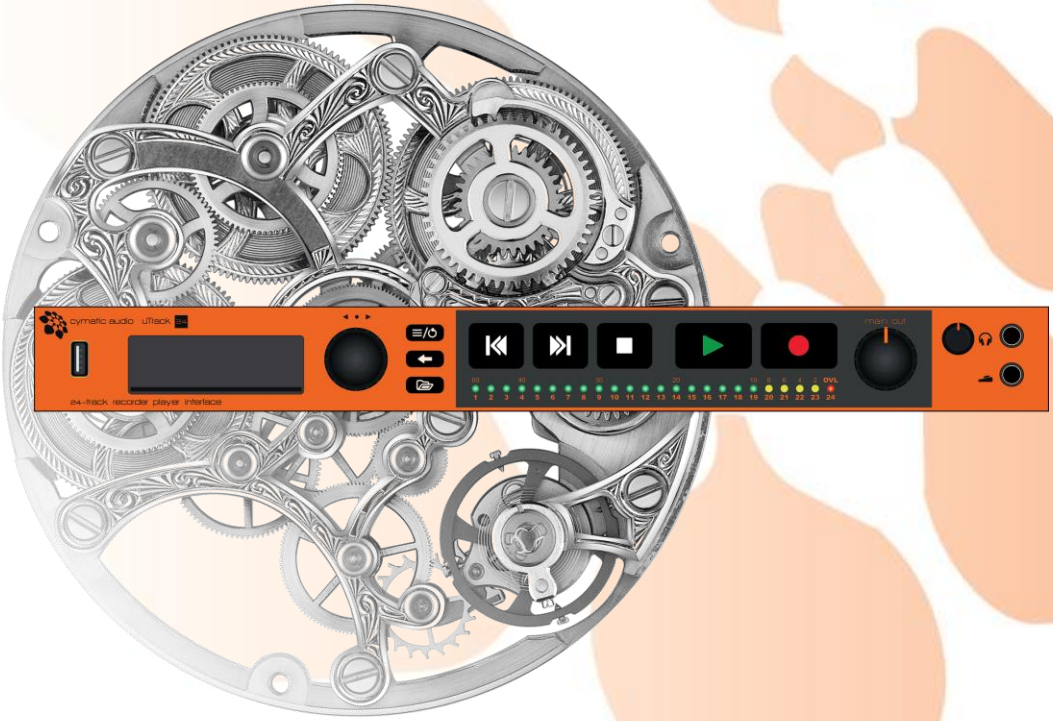
cymatic audio

uTrack24



Synchronization

uTrack24

July 2016

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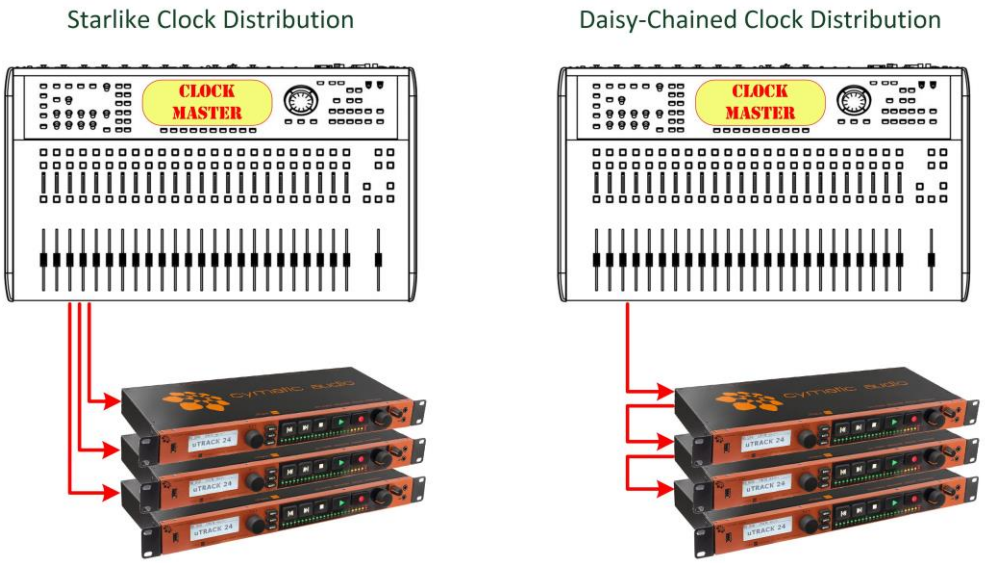
1. INTRODUCTION

