SMART PRODUCTS FOR SMART PEOPLE

VIBER X2+

Version: 1.2.0 En

Instrument manual

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Instrument basics

This section contains basic information about how to operate the instrument and the meanings of the different keys and symbols.

	ON/OFF Used to switch ON or OFF the Instrument.
	OK (Enter) Used to start a measurement, confirm an action or go forward in a menu.
	ESC (Escape) Used to cancel an action or to return to the previous menu.
	Arrows (up, down, left, right) Depending on the context, are used to change the selected items.

Connectors on front and rear sides

Vibration input Used to connect different types of sensors to measure vibration.

USB-C connector Used to connect the VIBER X2+ to a PC for transfering files or connecting to a charger to charge the battery.

Main menu description

When using the charger, the display shows the charger icon instead of the battery icon.

Each segment of the battery icon represents 20% of the remaining battery capacity.

Starts total value measurement.

Starts spectrum peaks measurement.

Starts bearing condition measurement.

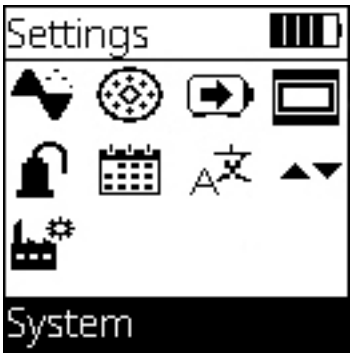
Opens the route mesurements menu.

Opens the settings menu.

Opens the information menu.

Starts the connection function via USB.

Instrument settings



Total value settings

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General Measurement Settings

In this section, we describe the general application settings commonly used across various applications. While these settings may vary from one application to another, their implications remain consistent.

Measurement type Milivolt, Acceleration, Velocity or Displacement.

Detection type RMS, Peak or Peak to Peak.

RMS The RMS value of a set of values or a continuous-time waveform is the square root of the arithmetic mean (average) of the squares of the original values or the square of the function that defines the continuous waveform.

Peak The amplitude of the sine wave at the frequency of interest is derived from the RMS value. This measure can be applied for the detection of acceleration, velocity, and high-frequency energy.

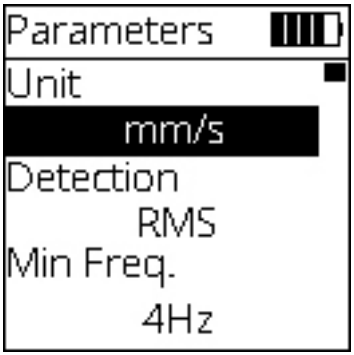
Peak-Peak The amplitude of a sine wave at the frequency of interest is determined from the RMS value. It is employed for the detection of displacement and occasionally for high-frequency energy. In the case of a sine wave, the peak-to-peak value is precisely twice the peak value due to the symmetrical nature of the waveform.

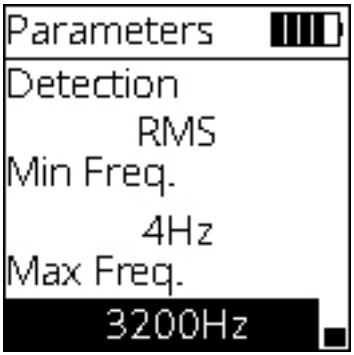
HP Filter or minimum frequency High pass filter establishes the minimum level from which the frequency will be displayed and calculated. The specific setting depends on the type of measurement.

LP Filter or maximum frequency Low pass filter frequency for the input signal sets the highest level from which the frequency will be displayed and calculated. The specific setting depends on the type of measurement.

Total value settings

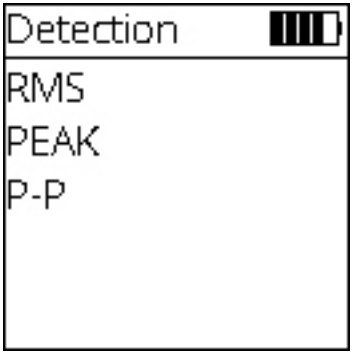
Total value settings contains settings for units, detection, lowest frequency range and highest frequency range.





