

# MAYAH Communications

## Application Note 23

### Centauri AES/EBU Clocking

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## 1 General

Centauri is a professional audio device and therefore it supports different kinds of AES/EBU clocking. Wrong configuration of AES/EBU clocking can cause audio failures as clicks or short interruptions which are very often originated by drifting clocks.

This application note explains the different kinds of AES/EBU clocking supported by Centauri. The influence of ADAT clocking via the optical Toslink input interface is not considered.

With Centauri there are four different kinds of AES/EBU clocking scenarios:

- Internal clocking
- Clocking by digital audio input
- Clocking by sync. input
- AES/EBU transparent (just available with Centauri II and special audio interface)

## 2 Pinlayout of Centauri AES/EBU interface

The Centauri AES/EBU interface is a female DB9 port with the following pin layout:

DB9 female (Centauri)	3 x XLR	Description
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### Digital Audio Input

5	2 of XLR1 (female)	In +
9	3 of XLR1 (female)	In -
1	1 of XLR1 (female)	Ground

### Digital Audio Output

4	2 of XLR2 (male)	Out +
8	3 of XLR2 (male)	Out -
1	1 of XLR2 (male)	Ground

### Digital Audio Sync Input

3	2 of XLR3 (female)	Sync In +
7	3 of XLR3 (female)	Sync In -
1	1 of XLR3 (female)	Ground

This pinlayout is also described in the Centauri interface manual which can be downloaded via the link:

[www.mayah.com/content/download/pdfs/manuals/centauri-interface\\_eng.pdf](http://www.mayah.com/content/download/pdfs/manuals/centauri-interface_eng.pdf)

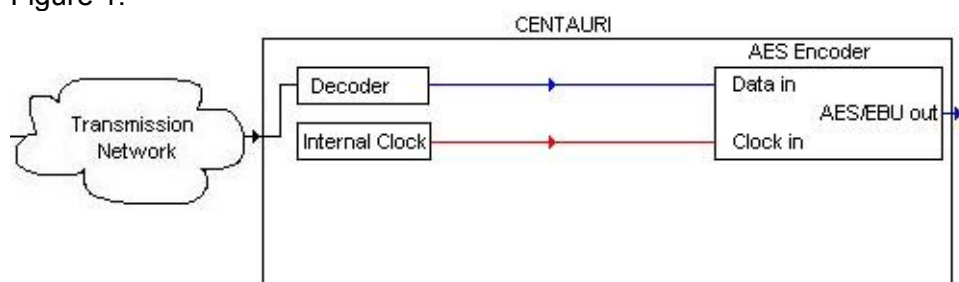
## 3 Kinds of AES/EBU clocking

### 3.1 Internal clocking

At **internal** clocking an internal Centauri word clock determines the used sample rate of the Centauri AES/EBU output. The following sample rates can be selected:

- 32 kHz
- 44.1 kHz
- 48 kHz
- 88.2 kHz
- 96 kHz

Figure 1:



Legend:

- a) —: telecommunication signal (e.g. IP, ISDN, X.21)
- b) —: audio signal
- c) —: clock

### Note:

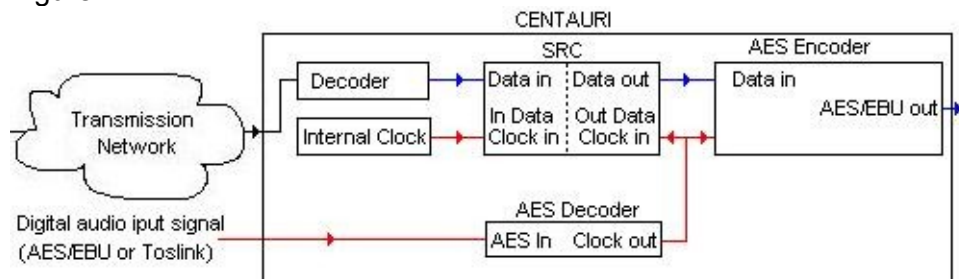
Internal clocking is the default value since it enables AES/EBU output without the need of an

clocking signal via the digital audio input port or the AES/EBU sync. input port. However, if every audio device in a AES/EBU audio chain use an internal clock, it is very probable that all the internal clocks are slightly different and therefore audio clicks can occur. If internal clocking is used then the Centauri AES/EBU clock should be the master clock for all other AES/EBU equipment behind.

### 3.2 Clocking by digital audio input

If **digital audio input** is selected as clocking source for AES/EBU output then the clock of the audio signal of the AES/EBU input port or the Toslink audio input port determines the sample rate of the AES/EBU output.

