

VIBSCANNER[®] 2

Operating Instructions



© PRÜFTECHNIK Condition Monitoring. All rights reserved.

LEGAL INFORMATION

Copyright notice

These instructions and the product described herein are protected by copyright. The authors reserve all rights. These instructions must not be copied, reproduced, translated or made available to third parties in any other form - in part or in full - without prior approval.

Exclusion of liability

Any claims against the authors in relation to the product described in these instructions are excluded. The authors do not provide any guarantee for the accuracy of the contents of these instructions. Furthermore, the authors are not in any way liable for any direct or indirect loss arising from using the product or from using these instructions even if the authors have identified the potential for such a loss. The authors do not accept any liability for potential faults in the product. This exclusion of liability also applies to dealers and distributors. Subject to errors and design changes, in particularly in terms of further technical developments.

Trademark

The trademarks and registered trademarks referenced in these instructions are generally marked as such and are the property of their owners. The absence of a marking does not however mean that names are not protected.

VIBSCANNER is a registered trademark of PRÜFTECHNIK AG.

PRÜFTECHNIK Condition Monitoring
Freisingerstr. 34
85737 Ismaning, Germany
Tel. + 49 89 99616-0

Contents

1 - Introduction	7
1.1 Prior to starting	8
1.1.1 Notes regarding these instructions	8
1.2 Safety	10
1.2.1 General safety	10
1.2.2 Intended use	13
1.2.3 Conformity	13
1.3 Legal Notes	14
2 - Description	15
2.1 Interfaces and operating elements	16
2.2 Display	17
2.2.1 Color scheme	17
2.2.2 Sleep mode	17
2.3 Operating keys	18
2.3.1 ON/OFF key	18
2.3.2 ENTER key	19
2.4 Connections	20
2.4.1 Analog IN	20
2.4.2 Charge socket	22
2.4.3 Data interface (Micro USB)	22
2.5 Rechargeable battery	23
2.5.1 Battery status	23
2.5.2 Charging the rechargeable battery	24
2.6 Onboard sensor system	25
2.6.1 Stroboscope	25
2.6.2 RFID reader module	25
2.6.3 Sensor for ambient light	26
2.7 Carrying pouch and shoulder strap	27
2.7.1 Adjusting strap length and hand straps	27
2.8 Transport case	28
2.8.1 Case lock	29
3 - Operation	31
3.1 Operation	32
3.1.1 Touch functions	32

3.2 Display and operating elements	33
3.2.1 Context line	33
3.2.2 Status bar	34
3.2.3 Display field	35
3.3 Device settings	40
3.3.1 WiFi	40
3.3.2 Bluetooth	41
3.3.3 Date & time	41
3.3.4 Units	43
3.3.5 Sensor	44
3.3.6 Display	45
3.3.7 Route settings	46
3.3.8 Language & keyboard	48
3.3.9 MQTT broker	48
3.3.10 Power options	49
3.3.11 About VIBSCANNER 2	49
3.4 Bluetooth	50
3.4.1 Establishing a connection	50
3.4.2 Disconnecting	50
3.4.3 Deleting a BT source	51
3.4.4 Adjusting the volume	51
3.5 Text editor	53
3.5.1 Basic functions	53
3.5.2 Extended functions	53
3.6 Update	55
4 - Route	57
4.1 Preparation	59
4.2 Loading the route onto the measuring device	60
4.2.1 Transferring the route via OMNITREND Center	60
4.2.2 Transferring route via file system	61
4.2.3 Transferring a route via a USB pendrive	62
4.3 Measuring the route	63
4.3.1 Starting the route	63
4.3.2 Performing the measurement	64
4.4 Measurement tasks	67
4.4.1 Vibration measurement with rotational speed determination	67
4.4.2 Measurement on a production line	68
4.4.3 Manual input	69

4.4.4 Measurement with triaxial sensor	69
4.4.5 Temperature	70
4.5 Coded measurement locations	71
4.5.1 VIBCODE sensor for vibration measurement	71
4.5.2 VIBCODE sensor for measurement location detection	72
4.5.3 Non-contact detection or measurement locations (RFID)	72
4.5.4 Teaching in RFID transponder	73
4.6 RPM measurement using the stroboscope	75
4.6.1 Verifying/measuring rotational speed	75
4.7 Route options	78
4.7.1 Measurement status	78
4.7.2 Displaying measurement values	79
4.7.3 Remeasuring	80
4.7.4 Moving measurement into history	81
4.7.5 Deleting a measurement	82
4.7.6 Cleaning the route	83
4.7.7 Deleting route from the measuring device	84
4.7.8 Skipping a measurement	84
4.7.9 Documenting the event	84
4.7.10 Route status report	86
4.8 Transferring measurement data for analysis	90
4.8.1 Transferring measurement data via direct connection	90
4.8.2 Transferring measurement data via the file system	91
4.8.3 Transferring measurement data via a USB pendrive	91
4.8.4 Transferring measurement data via MQTT	93
5 - Appendix	87
5.1 Technical data	88
5.2 Upkeep and maintenance	91
5.2.1 Storage	91
5.2.2 Cleaning	91
5.2.3 Warranty	91
5.2.4 Spare parts, accessories	91
5.2.5 Checking the measuring accuracy	91
5.2.6 Disposal	92
5.3 Scaling of the results display	93
5.4 Machine speed finder	97
5.4.1 Function	97
5.4.2 Level of confidence	97

5.4.3 Limits	97
5.5 Kinematic Model	99
5.5.1 Reference speed	99
INDEX	101

1 - Introduction

This section provides information about the following topics:

1.1 Prior to starting	8
1.1.1 Notes regarding these instructions	8
1.2 Safety	10
1.2.1 General safety	10
1.2.2 Intended use	13
1.2.3 Conformity	13
1.3 Legal Notes	14

1.1 Prior to starting

On delivery, check the goods for damaged or missing parts. Note any possibly objectionable parts on the shipping documents and claim them with the forwarder or your local PRÜFTECHNIK sales partner.

Service addresses

Feel free to contact us in case of questions:

- Hotline: +49 89 99616-0
- Fax: +49 89 99616-300

1.1.1 Notes regarding these instructions

These operating instructions describe the measuring device VIBSCANNER 2 and its accessories. They contain important information regarding safe operation as well as information for proper and efficient use. They must therefore be read prior to startup and all other steps.

These instructions were created with due diligence. PRÜFTECHNIK does not guarantee the completeness, correctness and currency of the data presented here and is not liable for errors or omissions.

These instructions are a part of the product. As such, they must be kept throughout the product service life. These instructions must be handed over to any subsequent owner or user of the product.

These instructions were created based on German Standard DIN EN 82079-1.

Text markings

Texts are marked according to their function as follows in these instructions:

- ▶ **Action steps** are indented and marked with a filled circle • as bullet point.
- **List entries** are indented and marked with an empty circle ° as bullet point.

Individual **menu items** and **text elements** on the screen are in bold font and enclosed in square brackets, such as **[Delete]** or **[Units]**.

The individual menu items in **menu sequences** are separated by a greater-than sign: **[Settings > Units > Acceleration]**.

Warnings are marked with text frame highlighted in yellow:

**WARNING!**

If there is risk of severe to fatal **injuries**, the warning is started with a red warning triangle and signal word WARNING!

**CAUTION!**

If there is risk of minor to medium **injuries**, the warning is started with a yellow warning triangle and signal word CAUTION!

**ATTENTION!**

If there is risk of **property damage**, the warning is started with an information icon and signal word ATTENTION!

**Note**

General information and tips are marked with a text frame highlighted in gray and signal word **Note**

Abbreviations

The following designations are considered equivalent in these instructions:

- VIBSCANNER 2 = measuring device, device
- Sensors, cables, brackets = measuring equipment
- Device technology = measuring equipment and measuring device
- Bluetooth = BT

Screenshots

Screenshots are generally depicted in a **black & white scheme** ("Display" on page 17).

1.2 Safety

VIBSCANNER 2 is designed and built following a careful selection of the harmonized norms to be complied with as well as other technical specifications. The measuring device therefore corresponds to state of the art, and ensures the highest degree of safety.

Nevertheless, there are still risks relating to its operation which are to be avoided. Observe the general safety instructions in this section as well as the warnings embedded in the overall instructions. Safety instructions explain how you should act in order to protect yourself, others and objects from harm. The user of the measuring device shall be responsible for damage and injuries caused by nonobservance of these instructions.

1.2.1 General safety

In addition to the information in these operating instructions, observe the general, legal and other binding regulations for accident prevention and environmental protection.

These may be, for example:

- Handling hazardous substances
- Wearing the required and prescribed personal protective clothing and protective equipment
- Observe and follow all national and regional occupational health and safety regulations
- Observe and follow all internal occupational, operational and safety provisions

Residual hazards and protective measures

VIBSCANNER 2 is safe if used as intended. The following damage may occur if used improperly:

- Personal damage
- Damage to the device technology or the monitored machine

Risk of damage to the device

Incorrect use of the measuring device and its accessories may lead to damage and, in the worst case, to the destruction of the device technology.

- Use original spare parts and original accessories only.
- During operation, charging and storage, protect the measuring device from unusual external heat (intense sunlight, storage in heated car, direct vicinity to open flame or heating devices). The temperature ranges specified in the technical data must be observed.
- The measuring device meets protection class 65 and is not waterproof. Do not submerge the measuring device in liquids.

- In a loaded industrial environment, the measuring device may have its function impaired due to contamination or moisture. Make sure that the protective caps are attached properly to the measuring device.
- Damaged device technology may reduce the quality of measurement results and in the worst case falsify the quality. Handle the device technology carefully and protect it from strong vibrations. Use the transport case to transport and store the device technology.
- Repairs on the measuring device and the measuring equipment may be performed by authorized specialist personnel only.
- The device technology is maintenance-free. Opening the measuring device or the sensor system by the user is prohibited.
- Modifications and changes to the device technology are prohibited.
- Improper operation may damage the touch display. Do not use any scratching or sharp objects for operation. In addition to using your finger to operate the device, it is also appropriate to use standard touch pens or touchscreen gloves. Do not apply too much pressure to the touch display. Light tapping is usually sufficient.

Observe the following safety instructions when handling the **rechargeable battery** and the **power adapter**:

- Only charge the battery by using the power adapter supplied. Observe the accompanying operating manual.
- Do not discharge the battery too deeply (< 15%).
- Discharge the battery so that the remaining battery power is less than 60% if the device is to be sent by air freight.
- Do not send the device by airfreight if the battery is defective.

Risk of injuries

Improper use of the measuring device or defective equipment may pose a hazard to the user.

- You may only operate the device technology with proper training in its operation.
- Immediately shut down the measuring device and the sensors if malfunctions indicate that they are no longer working properly or if they exhibit visible damage.
- Faults, such as defective plugs or loose connections, must be corrected immediately. Damaged components must be replaced immediately.

Observe the following safety instructions when handling the **stroboscope**:

- The stroboscope generates very bright flashes of light. Do not look into the light source.
- Do not direct the light beam towards people.
- Do not concentrate or focus the light beam.