Unit Availabe units are mV, g, mm/s, µm, in/s and mils.

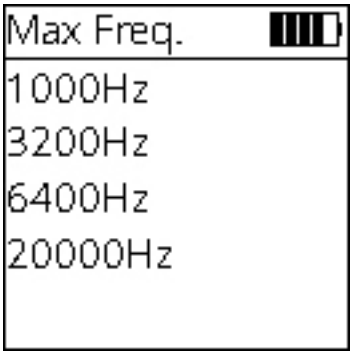
Detection Available detection types are RMS, Peak and Peak to Peak (P-P).



Minimum frequency The available frequencies, 2Hz, 4Hz, 10Hz and 20Hz, set the lowest frequency for calculating the total value and spectrum peaks of the vibration measurements. The selected frequency number in this setting, additionally determines the highest frequency range available in the maximum frequency setting.

Note! When adjusting the lowest frequency, it's important to check the highest frequency as well, as changes to the lowest frequency setting may impact the available range for the highest frequency in the measurement configuration.

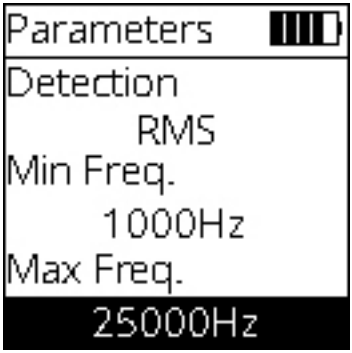
Maximum frequency The available frequencies 1000Hz, 3200Hz, 6400Hz and 20000Hz determine the highest frequency for calculating the total value and spectrum peaks of the vibration measurements.



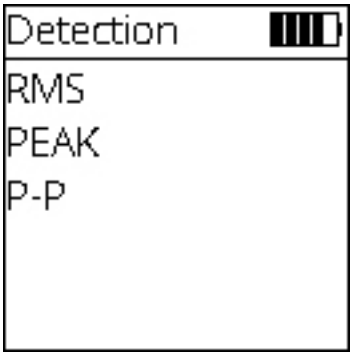
Note! Available frequency ranges include 2-1000, 2-3200, 4-1000, 4-3200, 4-6400, 10-1000, 10-3200, 10-6400, 10-20000, 20-1000, 20-3200, 20-6400 and 20-20000 Hz.

Bearing condition settings

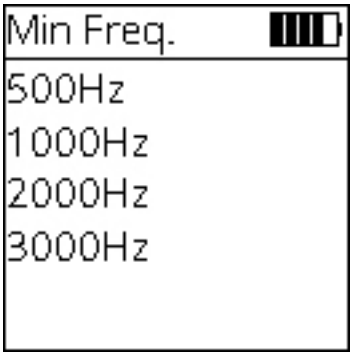
It includes settings for detection type, as well as the lowest and highest frequency ranges.



Detection Available detection types are RMS, Peak and Peak to Peak (P-P).



Minimum frequency The available frequencies, 500Hz, 1000Hz, 2000Hz and 3000Hz establish the lower limit for calculating the total vibration value, contributing to the measurement of the bearing condition.



Maximum frequency The available frequencies, 6400Hz and 25000Hz establish the higher limit for calculating the total vibration value, contributing to the measurement of the bearing condition.

Note! Available frequency ranges include 500-6400, 500-25000, 1000-6400, 1000-25000, 2000-6400, 2000-25000 and 3000-6400, 3000-25000 Hz.

Route settings

Settings for route measurements such as automatic change of measurement direction and display of route file name.

Auto advance Enabling this function will automatically transition to the next direction in the database upon completing a measurement.

Route list The system showcases the file's name and description, providing a seamless advantage in the selected language.

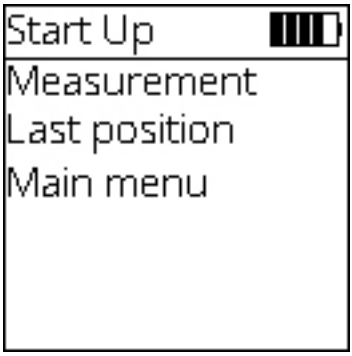
System settings

System settings contains settings for automatic shutdown time, start-up mode and the format of the values.

