VIBER X1+

Version: 1.0.1 En

Instrument manual

VMI International AB
Gottorpsgatan 5
SE-582 73 Linköping, Sweden

info@vmiab.com
www.vmiab.com

Table of contents

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.

VIBER X1+

Total Value

10.00
mm/s, RMS

Made in Sweden

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 X1+ to a PC for transfering files or connecting to a charger to charge the battery.

Main menu description

VIBER X1+

Settings

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 bearing condition measurement.

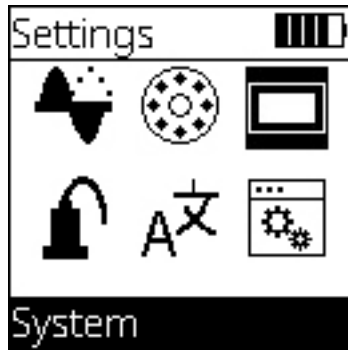Opens the settings menu.

Opens the information menu.

Starts the connection function via USB.

Instrument settings

 Total value settings

 Bearing condition settings

 System settings

 Transducer settings

 Language settings

 Application settings

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.

```
Parameters  ▮▮▮▯
Unit                  ■
        mm/s
Detection
           RMS
Min Freq.
          2Hz
```

```
Parameters  ▮▮▮▯
Detection
           RMS
Min Freq.
          2Hz
Max Freq.
        3200Hz      ■
```
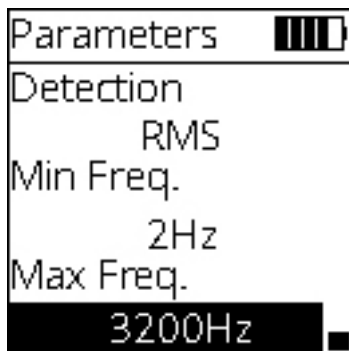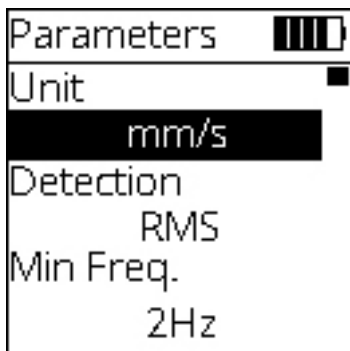
Unit Available units are mV, g, mm/s, μm, in/s and mils.
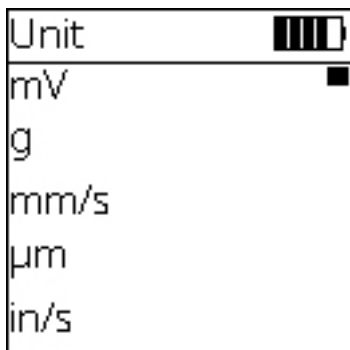
```
Unit        ▮▮▮▯
mV                    ■
g
mm/s
μm
in/s
```

```
Unit        ▮▮▮▯
g
mm/s
μm
in/s
mils              ■
```

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

```
Detection        ▐▌▌▌▐
RMS
PEAK
P-P
```
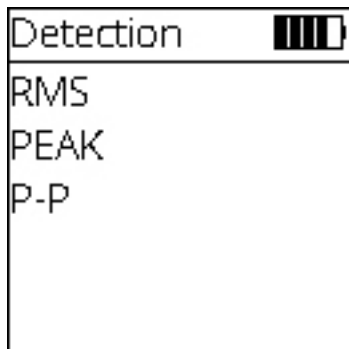
Minimum frequency The available frequencies, 2Hz and 10Hz, set the lowest frequency for calculating the total value of the vibration.
measurement. The selected frequency number in this setting additionally determines the highest frequency range available in the maximum frequency setting.

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.

```
Min Freq.        ▐▌▌▌▐
2Hz
10Hz
```

Maximum frequency The available frequencies 1000Hz, 3200Hz, and 16000Hz determine the highest frequency for calculating the total value of the vibration measurement.

```
Max Freq.        ▐▌▌▌▐
1000Hz
3200Hz
16000Hz
```
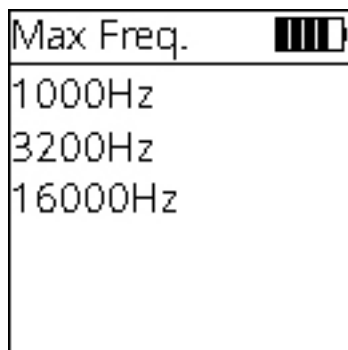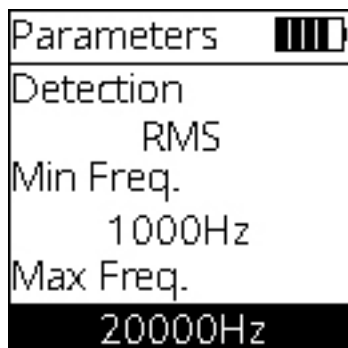
Note! Available frequency ranges include 2-1000, 2-3200, 10-1000, 10-3200 and 10-16000 Hz.