- The effects of light can trigger photosensitive epilepsy. Users with a neurological proclivity for epileptic seizures must not operate the stroboscope.
- Interference with active implants (e.g. pacemakers) cannot be ruled out. Wearers of active implants must not operate the stroboscope.
- Rotating components on the machine appear static in the flashing light of the stroboscope. Do not reach into the illuminated components

Observe the following safety instructions when using a **Bluetooth headset**:

- Before connecting the headphones, set the volume level on the measuring device and the headphones to a low level.
- Do not use the headphones if this may compromise work safety.

Dangers in industrial facilities!

Risk of fatal or severe injuries!

During measurements on the running machine, the device technology may be damaged on contact with moving machine parts (e.g., rotating shaft). Cables can wind up and drawn in. Danger due to fragments.

- Install the measuring equipment such that no contact with moving machine components may occur during the measurement. Contact the competent safety officer.
- Use the safety release cable between measuring device and sensor cable. This ensures that the sensor line is disconnected at the intended point in the case it is drawn on by rotating machine parts.
- If possible, always use the measuring device together with the carrying pouch and the carrying strap.
- The carrying strap is meant to secure the device from falling down inadvertently and is designed to be correspondingly sturdy. It can get stuck on protruding system components and cause severe injuries. Wear the measuring device so that the carrying strap cannot get caught and always pay attention to possible sources of danger, such as open waves or drive belts.

Risk of falling!

- Do not walk through the system while reading the screen or while operating the device.

Risk of injuries or measuring device damage!

You can injure yourself or damage the sensor system when capturing signals in areas that are not visible or that are poorly visible.

- Work so that your hands and the sensors are always in your visible range. If necessary, use a flashlight to illuminate the measurement locations.

Risk of incorrect measurements due to electromagnetic interference

High frequency radiation or electrostatic discharge in the vicinity of the measuring device and measuring equipment can lead to faulty measurements.

- Select a measurement site with low electromagnetic radiation exposure.

Data security

Risk of data loss!

- Back up the measurement data in the OMNITREND Center PC software after completion of data acquisition.
- Back up the data prior to resetting the measuring device to the factory settings.

Potentially explosive environment (Ex-zone)

Only intrinsically safe devices may be operated in the Ex-zone. Safety-related information for the intrinsically safe device can be found in the "VIBSCANNER 2 EX - Safety Instructions" document included in the delivery, item no. 0 0594 0247.

1.2.2 Intended use

The measuring device may only be used for the measurement of electrical signals in the industrial area taking into account the technical specification. Sensors and cables may only be used in the specified area. The currently applicable technical specification can be found in the Condition Monitoring catalog, which can be downloaded free of charge from the PRÜFTECHNIK homepage.

Any use beyond that is considered unintended and is not permissible. Faulty or impermissible use as well as nonobservance of the information in these instructions shall void the manufacturer's liability.

If the measuring device is used in a manner not intended by the manufacturer, device protection may be impacted.

1.2.3 Conformity

VIBSCANNER 2 complies with the relevant European directives. The complete Declaration of Conformity can be found at www.pruftechnik.com.

1.3 Legal Notes

User Information acc. to Sect.15.21:

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Compliance Statement acc. to Sect. 15.19:

This device complies with Part 15 of the FCC Rules and RSS Standards: Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Class B Statement Sect. 15.105 –)

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ▶ Reorient or relocate the receiving antenna.
- ▶ Increase the separation between the equipment and receiver.
- ▶ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ▶ Consult the dealer or an experienced radio/ TV technician for help.

2 - Description

This section provides information about the following topics:

2.1 Interfaces and operating elements	16
2.2 Display	17
2.2.1 Color scheme	17
2.2.2 Sleep mode	17
2.3 Operating keys	18
2.3.1 ON/OFF key	18
2.3.2 ENTER key	19
2.4 Connections	20
2.4.1 Analog IN	20
2.4.2 Charge socket	22
2.4.3 Data interface (Micro USB)	22
2.5 Rechargeable battery	23
2.5.1 Battery status	23
2.5.2 Charging the rechargeable battery	24
2.6 Onboard sensor system	25
2.6.1 Stroboscope	25
2.6.2 RFID reader module	25
2.6.3 Sensor for ambient light	26
2.7 Carrying pouch and shoulder strap	27
2.7.1 Adjusting strap length and hand straps	27
2.8 Transport case	28
2.8.1 Case lock	29

2.1 Interfaces and operating elements

The figures show the interfaces and operating elements on the measuring device.



#	Name	Function
1	Touch display	Graphical display and touch-sensitive user interface
2	Battery status display (LED)	Multi-color LED indicates the battery status when the display is switched off.
3	Sensor for ambient light	Automatic adjustment of the display brightness to the ambient light.
4	ENTER key	Operating key to start the measurement
5	Charge socket	Connection for power adapter.
6	Analog In	Connection for sensor.
7	ON/OFF button	Operating key to switch the measuring device ON and OFF; activating /deactivating sleep mode.
8	RFID reader module	Non-contact readout of RFID transponders.
9	Micro USB	Interface for data communication
10	Stroboscope	Flashlight source to verify the determined rotational speed.

2.2 Display

The display is the main display and operating element on the measuring device. It is touch-sensitive and is operated using touch functions ("Operation" on page 32).



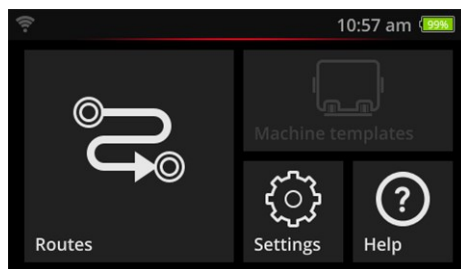
Note

On delivery, the display is protected with a transparent film. Remove this film prior to first startup.

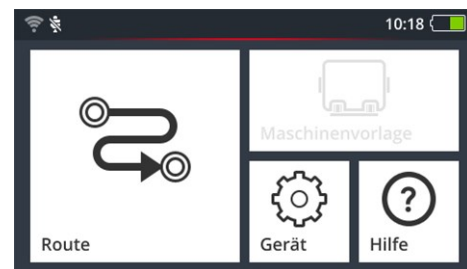
2.2.1 Color scheme

VIBSCANNER 2 offers two color schemes used to present the contents on the display. The "black & white" scheme is suitable for a dark environment. The "default" scheme with its bright background is ideal for a bright environment.

The color scheme is set in the device settings: **[Settings > Display > Color scheme]**.



Black & white



Default

2.2.2 Sleep mode

In sleep mode, the display switches off and the processor consumes less energy. The LED below the display lights up indicating the battery status and signals the user that the device is ready for operation.

The device **automatically** enters sleep mode if it is not operated within a certain period of time. The period is set in the device settings: **[Settings > Power options > Sleep]**.

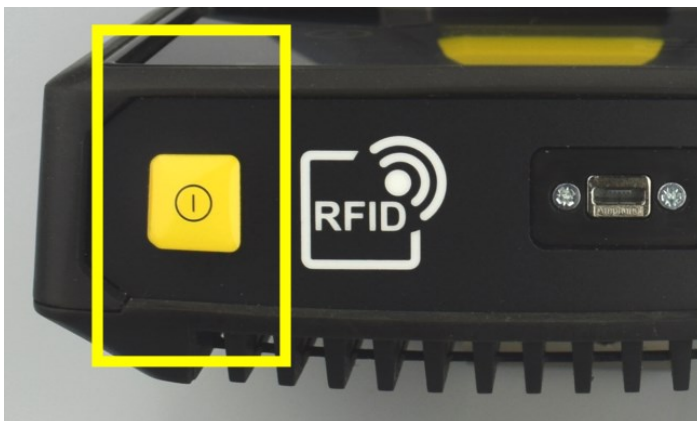
To force the device into sleep mode **manually**, briefly press the ON/OFF key until the display switches off.


In order to exit sleep mode, press the ON/OFF or the ENTER key.

2.3 Operating keys

VIBSCANNER 2 has two yellow operating keys: the ON/OFF key on the front side and the ENTER key below the display.

2.3.1 ON/OFF key



- ▶ **Switching on:** Press the ON/OFF key until the battery status LED lights up.
- ▶ **Switching off:** Press the ON/OFF key then tap  in the context line.



ATTENTION!

VIBSCANNER 2 cannot be switched on anymore at temperatures above 70 °C (158 °F). Observe the permissible temperature range for operation ("Technical data" on page 88).

Automatic switch-off

VIBSCANNER 2 switches off automatically if not operated within a certain period of time. The period is set in the device settings: [**Settings > Power options > Power off**].

Activating sleep mode manually

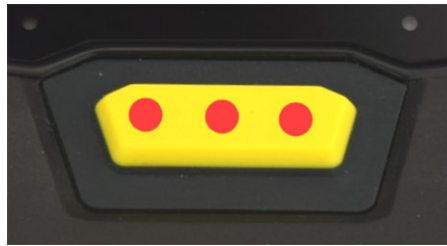
Press the ON/OFF key, until the display switches off ("Sleep mode" on page 17).

Forced switch-off

If VIBSCANNER 2 locks up / freezes, press the ON/OFF key, until the display switches off (approx. 5 seconds). Switch on the device again.


2.3.2 ENTER key

The ENTER key is used to start a measurement or to confirm a selection. Three pressure points simplify left- or right-handed operation using the thumb.



The ENTER key features three pressure points



The **OK**  element in the context line can also be confirmed with the ENTER key.

2.4 Connections

VIBSCANNER 2 features an analog measuring channel, a charge connection, and an interface for data exchange via USB. All connections are protected against humidity and contamination using flexible cover caps.



Charge socket (left) and multipole analog measuring channel (analog IN, right) at the bottom of the device.



Micro USB connection for data exchange.

2.4.1 Analog IN

The analog measuring channel is used to connect vibration sensors. A specifically tagged multipole sensor cable is available for every sensor type (e.g., CLD, IEPE, triaxial, etc.).



WARNING!

Severe injuries due to drawing in of the sensor cable possible during measurements on a running machine. A predetermined breaking point in the cable length triggers when the cable connection to the measuring device is drawn in.

Always use the provided **safety release cable** between measuring device and sensor cable.



ATTENTION!

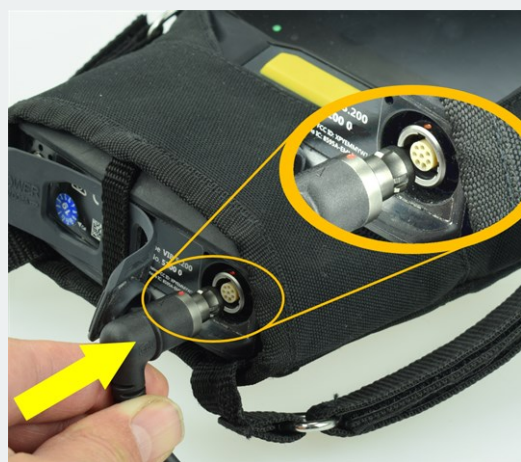
Damage to the measuring device possible due to loading of signals outside the specification.

Only connect signal sources to the analog measuring channel, whose output signals are within the specification ("Technical data" on page 88).

Connecting the cable

All cables used with VIBSCANNER 2 are protected against polarity reversal. A red dot mark on the plug is used to align it to the socket.