Auto off time This turns off the instrument after a set time which can be 1, 5, 10 or 30 minutes. When 'Never' is selected, the instrument will not turn off automatically.

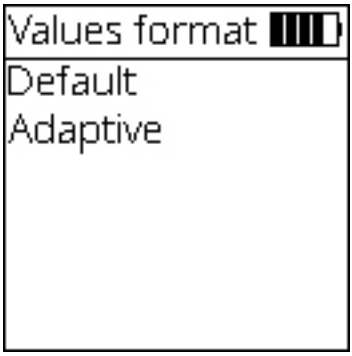
Start Up The startup settings provide three different modes for initiating the instrument.

- **Measurement** The instrument always starts at total value. measurement
- **Last Position** The instrument resumes startup at the last accessed menu after being switched off.
- **Main menu** The instrument always starts at the start menu.



Values format This setting provides two types of value formats.

- **Default** All measured values consistently display three decimals.
- **Adaptive** The decimal places in the measured value adjust automatically based on the selected unit.



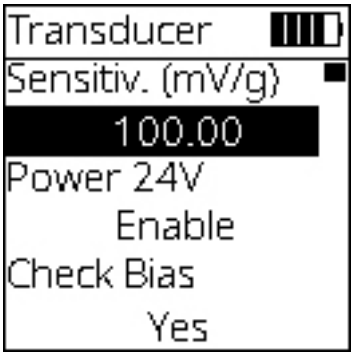
Frequency unit This setting provides two types of units for spectrum peaks.

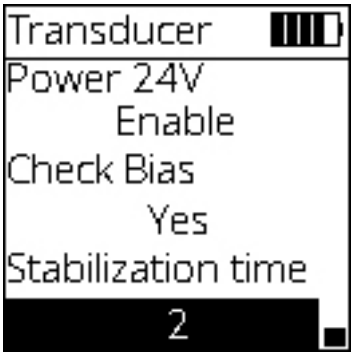
- **Hz** refers to the number of vibratory cycles that occur in one second of time.
- **CPM** or cycles per minute refers to the number of vibratory cycles that occur in one minute of time.

Transducer settings

This section allows setting the following factors.

- **Sensitivity (mV/g)** Press the right arrow on the keypad, set the transducer sensitivity per its calibration certificate, and press OK.
- **Power 24V** The supply voltage to the accelerometer can be enabled or disabled.
- **Check Bias** When enabled, this function checks the transducer and its cable at the start of measurement to ensure accurate readings.
- **Stabilization time** Sets the number of seconds to allow the transducer to stabilize when initiating measurement.





Date and time settings

This function allows users to set the system's date and time, which is utilized for timestamping route measurements and calibration dates.

Configure the system's year, month, day, hour, minute, and second settings for accurate timestamping and synchronization.

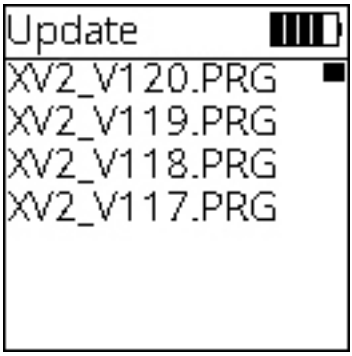
Note! Even when the instrument is switched off or the main battery is fully discharged, this setting ensures, courtesy of a dedicated backup battery designed to last for several years.

Language

Select the desired language from the list containing more than twelve languages and the instrument will change the language accordingly.

Update

Choose the desired firmware version from the list, install it, and remember to reboot for the selected firmware version to take effect.



