB cord
- ✓ 4 rubber-feet
- ✓ 1 x CD-ROM with driver software
- ✓ 1 x CD-ROM with bundle software
- ✓ this manual with quick installation guide

System-Requirements

For successful and orderly operation of the UCON CX, the following basic requirements have to be met.

- ✓ A computer with:
 - Intel Pentium-, or AMD CPU with at least 1 GHz
 - The operating system Windows™ XP Home or Professional with service pack 1a or 2 installed
 - A free USB 2.0 port
- ✓ An electrical outlet for the power plug of the UCON CX

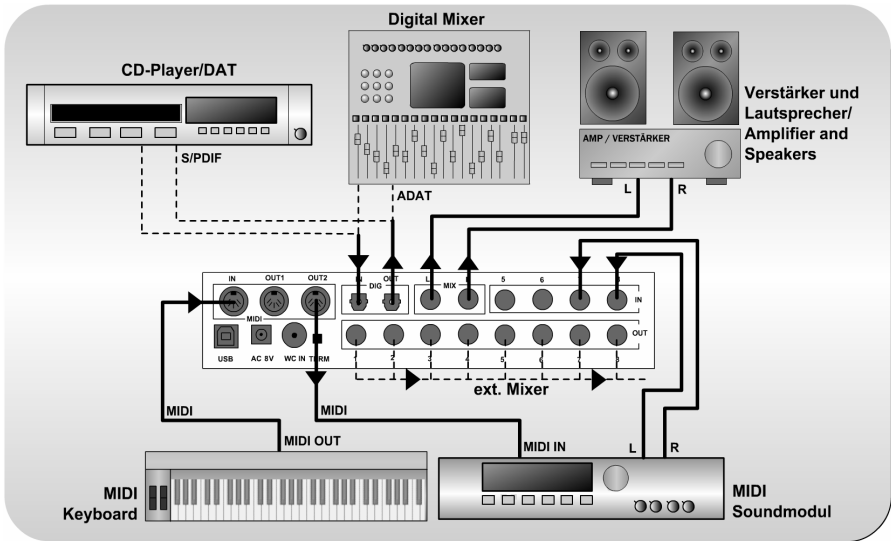
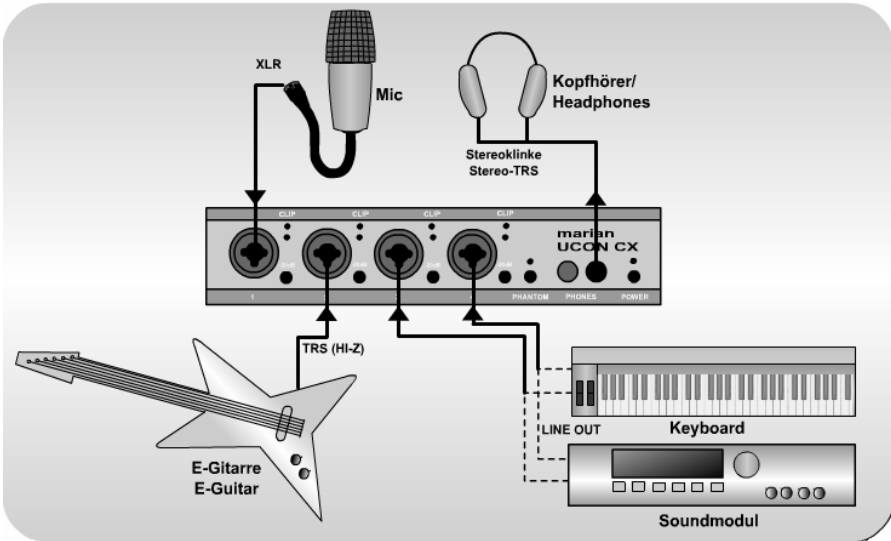
Furthermore, we would like to point out to you these important issues when using the USB interface for audio purposes:

- For the operation of the UCON CX, the installation of the Microsoft USB patch „WinXP-KB822603-X86-ENU.exe“ is urgently requested, if Microsoft Windows™ XP including service pack 1a is installed on the computer.
- The operation of the UCON CX with small latencies is unfortunately hindered by certain types of USB-host-controllers. Please check, prior to setting up the unit, if the USB-host-controller present in your computer harmonizes with the UCON CX.
- Other components of the computer may disturb the operation of the UCON CX with small latencies. This applies to certain graphic cards; networking cards or other components.

Information on tested USB-host-controllers and other system components you can find on our website <http://www.marian.de>.

Connectors

Here is one example of how the UCON can be set up in a music-studio-environment.



If you intend to connect a condenser-microphone to the UCON CX, you may turn on the needed phantom-power with the “PHATOM”-button, on the front of the UCON. Though turned on, dynamic microphones can be connected parallel to condenser microphones. Next to each microphone plug there is a ”-20dB”-switch. Pushing it will lower the level of a connected signal prior the pre-amp by 20dB. This is mostly needed for line signals and if an input signal is still distorted, even though the gain knob within the Mixer is pulled down completely. On the front of the UCON CX there is also the knob “Phones” for adjusting the volume of the headphone output.

▷ *When connecting an unbalanced signal, the level decrease will be only 10 dB.*

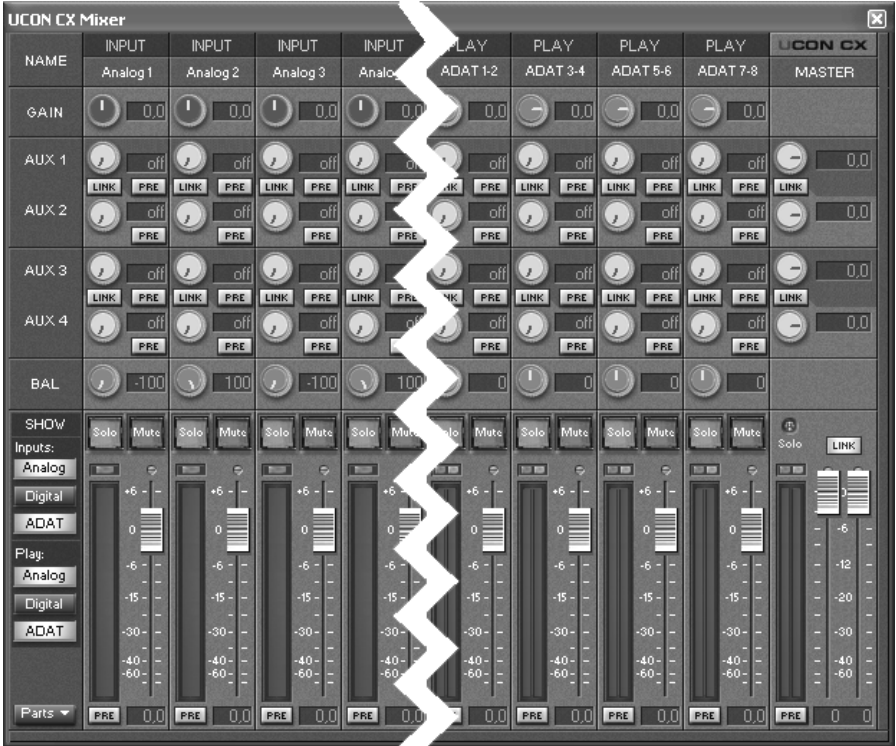
Spot on the UCON CX

The First Contact



After the successful installation the symbol of the UCON manager appears in the Windows™ taskbar of your computer. It offers you direct access to important driver settings, the DSP-based 32 channel Mixer and the Output Control of the UCON CX. Furthermore, you can save and load the setups for Mixer and Output Control. “Info” shows the current driver version of the UCON CX. This is needed when consulting our support service with certain questions. The menu is opened with a single mouse click, with another on the corresponding entry the window of it is being opened. Via clicking the option “Always on Top” it is prevented that any other window can cover the Mixer or the Output Control. This option is helpful, when working simultaneously with other windows, while constantly wanting direct access on Mixer and Output Control.

The Mixer



What is it all about?

In this window all input channels and the master section of the UCON manager are shown. 2 input channel types can be distinguished. In the upper part of the window you can read the labels “INPUT” and “PLAY” for the different channel types. “INPUT”-channels are physical inputs. These are the 8 analog inputs and the ADAT- or S/PDIF-input on the case of the UCON. As opposed to “PLAY”-channels, which are virtual inputs. On those, audio signals land up, coming from an audio application within your computer. The Mixer is democratic: it treats both channel types equally.

The channels



▷ For explanations on how to record analog audio signals correctly, please refer to the “hands on”-part “sounding good”.

▷ Instructions on how to monitor these aux sums on the UCON CX, you will find in section “The Output Control”.

All channels can basically appear in 2 forms, as stereo- or mono channel. Inputs “Analog 1” to “Analog 4” are predefined mono channels.