While digital audio has taken over the world it still provides some challenges to the user. Unlike in the good old analog domain where a cable was your guarantee for a reliable connection, the digital world additionally relies on synchronization. A setup without synchronized devices might completely fail on audio, or it suffers from clicks and pops that occur sporadically, more or less often but mostly quite audibly.

Good synchronization concepts have one clock master, the heartbeat of your system, and all other digital audio devices synchronize their sampling rate to this master; a starlike setup where every clock slave directly receives the high-quality clock from the clock master.

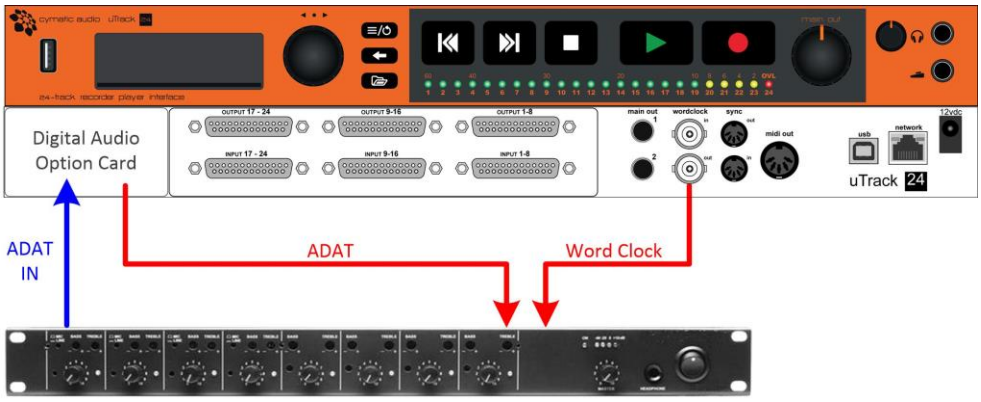
Lacking enough clock signals on your master, you may have to daisy-chain some of your equipment where a slave device forwards its clock to another device. Usually this is just fine, but note that the every device can add clock degradation and increase the time until your system is achieving a synchronized state.



There are many ways to synchronize devices. Some sync signals are even hidden and might not be that obvious to everyone. This document will show you how to properly setup uTrack24 and external equipment for perfect synchronization.

2. STAND-ALONE MODE

Clock Source: Internal



In this most common setup the uTrack24 is clock master and creates its own sampling rate. In recording mode the sampling rate is defined in the “Recording” menu, and in playback mode it is the song’s sampling rate.