Reset

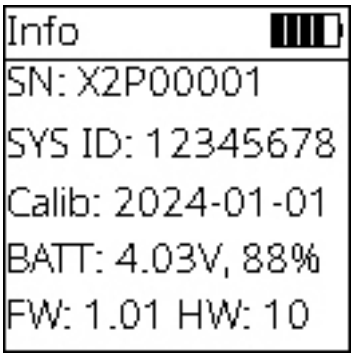
It resets some settings to factory defaults. The following list includes all affected positions.

- **Total value** mm/s, RMS, 4 - 3200 Hz.
- **Bearing condition** RMS, 1000 - 25000 Hz
- **Auto off time** Never
- **Start Up Last** position
- **Values format** Adaptive
- **Transducer sensitivity (mV/g)** 100.00
- **Power 24V** Enabled
- **Check Bias** Yes
- **Stabilization time** 2 seconds
- **Auto advance** Enabled
- **Route list** Description

Information

This menu outlines key details about the instrument

- **Serial number**
- **System ID number** It will read as 0 if no ID number is required.
- **Calibration date** It displays the date of the last calibration.
- **Battery level** It indicates the remaining battery capacity in percentage and the current battery voltage.
- **Firmware version** It displays the version number of the installed firmware.
- **Hardware version** It shows the version number of the hardware.



Connection

It facilitates communication between the instrument and a PC through USB, allowing the transfer of firmware files when an updated version is available and also route files. If the desired firmware version or route file is missing, download it to your PC. Connect your instrument to the PC using a USB C cable, initiate the connection on the instrument, and then copy the firmware file from your PC to paste it into the designated folder ‘VIBERX2P’.

Measurements

VIBER X2+ accurately measures vibration across various frequency ranges, including a total value and spectrum peaks measurement from 2Hz up to 20000Hz and a bearing condition measurement up to 25000Hz. It operates with high precision, capturing signals from very low levels at 0.5mV RMS to as high as 5000mV RMS.

Total value

This application is designed for analyzing the impact of mechanical actions and provides a convenient method to swiftly assess the vibration status of the machine.

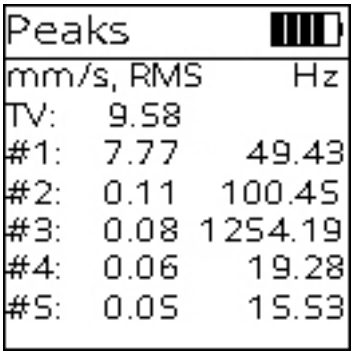
The displayed information shows the vibration level in the selected unit and detection type.

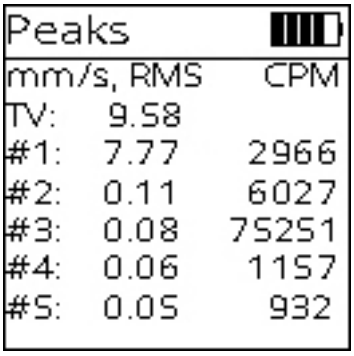
Note! Access other menus seamlessly during measurements using intelligent keyboard short-cuts for enhanced productivity.

- **Right and left arrow** Adjusts the unit of total value measurement incrementally.
- **Up arrow** Instantly navigate to total value settings.
- **Down arrow** Instantly navigate to spectrum peaks and bearing condition measurements.

Spectrum peaks

This measurement highlights the five highest peaks in the spectrum of frequencies, depicting the vibration of the machine component and the corresponding amplitude at each of these frequencies. The application adheres to the settings of the total value measurement and frequency unit, allowing users to choose between Hz or CPM.





The menu displays the unit and detection type for total value and the five highest peaks, along with the frequency unit. Data in the table are sorted from the highest peak and frequency to the lowest, organized in five numbered rows.

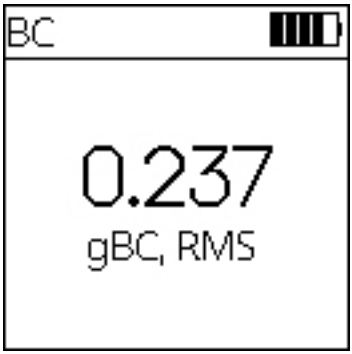
Note! Access other menus seamlessly during measurements using intelligent keyboard short-cuts for enhanced productivity.

