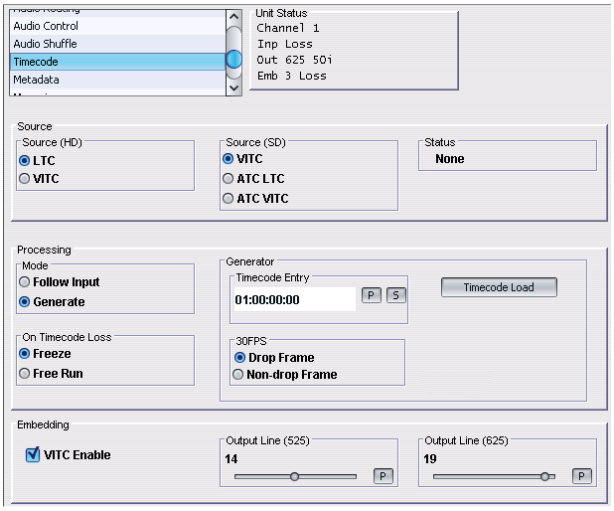
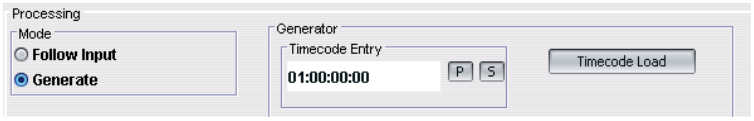
KudosPro timecode

With regard to timecode, KudosPro products can either pass timecode from the input, or generate timecode internally.



Generating timecode:

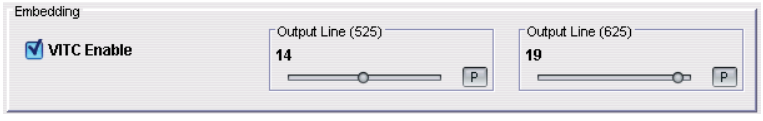
The operator can configure a start timecode event. Output timecode will count from this value when the Operator manually presses the 'Timecode Load' button. In this mode, if input timecode is present, it will be removed leaving only the generated timecode in the output video.



If the output has a frame-rate of 59.94, the output timecode can be set to either 'drop-frame' or 'non-drop frame'.

If the output is HD, ATC VITC will be placed on line 9 (& 571 for 1080i formats) and embedded ATC LTC will be placed on line 10 only. ATC timecode is embedded in HANC space.

In the SD domain LTC is not supported. VITC timecode can be enabled/disabled in the output and the line number of the first inserted VITC line can be set independently for 525i and 625i.



Handing timecode over from the input

In this mode, KudosPro will try to hand timecode over from the input to the output. However, it should be appreciated that it is often not possible to exactly hand timecode over. The configured conversion process and Genlock status will affect the result.

Same rate conversion TC hand over.

When input and output frame rates are the same and only when the KudosPro is I/O locked can timecode from the input be perfectly handed over to the output. When free-running, or Genlocked to an external reference, there will be a slight discrepancy between the number of input frames and output frames. The implications of this with respect to timecode, is that a compensation process will be needed to the timecode count, to ensure that output timecode follows input timecode as closely as possible. Any compensation process will cause discontinuities in output timecode.

When the input and output are both 59.94 and the input is 'non-drop-frame' frame, then the output will also be 'non-drop-frame'. If the input is 'drop-frame' frame, then the output will also be 'drop-frame'.

Convert mode TC handover

In convert mode timecode handover is is dependent on whether the KudosPro is I/O locked and on timecode requirements of the conversion process.

If the conversion is 50i to 59i and the KudosPro is I/O locked, then timecode is perfectly handed over to the output. By design the output TC mode will be 'drop-frame'. However, if the locking state is set to either free-run or externally locked, then again a compensation process will be required to achieve the timecode hand over.

For conversion from 59i to 50i with the source containing 'drop-frame' timecode and with the KudosPro I/O locked, then timecode from the input can be perfectly handed over to the output. If the KudosPro is not I/O locked, a process of compensation will be required to achieve the timecode handover.

Where the input timecode is 'non-drop-frame', timecode handover is more difficult and a process of compensation is far more frequently applied. This will result in many timecode discontinuities in the output.

23.98 frame rates

It should be appreciated that there is no 'drop-frame' method of timecode processing for 23.98, as there is when processing 59.94 field/frame rates. This means that any timecode associated with a 23.98 video stream is 'non-drop-frame' and will count slightly slower than real time.

For video processes between 23.98 and 25Hz, where timecode is configured to 'follow-input', the output timecode will contain discontinuities.

If the conversion is between 23.98 and 29.97Hz, then to hand over timecode, KudosPro will try to make 'drop-frame' timecode. Again timecode handover is difficult and a process of compensation is far more frequently applied. This will result in many timecode discontinuities in the output.

Other conversion modes

Generally, if the KudosPro timecode mode is set to 'Follow Input', almost any process that involves converting non-drop timecode from the input to an output will result is a large number of timecode discontinuities at the output.

The only exceptions to this are:

- When processing a 59.94 'non-drop' to 59.94 output.
- When processing a 23.98 source, when the output is also 23.98.

Source frame rates such as 24, 25 and true 60Hz, are not affected by the implications of 'drop-frame' or 'non-drop-frame' timecode.