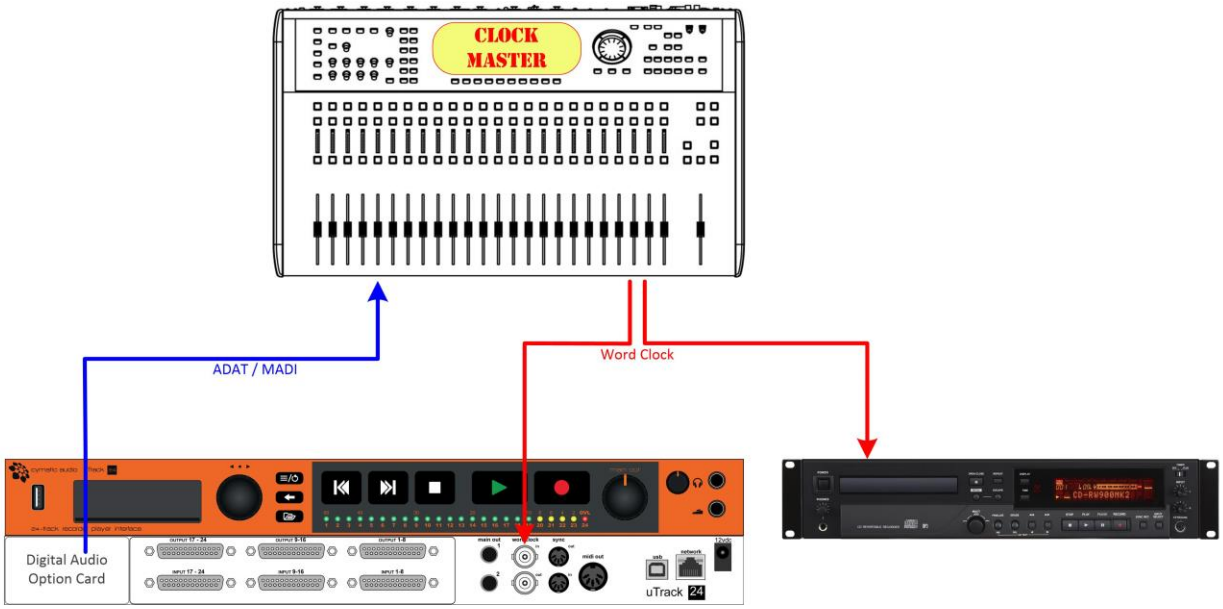
The sampling rate is always accessible on the word clock output BNC connector. If you have a digital option card installed, all available digital outputs will also have the uTrack24’s sampling rate.

Sync’ing External Digital Audio Devices

External digital audio devices like A/D converters with ADAT output need to be synchronized to the uTrack24. Use either the word clock output (BNC) or an ADAT output of your option card, and synchronize your peripheral device to this clock signal.

3. WORD CLOCK

Clock Source: Wordclock



Word clock synchronization is quite popular and most digital audio devices support it. uTrack24 should be sync'ed to word clock mainly for the following two scenarios:

1) Time-Aligned Recorders

Consider the situation where you are running two different recorders at the same time. In order to get recordings with exactly the same sampling rate, both recorders should be synchronized.

In the example setup above, both recorders are synchronized to a digital mixing console over word clock. Of course you may fed the word clock output of your other recorder directly to the uTrack24's word clock input.

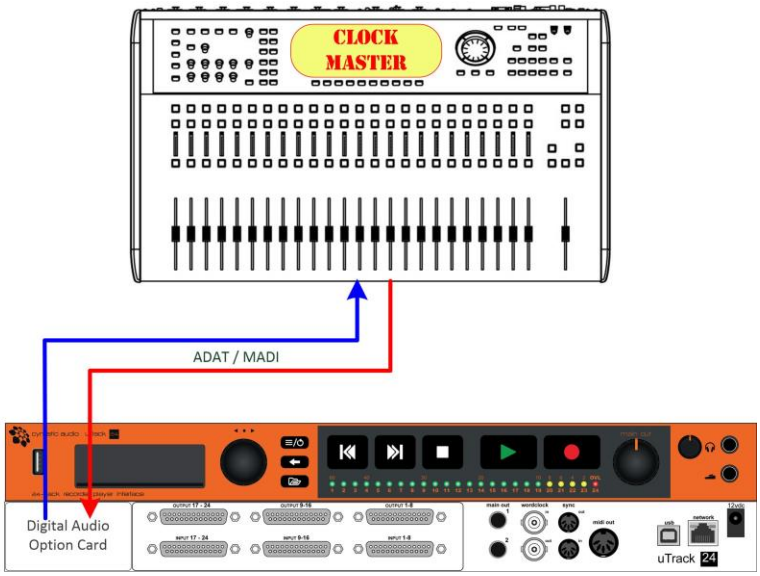
2) uTrack24 Digital Outputs

If you want to feed the uTrack24's digital outputs into your digital audio setup, simply synchronize the uTrack24 to a word clock signal.