- **Up arrow** Instantly navigate to bearing condition settings.
- **Down arrow** Instantly navigate to bearing condition and total value and spectrum peaks measurements.

Bearing condition

The application analyses the impact of lubrication or other actions on bearings. The bearing condition value is a sum average of high-frequency vibrations within a specified frequency interval, serving as an indicator of overall bearing health.

The displayed information shows the level in gBC unit and selected detection type.



Note! Access other menus seamlessly during measurements using intelligent keyboard short-cuts for enhanced productivity.

- **Up arrow** Instantly navigate to bearing condition settings.
- **Down arrow** Instantly navigate to total value and spectrum peaks measurements.

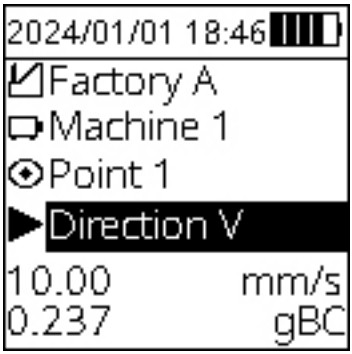
Route measurement

Route measurements seamlessly integrate with VMI's database and analysis software VibLyze. This functionality enables the creation of a route file, incorporating machine details, measurement points, and directions in the VibLyze. This route file can then be transferred to VBER X2+ for sequential measurements across all specified machines. Once data is collected, results can be seamlessly transferred back to the VibLyze, facilitating the creation of individual trends for each point and direction. This comprehensive process enables effective and controlled monitoring across all machines in the route file.

Route manager Upon entering the route measurement menu, the route manager displays a list of all route files previously transferred from the VibLyze to the ROUTE folder inVBER X2+ via USB-C. This streamlined interface facilitates easy access and selection of specific route files for measurement configuration.

Note! If “Description” is chosen in route settings for the route list, the file names will be displayed in the same language they were created in the VibLyze. This ensures consistency and clarity in file identification within the route list.

Route menu Within the route menu, essential information such as plant, machine names, point names, direction names, and the latest measurements for the selected direction are prominently featured. This organized presentation ensures quick access to relevant data for efficient route measurement management.



Navigate the cursor using the up and down arrows on the keypad to reach “Machine,” then employ the right and left arrows to select the desired machine. Repeat the procedure to select the preferred point and direction. Once all three are selected, initiate the measurement by pressing OK on the keypad. This streamlined procedure ensures efficient configuration and commencement of measurements.

Note! Upon completion and saving of the measurement, the system will automatically present the next direction if “Auto advance” is enabled in the route settings. If this feature is not enabled, the subsequent direction must be manually selected for further measurements.

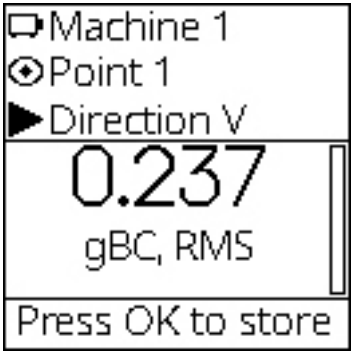
Note! VIBER X2+ has the capability to display the four names in various languages, even if a particular language is not explicitly included in the language settings.

Route measurement In the route measurement menu, the selected machine, point, and direction are prominently displayed. This feature serves to confirm and ensure that the correct point is being measured, providing clarity and accuracy in the measurement process.

Upon initiating the measurement, the hardware is initialized based on the selected settings in the VibLyze. A display bar on the right side indicates the stability of the measured value. When the stability bar reaches its minimum level, indicating a stable measurement value, the system is ready to save the value. The display prompts “Press OK to store”.

To record and store values in the system, simply press OK on the keypad after completing the measurements. This action confirms and saves the collected data for future reference and analysis in the VibLyze.

In certain cases, a direction may encompass both total value and bearing condition measurements, necessitating the need to save each type of measurement independently.



