

MAXAM



ZEB

**MAXAM Deutschland GmbH
Zünderwerke Ernst Brün**

VibraZEB VM-3F

EB00.904.2000

User Manual V1.1

MAXAM Deutschland GmbH
Zünderwerke Ernst Brün
Boschstraße 10a - 45770 Marl – Germany
Tel: +49 2365 5020 900
E-Mail: zeb@zeb.maxam.net
Web: www.zeb-maxam.com

Index

Index..... 2

Introduction 4

Safety information and Overview 4

 Explanation of symbols..... 4

 Proper use:..... 4

 Transportation and storage 4

 Batteries..... 5

 Scope of delivery..... 5

 Technical data 6

 Front panel..... 6

 Connections 7

 Micro-SD Card 7

Operation..... 8

 Main screen 8

 Configuration screen 8

 Record time screen 8

 Trigger level screen 9

 More options screen..... 9

 Date & time screen..... 9

 Beacon screen 10

 Timer screen 10

 More options screen (main menu) 10

 Show data screen..... 11

 Show Status screen 11

 Delete records screen..... 12

How to record events and longtime surveillance 13

 Waveform mode..... 13

 Bar-Graph mode..... 13

Additional Information..... 14

 Geophone test..... 14

 Reset 14

Software 15

Technical specifications	15
Operation characteristics	15
Environmental data	15
Safety characteristics	15
Calibration	15
General:	16

Introduction

The VibraZEB VM-3F was developed to easily record and evaluate vibrations.

In combination with the Vibration Meter Software, vibrations can be evaluated according to many international standards like DIN4150-3, ÖNORM 9020, SN640312 and others. The device features three integrated geophones in triaxial orientation (z, x, y). The construction complies with the requirements of DIN45669-1.

Safety information and overview

Explanation of symbols



Caution! Read this instruction manual carefully before using the device, even if you already have experience and pertinent training in measuring technology!

The device may only be used by trained and qualified personnel under observation of the applicable regulations and ordinances. It may only be transferred to third parties with the instruction manual. Access to the machine by unauthorized people must be prevented.



It is not allowed to power the ZEB VibraZEB VM-3F with an external power source other than a USB C standard power supply.

Proper use:

The use of the equipment in a way which is not specified in the manual does not guarantee its protection. Follow the instructions of the manual at all times in order to use the seismograph in a safe way.



CAUTION! Always switch equipment off after operation!

Transportation and storage

Please inspect the packaging immediately upon receipt and the device during unpacking for any visible outer damage. Store all parts in the transport bag or the original packaging in case return shipment becomes necessary. Only the original packaging may be used for return shipment. Secure all parts and protect them from damage. Be sure that the equipment is switched OFF.

Batteries

The ZEB VibraZEB VM-3F is powered by a rechargeable Lithium battery pack. It can be stored in any position without leakage. Don't use it in environments not described in the equipment specifications and / or in corrosive environments. Don't put the equipment near heat sources, high temperature environments, direct sunlight, ovens or pressurized containers. Don't expose it to temperatures over 60 °C (140 °F) to prevent damage and cause acid leak, warming or even fire and explosion. Don't drill or open the battery. If the battery leaks acid and the acid is touched with fingers, immediately wash with water and go to the doctor.



Charge temperature: 0°C to +45°C

Standard working temperature: -10°C to +55°C

Storage temperature (short time period): -20°C to +60°C

Storage temperature (long time period): -20°C to +25°C

The battery may be recycled or disposed properly. Use only the power supply provided with the equipment.

Scope of delivery

- VibraZEB VM-3F
- USB-C Wide range charger
- USB-C Cable
- Micro-SD Card
- USB-Micro-SD Card reader
- Transport Case
- Microphone with tripod (optional)
- Spikes (optional)
- This Instruction Manual