So, as an example for all, let’s take a look at input channel “analog 1” from top to bottom.

First we have the “GAIN”-knob. It serves for adjusting the audio level directly at the input of a channel. Especially on analog input channels, this level adjustment is executed within the analog digital converter of the UCON. This changes the level for all software applications recording from this input!

This is why gain knobs of analog input channels are pictured in another color. For all other channels this pre-amplification of the audio signal done by the gain knob, is only relevant within the Mixer.

Beneath “GAIN”, “AUX 1” and “AUX 2” are placed. Pulling up knob “AUX 1” will result in a volume increase of the signal in the signal sum aux 1, pulling up knob “AUX 2” increases the volume of the signal in signal sum aux 2 and so forth. Hence the aux knobs have the same function like the faders at the end of the channel, except: not for the master sum, but for each signal sum aux 1 to aux 4.

Besides the aux knobs the “PRE”-button is located. If it is activated with a mouse click, the fader at the end of the channel loses its influence on the corresponding aux knob. Thus, the fader can, for example, be placed on position “-60” while still a signal reaches the Output Control via the affected aux knob. Between “AUX 1” and “AUX 2” as well as “AUX 3” and “AUX 4” a “LINK”-button is situated. If clicked on, aux volume and pre buttons for aux 1 and 2

or aux 3 and 4 are connected functionally. That means: when opening up “AUX 1” “AUX 2” is equally pulled up. Just like that, “PRE”-button of “AUX 2” is activated when pushing “PRE”-button of “AUX 1”.

▷ *Examples on how to use pre switches and aux sums correctly please refer to the “hands on”-part.*

Now here comes the balance knob “BAL”. It regulates the volume relation between left and right channel of the signal, the way it shall appear in the master sum.

▷ *If you set up different volumes for “AUX 1” and “AUX 2” without the “LINK”-button activated, this relation remains with the “LINK”-button pushed.*

If the “Solo”-button is active in one or more channels, the mix out of the UCON provides only the signal of these channels.

If the “Mute”-button is active in one or more channels, the mix out of the UCON **and** the affected aux sums do not carry these signals. The aux busses of these channels are not muted if their “PRE”-button is active.

▷ *The solo button does not influence the aux sums!*



With the help of the fader at the end of the channel strip, the portion of volume of the channel on the master sum is regulated, which ends up at the mix out of the UCON. Next to it, the level meter with clipping LED (up) and “PRE”-button (down) are located. If “PRE” is active, the level of the signal is shown independently of the position or *before* the gain knob. The only exception made is for the analog inputs. Here, the level is captured after the gain knob but before the fader. If “PRE” is not active, it is measured and shown “post” – that means *after* the fader. This applies to all channel types.

This ends our little overview on the input channels of the UCON Mixer. Now, you know how to set up the volume of a channel on the master sum or the 4 aux sums. The only thing that’s missing is a possibility to control the level of all of these sum signals. That’s what the master channel on the right side of the Mixer is all about.

The master channel

The upper knobs regulate the volume of the aux sums. Between “AUX 1” and “AUX 2” as well as “AUX 3” and “AUX 4” a “LINK”-button is situated. If clicked on, aux volume and pre buttons for aux 1 and 2 or aux 3 and 4 are connected functionally. That means: when opening up “AUX 1”, “AUX 2” is equally pulled up.

The master faders serve as regulators for the volume of the main sum which comes out at the mix out and the headphone out of the UCON CX. They are assigned either to the left or the right channel. As long as “LINK” is pushed, they are moved synchronously.

▷ *If you set up different volumes for “AUX 1” and “AUX 2” or the right and the left fader without the „LINK”-button activated, this relation remains with the “LINK”-button pushed.*

Adaptable – changing the view of the UCON Mixer

The UCON CX can be operated in two different modes: ADAT Mode and Non ADAT Mode. If the UCON runs in ADAT mode, an input- and a play channel will appear for every ADAT input besides the analog input- and play channels. If the UCON runs in Non ADAT Mode, all ADAT input- and play channels are hid. In exchange an input- and play channel appears for the optical digital input.

Furthermore, you can find the section “Show” in the bottom right corner of the Mixer. This allows, with a click on the buttons “Analog”, “ADAT” or “Digital”, to hide or show the affected channels, separately either for the input- or play section.

▷ *In „The UCON Settings „, you get to know how to switch between these modes, and what the outcome will be.*



▷ *Note: Hidden channels are still active, just like they were shown.*

But that's not all. In order to further adjust the look of the Mixer according to your needs, single rows of control elements can be hid or shown with the help of "Parts". This applies to all gain-, aux- or bal knobs. All these functions can be very handy for saving precious space on your computer screen. But it's also useful if you wish to secure certain setups of faders or knobs from accidentally being changed. Of course, apart from all these functions, the window can be changed in horizontal size.

Congratulations! You just gained all necessary knowledge, in order to successfully mix audio signals with the UCON Mixer. Since we have had a look at common mixer concepts when designing the UCON Mixer, you should now be able to work at any other professional mixing console. If you have already been working with mixing consoles, you probably found a known user surface.

But we claimed that the UCON would be more, than just a mixer within the computer. So let's hop on to the next chapter to see what else the UCON CX is capable of.

The Output Control



So far, we have taken a look at signals, which either entered the UCON via a physical input or as a playback signal of a software.

The Output Control controls all signals, leaving the UCON CX. It is opened with single click on “Output Control” via the UCON symbol on the Windows™ taskbar.

You probably figure, that this window looks pretty much like the Mixer window, save it doesn't have gain-, aux and bal knobs, but routing buttons instead.

What is it all about?

▷ In „The UCON Settings“ you get to know how to switch between these modes, and what the outcome will be.

In this window, all available physical outputs of the UCON CX are shown as stereo channel strips with the name “OUTPUT”. In ADAT Mode you can see “ADAT 1-2” to “ADAT 7-8” as separate channel strips besides the regular “Analog 1-2” to “Analog 7-8”. In Non ADAT Mode you can see the optical digital port as a separate channel strip instead of “ADAT 1-2” to “ADAT 7-8”.

▷ Aux 1 and aux 2 as well as aux 3 and aux 4 are grouped to stereo-couples.

Now here is the trick: **In the Output Control the signals of the UCON can be routed completely freely to an available output.** This applies to any input signal, any play signal and both aux stereo sums.

This is how you do it: Example: you wish to monitor the sum “AUX 1-2” at the analog output 1-2 of the UCON. Thus, push the “AUX 1-2” knob in the output channel with the title “Analog 1-2”. That’s easy - isn’t it?

The same works for input signals. Example: you wish to route the signal of the analog input 5-6 to “ADAT 3-4”? – No problem. Just push the “Input”-knob on the input channel strip “ADAT 3-4”. In the drop-down menu below “Input” choose “Analog 5-6”. – DONE!

For a playback signal of an audio application push “Play” in the appropriate output channel strip. After that, choose the desired channel in the drop-down menu. If under “SOURCE” you choose a signal for an output channel you can adjust its volume with the fader at the bottom of that channel strip. The “Mute”-, “LINK”- and “PRE”-buttons as well as the level meter and clipping indicator work just the same way as you learned from the Mixer.

Adaptable – changing the view of the Output Control

As you know from the Mixer, there is a “SHOW” section in the bottom left corner of the Output Control. With click on “Analog”, “Digital” or “ADAT” the channels of this type can be either hid or shown.

If the UCON runs in ADAT Mode, for every ADAT output there is one output channel. As opposed to the channel of the optical digital output, which is hid and deactivated.

In Non ADAT Mode all ADAT output channels are hid and deactivated. As opposed to the channel of the optical digital output, which is now activated and shown. Depending on the mode, the drop-down menus of “SOURCE” - “Play” and “Input” – are being updated.

Now you should have an extensive overview for your daily work with the two most important windows of the UCON manager. For in-depth comprehension we recommend you to read the articles of the “hands on” part, which are of interest to you.