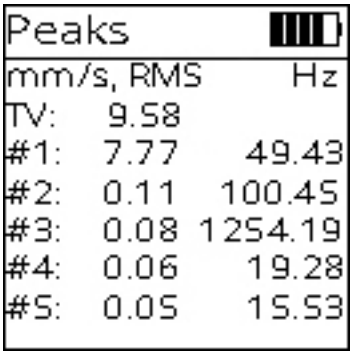
Route information For detailed information about a measurement, select the desired direction, then press the up arrow on the keypad four times to access a new menu with various sub-menus.

- **Change route** It redirects to the route manager menu

- **File info** Displays database and route file names, file size, and the number of records.

- **Measurement info** Shows record number, date and time, detection type, and alarm status.

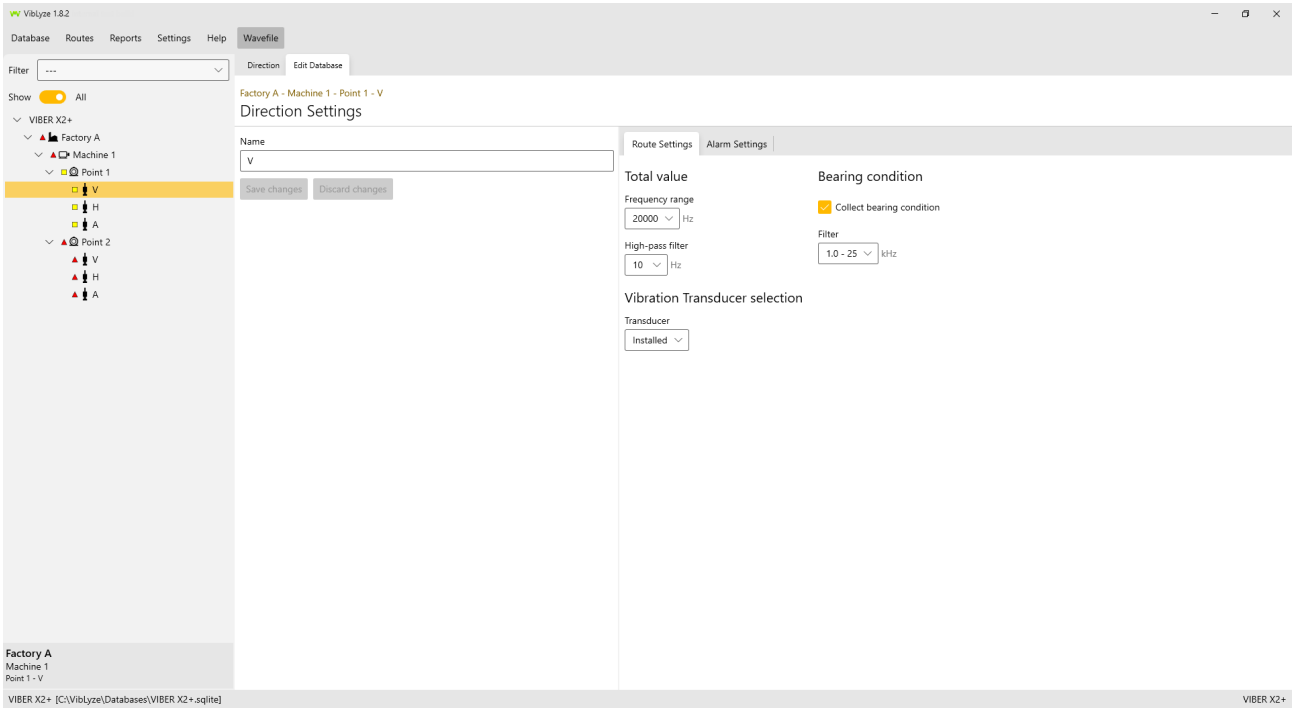
- **Spectrum peaks** Displays the same menu and table of the five highest peaks as the spectrum peaks measurement.



