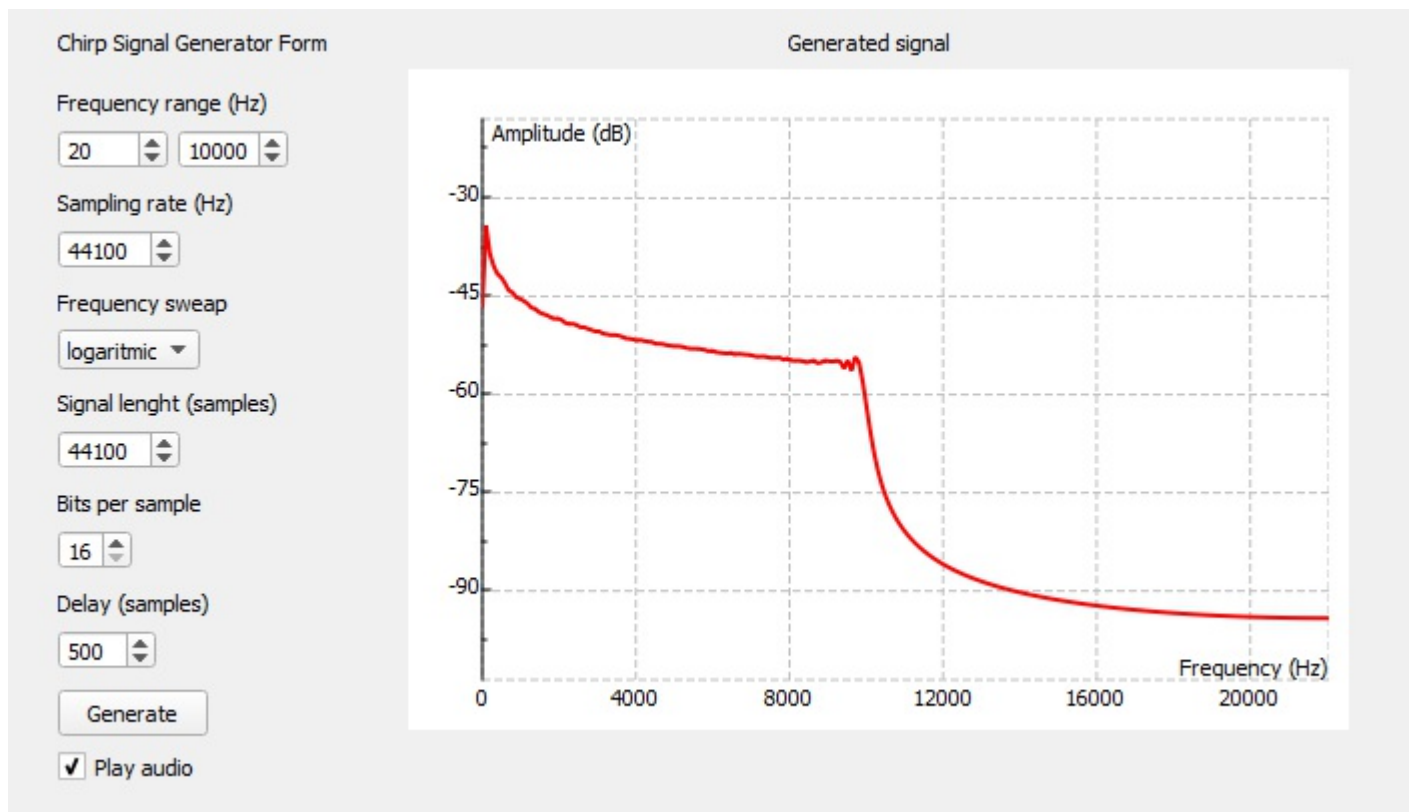# Generation of Chirp Audio Signal

A chirp audio signal whose frequency is swept in a defined frequency range is a very common test signal that is used for testing audio equipment. In MatDeck a Chirp Signal Generator Form is used to design a chirp audio signal. The Form is initialized using function chsiggenform(), whose arguments are widget ID and a string argument for the name of the Form. The resulting signal can be saved by using the function chsiggenresult() which returns the generated signal.