Bearing condition settings

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

```
Parameters       ▐▌▌▌▐
Detection
          RMS
Min Freq.
     1000Hz
Max Freq.
    20000Hz
```

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

```
Detection        ▮▮▮▯
RMS
PEAK
P-P
```
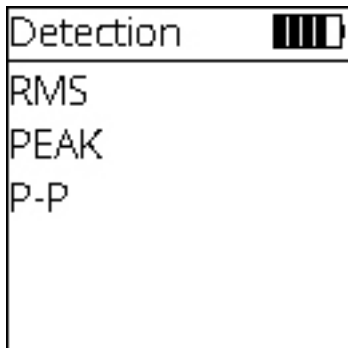
Minimum frequency The available frequencies, 500Hz and 1000Hz establish the lower limit for calculating the total vibration value, contributing to the measurement of the bearing condition.

```
Min Freq.        ▮▮▮▯
500Hz
1000Hz
```
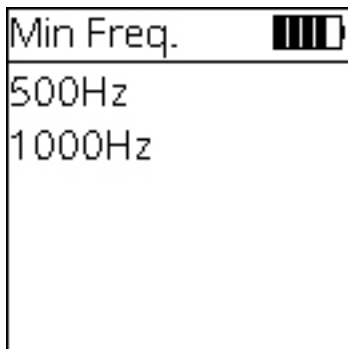
Note! Available frequency ranges include 500-6400, 500-20000, 1000-6400 and 1000-20000 Hz.

Maximum frequency The available frequencies, 6400Hz and 20000Hz establish the higher limit for calculating the total vibration value, contributing to the measurement of the bearing condition.
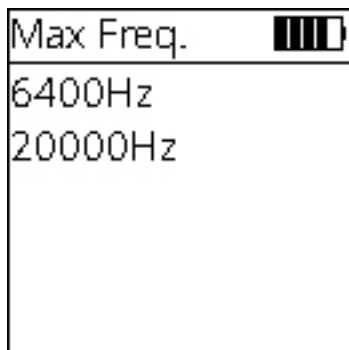
```
Max Freq.        ▮▮▮▯
6400Hz
20000Hz
```

System settings

System settings contains settings for automatic shut-down 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.

```
Auto off time   ▮▮▮▯
Never
 1
 5
10
30
```
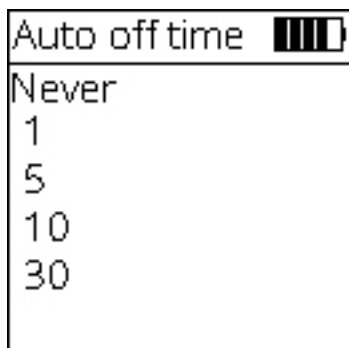
Start Up The start-up settings provide three different modes for initiating the instrument.

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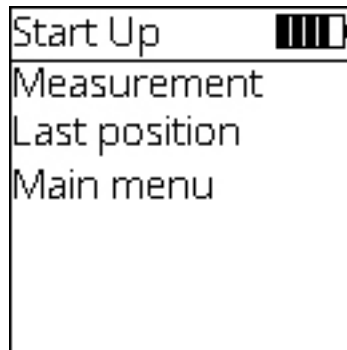- **Last Position** The instrument resumes start-up at the last accessed menu after being switched off.
- **Main menu** The instrument always starts at the start menu.

```
Start Up        IIII
Measurement
Last position
Main 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.