Connect the safety release cable to the VIBSCANNER 2



Connect the sensor cable



Disconnect the cable



Note

The plug has **no** mechanical locking mechanism.

2.4.2 Charge socket

The power adapter is connected to the measuring device using the charge socket. Using the power adapter, you can either charge the rechargeable battery or operate the measuring device with main power.



ATTENTION!

Measuring device or rechargeable battery can be damaged. Only use the enclosed power adapter for operating the measuring device and/or charging the rechargeable battery. Observe the enclosed safety information regarding the power adapter.

Connect the charger to the charger socket and to an outlet

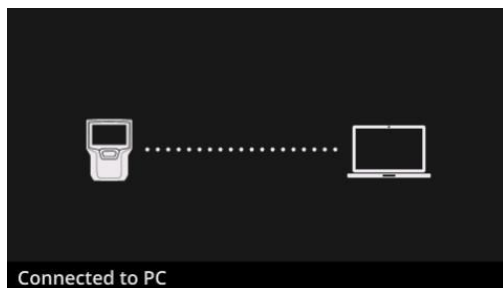


Note

The power adapter features international plug adapters for all common power sockets. Replace them as needed. Observe the enclosed safety operating instructions for the power adapter.

2.4.3 Data interface (Micro USB)

The supplied micro USB cable is used for data exchange with a PC. VIBSCANNER 2 switches automatically into data communication mode, as soon as the USB cable is connected.



VIBSCANNER 2 is connected with a PC via USB interface.

2.5 Rechargeable battery

VIBSCANNER 2 is supplied by a rechargeable lithium-ion battery, which is installed in the device during the entire service life. With a fully charged rechargeable battery, the operating time is typically 12 hours in continuous measuring operation.

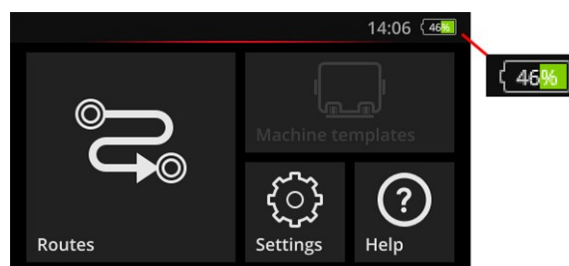
2.5.1 Battery status

The battery status is shown on the display using a colored battery icon. The remaining battery power is displayed as percentage value. This option can be activated in the device settings: **[Settings > Power options > Show battery percentage]**.

The display is switched off in **sleep mode**. The remaining battery power is then indicated by a **slowly** pulsating LED below the display. If the battery charge drops below a certain level, the measuring device switches off automatically. This ensures that the data and settings saved on the device remain preserved.



LED battery status indicator in sleep mode.



Battery status indicator with the display switched on.

Battery status and LED color in sleep mode			
Charge	0 ...14%	15...29%	30...100%
LED	Red	Orange	Green



Note

The battery status indicator flashes if the battery power drops below 10 %. The lower the battery power, the faster the flashing rate.

2.5.2 Charging the rechargeable battery

VIBSCANNER 2 is shipped with a partially charged rechargeable battery. If the rechargeable battery is discharged during transport or due to device use, recharge it by using the included power adapter ("Charge socket" on page 22).



ATTENTION!

Observe the following information to preserve the service life of the rechargeable battery.

Charge the battery if the remaining battery power drops below 15% of full capacity or if the charge status display lights up red.

Note the permissible temperature range for charging: +10 .. +40 °C [50 .. 104 °F].

If the measuring device is not used for an extended period of time, check the battery status regularly and charge the rechargeable battery as needed.



Tip

Always charge the rechargeable battery on the evening prior to the measurement day.

Regarding the charging process

- Do not perform any measurements using VIBSCANNER 2 during the charging process.
- The back of the device can heat up slightly during charging.
- The power adapter can remain connected to the measuring device after charging completion.
- Charging takes typically 5 hours with the device switched off and a fully depleted battery (charging temperature: 25 °C [77 °F]). The higher the ambient temperature, the longer the charging process.

Battery status display (LED)

The battery status display indicates the following states when charging:

State	Error*	Charging process	Battery is charged
LED color	Red	Red Orange Green.	Green
LED pulse rate	Very fast	Fast	Lights up continuously

* e.g., ambient temperature too high / too low

2.6 Onboard sensor system

The following sensors for data acquisition are installed in VIBSCANNER 2.

2.6.1 Stroboscope

Using the stroboscope, you can verify the rotational speed calculated from the vibration measurement. The measuring principle is based on the stroboscopic effect using the persistence of vision of the human eye. If the rotating shaft appears static in the flashing light, the rotational frequency of the shaft corresponds to the flashing frequency of the stroboscope.

The flashing frequency can be controlled using the touch display. The verified speed can be copied into the measurement data record and used as reference for further kinematic calculations on the machine ("RPM measurement using the stroboscope" on page 75).



CAUTION!

Risk of damage to the eyes! Do not look into the light source if the stroboscope is in operation.



Verifying rotational speed with the stroboscope.

2.6.2 RFID reader module

Using the RFID reader module, the coding of a measurement location equipped with a PRÜFTECHNIK transponder can be read. With that, VIBSCANNER 2 reliably detects every measurement location and always performs the intended measurement task at the proper measurement location.

RFID technology works with electromagnetic waves and is designed for short distances between transponder and reader. The RFID reader module on VIBSCANNER 2 is installed on the front end and marked with an RFID logo. Hold the measuring device as close as

possible to the transponder (approx. 2-3 cm) to record the measurement location coding ("Non-contact detection or measurement locations (RFID)" on page 72).



Identifying measurement locations using RFID technology (ISO 14443a and ISO 15693).

2.6.3 Sensor for ambient light

This sensor increases ease of operation and reduces power consumption at the same time by automatically adjusting the display brightness relative to the ambient light. Both inlet openings are located below the display area and must remain unobstructed if possible.

The sensor function can be switched on and off in the device settings: [**Settings > Display > Automatic brightness**].



Two inlet openings for ambient light sensor.

2.7 Carrying pouch and shoulder strap

A tailor-made carrying pouch ensures high comfort and offers safe transport protection. The durable woven fabric is robust and dirt-repellent and offers a safe and comfortable grip even with heavy protective gloves. A matching shoulder strap as well as two hand straps offer even more carrying comfort on extended routes.

2.7.1 Adjusting strap length and hand straps

The hand straps can be adjusted via Velcro fastener to a safe grip position. The strap length can be adjusted to the correct length using the buckles and the two Velcro fasteners on the neck strap.

The shoulder strap is fastened to the carrying pouch using snap hooks. The three eyelets to each on the right and left side allow custom attachment and a comfortable working posture.



VIBSCANNER 2 in the carrying pouch with shoulder strap and two hand straps.



Shoulder strap and hand straps can be adjusted for left- or right-handed operation.



ATTENTION!

When carrying the device using either the hand straps or the shoulder straps, the device display must face the operator. This ensures that cooling requirements and radio transmission requirements are met. In addition, the display remains protected.

2.8 Transport case

The entire device technology is stowed and protected against contamination and damage in a robust transport case. Thanks to an automatic pressure compensation valve the case is suitable for air travel. The case can be safely locked using the enclosed TSA lock.



ATTENTION!

Damage to the device technology possible. Use the transport case to transport and store the device technology. Avoid extreme mechanical impacts as they may occur in the case of falls from great heights.

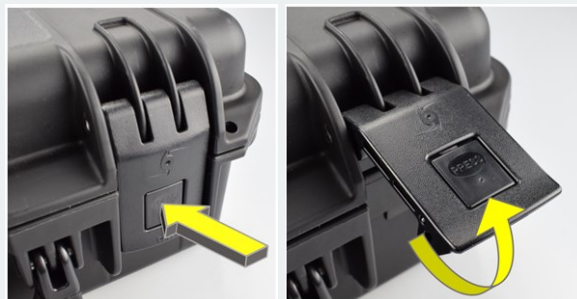


The transport case has two locks that can be unlocked by the push of a button.



The device technology is stowed in custom-made milled compartments. Additional measuring equipment can be stowed behind the covering in the lid of the case.

Opening the case



Procedure

- ▶ Press and hold the unlock buttons.
- ▶ Lift the latches.





2.8.1 Case lock

The case can be locked using the enclosed TSA combination lock. The factory-set combination is “000”. Change this combination prior to first use.



VIBSCANNER 2 Transport case with TSA combination lock.

Opening the TSA lock	Procedure
	<ul style="list-style-type: none">▶ Set the correct combination.▶ Move the shackle into the large opening.
	<ul style="list-style-type: none">▶ Pull out the bracket.

Changing the combination	Procedure
	<ul style="list-style-type: none"> ▶ Set the current combination. Factory setting: "000 "
	<ul style="list-style-type: none"> ▶ Push in the adjusting screw using a suitable flathead screwdriver. ▶ Turn the adjusting screw 90° counterclockwise.
	<ul style="list-style-type: none"> ▶ Set a new combination
	<ul style="list-style-type: none"> ▶ Return the adjusting screw into the original position.

3 - Operation








This section provides information about the following topics:

3.1 Operation	32
3.1.1 Touch functions	32
3.2 Display and operating elements	33
3.2.1 Context line	33
3.2.2 Status bar	34
3.2.3 Display field	35
3.3 Device settings	40
3.3.1 WiFi	40
3.3.2 Bluetooth	41
3.3.3 Date & time	41
3.3.4 Units	43
3.3.5 Sensor	44
3.3.6 Display	45
3.3.7 Route settings	46
3.3.8 Language & keyboard	48
3.3.9 MQTT broker	48
3.3.10 Power options	49
3.3.11 About VIBSCANNER 2	49
3.4 Bluetooth	50
3.4.1 Establishing a connection	50
3.4.2 Disconnecting	50
3.4.3 Deleting a BT source	51
3.4.4 Adjusting the volume	51
3.5 Text editor	53
3.5.1 Basic functions	53
3.5.2 Extended functions	53
3.6 Update	55

3.1 Operation

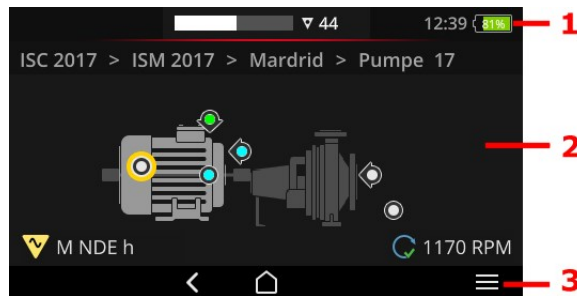
A large part of the operation is realized via touchscreen. The basic operation will be explained in greater detail below.

3.1.1 Touch functions

Icon	Function	Name	Description
	Tap	Simple tap	Execution of a standard action in all sections
	Double Tap	Double tap	Zooming into graphical objects by factor 2. A new double tap returns to the original view.
	Long Press	Long pressing (also “touching and holding”).	Long press on a route, machine, measurement location opens the context menu.
	Swipe	Horizontal scrolling.	Positioning of objects moving texts and switching of slide controls.
	Scroll	Vertical scrolling.	Positioning of objects and browsing in larger lists.
	Pinch	Move two fingers together or apart.	Increase or decrease the graphical display area.
	Rotate	Circular movement comparable with a knob.	Setting of measurement parameters, e.g. the flashing frequency on the stroboscope

3.2 Display and operating elements

The screen is divided into **three** functional areas with information and operating elements. The following overviews explain their functions and operation.