Chirp Signal Generator Form enables users to specify the frequency range of a test signal. Other parameters are: sampling rate, preferred way to sweep frequency which can be logarithmic or linear, signal length in samples, bits per sample and delay. The delay is used to introduce a certain period of silence at the beginning of the signal in order to allow, for example, the recording function to start. The user can choose to hear the generated signal by checking the appropriate boxes. The graph within the Form displays the amplitude spectrum of the obtained test signal.
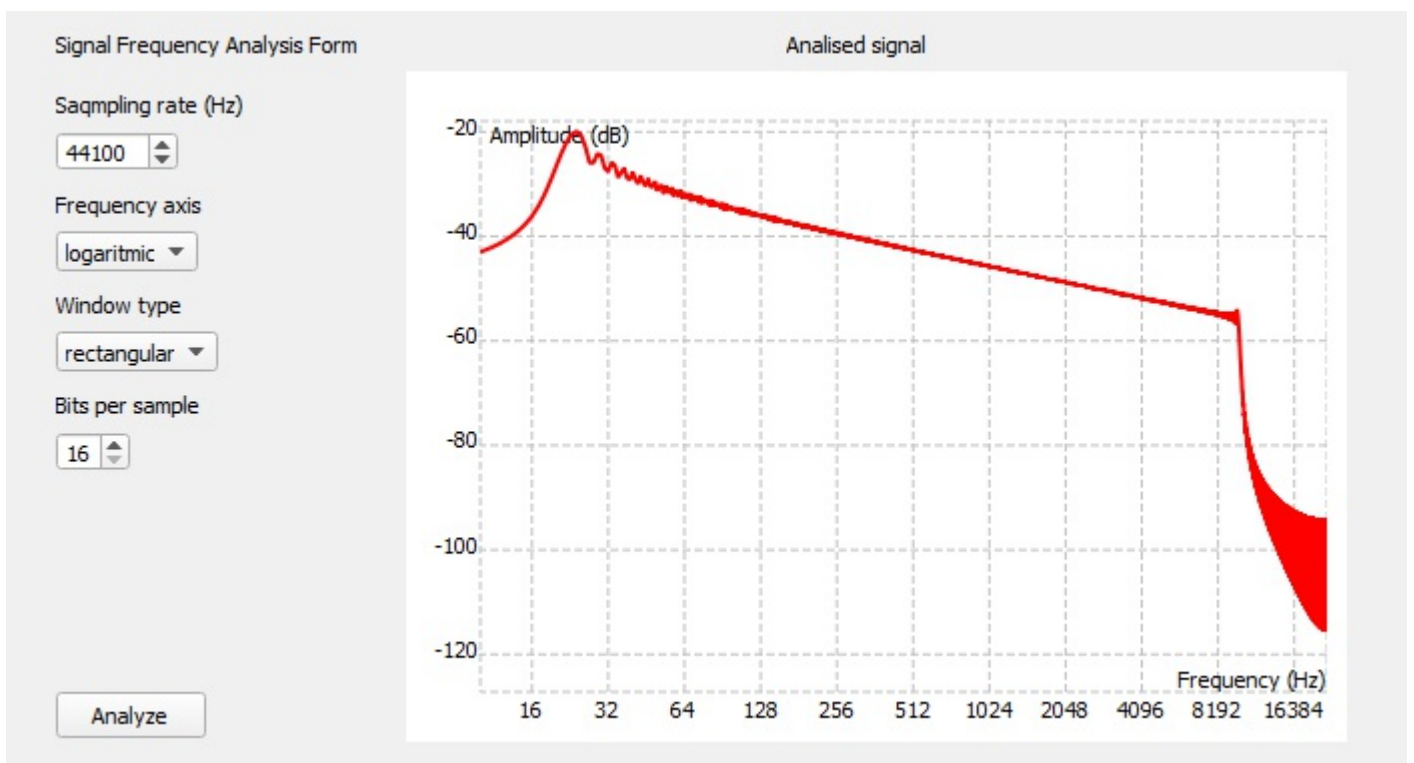
$f1 := chsiggenform(0 , "Gen11")$

Chirp Signal Generator Form

Frequency range (Hz)

`20` `10000`

Sampling rate (Hz)

`44100`

Frequency sweap

`logaritmic ▼`

Signal lenght (samples)

`44100`

Bits per sample

`16`

Delay (samples)

`500`

`Generate`

☑ Play audio

Generated signal

Amplitude (dB)

-30

-45

-60

-75

-90

0   4000   8000   12000   16000   20000

Frequency (Hz)

$Xchirp := chsiggenresult(f1)$

Frequency Analysis Form

MatDeck contains many tools for signal frequency analysis, for example fft, dct, periodogram, spectrogram. However, it is often required to display the amplitude spectrum in a fast and efficient manner. Signal Frequency Analysis Form is used to display the amplitude spectrum of the given signal. The function sigfreanaform() is used to initialize the Form, whose arguments are widget ID and string argument as the Form name. The amplitude spectrum can be obtained numerically using function sigfreanaresult(). This function uses parameters selected in the Form. The user can specify sampling rate, bits per sample as this is important for audio testing and the window type used for spectrum. The most important feature is the fact that user can select the frequency axis scale furthermore the signal spectrum can be represented using linear scale, or logarithmic (log2 or octave scale).

$f2 := sigfreanaform(0, "Analysis11")$

$Xspectar := sigfreanaresult(f2, Xchirp)$