Content

/65 Sampling Frequency Converter

Data sheet

102/65 Sampling Frequency Converter V2

Note: input sampling frequency = input fs
output sampling frequency = output fs

Description, Features

The SFC V2 is an asynchronuos Sampling Frequency Converter based on the Analog Devices SFC chip. The input and output sampling frequencies can be arbitrary and even time variing (varispeed).

The input fs is determined by the source device, while the output fs can be selected as follows:

- Internally 44.1kHz, crystal oscillator generated

- Internally 48.0kHz, crystal oscillator generated

- Externally via a wordsync input (75 Ohm, TTL level).

The output fs must not be greater than two times the input fs and not be smaller than half the input fs.

Operation

Before plugging in the module set the power up default to be "SFC on" or "SFC off". This can be set on the printed circuit board with a jumper.

On / off: The on/off switch on the frontpanel bypasses the SFC fully when off, i.e. 24 bits transparency, output fs equals input fs.

Input fs: Is determined by the audio source connected to the SFC. The input fs is allowed to lie in the range given in the technical data.

Output fs: Can be generated internally or fed in externally (selectable with a frontpanel switch).

In the "generated internally" mode, the output fs is generated by a crystal oscillator, which is tuned by an on board trimmer to the proper sampling frequency. This mode can be used to conveniently convert to 44.1kHz or 48kHz.

For all other output sampling frequencies the output fs has to be fed in externally via the BNC connector on the frontpanel. The range of the output fs is given in the technical data.

44.1kHz / 48kHz LEDs: Show the output fs when "internal" mode is selected. The output fs is chosen with the internal/external switch.

Error: This red LED lights whenever the SFC chip detects an invalid state, such as invalid fs, invalid fs ratio, varispeed too fast etc.

Settling switch: The SFC chip has to measure the ratio of the input and output sampling frequencies. This is done with a servo loop. Depending on the nature of the sampling frequencies (varispeed vs. steady state), the servo loop has to be able to react to changes in the sampling frequencies in a proper manner. This means a fast reaction time for varispeed applications, and a slow reaction time for steady state

applications. Why a "slow" mode at all? The slow mode reduces the jitter induced distortions, i.e. the SFC is less sensitive to jitter in the sampling frequencies and also to jitter inherent in the measurement algorithm. Ideally, the settling switch should stay in "slow", but for varispeed applications, to avoid audio interruptions, it may be necessary to switch to "fast".

Technical Data

Input Wordlength: 20 bits internal format (24 bits for bypass)

Output Wordlength: 24 bits

Input Sampling Frequency Range: 8 kHz ... 60 kHz

Output Sampling Frequency Range: 8 kHz ... 60 kHz

(The output sampling frequency must not be greater than two times the input sampling frequency and not be smaller than half the input sampling frequency.)

Group Delay: approx. 3ms at input sampling frequency = 50kHz

Passband Ripple 0..20 kHz: 0.01 dB (Passband span depends on output sampling frequency)

Stopband Attenuation: min. 110dB

Dynamic Range: min. 120dB (0..20kHz, -60dB input)

THD Plus Noise: max. -96dB (0..20kHz, full scale input)

Phase Response: linear (constant delay)

Interchannel Phase Deviation: 0 degrees

External Output Sampling Frequency Input: Level: TTL, Frequency: sampling frequency. Impedance: 75 Ohm

Frontpanel elements:
- fast/slow settling switch
- output fs selection switch with the positions: "internal 48kHz", "internal 44.1kHz", "external"
- output fs LEDs "44.1kHz", "48kHz"
- "error" LED
- external output fs input (BNC connector)
- on/off switch with LED

Powerup default: on or off (jumper selectable)

Frontpanel width: 30mm (1 1/5 inch)