▷ *Important on this one: Those channels are not deactivated but simply visually faded out!*



Saving and Loading Setups

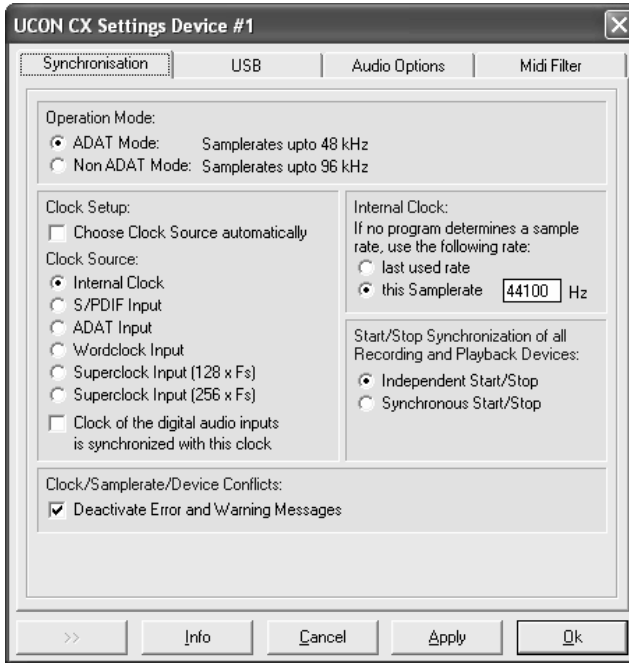


Within the UCON CX manager the options “Save Setup...” and “Load Setup...” can be found. With those you can save all current settings of the UCON Mixer and the Output Control into one single file and recall it when needed. Clicking “Save Setup...” opens the Windows™ file browser where location and file name of a setup are to be assigned. You can save many, many different setups.

Clicking on “Load Setup...” opens Windows™ file browser, where the location of an already saved setup is to be assigned. If a file is chosen, clicking “open” will delete all current settings of Mixer and Output Control and overwrite them with the settings of the new setup file.

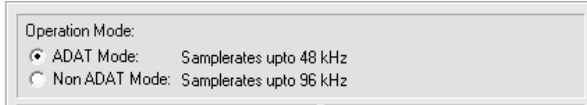
▷ *Choose very clear and direct names for your setups, e.g. the date of a session like “recording 2005-01-01”. Also memorize this location well, so you will find this setup quickly next time you need it.*

The Settings



The following chapter is all about the system settings of the UCON CX. You open the corresponding window via the UCON symbol on the taskbar. Don't worry about all those plenty of options, which it offers. We'll take it easy with'em, one after the other. Should questions remain, we recommend taking a look at the "hands on"-part of this manual. Especially the section "The clock settings" contains simple examples for right handling of the clock settings.

Operation Modes



The UCON CX can be operated in two modes. Depending on the desired mode, set the dot to “ADAT Mode” or “Non ADAT Mode”.

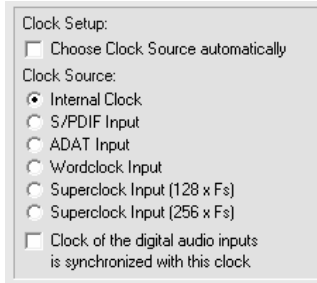
What’s the difference?

The ADAT Mode switches the optical digital ports of the UCON to ADAT usage. Now, it is not possible any more, to operate an S/PDIF signal there. According to the ADAT specifications, the operation of audio signals is now limited to max. 48 kHz + 15 % pitch. Since the sample rate for the UCON is set up globally, this applies to all audio signals passing the UCON. That means you are no longer allowed to record or to play back with e.g. 96 kHz.

The Non ADAT Mode does allow working with signals with up to 96 kHz. But this disables the ADAT capability of the optical digital port. Now it is operated in S/PIDF format.

When working with a sample rate of 96 kHz, the wordclock input of the UCON can not be used with the setting “Superclock 256 x fs”.

Clock settings



When working with digital audio signals, a clock is always required. The settings listed here, define where this clock comes from. If no clock is available or a wrong clock setting is made, playback errors or even system malfunction can be the result. In most cases, you can work fine with the setting “Choose Clock Source Automatically”. This makes the UCON choose the correct clock himself, and switch, if needed and if no playback is active, between different clocks. All other settings are being explained in the following.

▷ *For examples for the practical use and precise explanations of what a clock actually is, please refer to the “hands on”-part: “The clock settings”!*

The UCON CX as clock master

If “Internal Clock” is chosen, the UCON himself generates the clock. External devices can receive this clock signal via the ADAT- or S/PIDF output of the UCON. This lifts the UCON CX to clock master status. If external devices are configured as clock slaves, they will work synchronously to the UCON.

▷ *Details in “hands on” example 1 of “The clock settings”*

The UCON CX as clock slave

▷ See example 1 of “*The UCON in the Orchestra of Digital Devices*”

▷ See example 2 of “*The UCON in the Orchestra of Digital Devices*”

▷ See example 4 of “*The UCON in the Orchestra of Digital Devices*”

If one of the next 4 options is chosen, the UCON will work synchronously to connected digital devices and therefore turn into a clock slave.

When choosing “S/PDIF” or “ADAT Input” the clock is extracted out of the digital audio input signal.

When choosing “Wordclock Input” the clock at the wordclock input (WC IN) is interpreted as wordclock and used.

When choosing “Superclock Input (128 x Fs)” the clock at the wordclock input (WC IN) is interpreted and used as superclock with 128 times the sample rate.

When choosing “Superclock Input (256 x Fs)” the clock at the wordclock input (WC IN) is interpreted and used as superclock with 256 times the sample rate. If the UCON is operated with a sample rate of 96 kHz, this mode is not usable.

▷ See example 3 of “*The UCON in the Orchestra of Digital Devices*”

“Clock of the digital audio inputs is synchronized with this clock”

By choosing this option you tell the UCON, that the clock of the digital audio inputs is identical with the clock, which is already used for the audio outputs. This additional option can only be chosen, if the UCON does not choose the clock source automatically.

Important notes on specialties of the UCON and the clock.

1. Level metering in the UCON Mixer

In order for the UCON Mixer to show the levels of a digital input signal, he has to use the clock of this input. This leads to the following specialties:

- If the clock source is “Intern” (The UCON is clock master), no digital input signal can be used or shown. This is indicated with a small red square in the level meter of the affected input channel in the UCON mixer.
- If the clock setting “Choose Clock Source Automatically” is active, the UCON switches to “ADAT Input” or “S/PIDF Input” in order to show the level of these channels, as soon as the Mixer window is opened. A short clicking noise can be the result of that.

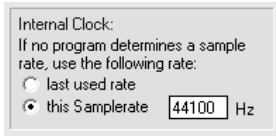
2. Clock settings when using ASIO

- If you work with an audio application using the ASIO interface of the UCON, all clock settings will be managed by that program and overwrite the current settings in the manager! Which clock source is used, can still be read in the clock settings within the UCON CX manager. By standard the option “Clock of the digital audio inputs is synchronized with this clock” is being activated. The manual of the application should give you report about which clock source the audio application chooses under which conditions. If the audio application is closed (communication with the ASIO driver is terminated), all previous clock settings are being reset.

3. Samplerate and clock signal

- Please note, that a certain sample rate for the UCON can be set only, if the internal clock is the current clock source. If the UCON is synchronized externally (Clock is being read form ADAT input or from wordclock input), the sample rate is defined by the connected devices.

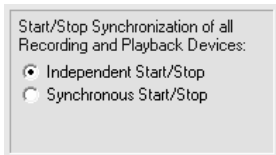
Internal Clock



In the section “Use this sample rate”, you can type in, which sample rate the UCON CX shall work with, if he is not busy with playing back or recording tasks of an audio application. For example, if you use the UCON purely as a digital mixer.

In choosing “last used”, the sample rate, which was used last by a recording or a playback through a software, is kept by the UCON.

Start/Stop Synchronization



The start/stop synchronization can be turned on or off for all audio devices. If this option is active, the audio data transfer of all audio devices is started and stopped simultaneously.

What effect does that have?

Let’s suppose you want to play back 4 stereo audio tracks from an audio application on different devices of the UCON (“ADAT 1-2” to “ADAT 7-8”). If all devices would be started and stopped asynchronously, it could happen, that track 1 (here: “ADAT 1-2”) starts first with playing back, and track 4 (here: “ADAT 7-8”) starts last with playing back. This offset can distinctively be hearable. But if you choose “synchronous start/stop” the playback of all tracks will start sample precise. There is no offset between “ADAT 1-2” to “ADAT 7-8”. The same applies for a recording situation.

▷ *You can activate the „classical“ MME drivers in the system settings under “Audio Options”.*

This option is only relevant, when working with “classical” MME drivers. In case of ASIO or GSIF, the synchronization is automatically ensured. For WDM/DirectSound the start/stop synchronization is, according to the specifications, not possible.