Figure 2:



Legend:

- a) SRC: Sample Rate Converter
- b) —: telecommunication signal (e.g. IP, ISDN, X.21)
- c) —: audio signal
- d) —: clock

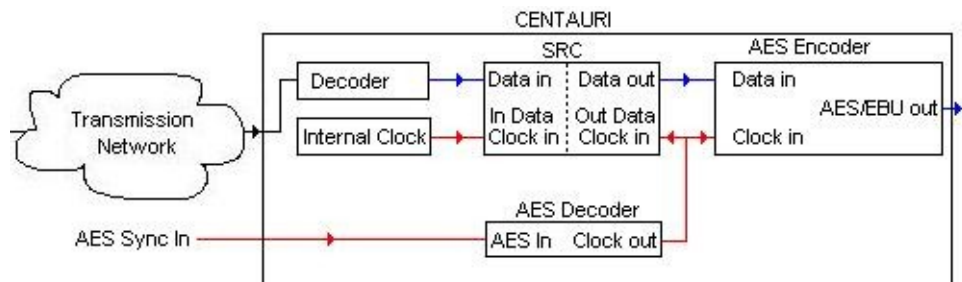
**Note:**

If **digital audio input** is selected as AES/EBU synchronisation source then a digital audio input signal should be fed to Centauri.

### 3.3 Clocking by sync. input

If **sync. input** is selected as clocking source for AES/EBU output then the clock of the sync. AES/EBU input port determines the sample rate of the AES/EBU output. Usually the AES/EBU sync. input signal is an empty AES/EBU frame but any AES/EBU signal can be used.

Figure 3:



Legend:

- a) SRC: Sample Rate Converter
- b) —: telecommunication signal (e.g. IP, ISDN, X.21)
- c) —: audio signal
- d) —: clock

**Note:**

If **sync. input** is selected as AES/EBU synchroniation source then a sync. input signal should be fed to Centauri.

**Note 2:**

Clocking by **sync. input** is very similar to the clocking via digital input . However, it enables that all AES/EBU devices of one location use one clock source independently of the fed in AES/EBU input signal. This prevents audio failures by different clocks.

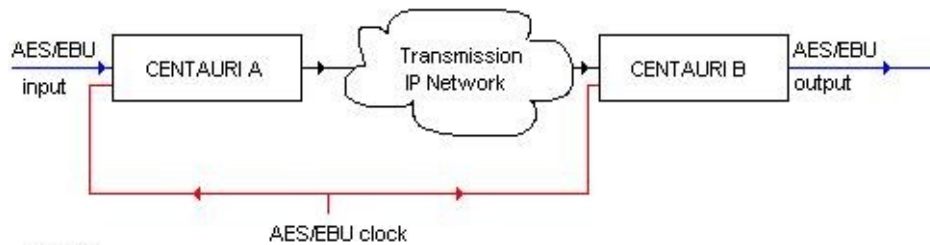
**3.4 AES/EBU transparent**

If **AES/EBU transparent** is used as coding algorithm the clocking at the AES/EBU output must be considered differenty to the clocking scenarios described above.

At the clocking scenarios described in item 3.1 to 3.3 the AES/EBU clocks of the Centauri's on both sides of the transmission line must not(!) be the same and therefore also internal clocking is possible.

At **AES/EBU transparent** all the bits of one AES/EBU stream are transferred transparently over the whole transmission line. However, since the clock cannot be derived from the AES/EBU data stream, the Centauri's on both side of the transmission line must use the same AES/EBU clock. Furthermore the sychronization source for AES/EBU output clock must be 'sync in' or 'digital audio in' (but not internal).

Figure 4:



Legend:

- a) —: telecommunication signal (e.g. IP, ISDN, X.21)
- b) —: audio signal
- c) —: clock

**Note:**

AES/EBU transparent is a special software plugin. Furthermore it is just available with Centauri II (not Centauri I) with a special audio hardware.

**4 How to set**

The configuration of the AES/EBU synchronisation output source can be done via the following menu items.

**4.1 Front panel of Centauri I**

Menu item: <Setup/Digital Audio Out Sync>

**4.2 Front panel of Centauri II**

Menu item: <Setup/Audio Settings/Digital Audio Out Sync>

**4.3 Windows Remote Control**

The latest the Centauri Windows remote control can downloaded via the link [www.mayha.com/remote](http://www.mayha.com/remote).

The synchronization source for the AES/EBU output can be set via the remote menu item <Settings/Audio..>.