- 1: Status bar
- 2: Display area
- 3: Context line

3.2.1 Context line

The context-dependent elements for navigation and operation can be found at the bottom of the screen. Operation is by simple tap.

The following overview explains the basic elements in the **context line (3)**.

Element	Name	Function
	HOME	Returns to the startup screen.
	BACK	Returns to the previous screen.
	MENU	Opens a context-dependent menu (context menu).
	CLOSE	Hides the menu again.
	OK	Applies the selection/input and closes the screen.
	CANCEL	Cancels the selection/input and closes the screen.
	POWER OFF	VIBSCANNER 2 powers off.
	SCREENSHOT	Saves screen as a *.png file.













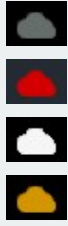
Note

Elements underlined in yellow can also be triggered with the ENTER key ("ENTER key" on page 19).

3.2.2 Status bar

The general status indicators can be found on the top of the screen. Operation in the **status bar (1)** is limited to the ROUTE STATUS element. All other elements are for information only.







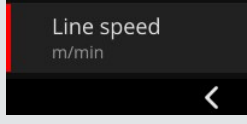


Element	Name	Function
	RECHARGEABLE BATTERY	Battery status: the remaining battery power is shown using a color segment. The percentage value can be indicated as an option.
	TIME	Time set on the measuring device.
	ROUTE STATUS	Graphical and numerical information about the number of measurement locations , machine trains still remaining and the estimated measurement duration . Numerical values can be queried by tapping on the icons in the bar.
	MEASUREMENT LOCATION STATUS	Graphical information about the measurement status at the current measurement location. Colors green, yellow, and red indicate a threshold violation. Blue indicates that no irregularities exist. The left bar shows historical measurements. The right bar presents the current measurement data record, including the appended measurement.
	TEACH IN	Mode for teaching in the RFID tag of a measurement location is active (teach-in).
	RFID	RFID reader module switched on; route contains the measurement locations with RFID transponder.
	SENSOR TYPE DETECTION OFF	Automatic sensor type detection is switched off and the default sensor is activated.
	DEFAULT SENSOR	Default sensor and automatic sensor type detection are activated.
	WiFi	WiFi connection is established. Signal strength: Number of white bars
	Bluetooth (BT) on	White: BT module active, no connection / Blue: BT module active, connection established

Element	Name	Function
	MQTT	<p>Data transfer via MQTT broker is active, icon color indicates the status:</p> <p>Gray: No connection to the broker, no data for transfer pending</p> <p>Red: No connection to the broker; there is still data for transfer pending</p> <p>White: Connected to the broker, no data transfer</p> <p>Orange: Connected to the broker and data transfer active</p>

3.2.3 Display field

Application-related information can be found as graphic or text in the **display field (2)**. User guidance in Route mode is intuitive using machine screens. Operation is possible via touch functions and using the ENTER key.

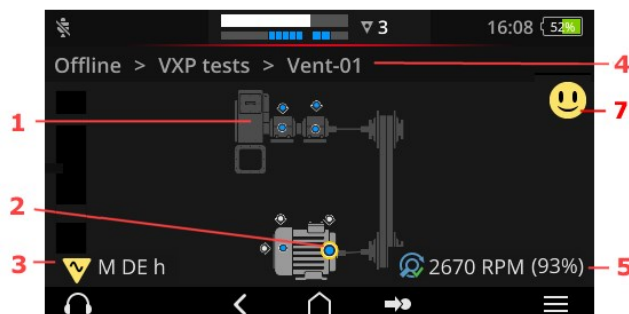
Default operating elements

Element	Name	Function	Operation
	Continuous slide control	Selection between minimum and maximum	
	Two-stage slide control	Activation/deactivation of the stored function	
	Option	<p>Selection of an entry from a pre-defined list.</p> <p>A filled circle marks the selection.</p>	
	Menu entry	<p>Active (white font): Open sub-menu, activate function.</p> <p>Inactive (gray font): Information for the user.</p> <hr/> <p>Route mode: Pressing and holding opens the context menu.</p>	 

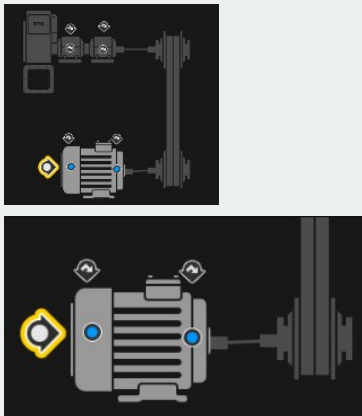




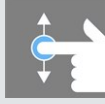
The following overviews familiarize you with the **specific** screen elements in **Route mode**.





Machine image view


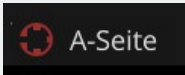

The machine image view is the main screen in route mode. The following elements are relevant in the display field:

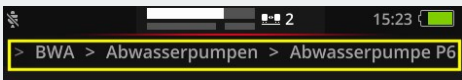






- 1: Machine image
- 2: Measurement location icon
- 3: Measurement location information
- 4: Navigation path
- 5: Speed information
- 7: Smiley (evaluation, results display)







1: Machine image	Operation	
	<ul style="list-style-type: none"> Select the first unmeasured measurement location on the machine. 	
	<ul style="list-style-type: none"> Zoom into the machine image by a factor of 2 and center it (double tap) 	
	<ul style="list-style-type: none"> Zoom in/zoom out the machine image continuously. 	
	<ul style="list-style-type: none"> Move the display area. 	 
<ul style="list-style-type: none"> Realistic presentation of the machine configuration and measurement location layout on the machine. 		



2: Measurement location icon	Operation	
	<ul style="list-style-type: none"> Select measurement location Start measurement Stop measurement 	
	<ul style="list-style-type: none"> Open context menu 	
<ul style="list-style-type: none"> Visualization of the measurement location position as well as the axis on the machine. Active measurement location is marked yellow and presented in enlarged view. The reference measurement location is marked with . Optional: The color in the measurement location icon indicates the status of the last measurement: blue = OK, green = prewarning, yellow = warning, red = alarm. Optional: Overall status of the machine train as smiley icon 		

3: Measurement location info	Operation	
 	<ul style="list-style-type: none"> Open measurement location information 	
<ul style="list-style-type: none"> Sub-menu with information about installation location, sensor, events. Icon indicates the measurement type and/or sensor type, e.g., vibration, VIBCODE, etc. 		

4: Navigation path	Operation	
	<ul style="list-style-type: none"> Navigate to a certain element in the path. 	
	<ul style="list-style-type: none"> Move non-visible path elements into the display field. 	
<ul style="list-style-type: none"> Display and navigation element in Route mode. 		

5: Speed information	Operation	
 2989 1/min (93%)	<ul style="list-style-type: none"> To call speed values one by one: <ul style="list-style-type: none"> Expected speed value (OMNITREND Center). Determined speed value (machine speed finder) Measured speed value (stroboscope, input) 	
<ul style="list-style-type: none"> Display element for the speed value at the active measurement location. 		




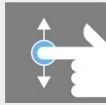
Icons	
	Machine speed finder activated. Expected speed is displayed.
	Machine speed finder activated. Determined speed is displayed. Reliability is displayed in percent (%).
	Speed is measured. The stroboscope is used for measurement or the measurement is entered.
	Measurement location with line speed indicated. Appears in the machine train list only.
	Speed value is specified or calculated via the kinematic model. Machine speed finder is inactive at this measurement location.
	Fault, reference measurement location is missing or kinematic model is invalid.

7: Smiley	Operation	
	<ul style="list-style-type: none"> Display measurement results¹ for the entire machine train: Bar chart visualizes the current reading and, if relevant, the set limit values. 	
<ul style="list-style-type: none"> Display element for evaluation of the measurements on the entire machine train. 		

¹overall values

Route menu

The Route menu is a selection list with all routes available on the measuring device. The menu appears, when **[Route]** is tapped on the startup screen.

Route menu	Operation
	Open route. 
	Open context menu. 
	Scroll through menu. 

The following information is displayed:

Column	Meaning
Route	Name of route.
Done	Number of measured measurement locations/total number of measurement locations.
Due	Number of machine trains due for measurement.



Note

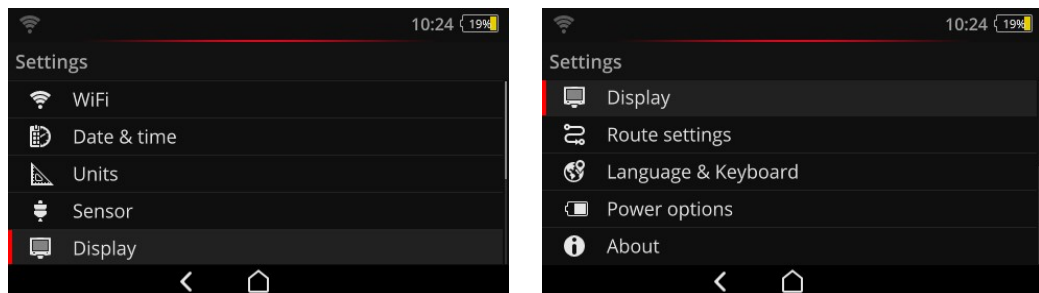
The entries in the Route menu can be sorted. For this purpose, tap the respective column title to sort the entries in ascending or descending order.

Example: If you would like to sort the routes alphabetically from A to Z, tap "Route" once. Tap again on the column title to sort the routes from Z to A.

3.3 Device settings

Check the settings and adjust them as needed within the scope of startup and measurement preparation.

- ▶ Tap on **[Settings]** on the startup screen. The **[Settings]** menu appears.
- ▶ Tap on one of the functions described below.



The device settings can be found in the **[Settings]** menu.

3.3.1 WiFi

This function is intended for wireless communication in the following applications:

- Transfer of the measurement data to a MQTT broker.
- Visualization and simulation of device operation together with the VIBSCANNER 2 demo program¹.

Switching on WiFi

- ▶ Activate the WiFi function using the slide control.
 - VIBSCANNER 2 scans the environment for networks in the environment and lists them.
 - Password-protected networks are marked with a lock icon.
 - The WiFi symbol appears in the status line; the signal strength is determined by the number of white bars.
- ▶ Tap on a network to connect VIBSCANNER 2 with the network.
- ▶ Enter the network password as needed.

¹only available for authorized PRUFTECHNIK specialist personnel

**Notes**


VIBSCANNER 2 remembers the networks it previously connected to. If one of these networks is within range, the device connects automatically. If it remembers several networks, the device connects to the network that appears first in the list.

Switch off the WiFi function if you do not need it. This saves energy.

Displaying network information

- ▶ Tap on the network name, **after** the device connected to the network. A menu appears with the connection information.

Deleting network from network list

- ▶ To delete the network from the list, tap on  in the context line.

**Note**

The networks appears again in the list, if you switch the WiFi function off and on again. You may have to re-enter the access password to connect.