Clock/Samplerate/Device Conflicts

Clock/Samplerate/Device Conflicts:
 Deactivate Error and Warning Messages

As you can see in "Important notes on specialties of the UCON and the clock" in chapter "The clock settings", situations can occur, where certain requirements to the UCON can not be met. For example:

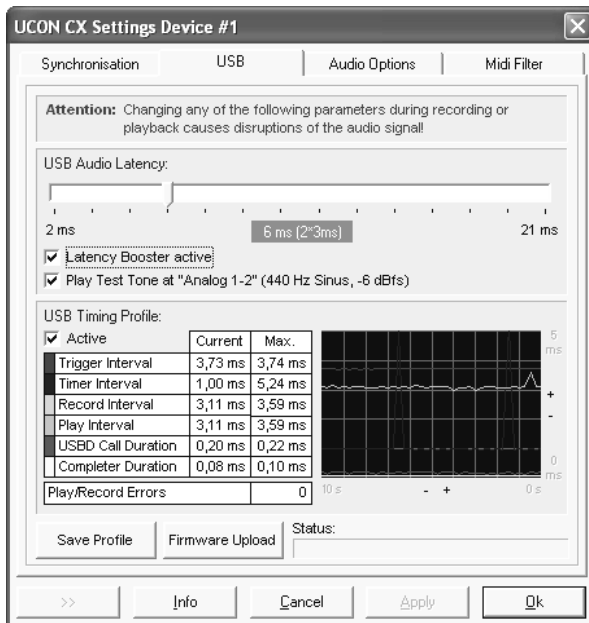
1. You already use "Internal Clock" for a recording or a playback. Additionally you wish to record from S/PDIF- or ADAT input. For this, a switching of the clock source would have to be done. But this could lead to disturbing signals on the running recording or playback. That's why the UCON will inhibit the usage of such channels.
2. You already work with certain in- or outputs of the UCON with a certain sample rate. Now you wish to use other in- or outputs simultaneously, but with another sample rate. This, as well, the UCON will prohibit, since there can only be one sample rate worked with.
3. You play back a signal via a certain device (e.g. "Analog 1-2") of the UCON, and wish to playback another via the same device.

▷ *Simultaneous playback of different audio applications via the same playback device and simultaneous operation of the UCON with different samplerates is only possible when using the "Standard MME Drivers or the DirectSound.*

Using the classical MME drivers, encountering such or an equivalent situation, which can not be established, the driver of the UCON can inform you about this with an appropriate error message or warning. Oftentimes, this can be insufficient. Some applications test all available devices of the UCON on system startup. This test, would certainly lead to an accumulation of such

messages. You'd be busy for quite a while confirming these by clicking "OK". By standard, error- and warning messages are therefore deactivated. For diagnostically purposes it is recommended to deactivate this option, since it can provide a good hint on searching causes for problems in this field.

USB



USB Audio Latency

▷ *Note: The latency set up here, defines the minimal latency that can be at all achieved with the UCON. The value of the latency of the audio driver interface (e.g. ASIO) must never be smaller than this.*

▷ *Important hints on how to set up the latency of the UCON you can find in the "hands on"-part.*

Via the upper slider you can set up the minimal possible latency achievable with the UCON CX. Depending on the position, the value of the latency is displayed in the middle beneath it. Example: "6ms"(2*3ms)". This label consists of the following:

1. "6ms" – this is the actual latency, which can at the most be achieved with the audio system.
2. "2" – this is the number of buffers, which are used in the audio data transfer between UCON CX and computer.
3. "3ms" – this is the size of the buffer, which is used in the audio data transfer between UCON CX and computer.

By clicking “Test tone on 'Analog 1-2'“ a sine wave is played back at the UCON on analog output 1-2 with -6dBfs . Listen to this signal and setup the value for the USB Audio Latency as small as possible, but without receiving distortion on the sine wave. „Latency Booster active“ enables minimal latencies and stabilizes them.

▷ *If you receive distortions on the audio signal no matter which USB Audio Latency is set up, please test wise deactivate the option „Latency Booster active“.*

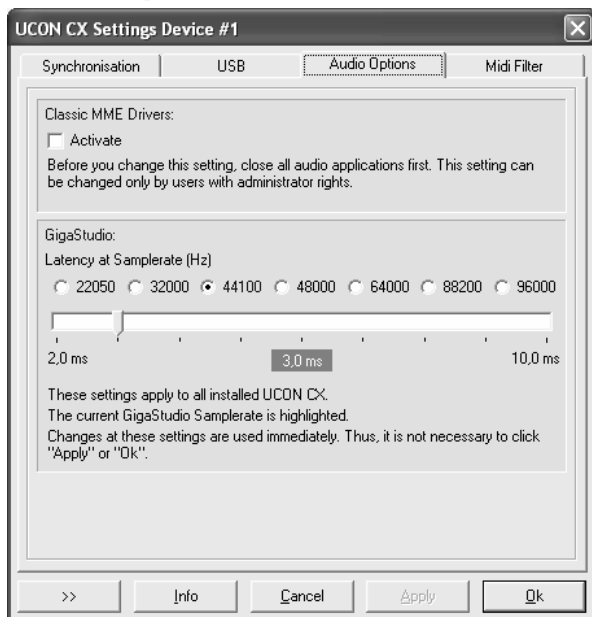
USB Timing Profile

The USB Timing Profile is turned on with a mouse click on “active”. Now, different system values of the USB communication are analyzed. On mobile computer systems, with variable CPU-clock, the values shown here, may differ from computers with comparable static CPU clock. They are not reliable in that case. Clicking on the “save”-button will create a file, including the data of the USB Timing Profile. This is needed, if you want to contact our support service, when receiving problems while recording or playing back.

Firmware Upload

This button serves for transmitting a new operating program into the UCON. Use this button only, when told to do so by our support service! Generally, a driver update checks the current operating program of the UCON CX, and performs, if needed, an automatic update.

Audio Options



Classical MME Drivers

On Windows™ XP, the MME drivers function via WDM. This may result in certain disadvantages. By activating this option, all in- and outputs of the UCON CX can be used via the “classical” MME interface. They appear with the suffix “(MME)” on recording and playback devices within an audio application. Please quit all audio applications prior to activating this option.

GigaStudio

This section is available only if a Tascam GigaStudio application is installed. The sample rate, defined by GigaStudio, is marked in color. The latency time can be adjusted with the slider.

MIDI filter



This section gives you many options to optimize and adjust the MIDI in- and outputs of the UCON CX. Those features are usually found in pretty complex audio applications only.

Device

Choose the MIDI in- or output which you would like to edit.

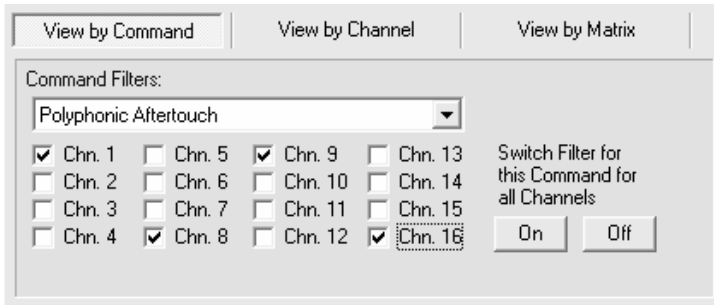
“MIDI Stream Optimizing active” filters unneeded data out of the transmitted MIDI data. You get shorter processing times of the MIDI signals, but without losing a single MIDI command.

“Filters active” activates all existent MIDI filter options.

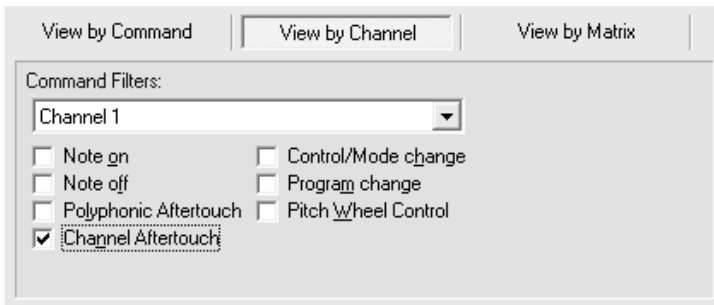
For most comfortable editing, you can change the look of the section “command filters”. There are 3 viewing modes available:

▷ *All following setups are meant for the MIDI port chosen here!*

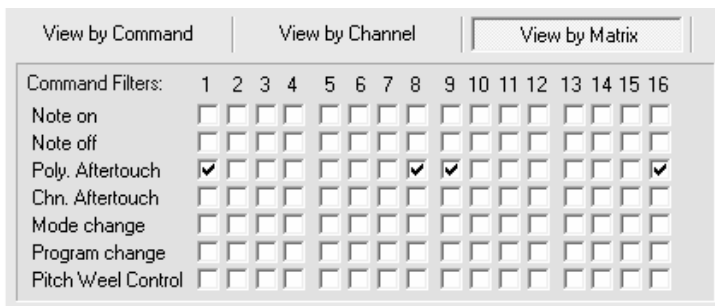
▷ *All following commands, which are checked, are filtered/deleted out of the MIDI data stream and are no longer transmitted!*



On “View by Command”, “Command Filters” shows the MIDI commands, which can now be filtered for each single channel. By clicking “On” or “Off”, the chosen MIDI command is filtered or passed through on all channels.