VibLyze

With the VibLyze, you can establish a database for all machines in a factory, configuring vibration measuring points for each machine across horizontal, vertical, and axial directions. Each direction features distinct settings for vibration measurement, bearing condition measurement, and dual-level alarms (warning and danger). Once the entire database, along with its settings, is stablished, a route file is prepared for transfer to the VIBER X2+, facilitating vibration level measurements on all machines. Subsequent route measurements contribute to the creation of vibration level trends for each point and direction. This trend provides a concise overview of alarm levels in the database tree, along with detailed information per point and direction, ensuring comprehensive monitoring and analysis.

Vibration settings Settings for a specific direction encompass the highest frequency for total value measurement and the high-pass filter, representing the lowest frequency in the measurement. Enabling bearing condition measurement for that direction is straightforward within these settings, offering a range of frequency options. Users can choose between the instrument's own accelerometer, with sensitivity configured in the instrument, or a user-defined accelerometer. The flexibility extends to setting the sensitivity in the VibLyze, irrespective of the selection made in the instrument. This versatile configuration ensures precise customization for varying measurement scenarios.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kHz
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Factory A
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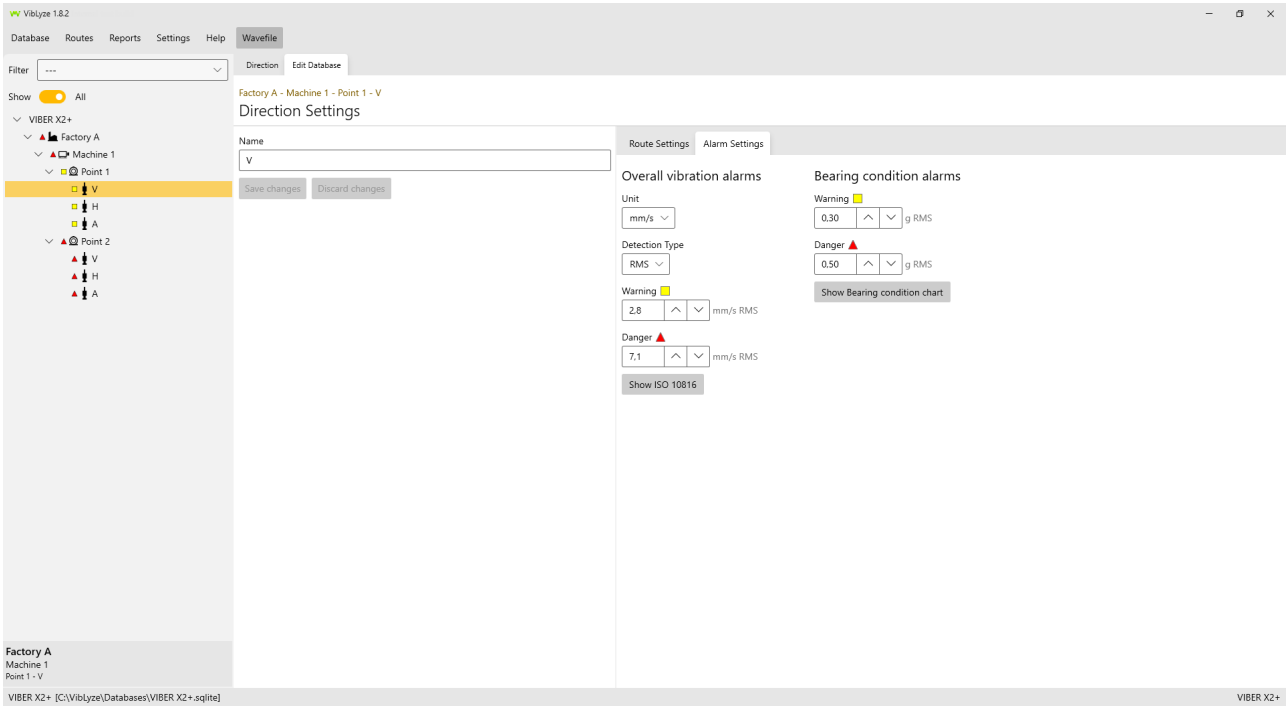
VIBER X2+ [C:\VibLyze\Databases\VIBER X2+.sqlite]
VIBER X2+