3.3.2 Bluetooth

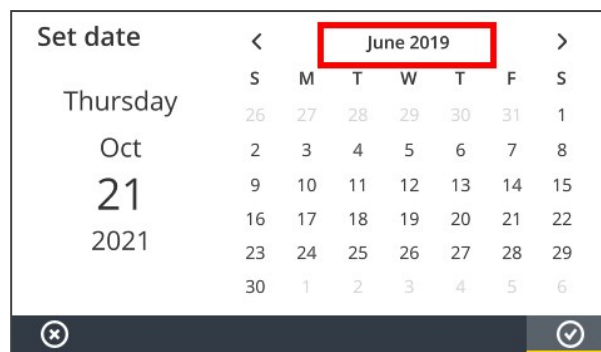
Here you can establish a VIBSCANNER 2 wireless connection to BT headphones. Further details about establishing the connection can be found in the section entitled "Bluetooth" on page 50

3.3.3 Date & time


The current settings for date and time are indicated under the respective menu items. To change the settings, proceed as follows:

Setting the date

- ▶ Tap on **[Set date]**. A calendar sheet view appears in which the set date is marked.
- ▶ If necessary, tap on the current date.
- ▶ If the **Month** and/or **Year** are to be changed, carry out the following selection steps:
 - ▶ To select a different **Month**, tap on **Month Year** in the calendar sheet view at the top of the screen (in this example: June 2019):

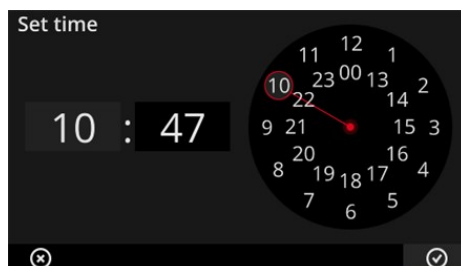


The **Month overview** appears.

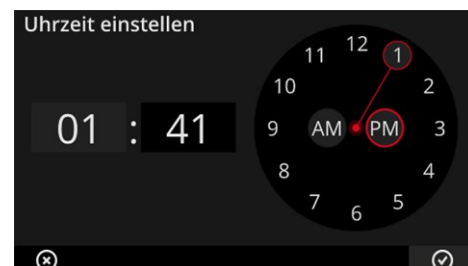
- ▶ Tap on the desired month, and then on the current day in the calendar sheet.
- ▶ To select a different **Year**, tap on the year displayed in the month overview. The **Year overview** appears.
- ▶ Tap the desired year, and then the month and the current day in the calendar sheet.
- ▶ Click  to apply the settings.

Setting the time


- ▶ Tap on **[Set time]**. A clock face appears showing the hours and/or minutes.



Clock face with hours in 24-hour format.



Watch face with hours in 12-hour format.

- ▶ Tap on the current **hour**. The watch face switches automatically to minute presentation.
- ▶ Set the **minutes** by rotating the minute hand on the watch face.
- ▶ Click  to apply the settings.




Notes


If the time is set in **12-hour format**, select the current half of the day first before setting the hour: **[AM]** or **[PM]**.

To manually switch between the watch faces, tap on the respective number field (hours/minutes) in the **digital display**.

Setting the time zone

- ▶ Tap on **[Time zone]**. A list with the times zones worldwide appears.
- ▶ Select your time zone.
- ▶ Click  to apply the settings.

Date format


- ▶ Tap on **[Date format]**. A list with the available date formats appears.
- ▶ Select the desired date format (e.g. dd.mm.yyyy).
- ▶ Click  to apply the settings.

24-hour format


- ▶ Activate the **[Use 24-hour format]** option as needed.

3.3.4 Units

VIBSCANNER 2 can be set to the **metric** system of units or to the system with **imperial** units of measure.

- ▶ Tap on **[System]**. A sub-menu appears.
- ▶ Select to system of units for all metrics: **[Metric]** or **[Imperial]**.
- ▶ Click  to apply the settings.

You can also set the system of units **individually** for every measured value:

- ▶ Tap on the respective measured value, e.g. **[Acceleration]**.
- ▶ Select the desired unit, e.g. **[m/s²]**.
- ▶ Click  to apply the settings.




Notes

If you set metric and imperial units (e.g., “m/s²” for acceleration and “F” for temperature), entry **[Custom]** appears under the **[System]** menu item.

Two units are possible for measured value **[Acceleration]** in imperial units of measure: **[inch/s²]** or **[g]**. Adjust the setting individually as needed.

Decimal places

Set the number of decimal places for the current units as follows:

- ▶ Tap on the respective measured value, e.g. **[Acceleration]**.
- ▶ Tap on the **[Plus]** or **[Minus]** button, until the desired number is reached.
- ▶ Click  to apply the settings.

3.3.5 Sensor

When transferring a route to the measuring device, a suitable sensor is assigned to every measurement task. This sensor meets the prerequisites required for data acquisition using VIBSCANNER 2 and is thus expected as sensor in the measurement chain on measurement start.

In practice however, it may occur that the intended sensor is not available and that the measurement must be performed with another sensor with comparable properties. In this case, define the used sensor as default sensor for all vibration measurements.

VIBSCANNER 2 monitors the measurement chain for cable and sensor breakage. If the sensor cable or sensor is not connected, a fault message occurs. This function is always active.

In addition, another function checks, whether the intended sensor or a comparable sensor type is connected. This function is optional and can be deactivated as needed. If sensor type detection is deactivated, a default sensor must be provided.

Defining the available sensors

VIBSCANNER 2 has all PRÜFTECHNIK vibration sensors stored. You can reduce this selection to the sensors actually available to you for a better overview.

- ▶ Tap on **[Available sensors]**. A sub-menu with all stored vibration sensors appears. The sensors are identified by their article number (VIB 6.xyz) and/or brand name (VIBCODE).
- ▶ Activate the sensors available to you in the list.

Pressing and holding a sensor opens the context menu with the following options:

- **[Show details]**: Displays the parameters for PRÜFTECHNIK sensors.
- **[Delete sensor]**: Deletes sensor created by the user.
- **[Edit details]**: Displays and edits the parameters for sensors created by a user.
- **[Add sensor]**: Creates a new sensor.

To create a **new sensor**, proceed as follows:


- ▶ Tap on **[MENU]** in the context line.
- ▶ Tap on **[Add sensor]**. A sub-menu appears.
- ▶ Enter the required sensor parameters:
 - **[Sensor name]**: arbitrary label
 - **[Sensor type]**: IEPE (ICP) /Linedrive / voltage
 - **[Quantity]**: acceleration
 - **[Offset]**: sensor offset, numerical value
 - **[Sensitivity]**: sensor sensitivity numerical value
 - **[Linear from ... to]**: Range of linearity, interval limits
 - **[Resonance Frequency]**: sensor resonant frequency numerical value

- ▶ Next, tap on BACK to return into the **[Available sensors]** menu. The newly created sensor is automatically added to the list of available sensors.
- ▶ Tap on BACK to return into the **[Sensor]** menu.

Using the default sensor

In the **[Sensor]** menu, the currently set default sensor is indicated under **[Default sensor]**. If this function seems to be deactivated: **[Select default accelerometer]**.

To activate the function or to select a different sensor, proceed as follows:


- ▶ Tap on **[Default sensor]**. A sub-menu appears.
- ▶ Activate the **[Use default sensor]** option as needed.
- ▶ Select the desired sensor from the sensor list.
- ▶ Click  to apply the settings.




Notes

The set default sensor is only accepted for measurement tasks compatible with the sensor type. For example, the VIBCODE sensor can only be used for measurements at tagged measurement locations.

The set default sensor is not valid for measurement locations with permanently installed sensors.

If the default sensor is activated,  appears in the status bar.

Sensor type detection

The current status of this function is indicated in the status bar. If sensor type detection is switched off,  appears.

- ▶ If you would like to switch off sensor detection, deactivate the **[Sensor detection]** option.



Note

If sensor detection is deactivated, a default sensor is required. VIBSCANNER 2 prompts for the selection of a default sensor on deactivation of this function.

3.3.6 Display

Display background and brightness are set in this menu:

- **[Color scheme]**: Default or Black & white can be selected
- **[Automatic brightness]**: Brightness is adjusted to the ambient light.

- Controlling **[Brightness]**: The brightness can be adjusted continuously using the slide control. Even if automatic brightness is selected, the brightness can be re-adjusted manually.





3.3.7 Route settings

Using this menu, the functions available for data acquisition can be set.

Machine train evaluation

Here you define the sequenced for data acquisition on a machine train. The following functions can be selected:

- **Machine train evaluation**: The current measurements on the machine train can be evaluated using a smiley icon. If all measurements are within the specified limit values, a **friendly** smiley appears. If a limit value is exceeded, one of the three icons listed below is displayed for **conspicuous** measurements. Activate this function as needed.

	At least one measurement is irregular		
			
Everything OK (blue)	Prewarning (green)	Warning (yellow), or Measurement deviations too high	Alarm (red)



Note:

The **Results display** is called up by tapping on the smiley icons. At this point, the current readings are shown in the form of a bar chart. If no limit values are specified, the OK icon appears to enable call-up of the results display.

- **[Results display (bar chart)]**: The results of the overall value measurements can be visualized in the form of a bar chart. In this menu, you can specify which parameters are to be shown in each case. The results display can be configured for the following overall value measurements:
 - Vibration acceleration
 - Vibration velocity
 - Vibration displacement
 - RPM
 - Manual input

If **no limit values** are defined, the **Scaling** for the bar charts is preset. An overview of all parameters can be found in the appendix ("Scaling of the results display" on page 93).

- **[Go to next machine train after...]**: The route sequence can be accelerated using this function. After completion of all measurements on a machine train, the program calls the next machine train automatically. Select the respective waiting time in the corresponding sub-menu. To deactivate this function, select the **[No]** option.
- **[Stay on measurement location on...]**: If a threshold violation occurs, switching to the next measurement location can be interrupted. In the sub-menu, select the threshold, when the program should stop at the machine train. To deactivate this function, select the **[No]** option.

Detail route guidances

Here you defined, how you should be guided to the first measurement location, when the route is started.

- **Activated**: You are guided through the entire navigation path of the route to the respective measurement location. Every step must be confirmed.
- **Deactivated**: The respective measurement location is called directly.

Machine speed finder

Machine speed finder is a function that determines the speed of the machine based on the measured vibration signal. The suggested speed value can be verified afterwards using a stroboscopic measurement.

Here you define, whether the speed should be determined at all measurement locations or at the reference measurement location only.

- **Activated**: The suggested speed value must be confirmed and possibly verified after every measurement.
- **Deactivated**: The speed is determined at the reference measurement location only and transferred to all measurement locations on the machine train via the stored kinematic model.



Note

Machine speed finder is only used if the following prerequisites are met:

- ▣ Machine train contains a reference RPM measurement.
- ▣ Several machine trains are configured as production line

Practical tip:

Activate machine speed finder for all measurement locations on the machine train, if the speed briefly fluctuates during data acquisition on the machine train.

Measurement locations status indicator


Here you can switch the status indicator for the active measurement location on and off.