On “View by Channel”, “Command Filters” shows all MIDI channels, on which the MIDI commands can now be filtered.



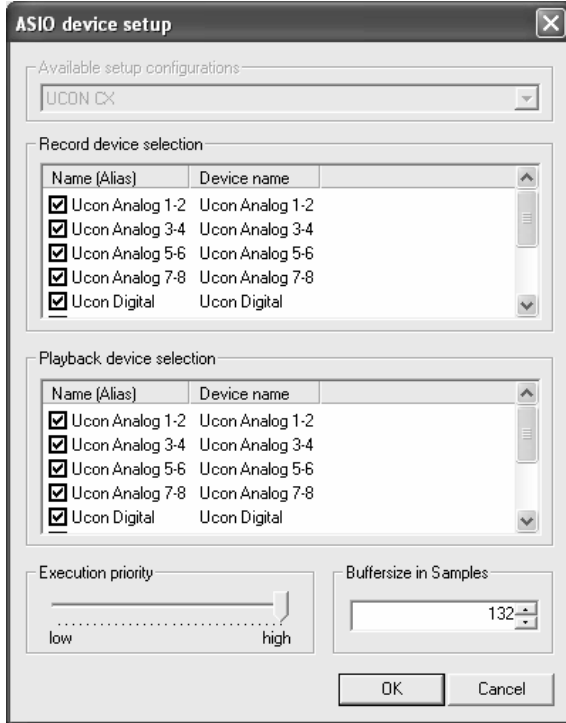
On “View by Matrix” all MIDI channels and the MIDI command filters are shown in form of a matrix.

System Data Filter



The command filters offered here are MIDI channel independent, but concern the chosen MIDI port.

ASIO Device Setup



▷ Please consult the manual of your audio application to get to know, where exactly the configuration of the ASIO driver is made.

▷ Note: Depending on the mode the UCON runs in, ADAT- or Non ADAT Mode, either only S/PDIF or only ADAT devices will work, even though they are both listed.

Due to small latency time, the ASIO interface has become a standard for professional music production. The ASIO Device Setup offers important settings for the UCON CX using the ASIO interface. It is opened from within the audio application, which supports the ASIO standard. Most times there is a button called “control panel” next to the field where the ASIO driver is selected – a click on it opens the ASIO Device Setup.

In this window you can see all in- and outputs the UCON CX offers. If one entry is checked, then the corresponding in- or output is activated and usable for the audio application.

With a click on an entry of an in- or output in the column “name (alias)”, you can change its name. This name will also appear this way in the ASIO application. For example: You re-name “UCON CX Digital Record” to “From CD-Player”. Now you can see in the audio program at first glance, which signal origins from the CD-player.

In the bottom left corner of the window, the “Execution priority”-slider is situated. It can be moved between “high” and “low” by dragging it with the mouse. In position “high” the transfer of the audio data between ASIO audio application and UCON receives the highest priority. That means the CPU of the computer processes them preferably.

In position “low” the calculation of plug-in effects is given the highest priority, the audio data transfer is cared about secondarily.

In the bottom right corner of the window, the “buffersize in samples”-field is situated. With a click into this field, you can enter a value using the computers’ keyboard. This value defines the delay time (latency) of the audio data transfer for ASIO.

Example: When working with a sample rate of 44.1 kHz, a buffer size of 176 samples will give you a delay time of 4ms. Working with a sample rate of 88.2 kHz, 176 samples will give 2ms delay.

▷ *Hint: Note: some audio applications require additional steps of activation, so the in- or outputs of the UCON can actually be used. For further details, please take a look at the manual of the audio application.*

▷ *If problems with clicks and crackling appear in the audio material, even though the USB- and ASIO latency are set up correctly, try different positions of this slider!*

▷ *Attention: The buffer time set up here must not be smaller than the value of the “USB Audio Latency”!!!*

Hands on the UCON

Setting up the Latency of the UCON

In digital systems the processing of audio data always comes with a certain delay time. Here is where you get to know, how to set up and optimize this delay time (latency) for the UCON CX.

Background

Within a computer, digital audio data is transported in small packages, the so called buffers. Thus, an audio signal is split up in little portions (data amounts) and is send away piece by piece. Looking at the UCON CX, these buffers have to be send from audio application to the driver of the UCON. From there they go to the driver of the USB interface, which finally passes them on into the UCON. If a recording is to be managed with the UCON, all of the mentioned happens in reverse.

Let's make this a little clearer with an example: A composer wants to write a little piece for a piano player. So in just 5 minutes he fills the first piece of paper with lots of notes. He then hands the paper to the musician who instantly starts to transform these notes into beautiful melodies. He, too, is now busy for 5 minutes. The composer could have written 2 pieces of paper in 10 minutes, just as well, while the musician continues to play one piece of paper in 5 minutes. In order for the musician to continuously play, so the music won't stop, the composer must not write less then 1 score in 5 minutes.

In this example, the piece of paper is the audio buffer. Just like it contains notes, the buffer contains audio data. The composer is the audio application sending buffers via the audio driver. The musician is the UCON CX, who receives these buffers via the USB driver. In order for the continuous data stream to not break up, the buffers of the audio application have to be just a little greater than the buffers of the USB driver. That means that the latency of the audio application must not be smaller than the USB driver latency (USB Audio latency).

To adjust the latency times of your computer please proceed as follow:

Setting up the “USB Audio Latency”

Connect your stereo to the analog output 1-2 at the UCON CX.

1. Activate “Test tone on Analog 1-2” in the settings window
2. Wait approx. 2 to 4 seconds to check if distortions appear during playback
3. If clicks and crackles appear continuously, move the slider one position to the right. If no distortions appear, move the slider one position to the left.
4. Repeat step 3 and 4, until a playback without distortions is recurrently ensured

Depending on your computer system, you should receive values between 2 and 8 ms for distortion-free playback.

▷ *Please note: the smaller the latency, the higher the system load to the CPU of your computer. For many purposes, e.g. audio editing, mixing, and mastering, small delay times are not relevant. In case of such application - field setting up a higher latency for smaller system load is recommended.*

Setting up the audio driver latency

▷ Sometimes it is needed to subsequently adjust the USB Audio Latency and/or the audio driver latency. This is mostly the case, if the system load has increased due to a extended music project (e.g. lots of audio tracks and plug-ins.)

1. Open the audio application
2. Start playing back a simple signal (e.g. a stereo track) and control it via the UCON.
3. Go to the audio setup of the audio application
4. For an ASIO application the latency is set up at the ASIO Device Setup. For an GSIF application the latency is adjusted in the settings window of the UCON manager. For DirectSound- and MME applications, there is a setup field for the buffer size, defining the latency, mostly within the application.
5. Decrease the buffer size or latency as far as needed, but without causing the playback signal sound distorted

Sounding Good

Background

Surely at least once in your life you have recorded something with a cassette recorder. You also probably noticed that the signal can let the overload lamps flash in the bottom parts once in a while, without the music instantly sounding distorted and unpleasant. On digital audio systems, the level meter must never reach the overload status. In that case, distortions would appear instantly. On the other hand, you try to get the signal as loud as possible, in order to keep the noise floor as low as possible. For every analog signal you'd like to record with the UCON CX, you have to start with adjusting the level! This happens within the UCON Mixer, with the help of the gain knob.

How to do it?

1. Turn on the "PRE"-button in the lower part of the concerning channel strip. Now the level meter is independent of the fader position. That means you hear the signal with the desired volume, without affecting or falsifying the level meter.
2. Carefully turn up or turn down the "GAIN"-knob of the channel strip, but only so far that the red overload indicator will never light up.

▷ *If the overload lamp flashes when using the 4 analog inputs on the front of the UCON CX, even though the gain knob is completely closed, the "-20 dB"-switch needs to be pushed for the corresponding channel!*

Hint:

If you are about to record a drummer let him play a real song, while you do the leveling. This often comes louder and with much more dynamic. That really shows you how far you can go, pulling up the gain knob.

The UCON in a Project Studio

Situation

▷ *This article bases on section “Mixer” and “Output Control”, as well as “Sounding Good” from the “Hands on”-part.*

Let’s imagine the following: Producing your brand-new chart hit you reach a critical phase: you want to record the vocals. For a singer to provide a perfect performance it is important, that the surrounding conditions are as well: most advantageous. The first step towards this, is a latency-free headphone mix in best possible quality. For that you use your studio reverb. For its latency-free integration – the UCON CX.

How to do it?

Hardware routing

▷ *Read section “Sounding good”.*

Plug the microphone cable into the pre-amp of the analog input 1. Within the UCON CX Mixer, bring the signal up to perfect level using the “GAIN”-knob. Into analog output 1-2 of the UCON, plug the headphone pre-amp for your musician. Now take care of the effect unit: the analog output 5-6 of the UCON is plugged to the input of the effect unit. Its output goes to the analog input 5-6 of the UCON.