Technical data

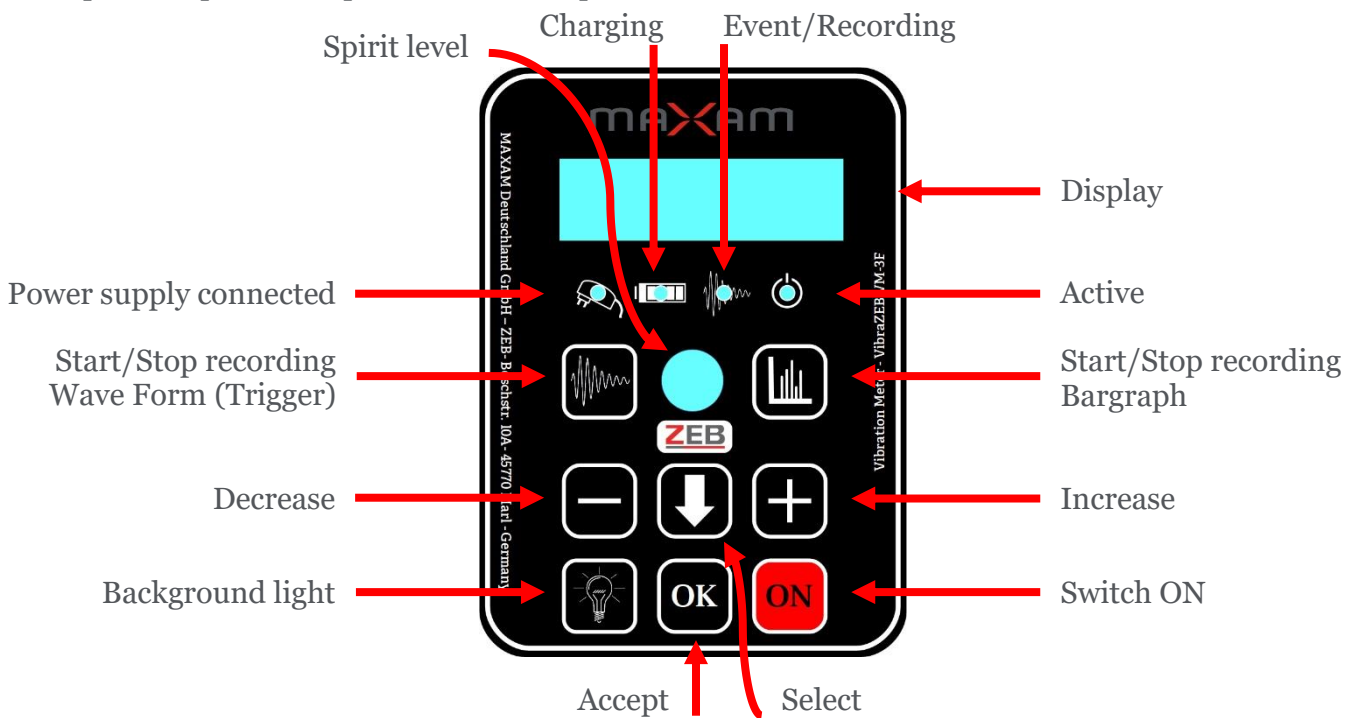
The VibraZEB VM-3F is equipped with a three-axis block of geophones with a frequency range from 1 to 315 Hz.

An optional low frequency microphone can be connected to record the pressure over the air value.

Type	VM-3F	Display	4 * LED + LCD-Display
Channels	3 Geo, 1 Mic	Protection	IP65
Sample rate [sps]	1024	Trigger	Wave/Bar graph
Frequency range [Hz]	1-80	Weight [kg]	1,6
Sensors	Geophone	Dimensions [mm]	160*155*70
Memory	1.000 events	Temperature range [°C]	-20°C - +55°C
Battery (rechargeable)	Li-Ion (intern)	Power Supply	USB-C (PD)

Front panel

For a better understanding of this user manual the explosion chart shows the most important parts and positions of components.



Connections

The VibraZEB VM-3F stores the recordings on a micro-SD card. The socket can be found on the lower side of the housing.



The upper side hosts the USB-C PD port that operates in charging mode only to recharge the internal battery. Next to the USB-C port is the socket for the over-the-air pressure microphone.



Battery status: Shows charging level in %. Flashes while recharging.

Radio: **Connect** Led shows while a stable link is established. **Act** flashes while active communication is done. Idle telegrams at 3 seconds interval.

Micro-SD card



Remove and insert the Micro-SD card only while the equipment is turned off!




Do not perform any erasing or writing operation of the SD card on a computer or any other type of electronic device.

Operation

The equipment is configured using the display.

Main screen

08:07:28	SD	
> Configuration		
More options		
Switch off		

Once the **ON** button is pressed the equipment will start. The starting sequence takes about 2-5 seconds.