- **Activated:** A bar display appears in the status bar. It allows the evaluation of historical and current measurement data per color scale ("Status bar" on page 34).
- **Deactivated:** The bar display is hidden.

3.3.8 Language & keyboard

The language settings in the device can be adjusted in this menu.

Setting the language

- ▶ Tap on **[Language]**. A sub-menu appears.
- ▶ Select a language from the list.
- ▶ Click  to apply the settings.




Note

The change is applied during runtime. The device must not be restarted.

Keyboards

Different input languages can be selected in the text editor by selecting several keyboard layouts. This function simplifies the input of multi-language texts.

Selecting keyboards

- ▶ Tap on **[Keyboard]**. A sub-menu appears.
- ▶ Activate the keyboard layout, you would like to use in the text editor.
- ▶ Click  to apply the settings.

3.3.9 MQTT broker

This menu allows you to configure and activate measurement data transfer via MQTT broker using the following functions:

- **IoT:** Activate data transfer; the connection status appears in the second line. Ensure that the WiFi function is switched on and that VIBSCANNER 2 is registered on a WiFi network.
- **Broker Type:** Select **PRUFTECHNIK**, if VIBSCANNER 2 is to transfer the measurement data to a PRUFTECHNIK broker. A PRUFTECHNIK broker is installed at the same time as **OMNITREND Asset View - OAV** is installed.
Select broker type **Standard** if the data is to be transferred to a broker of a third-party provider.

**Note**

Details of the payload data that is transferred to the two broker types can be obtained from PRUFTECHNIK TechSupport on request. Please contact **tech-support@pruftechnik.com**.

- ▶ **URL:** Enter the address and port of the MQTT broker here. Computer name or IPv4 address are possible. For encrypted transfer, use "https".
Example: https://123.123.123.123:1883
- ▶ **User name:** Enter the user name under which the measuring device is to log on to the broker. User name and password are stored during configuration of the broker. The broker is configured with the "OMNITREND IIoT Configuration" application.
- ▶ **Password:** Enter the appropriate password here.

3.3.10 Power options

The power consumption can be optimized in this menu. Here you set the time periods for activating sleep mode and automatic power off.

Sleep mode

In sleep mode, the display switches off and the processor consumes less energy. The device **automatically** enters sleep mode if it is not operated within a certain time period.

- ▶ Select the respective waiting time in the corresponding sub-menu.
- ▶ To deactivate this function, select the **[No]** option.

Power off

The device switches off automatically if it is not operated within a certain period of time.

- ▶ Select the respective waiting time in the corresponding sub-menu.
- ▶ To deactivate this function, select the **[No]** option.

Show battery percentage

The remaining battery power can be overlaid as percentage value in the battery icon.

- ▶ Activate this option as needed.

3.3.11 About VIBSCANNER 2

Using this menu, you can reset the device to the factory settings and change the device name. This name is displayed during communication (WiFi, USB).


Furthermore, license-related information, such as the following device information, is shown in this menu: Serial number, Storage space, free/total, Firmware version, Hardware version, Next calibration

3.4 Bluetooth

VIBSCANNER 2 features a Bluetooth (BT) module for wireless signal transmission at close range. Together with suitable¹ headphones you can monitor and evaluate the measured vibration signal directly at the machine on-site.


3.4.1 Establishing a connection

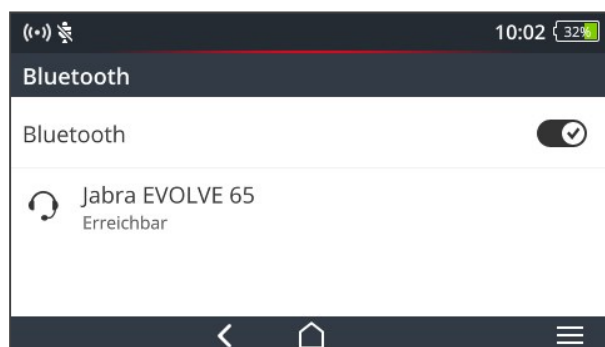
Proceed as follows to establish a connection between VIBSCANNER 2 and a set of BT headphones:


- ▶ Switch on VIBSCANNER 2.
- ▶ Tap on **Device** in the startup screen to open the device settings.
- ▶ Tap on **Bluetooth**. The Bluetooth menu appears.
- ▶ Activate the Bluetooth function by sliding the slide control into the right-hand position.  appears in the status bar.
- ▶ Switch on the headphones and activate pairing mode.




Details of this can be found in the documentation for the headphones.

- ▶ Tap on  in the context line and then on **[Update]** to display the active Bluetooth sources within range:




- ▶ Tap on the desired BT headphones in the list. The connection is established.  appears in the status bar as soon as there is a BT connection with the headphones.

3.4.2 Disconnecting

- ▶ Tap on  in the context line and then on **[Disconnect]** to interrupt the connection. The BT source is retained in the list.
- ▶ If the BT function is no longer required, deactivate it to save energy.

¹Recommendation: BT Standard 4.0 and higher; A2DP (Advanced Audio Distribution Profile)

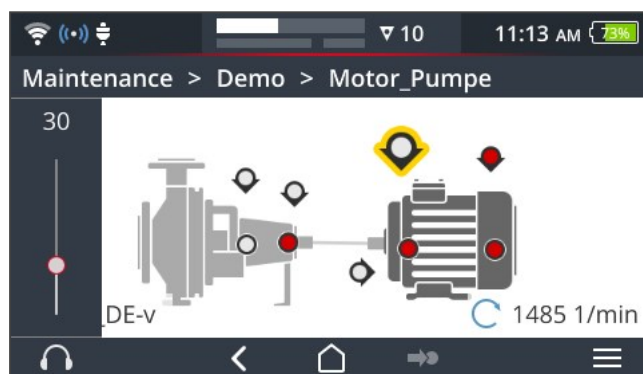
3.4.3 Deleting a BT source


- ▶ Mark the relevant BT source in the list.
- ▶ Tap on  in the context line and then on **[Delete]**.

3.4.4 Adjusting the volume

VIBSCANNER 2 amplifies the measured acceleration signal via the amplifiers at the analog input. This provides a greater dynamic range than volume adjustment on the headphones. In addition, the signals on different machines can be better compared because the volume is directly proportional to the signal level.

Volume adjustment is only available in the measurement screen:




- ▶ Tap (approx. 2 seconds) on the headphones icon . Volume adjustment appears on the left of the screen.
- ▶ Connect the sensor to the measurement location.



CAUTION!

Danger of **hearing damage** due to the volume being set too loud.

Before you put on the headphones, adjust the volume to a lower value (e.g. 30) if necessary.

- ▶ Put the headphones on. You should be able to hear the vibration signal.
- ▶ Adjust the **volume** to an appropriate listening level using the slide control.
- ▶ To **mute** the headphones, **briefly** tap on the headphones icon.  appears in the context line.

**Note**

The vibration signal is permanently output on the headphones as long as the measurement screen is displayed. The signal transmission to the headphones is not dependent on whether a measurement is in progress or whether a certain measurement location is selected.

Exceptions: For measurements with the VIBCODE sensor and measurements using multiplexers, the vibration signal can only be transmitted to the headphones if a measurement is in progress.

3.5 Text editor

The text editor appears if you must enter a text such as a comment:



3.5.1 Basic functions

- ▶ To enter a character using the overlaid keyboard, tap on the respective letter. A maximum of 144 characters can be entered. Multi-line inputs are not possible.
- ▶ To switch between upper and lower case, tap on the **[Shift key]**.
- ▶ To delete a character, tap on the **[Reset key]**. The character on the left of the cursor is deleted only.
- ▶ To enter numbers and special characters, overlay the special character keyboard as follows:
 - ▶ Tap on the **[&123]** key. If the character in question is not visible, overlay the second section of the keyboard.
 - ▶ For this purpose, tap on the **[1/2]** key.
 - ▶ To switch to the letter keyboard, tap on the **[ABC]** key.

3.5.2 Extended functions

Replacing text

Existing text is highlighted in blue on opening of the text editor (see above).

- ▶ Tap on the **[Reset key]** to delete the text.
- ▶ Enter the new text using the keyboard.


Text suggestions

The text editor offers predictive text. Similar terms appear underneath the input field during a text entry. They can be accepted by tapping.

Changing the input language

It can be switched between different input languages in the text editor, e.g., Chinese, Japanese, Russian, Polish. The available keyboard layouts can be defined in the device settings: **[Settings > Language & keyboard > Keyboard]**.

The current keyboard layout is indicated on the **[space bar]**.

- ▶ Tap on , until the desired layout appears. The previously selected keyboard layouts are displayed one by one:



Text editor with layout for **English**.



Text editor with layout for **German**.

3.6 Update

Technical enhancements and improvements of the firmware are loaded into the measuring device via an update. The current firmware software is available for download on the PRÜFTECHNIK homepage.

Preparations

- ▶ Back up any current measurement data prior to an update. Transfer the measurement data into the OMNITREND Center software ("Transferring measurement data for analysis" on page 90).
- ▶ If the battery status is less than 50 %, connect the power adapter on the measuring device to a power socket.
- ▶ Download the current firmware software from the PRÜFTECHNIK homepage. The file name contains the version number.
For example, version 1.10: **VSC2_v110.rom**

Procedure

- ▶ Switch on VIBSCANNER 2.
- ▶ Connect VIBSCANNER 2 to the PC, where you saved the current update. Use a commercially available USB cable with Micro USB connection.
- ▶ Open **Windows Explorer**.
- ▶ Click under **[Devices and drives]** on the connected VIBSCANNER 2. The two drives on the measuring device appear: **[Measurement Data]** and **[System Data]**.
- ▶ On the **[System Data]** drive, open the **[Update]** folder.
- ▶ Copy the update file (VSC2_vxxx.rom) from the PC into the VIBSCANNER folder **Update**.



- ▶ Disconnect VIBSCANNER 2 from the PC.



Note

The USB connection must not be logged out on the PC side.

- ▶ A prompt asking for the update time appears on the measuring device. Select one of the two following options:

- **Update now:** The update is performed immediately. The measuring device is restarted and the update process starts.
- **Update later:** The update is only performed, when the measuring device is switched on next.

**Note**

During the update process, the screen darkens for a few seconds, before the start sequence begins. Do not switch off the device in the meantime.

4 - Route

This section provides information about the following topics:

4.1 Preparation	59
4.2 Loading the route onto the measuring device	60
4.2.1 Transferring the route via OMNITREND Center	60
4.2.2 Transferring route via file system	61
4.2.3 Transferring a route via a USB pendrive	62
4.3 Measuring the route	63
4.3.1 Starting the route	63
4.3.2 Performing the measurement	64
4.4 Measurement tasks	67
4.4.1 Vibration measurement with rotational speed determination	67
4.4.2 Measurement on a production line	68
4.4.3 Manual input	69
4.4.4 Measurement with triaxial sensor	69
4.4.5 Temperature	70
4.5 Coded measurement locations	71
4.5.1 VIBCODE sensor for vibration measurement	71
4.5.2 VIBCODE sensor for measurement location detection	72
4.5.3 Non-contact detection or measurement locations (RFID)	72
4.5.4 Teaching in RFID transponder	73
4.6 RPM measurement using the stroboscope	75
4.6.1 Verifying/measuring rotational speed	75
4.7 Route options	78
4.7.1 Measurement status	78
4.7.2 Displaying measurement values	79
4.7.3 Remeasuring	80
4.7.4 Moving measurement into history	81
4.7.5 Deleting a measurement	82
4.7.6 Cleaning the route	83
4.7.7 Deleting route from the measuring device	84
4.7.8 Skipping a measurement	84
4.7.9 Documenting the event	84
4.7.10 Route status report	86
4.8 Transferring measurement data for analysis	90
4.8.1 Transferring measurement data via direct connection	90

4.8.2 Transferring measurement data via the file system	91
4.8.3 Transferring measurement data via a USB pendrive	91
4.8.4 Transferring measurement data via MQTT	93

4.1 Preparation

Controlling device technology

It is important to be familiar with the device technology and its functions to achieve optimal measurement results with VIBSCANNER 2.