Software routing

In the Output Control of the UCON assign under “SOURCE” “AUX 1-2” to “Output Analog 1-2”. On “Output 5-6” under “SOURCE” push “AUX 3-4”.

Volume settings

In order for your musician to hear him/herself on the headphones, you need to pull up “AUX 1” and “Aux 2” in his/her channel (analog input 1) in the UCON Mixer. For a portion of the signal going to the effect unit, “AUX 3” and “AUX 4” have to be pulled up. (Push the “LINK”-button between the knobs.)

The Output signal of the effect unit reaches the Mixer via analog input 5-6. In order for your musician to hear this reverb effect, you need to pull up “Aux 1-2” in this channel as well. (Push the “LINK”-button between the knobs.) The same can be done with a playback signal from an audio application e.g. a sequencing program. This will run into a channel in the Mixer on e.g. “Play Analog 1-2”. This is where you also pull up “AUX 1-2”, so your musician can hear the playback.

Finalizing

Now you are able to regulate your monitor volume independently of the musician. You wish to hear the signal solo or want to let the musician be louder than the playback? – No problem, the headphone mix is not affected. Important for that: for all aux knobs the pre button has to be active!

Please take care: When pulling up aux3/aux4 in the analog input 5-6, you will get a feedback. Because: Aux 3-4, according to their assignment, go, via analog output 5-6, to the effect unit.

Best would be, you save this setup using a clear and direct name. This way it can always be recalled in a similar situation.

With this setup, you have complete control of what the musician hears. You can increase the vocals, completely and quickly mute the reverb if needed or even put reverb to the playback. Do everything possible, so your musician feels just fine – he/she will thank you with sensational takes.

By the way: Some musicians like to hear themselves on just one side of the headphones. In that case, pull up aux 1 OR aux 2 of the input channel of the microphone, only.

The UCON in a Live Session

Situation

▷ *This article bases on section “Mixer” and “Output Control” as well as “Sounding Good” from the “Hands on”-part.*

Let’s imagine the following: A good friend of yours, asks you to do the mixing at a live concert of his band with 4 musicians. “No problem” is your simple answer. You grab the UCON CX and your notebook and off you go for the sound check at the concert hall. Here the already set up PA and a bunch of cables, with the different signals of the band, await you.

Hardware routing

The first step is done quickly. The microphone of the singer goes to analog input 1 of the UCON. The bass guitar goes to analog input 2. The signal of the rhythm guitar goes through an effect unit. This provides a stereo signal and is connected with the analog input 5-6. The 8 microphone signals of the drums go to an ADAT converter, which is connected with the ADAT input of the UCON. Now, take good care that all signals reach the UCON Mixer with perfect level. The mix out of the UCON CX is connected to the amp which feeds the PA of the concert hall – you can check this signal in detail using the headphone plug at the front of the UCON. All Faders up, at last the master sum, and here we go... Though the concert hall really sounds great now, the musicians only hear themselves indirectly via the speakers, directed away from them into the audience. All right: you need to give each musician an individual monitor signal or headphone mix. Well, that’s easy, because the UCON features 4 independent aux busses. How to do it?

▷ *See section “Sounding good”.*

Setting up the monitors

Connect the amps of the monitor-speakers (or headphone pre-amps) to the analog output 1 to 4. Analog output 1 goes to the singer, analog output 2 goes to the bass guitarist, analog output 3 goes to the rhythm guitarist, and analog output 4 goes to the drummer.

Software routing

Open the UCON CX Output Control and perform the following changes: On output analog 1-2 under “SOURCE” push “AUX 1-2”, on analog output 3-4 the “SOURCE”-button “AUX 3-4”. Now deactivate the “LINK”-button for both outputs and position faders 1 to 4 to “-6”dB.

Setting up the monitor volumes

In order for the singer to hear himself on the speaker or on his headphones – simply pull up “AUX 1” on his channel in the UCON CX Mixer (analog input 1). In order for the singer to hear the bass guitarist, also “AUX 1” has to be pulled up in that channel (analog input 2). Hence: in order for the bass guitarist to hear himself – simply pull up “AUX 2” at his channel (analog input 2). In order for the bass guitarist to hear the singer, “AUX 2” has to be pulled up at channel analog input 1. This way you can achieve, that the bass guitarist hears himself louder than the singer, while the singer hears himself louder than the bass guitarist.

Proceed similar with all remaining signals/channels. Every channel having “AUX 3” pulled up, is hearable for the guitarist. Wherever “AUX 4” is pulled up, the drummer can hear this signal.

Finalizing

If you set up perfect monitor mixes for every musician independently, it could be that one asks you to increase or decrease his personal mix in volume. This can easily be done with the unlinked faders of the Output Control.

Important note: For the volumes of the channels going to the master sum (the signal of the concert hall) to be leveled independently of the monitor mixes of the musicians, all pre buttons have to be activated for all used aux busses!

Simply save this setup with the help of the UCON manager. Now you can take your time and drink a coffee... when the gig starts, turn on the notebook, load the UCON setup – and here we go!

The UCON as Hard-Disk-Recording-System

Due to its great number of audio connectors simultaneously made available by the UCON, he is capable of upgrading your computer to a great multitrack recorder. With the following example, we would like to show you, how to setup and optimize the UCON CX for such purposes.

Situation

▷ *Section: “The UCON in a live session”*

Let’s recall your friend, who asked you to mix his band at a live gig. Just shortly before the concert is about to begin, he comes up to you, pretty excited, and tells you how very fit and awake his band members are today. That’s why, he says, it would be really great to have a recording of this concert. But in a way where all tracks can still be edited afterwards.

What’s there to care about?

Amount of Data

Digital audio-data requires memory space – quite a lot...

It depends mostly upon the used sample rate. That means: double the sample rate and you will need the double of memory space. This is a little example for a 60 minute concert, with 16 tracks, recording at 44.1 kHz:

- $24 \text{ bit} * 44100\text{Hz} = 1058400 \text{ bit per second}$
- $1058400 \text{ bit/s} = 129\text{Kbyte/second}$
- $60 \text{ seconds} * 60 \text{ minutes} * 16 \text{ tracks} = 57600 \text{ seconds}$
- $1\text{Kbyte} * 57600 \text{ seconds} = \text{approx. } 7 \text{ Gbyte}$

Depending on the audio software, there is mostly more data stored. Always plan about 1/3 more memory than calculated.

That means you need quite a modern hard drive with at least 10 Gbyte of memory and a high saving rate.

Needless to say, the affected computer should be of a newer date, to reliably process that amount of data in the given time.

The software

You need a multitrack-capable software, which can reliably record the audio signals of the UCON. The software communicates with the UCON via the audio driver. In our example there are actually two that are of concern: the “classical” MME drivers, or the ASIO drivers.

▷ *This could be e.g. Emagic Logic Audio, Cakewalk Sonar, Steinberg Cubase, Adobe Audition...*

The setup

Since, when recording, the audio data has to be transported between the computer and the UCON distortion-free and error-less, the USB Audio Latency has to be adjusted perfectly. Check the corresponding settings! Choose bigger values (e.g. 10-20ms) to keep the system load small. Start your preferred audio application and choose the “ASIO UCON CX”-driver or the Multimedia driver, in “Audio Settings” or “Audio Options” from within the software. The

▷ *Please see section “USB Audio Latency” in “The UCON Settings”!*

▷ *We urgently recommend activating the options “Classical MME-driver” and “Start/Stop Synchronization” within the UCON manager.*

in- and outputs of the UCON appear in the format “Analog 1-2 (MME)” Using the ASIO driver, all wanted in- and outputs have to be activated via the ASIO device setup. Using the multimedia driver, all wanted in- and outputs are commonly activated via the audio software. Set up the latency for MME/ASIO. Again: rather enter bigger buffers, for a more relaxed system load.

▷ *Read section “Setting up the latency of the UCON.*

Create the desired number of tracks in the software and assign them to the different inputs of the UCON. Put the tracks to record mode, push “record” and there we go...!

The UCON in the “Orchestra” of Digital Devices

Background

As you probably already know, there is one big difference between analog and digital audio signals: analog audio signals are continuous. That means at any given time you can measure this signal and receive a defined measuring value. As opposed to digital audio signals. They consist of many single values (samples), which follow each other in a certain frequency (sample rate). Here it is not possible to receive a measuring value at any time, only as often as the sample rate defines. Example: having a sample rate returning one value a second, you can't measure a value in half a second.

What is a clock?

As you can see, there has to be something governing, at which moment of time a digital value is to be measured. This is exactly the task of the clock. It is the impulse- or rate generator. The rate, given by the clock, defines the sample rate.