⚠ *If the sampling rate for recording doesn't match the external word clock's sampling rate, no audio is played out. Also, if the sampling rate of your playback songs differs from the external sampling rate, the playback will not start. The LCD screen indicates a synchronization problem with a* ***blinking [Wck]****.*

4. ADAT / MADI

Clock Source: Digital I/O

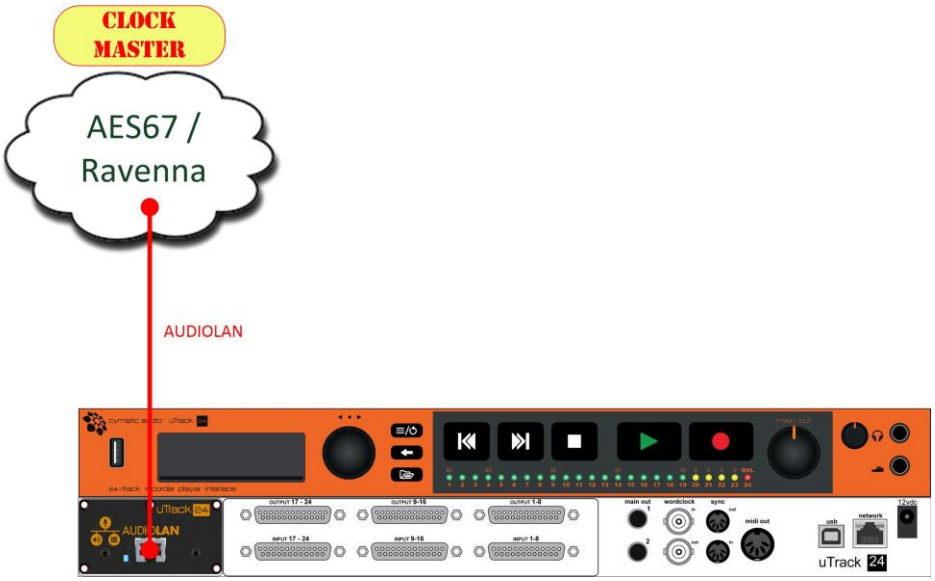


With a digital expansion card installed in your uTrack24, it is possible to directly synchronize your unit to a MADI or an ADAT input signal, without the need for an additional word clock cable.

⚠ *If the sampling rate for recording doesn't match the external digital input sampling rate, no audio is played out. Also, if the sampling rate of your playback songs differs from the external sampling rate, the playback will not start. The LCD screen indicates a synchronization problem with a* ***blinking [Ext]****.*

5. AUDIOLAN

Clock Source: Digital I/O



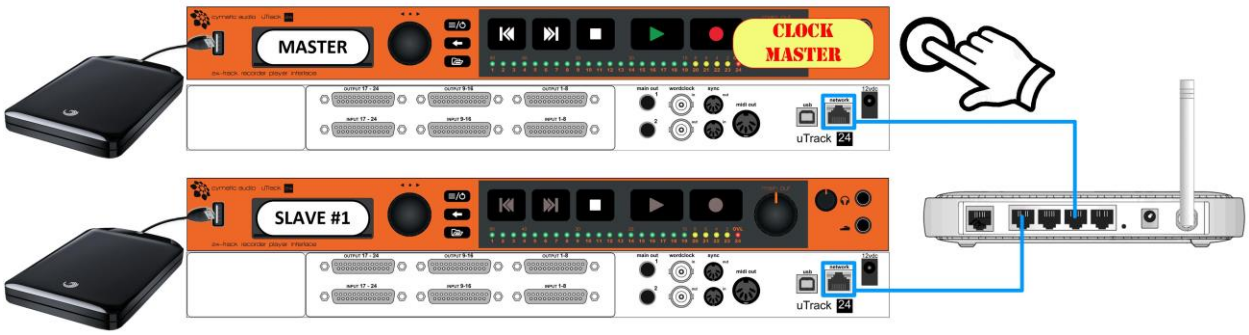
The AUDIOLAN option card gives you access to any AES67 and Ravenna audio network. The uTrack24 is always clock slave and requires the selection “Digital I/O” as clock source.

Note that you can always use the uTrack24’s word clock output to synchronize other equipment to the AES67 network.