Alarm level settings The alarm settings provide a dual-level system, offering both warning and danger thresholds for both total value and bearing condition measurements. To assist users in aligning with the latest ISO standards, interactive help is available. This feature aids in the accurate selection of alarm levels, ensuring that measurements align with established standards for optimal monitoring and analysis.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Direction Settings
Name
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Save changes
Discard changes
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Alarm Settings
Overall vibration alarms
Unit
mm/s
Detection Type
RMS
Warning
2.8
mm/s RMS
Danger
7.1
mm/s RMS
Show ISO 10816
Bearing condition alarms
Warning
0.30
g RMS
Danger
0.50
g RMS
Show Bearing condition chart
Factory A
Machine 1
Point 1 - V
VIBER X2+ [C:\VibLyze\Databases\VIBER X2+.sqlite]
VIBER X2+

Trend view This view provides a wealth of information divided into two main parts.

On the left, the entire database tree hierarchy is showcased, starting from the plant and machines down to each direction of a measurement point. Each individual part is represented by two icons, one clearly indicating its type, and the other indicating if measurement values have surpassed the alarm levels.

On the right side, a trend graph illustrates various measurement occasions, complete with date stamps and distinct boundaries for different alarm levels. Selecting each measurement date provides detailed information, including the total vibration value, bearing condition measurement (if available), and a table showcasing the five highest peaks in the spectrum. Each of the five different frequencies is presented alongside its respective vibration level, ensuring a comprehensive overview of measurement details for thorough analysis.


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days
Delete Measurement
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Vibration
g RMS
BC
2024-01-21
2024-02-04
2024-02-18
2024-03-03
2024-03-17
2024-03-31
2024-04-14
2024-04-28
2024-05-12
Vibration 2024-05-22 12:30:38
mm/s
RMS
Vibration: 4,6 mm/s RMS
BC: 0,26 g RMS
Vibration mm/s RMS
Frequency Hz
3,56
52.04
0,14
102,38
0,13
302,96
0,08
1256,74
0,08
19,17
Factory A
Machine 1
Point 1 - V
VIBER X2+ [C:\VibLyze\Databases\VIBER X2+.sqlite]
VIBER X2+

Charging

VIBER X2+ is charged using a standard USB Type-C charger and supports a voltage range of 5 - 12 VDC 10W.

Utilizing the VMI's original charger provides up to 70% capacity from a fully discharged level in just two hours.

Battery

VIBER X2+ is equipped with a lithium battery boasting a 2.4 Ah capacity, ensuring usage for up to 16 hours on a single charge under normal ambient temperature conditions.

Note! The backlight automatically turns off for a few seconds as a warning before the instrument shuts down when the battery capacity is nearing its end.

Each segment of the battery icon represents 20% of the remaining battery capacity.

- 100% remaining of battery capacity.
- 80% remaining of battery capacity.
- 60% remaining of battery capacity.
- 40% remaining of battery capacity.
- 20% remaining of battery capacity.

Technical data

Digital	ADC	16 bit
	Dynamic range	96 dB
	Memory	32GB
Display	Size	2.2 inch, 128x128 pixels
Signal input	AC inputs	All standard ICP accelerometers (4mA/24V)
Measurements	Frequency range total value	2 to 20000 Hz
	Frequency range BC	500 to 25000 Hz
	Amplitude range	Up to 80 g, peak
	Accuracy	0.01 g ± 2 % for non integrated 0.1 mm/s ± 3 % for single integrated 1 µm ± 5 % for double integrated
	Resolution	Up to 0.25 Hz/line
Power	Battery	3.7 V, 2.4 Ah Li-ion
	Operating time	16 hours typical use
	Charging	4h fully charged, 2h up to70%
	Charger	5 - 12 VDC, 10W, USB-C
Temp.	Operating Storage	-20 °C to +70 °C (-4 °F to 158 °F) -30 °C to +80 °C (-22 °F to 176 °F)
Size	Dimensions Weight	140 x 75 x 50 mm 220 gr