The main screen shows the current time in the upper left corner. In the middle of the top line the operator can see if a Micro-SD-Card is inserted. The top right corner shows if the equipment is working on batteries or if an external power source is connected.

Use the **SELECT** button to navigate to one of the categories and confirm with **OK**.

Configuration screen

> Record time
Trigger level
More options
Exit

Record time screen

After selecting the **Record time** menu, the operator can choose the length of each record while recording in waveform mode.

Record time:
1 s

Trigger level screen

The trigger only works in waveform mode. Every time the vibration level exceeds the set trigger level, the vibration is recorded.

Trigger levels	
> Vib: 1.0 mm/s	
Mic: 120.0 dB	
Wave -1	Bar +1

The **SELECT** button switches between the vibration and microphone (air over-pressure) trigger levels. The **Increment (+) / Decrement buttons (-)** change the values in steps of 0.1 mm/s. The **waveform** and **bargraph** buttons change the value in larger steps of 1.0 mm/s. To continue to the next screen, press **OK**.

Trigger on vibrat:
> Yes
Trigger on sound:
No

This screen is used to select the source of the trigger levels. Both vibration and over-the-air pressure can be selected. Use the **Increment (+) / Decrement (-)** buttons to toggle Yes/No.

More options screen

To configure the VibraZEB VM-3F for time and other options please move to the **more options menu**.

> Date & time
Beacon level
Set timer
Exit

Date & time screen

This screen is used to set the system date and time.

Time:
>16 03 48
Date:
Jun 15 2025

Beacon screen

If a beacon alert system is connected the levels for red and yellow alarms could be setup.

Red level:
> 10.0 mm/s
Yellow level:
> 5.0 mm/s

Timer screen

To save energy the operator can choose if the VibraZEB VM-3F only starts up in a selected time frame and does recordings. While outside the selected time frame the equipment will shut down.

Timer
From: >06 : 00
To: 18 : 30
Active: Yes

In this example the equipment will only operated between 6:00 in the morning until 18:30 in the afternoon.

More options screen (main menu)

Starting in the main menu the *more options* screen can be accessed.

> Show data
Show status
Delete records
Exit

Show data screen

This screen shows an overview of the latest records.

Mar/09/2018	-	15:31:47
2.35 mm/s		14 Hz
105.8 dB		86 Hz
Vsum:		2.86 mm/s

The first line shows the date and time of the record. The second line shows only the maximum vibration value of the 3 axis (vertical / longitude / transverse). The third line shows the maximum amplitude recorded by the microphone. The last line is displays the vector sum of the vertical, longitude and transverse components.

To navigate through the records, use the *Increment (+) and Decrement (-)* buttons.

Show status screen

This screen shows the serial number, system date, system time and date of last calibration.

Serial:	ZVXXXX
Date:	Apr/22/2025
Time:	08:40:44
Calibrat:	Feb/09/2025

The second screen shows the battery level, records on Micro-SD card, free memory and the firmware version.

Battery:	100 %
Records:	200
SD Card:	3608 MiB
Firmware:	XX.XX.XX

Delete records screen

This screen allows the user to delete all records stored on the Micro-SD card.

WARNING	
All the memory will	
be deleted.	
Proceed?:	No



CAUTION: Be careful with this option, and use it only after checking that all the records have been transferred to a computer.



IMPORTANT NOTE: Only delete records with this menu option! Never use the computer for this operation, it will destroy the data table of the Micro-SD card.

How to record events and longtime surveillance

The VibraZEB VM-3F features two different recording modes: Waveform and Bar-graph mode. The waveform mode is intended for analyzing the waveform of a vibration with the computer program. It is trigger based and suited for blast monitoring. The Bar-graph mode is intended for long periods of vibration measurement like civil engineering activity on construction sites or machine surveillance.

Waveform mode



Press the **Waveform** button (in any menu) to begin a recording according to the set trigger values. To stop recording, press this button again.

Last:	13:02:55
4.25 mm/s	18 Hz
112.3 dB	59 Hz
Vsum:	4.85 mm/s

The first line shows the time of the last recorded event. The second and third lines show the maximum peak value and frequency of vibration and sound. The last line shows the vector sum.

