

## Possibilities of converter application

### Connected to PC and SigView software it allows:

- two-channel vibration recording and evaluation
- evaluation of vibration single-shot effects (surges, changes of mechanic parts position etc.)
- periodic vibration measurement with evaluation of time record of vibration including special parameters ( $S_{MAX}$  etc.)
- evaluation of vibration frequency spectrum (FFT analysis, spectrogram)
- connected to calibrating accelerometer it can be used in calibration chains
- using both in laboratories and in industrial conditions
- connected to portable PC is possible to do both permanent and mobile measurement (e.g. in traffic violations, round measurement etc.)



C8.5-USB two-channel vibration converter serves for the signal processing from two passive (piezoceramic) or active (ICP) accelerometers. The output is a serial data channel of USB standard. Data on USB output contain samples in two independent channels proportional to the instantaneous value of measured quantity. On a connected PC the converter is recognized as an external audio device. It allows to store and display the signal time record from both channels and than these records could be freely analysed.

### Converter set

The vibration converter is delivered either as a single unit or in set with accelerometers and appropriate connecting cables. The complete C8.5-USB set consists of:

- ◆ 1 x C8.5-USB converter
- ◆ 2 x accelerometer
- ◆ 2 x magnetic clip for accelerometer
- ◆ 2 x connecting cable for sensor
- ◆ 1 x USB connecting cable
- ◆ 1 x transport box
- ◆ 1 x user's manual

### C8.5-USB converter features and versions

- the converter contains two independent inputs on BNC connectors with common electrical ground (shielding)
- **C8.5USB-Q** version inputs are from the factory configured for passive accelerometers with charge output
- **C8.5USB-I** version inputs are from the factory configured for active ICP accelerometers (with built-in amplifier)
- measured quantity is vibration acceleration
- converter output are USB data containing samples in L, R channels, proportional to instantaneous value of measured quantity
- frequency range of measured quantity is from 3 Hz to 22 kHz in standards. It is also affected by the sampling rate
- the converter is equipped with a switch for setting of basic sensitivity in steps -20dB/0dB/+20dB
- sensitivity setting (calibration) for every channel of delivered sensors is done by the manufacturer
- indication of signal over-excitation by signal LED-diodes
- robust metal housing of converter
- power supply via USB bus from connected PC – doesn't require any external power supply source for its operation
- sensors housing is galvanically insulated from the converter USB output

### Accelerometers and cables

For C8.5-USB-Q converter version are delivered passive accelerometers type SV128B usually.

For C8.5-USB-I converter version the accelerometers with built-in amplifier (ICP standard) are used.

Sensors are fixed either by the magnetic clip or screwed by the suitable screw or reduction to the bottom hole of the measuring place. Instead of AURA accelerometers is possible to use also accelerometers of another manufacturers. While fixing the sensor on the measuring place is necessary to consider accelerometers have the direction of main sensitivity usually identical with the axis of accelerometer rotation symmetry.

The signal is led by special cables from sensors to BNC type connector of the converter. Sensors cables are customized, the cable for passive accelerometer can't be adapted without special instruments.

### SW equipment

The drivers are a part of operating systems for PC with Win OS (Win98, Millenium, Win2000, WinXP, Vista, Win7, Win8), the installation will be done automatically after C8.5-USB connection to PC. It is installed as „USB Audio Device“, resp. „USB Audio Codec“.

For the basic work with the converter (vibration signal loading, saving to WAV format, timing displaying) is possible to use almost any software for audio signals processing. Some of them is a basic accessory of Windows OS.

The effective signal analysis allows only the specialized software. SigView software is delivered with the converter in standard. This software offers wide possibilities of signal records and analysis.

SigView software is in english but we have the complete czech manual at disposal, where the program functions are described in details.

## Measured quantity and measuring ranges

The measured quantity is the instantaneous value of vibration acceleration. If is necessary to evaluate the vibration speed or displacement, is possible to apply the digital signal integration on the signal.

The measuring range responding to the max. extension of loaded sample is set by the manufacturer and it covers the most of usual measurement applications.