```
Values format IIII
Default
Adaptive
```
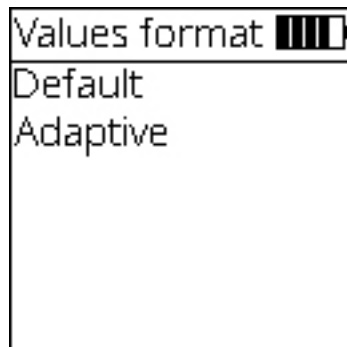
Transducer settings

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.
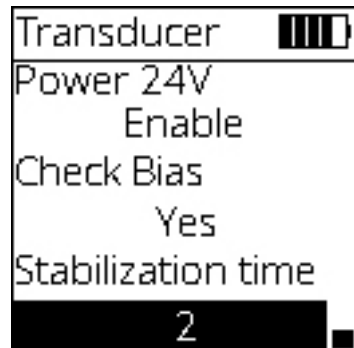- **Power 24V** The supply voltage to the accelerometer can be enabled or disabled.
- **Check Bias** When enabled, this function checks the transducer and its cable at the start of measurement to ensure accurate readings.
- **Stabilization time** Sets the number of seconds to allow the transducer to stabilize when initiating measurement.

Transducer ▮▮▮▯	Transducer ▮▮▮▯
Sensitiv. (mV/g) ■	Power 24V
100.00	Enable
Power 24V	Check Bias
Enable	Yes
Check Bias	Stabilization time
Yes	**2** ■
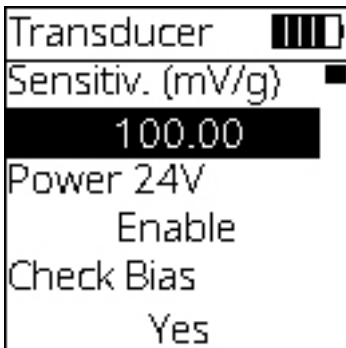
Language

Select the desired language from the list containing more than twelve languages and the instrument will change the language accordingly.
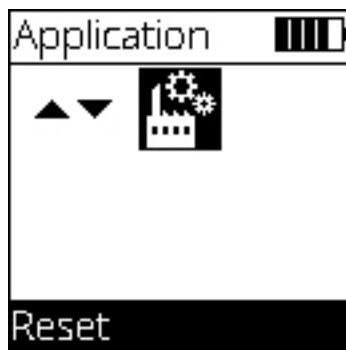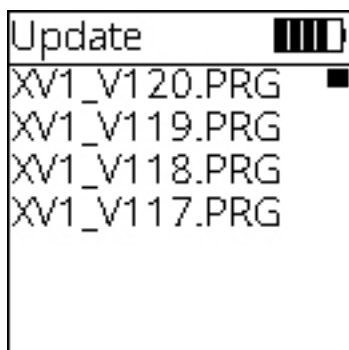
```
Language        IIII
English
中文
Čeština
Français
Deutsch
```

Application

It includes two functions, update and reset.

```
Application     IIII


   ▲▼   [icon]



Reset
```

▲▼ Update

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

```
Update        IIII▯
XV1_V120.PRG   ■
XV1_V119.PRG
XV1_V118.PRG
XV1_V117.PRG
```

Reset

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

- **Total value** mm/s, RMS, 2 - 3200 Hz.
- **Bearing condition** RMS, 1000 - 20000 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

ⓘ 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.

```
Info                ▮▮▮▯
SN: X1+00001
SYS ID: 12345678
Calib: 2024-01-01
BATT: 4.03V, 88%
FW: 1.01 HW: 10
```

Connection

It facilitates communication between the instrument and a PC through USB, allowing the transfer of firmware files when an updated version is available.

If the desired firmware version 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 'VIBERX1P'.
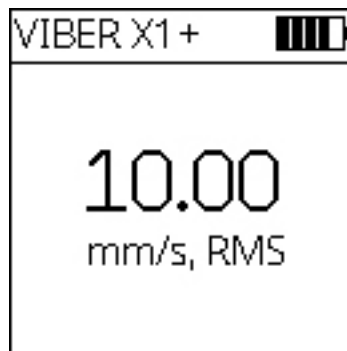
Measurements

VIBER X1+ accurately measures vibration across various frequency ranges, including a total value measurement from 2Hz up to 16000Hz and a bearing condition measurement up to 20000Hz. 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 analysing 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.
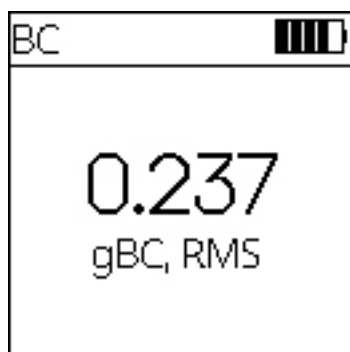
- **Right and left arrow** Adjusts the unit of total value measurement incrementally.
- **Up arrow** Instantly navigate to total value settings.
- **Down arrow** Instantly navigate to bearing condition measurement.

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.

BC

0.237

gBC, RMS

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 measurement.

Charging

VIBER X1+ 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 X1+ 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	4MB
Display	Size	1.8 inch, 128x128 pixels
Signal input	AC inputs	All standard ICP accelerometers (4mA/24V)
Measurements	Frequency range total value	2 to 16000 Hz
	Frequency range BC	500 to 20000 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	115 x 65 x 40 mm 170 gr