- ▶ Familiarize yourself with the operation of the measuring device and the associated sensor system.

Knowing the route

- ▶ Make sure that the route to be measured is available on the measuring device.
- ▶ Familiarize yourself with the route. In particular, consider the following aspects:
 - What machines must be measured?
 - What system areas must be accessed?
 - Is special protective equipment required?
- ▶ Are measurements planned on a production line? Determine the line speed before accessing the machine on site. This parameter is often known in the control room.

Ensuring operational capability

- ▶ Before starting the measurement, ensure that
 - the device technology is operational and is not damaged,
 - the battery is charged ("Rechargeable battery" on page 23),
 - sufficient storage is available ("Furthermore, license-related information, such as the following device information, is shown in this menu: Serial number, Storage space, free/total, Firmware version, Hardware version, Next calibration" on page 49),
 - the required sensor system and accessories are available,
 - the sensor cable and safety release cable are connected correctly ("Connections" on page 20),
 - possible required adapters for coupling to the measurement location are mounted correctly on the sensor.

Also ensure that all important device settings have been set ("Device settings" on page 40).

4.2 Loading the route onto the measuring device

You must load the necessary information regarding the individual measurements onto the measuring device prior to starting data acquisition. This information is saved in a so-called route, which is created and managed using the OMNITREND Center PC software.

4.2.1 Transferring the route via OMNITREND Center

VIBSCANNER 2 and OMNITREND Center must communicate directly for this method.

Procedure

- ▶ Switch on VIBSCANNER 2.
- ▶ Connect VIBSCANNER 2 with the PC with OMNITREND Center installed. Use the enclosed USB cable with Micro USB connection.
- ▶ Start **OMNITREND Center**.



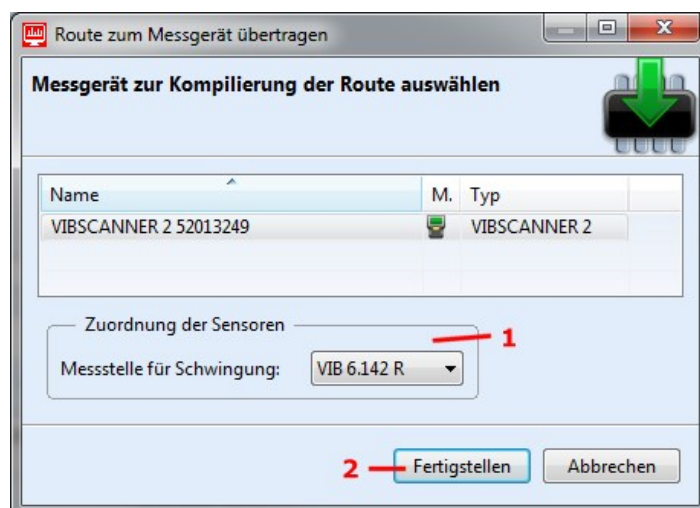
Note

The following steps describe the sequences in OMNITREND Center.

- ▶ Open the **[Communication perspective]**.
- ▶ Open the **[Routes]** view.



- ▶ Select database (1), which contains the route, in the local icon bar.
- ▶ Set the measuring device filter (2) to VIBSCANNER 2.
- ▶ Mark the route to be transferred.
- ▶ Click on **[Send Route to Device]** (4). A dialog window appears.



- ▶ Select the sensor intended for the vibration measurement locations in the **[Sensor assignment]** (1) field.
- ▶ Click on **[Finish]** (2). The route is compiled, checked for inconsistencies, and then transferred onto the measuring device.




Note

If the route already exists on the measuring device, an error message occurs and the route is not transferred. Delete the route from the measuring device and repeat the transfer.

4.2.2 Transferring route via file system

No direct communication between VIBSCANNER 2 and OMNITREND Center is required for this method. The route is exported as file first. The route file can be transferred onto VIBSCANNER 2 at a later point in time.

Exporting route to file system

- ▶ Open the **[Routes]** view in OMNITREND Center (see section above).
- ▶ Click on **[Export to file system]**  (3) in the local icon bar. A dialog window appears.
- ▶ Select the **[Folder]**, into which the route should be exported.
- ▶ Click on **[Finish]**. The route is compiled, checked for inconsistencies, and saved in the selected folder.

Loading route into VIBSCANNER 2

- ▶ Switch on VIBSCANNER 2.
- ▶ Connect VIBSCANNER 2 to the PC containing the route. Use the enclosed USB cable with Micro USB connection.
- ▶ Open **Windows Explorer**.

- ▶ Click under **[Devices and drives]** on the connected VIBSCANNER 2. The two drives on the measuring device appear: **[Measurement Data]** and **[System Data]**.
- ▶ On the **[Measurement Data]** drive, open the **[Routes]** folder.
- ▶ Copy the route file from the PC into the **Routes** folder.

4.2.3 Transferring a route via a USB pendrive

A direct connection to the OMNITREND Center or PC is not required for this method. The route file is stored on a standard USB pendrive and can be loaded onto the measuring device if necessary.



Notes

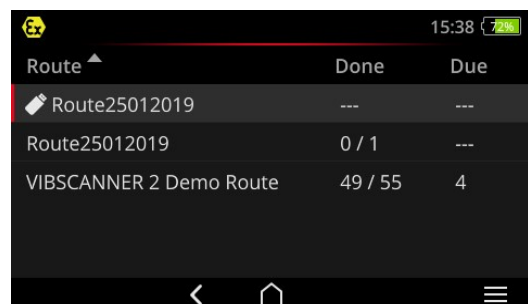
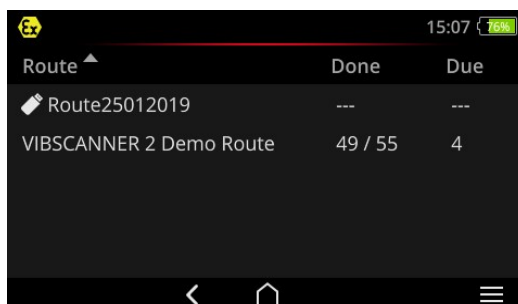
Specification for USB pendrive: USB 2.0; file system FAT or FAT32

Adapter: USB 2.0 OTG (micro-b plug / a-coupling)

The route file needs to be stored in the **\vibscanner** folder on the USB pendrive for the measuring device to detect and import the route.

Loading route into VIBSCANNER 2

- ▶ Switch on VIBSCANNER 2.
- ▶ Connect the USB pendrive to the USB port of the measuring device using a suitable connection cable.
- ▶ Tap on **[Route]** on the startup screen. The **Route menu** appears. The route on the USB pendrive is marked by a corresponding USB icon.
- ▶ Tap on the USB route to transfer it from the pendrive to the measuring device (see figure below on the right).
- ▶ Remove the USB pendrive from the measuring device.



4.3 Measuring the route



Data acquisition with VIBSCANNER 2 is intuitive and quick. Graphical elements simplify operation, intelligent algorithms and functions ensure an efficient sequence as well as transparent and reliable condition information.

The following sections show the typical sequence of a route as well as numerous options available for data acquisition.

4.3.1 Starting the route

The route is on the measuring device and can already contain historical measurement data from previous inspection runs.

Procedure

- ▶ Tap on **[Route]** on the startup screen. The **Route menu** appears ("Route menu" on page 39).
- ▶ Tap on the route to be measured. The **[Route summary ...]** screen appears. Here you can find all information for the selected route (see below).
- ▶ To start a route, execute one of the following two actions:
 - ▶ Tap on  if you would like to start the route at the **first** measurement location to be measured.
 - ▶ Tap on , if you would like to **continue** the route at the measurement location, where you exited the route.
Depending on the option set for route guidance, the program jumps directly to the respective measurement location or you are guided step-by-step to the location ("Detail route guidances" on page 47).
- ▶ Perform the measurements on the machine (see the sections below).

Route summary

Prior to starting a route, the following route information is displayed:

Entry	Meaning
Machine trains done	How many machine trains have already been measured /of total?
Machine trains in alarm/warning	Number of machine trains with an alarm/warning
Still to be measured:	Number of machine trains still to be measured.
Due to measure:	When must the route be measured next?
Last time measured:	When was the route measured last?

Entry	Meaning
Time to measure:	How long does it take to measure the route?
Time to finish:	How long does it take to measure the route at the current state?
Needed equipment:	Which sensor is required?
Database:	Name of database, where the route was created.
Database ID:	Database ID
Downloaded:	When was the route transferred onto the measuring device?

4.3.2 Performing the measurement

The point of origin for a measurement is the **machine image view** (" 1: Machine image" on page 36).



Note

Prior to a measurement, check which sensor is planned for the measurement as needed. This information can be found in the **[Measurement location information]** menu (" 3: Measurement location info" on page 37).

Vibration measurement

The procedure described below describes a vibration measurement using a mobile vibration sensor. Data acquisition with other measurement tasks and/or sensor types is described in the next sections.

Procedure

- ▶ Connect the sensor to the measuring device.



WARNING!

Severe injuries due to drawing in of the sensor cable possible during measurements on a running machine.

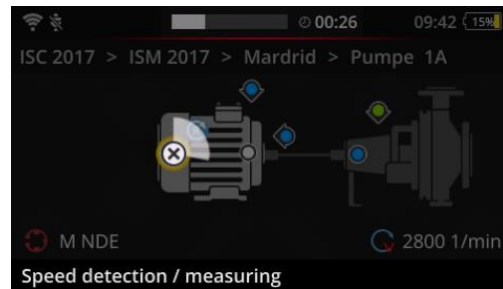
Use the **safety release cable** as predetermined breaking point between measuring device and sensor cable ("Analog IN" on page 20).

- ▶ Connect the sensor to the measurement location. Position and axis can be found in the machine image.
- ▶ Tap on the measurement location icon or press the Enter key to start the measurement.

**Note**

As long as you do not exit the route, you can execute all measurements on the route using the ENTER key.

- If you would like to stop the measurement during data acquisition, tap again on the measurement location icon.



The screen is darkened during the measurement.

An animated circle segment shows the measurement progress.

After measurement completion, the next measurement location on the machine is called automatically.

**Note**

Automatic switching is interrupted in the following cases:

- Route function [**Stay on measurement location on...**] is activated, and
- A threshold is exceeded, which triggers the interruption.

Tap on to switch to the next measurement location.