To extend the possibility of use the converter is equipped by the switch for basic sensitivity setting in steps -20dB/0dB/+20dB. Nominal measuring ranges (FS) are standardly set:

switch +20dB: FS = ± 32.767 m/s<sup>2</sup>

switch 0dB: FS = ± 327.67 m/s<sup>2</sup>

switch -20dB: FS = ± 3276.7 m/s<sup>2</sup>

The frequency range is set from 0,0005.f<sub>vz</sub> to 0,5.f<sub>vz</sub> in standard, f<sub>vz</sub> means the adjustable sampling rate.

The fine setting of the gain in measuring path is possible by „Cal.“ rotating elements used for calibration path of converter with delivered sensors so that the conversion constant of vibration is defined for both channels equally even if the used sensors don't have the same sensitivity.

If the user performs the adjustment of sensitivity by Cal. element, the factory calibration data are expired.

Total accuracy of vibration measurement is better than 5% of FS of calibration frequency.

## Calibration

The calibration is done by the manufacturer on calibration frequency 80Hz and shows the calibration data of resulting setting. The calibration is performed with the factory vibration standard bound to the state metrology. On the calibration frequency is calibrated the whole measuring path – the transfer of vibration to the resulting converter value (bits/m.s<sup>-2</sup>, sample/m.s<sup>-2</sup>), namely for sensors concrete constants. At measurement there is necessary to use the appropriate sensor in L, R input which is was calibrated with. This assignment is stated on the label of converter's bottom side.

## Ordering

Converter C8.5-USB order has to contain:

### 1) Converter type specification:

- ◆ For passive sensors: C8.5-USB-Q
- ◆ For ICP sensors: C8.5-USB-I

### 2) Requirement for the whole set delivery:

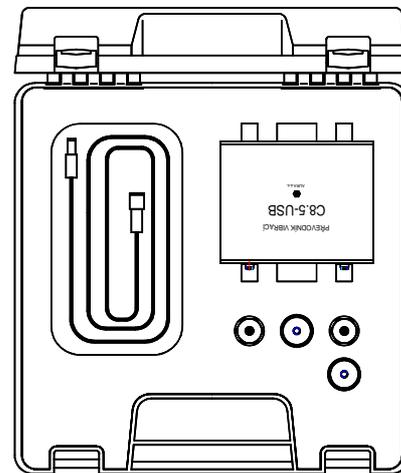
- ◆ accelerometers: type SV128B, eventually SV156, SVE
- ◆ cables for accelerometers: to specify their length, min 0.5m, max. 15m
- ◆ magnetic clips
- ◆ delivery without accelerometers, cables, magnetic clips

### 3) Special requirements:

- ◆ non-standard setting of amplitude range
- ◆ non-standard setting of frequency range

### 4) Number of ordered pieces of the same version

## Converter set in the box



## C8.5-USB converter basic technical parameters

### Converter electrical parameters

Measured quantity:	vibration acceleration	Power supply:	from USB bus, 5V/100mA
Measuring ranges +20dB:	FS = ± 32.767 m/s <sup>2</sup>	Operation system:	Microsoft W98, W2000, WinXP, Vista, Win7, Win8
0dB:	FS = ± 327.67 m/s <sup>2</sup>	Driver:	USB audio codec
-20dB:	FS = ± 3276.7 m/s <sup>2</sup> *)	Analytical SW:	SigView (SignalLab)
Optional sampling rate f <sub>vz</sub> :	8, 11.025, 16, 22.05, 32, 44.1, 48 kHz	Output – PC connection:	USB 2.0, connector type B
Frequency range:	from 0,0005.f <sub>vz</sub> to 0,5.f <sub>vz</sub>	Input – sensors connection:	2 x BNC connector
Measurement accuracy:	better than 5 % of measuring range	Converter resolution:	8 or 16 bits

### Sensors

Type for C8.5-USB-Q:	SV128B passive accelerometer	Nominal sensitivity -Q:	3,0 pC/m.s <sup>-2</sup>
Type for C8.5-USB-I:	ICP accelerometer - SVE	Nominal sensitivity -I:	100 mV/g

### Construction and operation data

Box:	ALU alloy, silver anodizing	Dimensions (w x h x d):	105 x 22 x 84 mm
Operating environmental temperature:	from -25 to +55 °C	Environmental humidity:	0-80 %

\*) Possible use of measuring range depends on the dynamic range of connected sensor