Let's make this a little clearer with an example: Imagine an orchestra with a conductor. The maestro lifts and lowers the baton – he gives the beat. Depending on the beat, the musicians play either fast or slow. The conductor is thereby the clock and the speed the orchestra plays with, that is the sample rate.

What happens if an orchestra plays without a conductor? – complete chaos! Every musician plays just like he wants in a different speed. The same happens if you connect digital audio devices. Just like in the orchestra example, there has to be defined, who is maestro (the master) and who are the musicians (the slaves).

By the way: you can see something else in this example. In front of an orchestra, sometimes the conductor wildly cuts the air with the baton more often than the speed the orchestra plays in. The same way a clock can have a higher frequency than the sample rate – see superclock, which mostly is 256 times the sample rate.

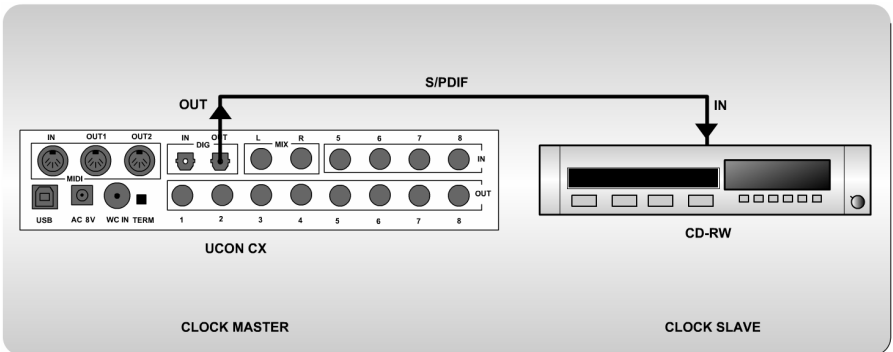
The rules in the digital audio world

Connecting digital audio devices the following 3 simple rules have to be maintained.

1. All devices have to be synchronized with each other. (Using the clock)
2. There can only be one! That is the device (the master) governing the rate. All other devices have to look in on this rate (the clock) of the master and are thereby slaves.
3. Digital audio connections mostly include a clock. (S/PDIF; ADAT or AES/EBU). Besides that, the synchronization can be ensured using wordclock- or superclock connections. But within a compound of digital audio devices, the clock has to be the same – everywhere.

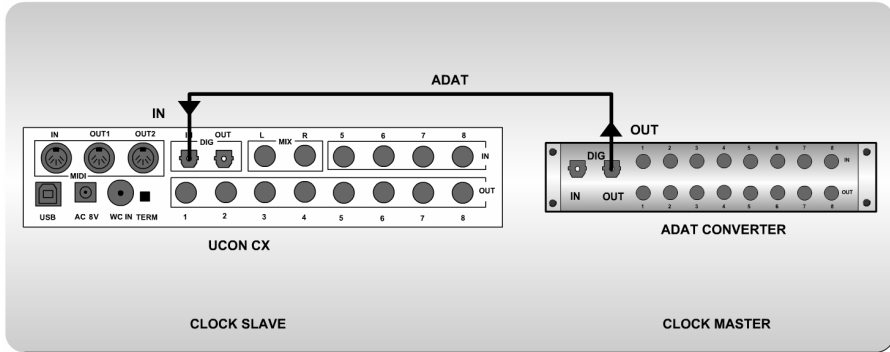
Let's take a look at 4 simple examples on how to connect the UCON CX digitally.

Example 1 – Connection via optical S/PDIF port



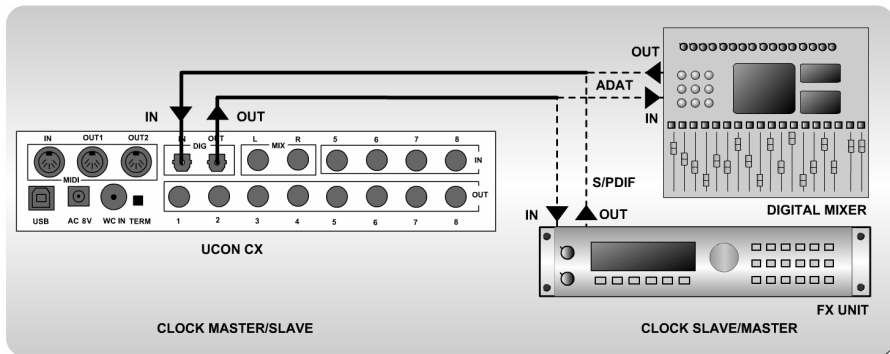
In this example the digital output of the UCON CX is connected with the digital input of the CD-RW device. The audio cable transmits the clock signal simultaneously. In order to operate the CD-RW device synchronously with the UCON CX, the clock setting „Internal Clock“ must be active. The UCON CX is now clock master. The CD-RW device must be configured as clock slave.

Example 2 – Connection via optical ADAT port



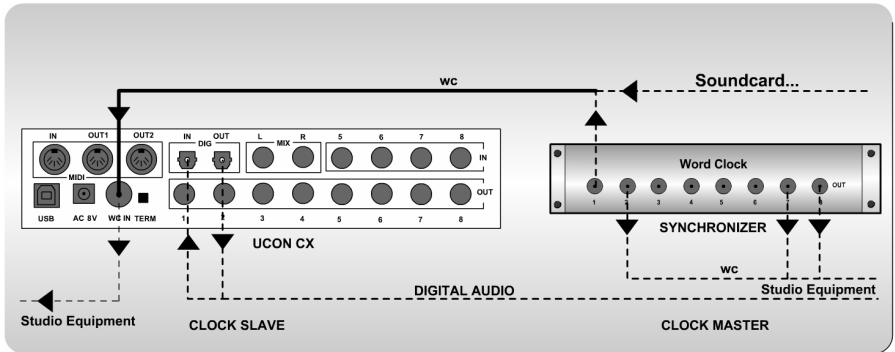
In this example the digital output of an ADAT converter is connected with the digital input of the UCON CX. The audio cable transmits the clock signal simultaneously. In order to operate the UCON CX synchronously with the ADAT converter, the option „ADAT input“ must be active. The ADAT converter has to be configured as clock master.

Example 3 – cross connection for S/PDIF or ADAT



In this, the digital output of the UCON CX is connected to a FX unit or a digital mixer. The digital output of the device is again connected with the digital input of the UCON CX. If the UCON CX is supposed to be clock master, the options „Internal Clock“ and “Clock of the digital audio inputs is synchronized with this clock” must be active. If the FX unit or the digital mixer have to be clock master, the option „S/PDIF Input“ or „ADAT Input“ has to be active (depending on the situation). The UCON CX then gives the clock of the S/PDIF- or ADAT input out on the S/PDIF- or ADAT output.

Example 4 – Clock-Setup using the WC-input



In this example the UCON CX is synchronized external via a soundcard or a synchronizer. Depending on the wordclock signal the option „Wordclock Input“, „Superclock Input (128 x Fs) or „Superclock Input (256 x Fs) must be active. If the wordclock cable of the UCON CX is not lead further to another device, the termination switch must be turned on.

The UCON in Stand Alone Operation

What in the world is “stand alone”?

That means the UCON CX is operated without being connected to a computer!

Situation

You own a digital mixer and wish to use all available channels. Mostly digital mixers do not support as many analog inputs as they could digitally work with.

Solution

Use the UCON CX as an independent ADAT converter. If supported, you can connect the input of the mixer with the ADAT output of the UCON. This gives you 8 more analog, balanced inputs, 4 of them with high-quality microphone preamps. The UCON does not have to be connected to a computer in order to use this!

Finalizing

In the example described above, the UCON CX is clock master. That means, you have to configure the mixer as clock slave. Now the sample rate is given by the UCON naming 44.1 kHz. In order to convert the analog signals of the UCON with a different sample rate, e.g. 48 kHz, the mixer of your studio has to work as clock master. For that, simply connect the ADAT output with the ADAT input of the UCON CX. The UCON automatically switches over to clock slave mode. This way you receive another 8 balanced outputs for your mixer via the UCON CX.

If no clock signal is available for the UCON via the ADAT input, the wordclock input is checked. If there is a valid clock coming in, the UCON can be operated in clock slave mode. (Connect the wordclock output of the mixer with the wordclock input on the UCON side) If there is no clock present on either ADAT input or on the Wordclock input, it leaves the UCON no other choice than to switch back to clock master mode.

Hint: A second UCON in stand alone mode can be operated via ADAT on a UCON. This way, all in all, 16 analog signals, 8 of which are equipped

with microphone pre-amps, can reach your computer – via one single USB cord!

