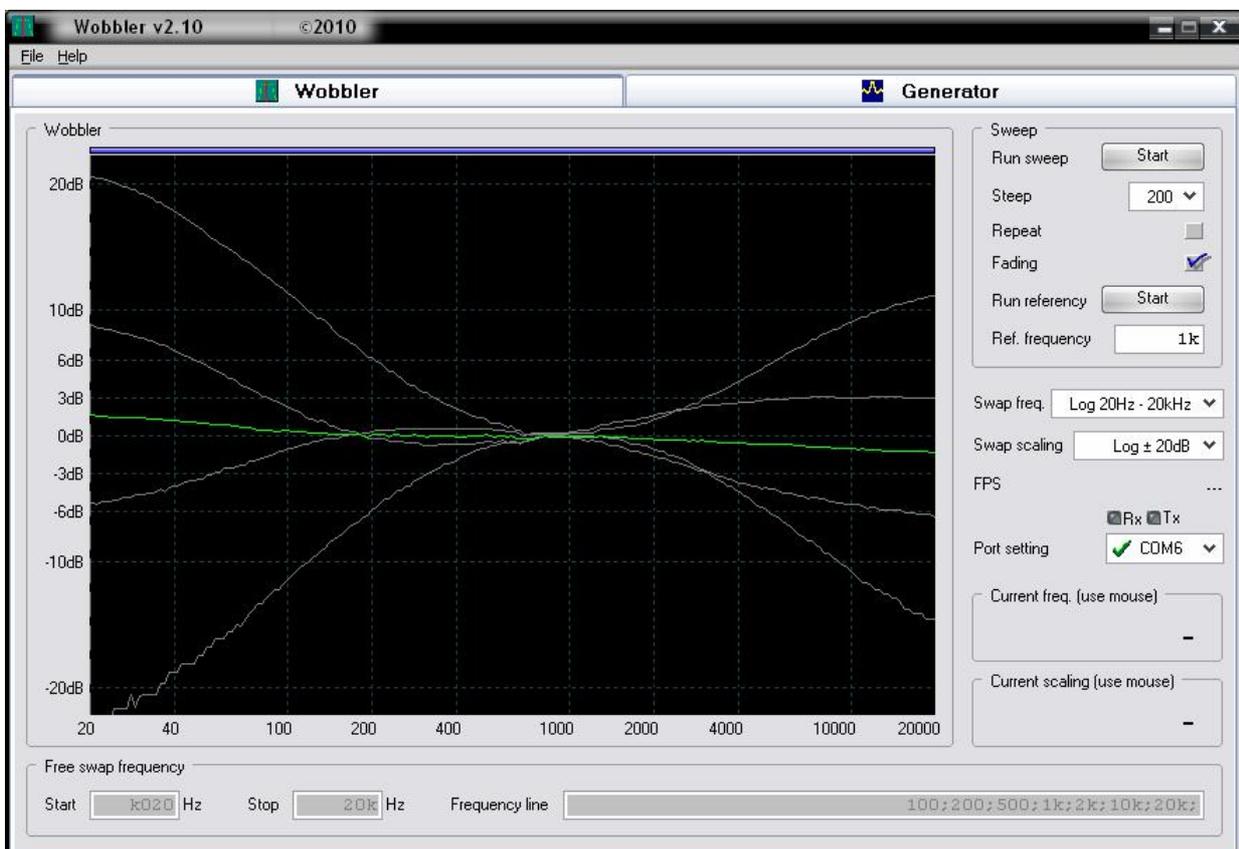# NF wobbler

Použití Wobbleru NF

Wobbler NF is designed for measuring of the frequency charakteristics of following audio devices:

1. power amplifiers
2. preamplifiers
3. correcting circuits
4. different types of low frequency filters
5. speakers and boxes (with the help of measuring microphone)
6. and other types of audio equipment

SW description (Wobbler.exe)

SW window - the picture shows the scanning of the correcting amplifier cuurves for audio.

Popis SW:

Function name	Style	Function	Value	Notice
Run sweep	Press button	Start / Stop		Waveform display is switched on / off
Steep	Combo box	number	200	200 measured points for selected range (see Notice 1)
			100	100 measured points for selected range
			50	50 measured points for selected range
Repeat	Check box			If switched off, only one course is performed
				If switched on, the next course is starting after the previous one until Stop is pressed
Fading	Check box			If switced off, the last course is cleared and the new course runs
				If switched on, the last five courses are displayed together with actual course
				The actual course is green, the previous courses are gray
Run frequency	Press button	Start / Stop		The reference frequency is switched on
Ref. Frequency	Edit box	number		Set value of reference frequency (see Notice 2)
Sweep freq.	Combo box	Frequency range	Log 20Hz - 20kHz	Set range of frequency, vertical indication lines are created automatically
			Log 10Hz - 50kHz	- " -
			Log 10Hz - 100kHz	- " -
			Lin 10Hz - 100Hz	- " -
			Lin 20Hz - 200Hz	- " -
			Lin 50Hz - 500Hz	- " -
			Lin 100Hz - 1kHz	- " -
			Lin 200Hz - 2kHz	- " -
			Lin 500Hz - 5kHz	- " -
			Lin 1kHz - 10kHz	- " -
			Lin 2kHz - 20kHz	- " -
			Lin 5kHz - 50kHz	- " -
			Log free	User-adjustable range of frequency logarihtmical (see Notice 3)
			Lin free	User-adjustable range of frequency linear (see Notice 3)
Sweep scaling	Combo box	Voltage displaying	Linear	Level of measured signal level is displayed
			Log ± 3dB	- " -
			Log ± 6dB	- " -
			Log ± 10dB	- " -
			Log ± 20dB	- " -
			Log 0dB… -50dB	- " -
FPS	Info box			Frequency samples/sec. – speeed of sampling
Rx, Tx	Communication indicators			Communication process with wobbler is displayed
Port setting	Combo box		COM/USB port	Port setting for wobbler connection (see Notice 4)
Curent freq	(use mouse)		value	The value of cursor actual position is displayed
Curent scaling	(use mouse)		value	The value of cursor actual position is displayed
Free sweep frequency		Start		User-adjustable box for Start frekvence set value Lin,or Log sweep
		Stop		User-adjustable box for Start frekvence set value Lin,or Log sweep
		Frequency line		We can enter any indication frequency perpendicular lines, separated by semicolon

Poznámky:
1. The number of measured points affect the resolution and speed of sweep. The higher numer of points will create the softer curve, but the process takes longer.
2. Setting of reference frequency: Choose the required frequency, set the desired voltage by controller and potentiometer in the section „Oscillator". This value is adjustable in the window „Currenr scaling", the color of this value is red. For example – we measure the course of corrections of audioamplifier. We set the Sweep freq. to LOG 20Hz – 20 kHz and Sweep scaling to LOG ± 20dB. Then we set Ref frequency to the required value (1kHz in this case). We switch on Run frequency and set 0 dB by switch and potentiometer in the section „Measure". The setting of control elements must be done carefully to avoid the circuit over-driving. The recommended procedure is following: Set the required level of voltage by potentiometer and switch in the section „Oscillator". Then raise the range by Measure switch, until the value is higher than required. Finally, tune it by potentiometer Measure.
3. Function Free sweep frequency is gray during the run and the wriring is not possible. If we set the Sweep freq. to Log free or Lin free, this function gets white and the writing is possible now.

4. USB is made up of circuit FDTI, what is a converter of USB / USART. USB is installed as virtual COM-port and is reported as COMx.
5. LED-indication. The green LED indicates the connection of Wobbler to the USB port. The red LED indicates the amplifier overdriving. In this case, the measurement is incorrect. We have to decrease the voltage level of oscillator.
6. The frequency syntax could be dual: we can use either the integer and the value is represented in Hz (for example 20, 1200, 20000 etc.), or the k-letter and the value is represented in kHz (for example k020, 1k2, 20k etc.)
7. In the folder File, you can Save the measured curve or Load the saved curve.

Calibration
After the first switch-on of Wobbler appears the message, that the calibration hasn't been performed. We can perform it following way:
1. Connect the oscillator output with measuring unit input by BNC cable¨
2. Set the oscillator switch to mV, potentiometer to max
3. Set the measuring unit switch to 300 mV in the section Measure, potentiometer to the middle.
4. Start Calibration in folder File
5. Ref frequency is set to 1 kHz automatically; now start Run frequency and in the window Curent svaling set the potentiometer Measure to 80%. Then stop Run frequency.
6. Start the Calibration and wobbler provides the calibration in 600 points of the curve Log 10Hz – 100kHz
7. The calibration is now finished.

We can do the calibration anytime, when we start Calibration in the folder File.

Technical parameters of hardware

Oscillator:
Frequency range	10Hz – 100kHz
Output voltage row	3mV, 30mV, 300mV, 3V (RMS)
Output voltage fine	0 – MAX
Output resistance	< 100 ohm

Measuring part
Frequency range	10Hz – 100kHz
Input voltage row	30mV, 300mV 3V, 30V
Input voltage fine	0dB … -60dB
Maxima voltageí	400V DC / 275V AC
Input resistance	1 Mohm / 15pF

Communication and power supply   USB port, communication and power supply are galvanically isolated