⚠ *If the sampling rate for recording doesn’t match the external digital input sampling rate, no audio is played out. Also, if the sampling rate of your playback songs differs from the external sampling rate, the playback will not start. The LCD screen indicates a synchronization problem with a* ***blinking [Ext]****.*

6. SYNC GROUP (STAND-ALONE)

Clock Source: PTP

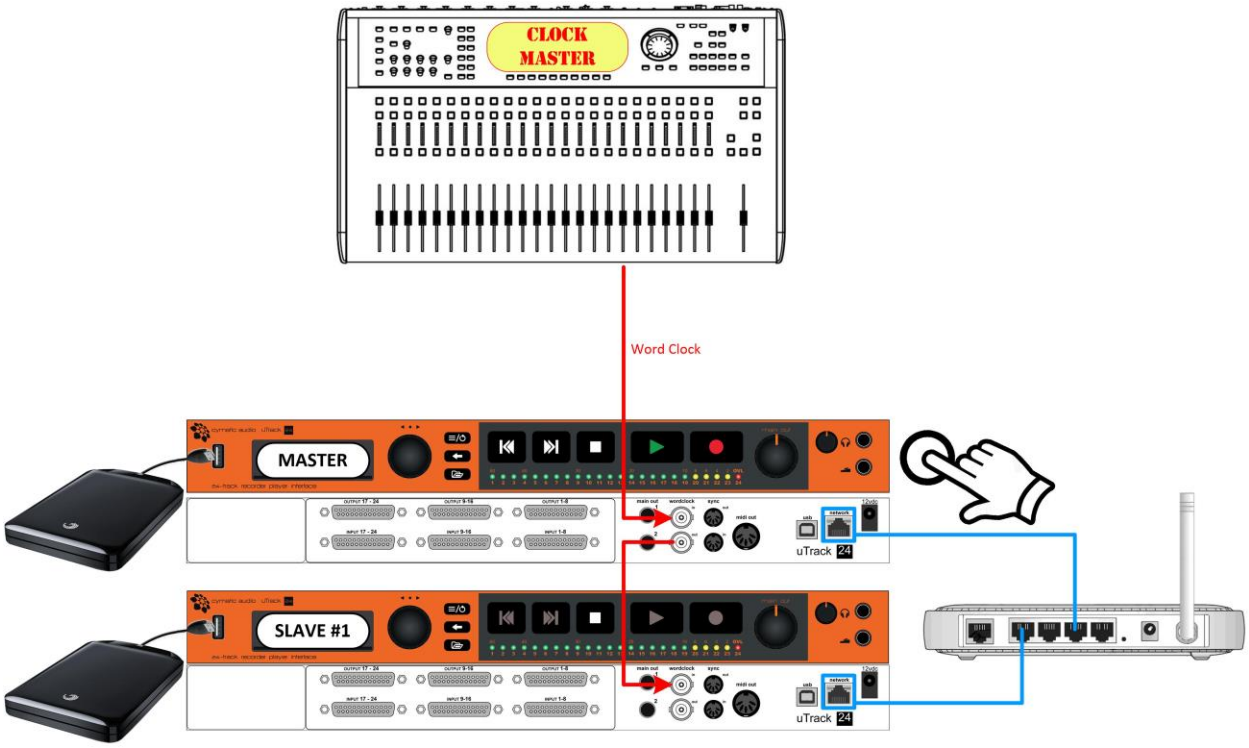


Multiple uTrack24 units can be tied together in a so-called sync group. Please read the uTrack24 Sync Manual for further details.

The clock source should be set to PTP on the master and on all slave units. The master will take the role of the clock master in this stand-alone setup. However, this is not guaranteed when other AES67/Ravenna devices are present in the audio network; in any case it is completely irrelevant.

7. SYNC GROUP (SYNC'ED)

Clock Source: Wordclock or Digital I/O



If you need to synchronize a sync group to an external clock master, it is mandatory distributing the clock to all uTrack24 units. In the example shown above, the master word clock is fed to the first uTrack24 which in turn provides its word clock output to the next uTrack24. Both units have the clock source set to Wordclock.

The same concept applies if digital I/O cards are used for audio I/O and synchronization, e.g. MADI. Then, the clock source is set to Digital I/O.

Note that the Ethernet connection is still required for command and status exchange between the uTrack24 units.

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