▷ *Attention: The gain knob of the Mixer „remembers“ its last setting. When operated in stand alone mode the UCON CX this last setting is still active. Example: you turn down one gain knob of the Mixer when the UCON CX is connected to the computer. It will still be turned down, when working in stand alone mode!*

Glossary

ASIO

▷ *The UCON CX supports the current version 2.0 of the ASIO standard*

ASIO stands for “Audio Streaming Input Output” and is a driver interface for soundcards developed by the company Steinberg. With ASIO very small latency times can be achieved. The ASIO driver is not multi-client capable. That means, different audio applications may not use the same audio device simultaneously.

ADAT

▷ *The UCON CX features one ADAT in- and output*

ADAT stands for “Alesis Digital Audio Tape” and is a transmission protocol for digital audio data developed by the company Alesis. 8 Mono channels with a quality of 24 bit and 44.1/48 kHz are transmitted via a singly light conductor cable (TOSLINK). This interface can often be found on digital mixing consoles.

Audio Device

▷ *The UCON CX features 18 Stereo audio devices. Analog 1-8 in and out; ADAT 1-8 in and out, and digital in and out.*

In the field of digital audio processing, this mostly names an in- or output of an audio system, the way it appears in an audio application.

Aux

In the audio world “Aux” or “Auxiliary” names an additional in- or output. That means a physical in- or output or a mix signal besides the main mix signal.

▷ *The UCON CX features 4 aux sums.*

Buffersize/Buffer

When transporting audio data within a computer (e.g. recording or playing back a signal), they are chopped in equal blocks called “buffer”. That means, they are a certain time frame out of a complete signal. The number and size of the buffer defines the delay time (latency).

Direct Sound / Direct X

DirectX is a Windows™ system-software, which allows hardware manufacturers, to support different input-, graphic- or sound functions with their hardware and thereby accelerate it. DirectSound is a part of DirectX. A DirectSound driver creates less CPU load and enables faster latency times than a standard MME driver.

▷ *The UCON CX supports DirectSound.*

Driver

A driver is a package of software, consisting of a couple of single programs or a part of a software, which ensures communication between a hardware device and other drivers or software applications on standardized level. Certain interfaces are used doing this.

▷ *The UCON CX driver ensures the operation of the UCON on a computer with the help of the USB-interface. Additional interfaces allow the communication between audio applications and the UCON.*

DSP

▷ *Within the UCON CX a DSP calculates all settings of the Mixer and the Output Control. The calculation takes place without using any computer-resources.*

DSP stands for “Digital Signal Processing”. Most times this names an electrical component, processing audio signals digitally. It calculates, for example, the sum of two signals or an effect into an audio signal.

GSIF

▷ *The UCON CX supports the current version 3 of the GSIF standard.*

GSIF stands for “GigaStudio InterFace” and is a driver interface for soundcards developed by the company TASCAM. GSIF is mainly used for the Tascam software “Giga Sampler” and “GigaStudio”.

Interface

▷ *The UCON CX is an audio interface. It communicates with the computer via the USB interface.*

Interface names a part of a device or software, which other devices or software applications can communicate and possibly exchange data with.

Latency

Latency is, in the field of digital audio signal processing, another word for “delay time”. Example: if you connect a microphone signal to the UCON CX, it takes some time until it comes from the UCON input all the way to an audio application (e.g. your recording software). Similar, it needs some time, until a playback signal of an audio application actually can be heard at the UCON. This time is called latency and is specified in milliseconds.

Metering

Or level metering. Means the visualization of volume relations of an audio signal.

▷ *Within the manager of the UCON CX, there is a precise metering taking place.*

MIDI

MIDI stands for “Musical instrument digital Interface” and is a standard of transmitting control signals for sound expanders. It transmits e.g. note information, which request a sound expander to play certain notes.

▷ *The UCON CX can send MIDI signals on 2 MIDI outputs with each 16 MIDI channels and receive on one MIDI input with 16 MIDI channels.*

Pitch

In the field of audio techniques, this means the difference of a sample rate from a pre-defined one. If several digital audio devices are present, this fluctuation of sample rate has to be supported by all devices.

▷ *The UCON CX supports a pitching to any sample rate.*

Routing

This word describes which paths on switches audio signals and clock signals take within a system.

▷ *The UCON CX features extensive routing ways, e.g. with the Output Control.*

Samplerate

In order to convert analog audio signals into digital audio data, they are chopped into a time grid. In this rate, the volume of the audio signal is measure, e.g. 44100 times a second. The smaller the grid, the better is the resulting audio quality.

▷ *The UCON CX works with samplers up to 96 kHz + 15%.*

S/PDIF

▷ *The UCON CX features a switchable S/PIDF in- and output in TOSLINK format.*

S/PDIF stands for “Sony Philips Digital Interface” and was developed by the companies Sony and Philips. With it a digital audio signal is transported either with a light conductor cable (TOSLINK) or a cinch coaxial cable.

USB

▷ *The UCON CX exchanges audio data with the computer using USB 2.0.*

USB stands for “Universal Serial Bus” and is a computer interface, which can be found on most modern computers. With USB 2.0, 2 devices can exchange data with a rate of up to 480Mbit/s via one single cable.

WDM

▷ *The UCON CX supports WDM*

WDM stands for “Windows™ Driver Model” and is an extensive driver model developed by the company Microsoft. Other drivers can build upon this. A derivation of it is used, to handle digital audio data within the computer – see Direct X.

Wordclock

▷ *The UCON CX features a wordclock input, supporting superclock, too.*

Is the name for a synchronization signal for digital audio systems. It ensures, for all devices connected, to work with the identical sample rate (e.g. 44.1 kHz). Most digital audio formats transmit a clock besides the audio information. E.g. S/PDIF, AES/EBU or ADAT. If no synchronization is possible via the audio connection (e.g. TDIF), digital audio devices have to be supplied with the wordclock signal. Please don't confuse this with MIDI clock or time code synchronization (e.g. SMTPE).

Technical Facts

Inputs 1-4 front	
Impedance ¼" jack	1 MOhm; 10 kOhm with -20 dB switch
Impedance XLR jack	2 kOhm
Level adjustment	-48 dB - +47 dB
Max. input level bal.	+12 dBu
Phantom power	+48 V / 10 mA
Inputs 5-8 back	
Impedance	10 kOhm
Level adjustment	-48 dB - +18 dB
Max. input level bal.	+12 dBu
Outputs 1-8	
Max. output level 0 dBFS bal. @ 600 Ohm	+4,3 dBu
Max. output level 0 dBFS bal. @ 10 kOhm	+7,5 dBu
Frequency response @ 44,1 kHz	20 Hz - 20 kHz
Frequency response @ 96 kHz	20 Hz - 40 kHz
SNR AD @ 44.1 kHz	104 dB(A)
SNR DA @ 44.1 kHz	110 dB(A)
THD+N AD @ -0,5 dbFS	0,003%
THD+N DA @ 0 dbFS	0,002%
Sample formats	8, 16, 20, 24, 32 Bit Mono/Stereo
Sample rates analog	32 - 96 kHz +/- 15% Pitch
Sample rates digital	32 - 96 kHz +/- 15% Pitch
Sample rates ADAT	36 – 52 kHz
External power supply	AC 8V / 1A
Size (WxHxD) in mm	218 x 44 x 130

Service and Support

Warranty

Each UCON CX leaving us, is put under extensive functionality checks. We allow full 24 month of warranty. A copy of the receipt or bill serves as proof of purchase. If there is a deficiency occurring during the time of warranty, you can exchange the unit at your dealer. Damages originating in inappropriate handling or false operation are excluded of the warranty.

You can still send the unit in to us for repair after the warranty has expired. You can decide to have it repaired, after receiving a calculation of the approximate repair costs. For this, please get in contact with our support service.

Care and maintenance

For the UCON CX to serve you a long time errorless, please take care of the following:

- Keep the UCON CX far off from any heat source and direct sun rays.
- Stick the rubber feet beneath the case of the UCON CX to ensure good ventilation.
- Never cover the ventilation slots of the UCON CX in order to prevent overheating and system failure.
- Leave free space to other devices when putting the UCON CX into a rack, in order to ensure good ventilation.
- No liquids are to enter the inner parts of the UCON CX via the ventilation slots!
- Clean the UCON CX with a soft, slightly watered, cloth, only.

Contact

If you have any questions or problems when installing or operating the UCON CX, please proceed as follows:

1. Make sure, the newest driver is installed. The current driver-files can be found on: *www.marian.de/en/downloads*
2. Take a look at our Audio Guide published on the internet under: *www.marian.de*
3. If still any questions remain, you can contact us via the internet using our support form at: *www.marian.de/en/support*.
4. Or talk to us personally. Dial: *+49 (0)341-589 32 22*

Interesting news, information, and driver-updates as well as information about our products and authorized dealers can be found on *www.marian.de*.