Bar-Graph mode



Press the **Bar-Graph** button (in any menu) to begin a continuous recording. To stop recording, press this button again.

By using the **Increment (-) & Decrement (-)** buttons two views of data can be selected.

Decrement (-) screen - maximum instantaneous value of the period & frequency per channel.

V:	1.49 mm/s	18 Hz
L:	1.93 mm/s	12 Hz
T:	2.01 mm/s	16 Hz
M:	<90.0 dB	102 Hz

Increment (+) screen - maximum values from the beginning of the record

Maximum	490 s
3,88 mm/s	21 Hz
108,3 dB	59 Hz
V. Sum:	4,06 mm/s

Additional information

Geophone test

The VibraZEB VM-3F performs a test of the built-in geophones at the start of each new recording. If a fault is detected, a warning message will be shown.

The most common reason for the warning message is a bad leveling of the geophones. Level the VM-3F that the bubble is centered and try again.

If the warning message continues to be shown, return the VM-3F to the manufacturer for a new calibration.

Reset

In case something is not working as described in the used manual the user can perform a reset. The “*light*” button needs to be pressed for minimum 10 seconds until the equipment switches off.

After the next start up, please check the configuration options.

Do not carry out a reset unless it is absolutely necessary.

Software

To analyze records please use the *Vibration Meter Software* that can be downloaded from our website.

Technical specifications

Operation characteristics

MAXAM Deutschland GmbH – Zünderwerke Ernst Brün guarantees the characteristics expressed in numerical values with the established tolerances.

Environmental data

The environmental data mentioned in this manual is based on the results of the procedures of manufacturer verification.

Safety characteristics

This manual contains information and warnings that must be followed by the user to guarantee safe handling and to maintain the instrument in a safe condition. The use of this equipment in a manner other than that specified by the manufacturer can impair the protection and/or technical specifications of the equipment.

Calibration

The equipment is provided with a certificate of calibration. To ensure that the equipment meets the specifications, a two-year calibration period at the manufacturer is recommended.

General

Depending the configuration, some of the following parameters will not be applicable.

Number of channels	3 or 4
Sampling rate (samples per second)	1024
A/D-Converter	16 bits
Data storage memory	1000 records
Frequency range	1-80 Hz (DIN 45669-1)
Record time	1- 32 seconds in increments of 2 ⁿ seconds
Trigger mode:	Automatic
Record modes	Waveform/Bar-graph
Data transfer	SD card
External power supply	USB-C PD
Internal power supply	Li-ion battery
Autonomy ¹	50 hours
Visualization	LCD 4 lines x 20 characters, 4 Leds
Keyboard	8 keys membrane
Protection	IP-65
Dimensions (mm)	160x155x70 mm
Weight (without accessories)	1600 grams
Working temperature	-15°C to +50°C
Storing temperature	-20°C to +60°C
Working humidity	Without condensation
Storing humidity	Without condensation

Note 1: This parameter is reduced based on the cycles of charge and discharge of the battery. This time is calculated with the equipment in continuous use and may change depending on the LCD Back-light use.

1 - 315 Hz Version (According to DIN 45669):

Seismic channels range	0.03 to 120 mm/s PPV
Seismic channels resolution	0.01 mm/s
Air over-pressure channel maximum	502 Pa (148 dB)
Air over-pressure channel resolution	0.1 Pa
Minimum measurement - air over-pressure channel	2 Pa (100 dB)
Frequency range - Seismic channels	1 – 315 Hz
Frequency range - Air over-pressure channels	2 - 250 Hz
Seismic transducer's type	Geophones $f_n = 4.5$ Hz
Transducer's response correction	IIR Filter

The theoretical frequency response is in accordance to this expression:

Where: f = Frequency, $f_0 = 1$ Hz. $f_1 = 315$ Hz.

Tolerances:

The maximum tolerances over the frequency response of the equipment are as follows:

1 - 315 Hz Version			
Frequency	0,5 – 1,25 Hz	1,25 - 252 Hz	252 - 630 Hz
Upper limit	20,00%	10,00%	20,00%
Lower limit	20,00%	10,00%	20,00%

Note: The deviation of the equipment plus the uncertainty in the calibration must be below these values.

Electrical parameters:

Power supply	USB-C PD - See the characteristics on the power supply unit.
Internal Li-Ion battery	8.4 V