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Data sheet
102/71 Upsampler
Description, Features

The Upsampler doubles the sampling frequency of an audio signal, i.e. for a 44.1kHz input signal, the output will be 88.2kHz and for a 48.0kHz input, the output is 96.0kHz. The output sampling frequency is generated in the module by a PLL circuit.

The whole Upsampler can be bypassed with a switch on the frontpanel. When bypassed, the output sampling frequency is the same as the input sampling frequency and the output data is the same as the input data.

Three LEDs on the frontpanel show the input sampling frequency value, i.e. 44.1k, 48.0k or "invalid".

Operation

The operation depends on the system configuration the Upsampler is used in:

1.) Upsampler used in conjunction with a Downsampler module:

In this case the bypass switch must not be used, i.e. should stay in the position "on". This because the modules between Up- and Downsampler always will be operated in double sampling.

Exception: The input signal is already in double sampling, i.e. the Upsampler is not required and thus must be bypassed with the bypass switch.

Note that the filter in the Upsampler <u>automatically</u> is bypassed whenever all modules between Up- and Downsampler are bypassed. This to guarantee that the system is fully transparent when all signal processing is bypassed. (Also see the data sheet of the Downsampler).

2.) Upsampler used without Downsampler module:

This is required if the output of the 102 Series system should be in double sampling. In this case the bypass switch can be used whenever the input is already in double sampling and thus the Upsampler is not required.

Technical Data

Input Format / Wordlength: up to 24 bits internal format
Output Format / Wordlength: up to 24 bits internal format
Input Sampling Frequency: 44.1kHz .... 48kHz (44.1kHz....96kHz when bypassed)
Processing precision: 32 bit floating point
FIR filter passband ripple: less than 0.0001 dB
FIR filter stopband suppression: >120 dB for frequencies > 24kHz at 44.1kHz fs
Frontpanel elements: on/bypass switch, sampling frequency LEDs: 44.1k, 48.0k, invalid
Width of module: 30 mm (1 1/5 inch)

Data sheet
102/72 Downsampler
Description, Features

The Downsampler halves the sampling frequency of an audio signal, i.e. for a 88.2kHz input signal, the output will be 44.1kHz and for a 96.0kHz input, the output is 48.0kHz. The output sampling frequency is generated in the module by dividing the input by 2.

The whole Downsampler can be bypassed with a switch on the frontpanel. When bypassed, the output sampling frequency is the same as the input sampling frequency and the output data is the same as the input data.

Three LEDs on the frontpanel show the input sampling frequency value, i.e. 88.2k, 96.0k or "invalid".

Operation

The operation depends on the system configuration the Downsampler is used in:

1.) Downsampler used in conjunction with an Upsampler module:

In this case the bypass switch must not be used, i.e. should stay in the position "on". This because the modules between Up- and Downsampler always will be operated in double sampling.

Exception: The output signal should stay at double sampling, i.e. the Downsampler is not required and thus must be bypassed with the bypass switch.

Note that the filter in the Downsampler <u>automatically</u> is bypassed whenever all modules between Up- and Downsampler are bypassed. This to guarantee that the system is fully transparent when all signal processing is bypassed. (Also see the data sheet of the Upsampler). In order for the Downsampler to switch its FIR filter off when all processor modules between Up- and Downsampler are bypassed, the Downsampler must "know" which modules are plugged in between Up- and Downsampler. This can be configured with a few jumpers on the Downsampler module. The pin arrangement for these jumpers are as follows (near the frontpanel):

pin A x
pin B x
pin C x
pin D x
pin E x
pin F x x pin G
pin G x x pin I
pin K x x pin L
pin M x x pin N

Connect the following pins depending on the processor modules used in double sampling. If any processor modules are used which are <u>not</u> between the Up- and Downsampler, i.e. not in double sampling, then the corresponding jumper(s) <u>must not be set</u>.

1st Parametric EQ M - N
2nd Parametric EQ A - B
3rd Parametric EQ A - C
4th Parametric EQ A - D
1st Dynamics Processor K - L
2nd Dynamics Processor A - E
De-Esser F - G

For the 4 in 2 Mixer module, which is also available in double sampling, no provision has been made to detect a bypass condition and thus no jumper is assigned. This because it is difficult to detect a bypass condition (faders at 0dB, polarity etc.) for the Mixer module. If a 4 in 2 Mixer module is used, it is recommended to use it either outside of the double sampling region (i.e. before the Upsampler or after the Downsampler) or, if it is inside the double sampling region, then none of the jumpers mentioned above should be set. This prevents the Up- and Downsampler from automatically bypassing at any time.

2.) Downsampler used without Upsampler module:

This is required if the input of the 102 Series system already is in double sampling. In this case the bypass switch can be used whenever the output should be in double sampling and thus the Downsampler is not required.

Technical Data

Input Format / Wordlength: up to 24 bits internal format
Output Format / Wordlength: up to 24 bits internal format
Input Sampling Frequency: 88.2kHz ..... 96kHz (44.1kHz .....96khz when bypassed)
Processing precision: 32 bit floating point
FIR filter passband ripple: < 0.0001 dB
FIR filter stopband suppression: > 120 dB for frequencies > 26kHz at 44.1kHz fs
Frontpanel elements: on/bypass switch, sampling frequency LEDs: 44.1k, 48.0k, invalid
Width of module: 30 mm (1 1/5 inch)