- Repeat the procedure for all other measurement locations on the machine train.
- Once all measurements on the machine train are completed, go to the next machine train.

The following scenarios are possible:

- **Automatic switch:** The next machine train is called automatically, if route function [**Go to next machine train after...**] is activated (, "Machine train evaluation" on page 46).
- **Manual switch:** Automatic switching is deactivated or suspended due to a threshold violation. Tap on to switch to the next machine train.
- **Route finished:** A summary appears:

**Note:**

The measurement locations can be processed in an arbitrary sequence. You can save a new measurement sequence for future inspection runs on the measuring device and apply it in OMNITREND Center when transferring the measurement data.

For this purpose, activate the **[Save as new measurement sequence]** option.

Activate the **Save route status report** option if you wish to save a corresponding report on the measuring device in PDF format (c.f. "Route status report" on page 86).









- After route completion, perform the following actions if required in the indicated order:
- Transfer the measurement data into the OMNITREND Center software ("Transferring measurement data for analysis" on page 90).
 - Move the route into history ("Moving measurement into history" on page 81).
 - Check the device technology. Clean as needed and stow in the transport case for the next inspection run.

Automatic data transfer via MQTT

If data transfer via MQTT broker is active, the VIBSCANNER 2 automatically sends the measurement data when all measurement tasks on the **machine train** are finished.

4.4 Measurement tasks

The measurement location information icon (" 3: Measurement location info" on page 37) indicates the measurement task to be measured at the active measurement location:

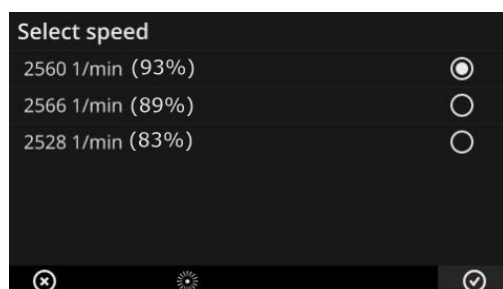
Icon	Measurement task
	Vibration measurement with vibration acceleration sensor. Determination of the rotational speed, when machine speed finder activated.
	Vibration measurement at a tagged measurement location with VIBCODE sensor. Determination of the rotational speed, when machine speed finder activated. ("Coded measurement locations" on page 71).
	RPM measurement (explicit) with the stroboscope or via manual input. Only at measurement locations, where no vibration measurement is planned.
	Manual input of process parameters and data from visual inspections.
	Vibration measurement using a triaxial vibration sensor.
	Measurement of the relative movement via the signal output on a protection system (vibration displacement or distance).
	Measurement of process parameters as vibration level (DC).
	Temperature via manual input.

4.4.1 Vibration measurement with rotational speed determination

VIBSCANNER 2 features a function which can be used to determine the rotational speed from the vibration signal ("Machine speed finder" on page 97).

Procedure



- The measurement is similar to a vibration measurement ("Vibration measurement" on page 64).
- The **[Select speed]** dialog window appears after measurement completion:



Machine speed finder determines three probable speed values from the vibration signal.

- ▶ Select the value with the highest probability (**level of confidence**).

- ▶ Execute one of the following actions:

- ▶ Tap  if you are sure that the value is correct.
- ▶ Tap  [**Strobe**] if you would like to verify the level of confidence using the stroboscope.



Note

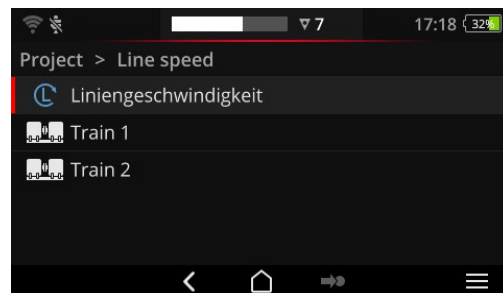
Details regarding the measurement using the stroboscope can be found in section "RPM measurement using the stroboscope" on page 75.

4.4.2 Measurement on a production line

Line speed is an important parameter in production lines. Based on this value, the rotational speed can be calculated at every measurement location if the kinematic conditions within the production line are known.


Thus, the line speed must be known before starting a route.

- If you reach a production line on a route, the following screen appears:



The measurement task for the line speed is contained in the **machine train list**.

The respective value must be entered before starting the measurements.

- ▶ Tap on the measurement task for the line speed . The number editor appears.
- ▶ Enter the line speed. Observe the permissible interval limits.



Note

You must enter the line speed again, if you exit the route and resume it.

4.4.3 Manual input

Process parameters read on a display element or results of visual inspections must be entered manually.

- ▶ Execute one of the following actions:
 - ▶ Enter a numerical value via a numeric keyboard. Observe the permissible interval limits.
 - ▶ In the case of visual inspections, select the respective result from the list.

- ▶ Tap on **OK** in the context line to accept the inputs.



Notes

If several measurement tasks are defined at the measurement location, scroll with **>** to the next measurement task.

A visual inspection can also be created under the **Location** hierarchy. The respective measurement task appears then in the machine train list.

4.4.4 Measurement with triaxial sensor

The following measuring equipment is provided for vibration measurements on 3 axes:

- **Triaxial sensor**, VIB 6.655, and sensor cable for triaxial sensor, VIB 5.237.
- **Hybrid triaxial sensor** including sensor cable, VIB 6.221



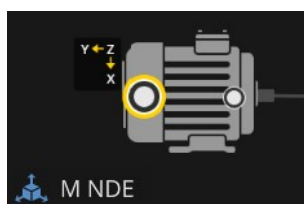
Note

During configuration of the route in the OMNITREND Center, ensure that the **axial** axis is set as follows:

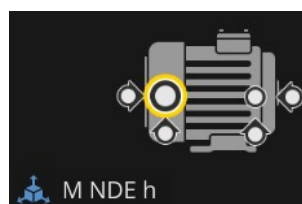
- Triaxial sensor VIB 6.655: **Y-axis**
- Hybrid triaxial sensor VIB 6.221: **X-axis**.

Triax measurement location for 1-axis sensor

If you would like to perform the measurement using an 1-axis sensor, activate the default sensor function and enter the available sensor. The Triax measurement location is divided into three equivalent measurement locations:



Triax measurement location for Triax sensor (e.g. VIB 6.655). The specified axis orientation is to be observed in relation to sensor installation.



Triax measurement divided for 1-axis sensor. The axes are orthogonal:
h: horizontal / a: axial / v: vertical

4.4.5 Temperature

The temperature cannot be directly recorded. It must be entered manually.

- ▶ Measure the temperature using a suitable sensor
- ▶ Enter the temperature value in VIBSCANNER 2.

4.5 Coded measurement locations

The device detects coded measurement locations reliably based on their individual identification code and automatically calls the intended measurement tasks.

4.5.1 VIBCODE sensor for vibration measurement

A measurement with the VIBCODE sensor starts automatically, as soon as the sensor is connected to the tagged measurement location. Compliance with a certain sequence during processing of the measurement locations is not required.



ATTENTION!

The VIBCODE sensor may be damaged in the case of improper use. Observe the operating notes in the VIBCODE operating instructions (VIB 9.834.G).

Prerequisite

- VIBCODE measurement locations are contained in the route.
- The VIBCODE sensor is configured as sensor for measurements at VIBCODE measurement locations.

Procedure

- ▶ Open the route. The [Route summary ...] screen appears.
- ▶ Connect the VIBCODE sensor to the device and the VIBCODE measurement location. The VIBCODE sensor reads the code of the measurement location and starts the intended measurement task.
- ▶ Disconnect the VIBCODE sensor after the measurement.
- ▶ Connect the VIBCODE sensor to the next VIBCODE measurement location.
- ▶ Repeat the procedure for all other VIBCODE measurement locations.



Connect the VIBCODE sensor to the VIBCODE measurement location.

4.5.2 VIBCODE sensor for measurement location detection

The actual measurement takes place at a different, usually **permanently installed** measurement location using a different vibration sensor. This measurement location can be accessed directly or via a cable interface at the location of VIBCODE detection.

Prerequisite

- The respective measurement location is configured in the OMNITREND Center software with a permanently installed sensor (e.g., VIB 6.122 R).

Procedure

- ▶ Open the route.
- ▶ Connect the VIBCODE sensor to the device and the VIBCODE measurement location. The measuring program reads the code of the measurement location. However, it does not start the measurement automatically.
- ▶ Disconnect the VIBCODE from the device.
- ▶ Connect the vibration sensor to the device and the measurement location.
- ▶ Start the measurement using the ENTER key.

4.5.3 Non-contact detection or measurement locations (RFID)

Measurement locations that are equipped with a PRÜFTECHNIK transponder, are detected automatically by VIBSCANNER 2, as soon as the RFID reader is held into the reception range of the transponder.

The transponder code must first be taught to VIBSCANNER 2. Teach-in can be performed before or during a route (see next section).



Note

In practice, the RFID method is used for identifying the machine train. For this purpose, the first measurement location on the machine train is equipped with a RFID transponder. Then, the individual measurement locations on the machine train are processed as usual using the graphical route guidance.

PRÜFTECHNIK transponders are available as accessories
- **non-EX version:** 25 pcs, art. no.: ALI 50.628-25

Prerequisite

- The measurement locations are equipped with PRÜFTECHNIK transponders.
- Transponder code has already been taught.

Procedure

- ▶ Open the route.
- ▶ Hold the measuring device with the front end into the close range of the transponder (approx. 2-3 cm). VIBSCANNER 2 reads the code and activates the respective measurement location in the machine image view.
- ▶ Connect the sensor to the device and the measurement location.
- ▶ Start the measurement.



The RFID reader captures the code of the transponder without contact.

4.5.4 Teaching in RFID transponder


Unlike the VIBCODE method, the code is not configured in the OMNITREND Center software for the RFID method.


Read the transponder directly on site and transfer the code together with the recorded measurement data to the OMNITREND Center software.

Prerequisite

- The measurement locations are equipped with PRÜFTECHNIK transponders.
- The route with the RFID measurement locations is available in VIBSCANNER 2.

Procedure

- ▶ Open the Route menu.
- ▶ Tap and hold on the route, until the context menu appears.
- ▶ Tap on **[Teach in]**. The teach in mode is activated. The  icon appears in the status bar.
- ▶ Go to every measurement location equipped with an RFID transponder.
- ▶ Navigate to the respective measurement location on the route.
- ▶ Tap on the measurement location icon to activate it.
- ▶ Hold the device to the transponder. The **[Assign RFID tag]** dialog window appears.

- ▶ Confirm the code assignment.
- ▶ Perform the intended measurement task at the measurement location as needed.
- ▶ Repeat the procedure for all other RFID measurement locations.
- ▶ Tap  to exit the teach in mode and open the startup screen.
- ▶ Transfer the route to the OMNITREND Center software.

4.6 RPM measurement using the stroboscope



WARNING!

Severe or fatal injuries possible. Rotating components on the machine appear static in the flashing light of the stroboscope. Do not reach into the illuminated components.



CAUTION!

Risk of damage to the eyes! Do not look into the light source if the stroboscope is in operation.



Point stroboscope onto the rotating component.
Adjust the flashing frequency using the adjuster wheel on the screen.



4.6.1 Verifying/measuring rotational speed

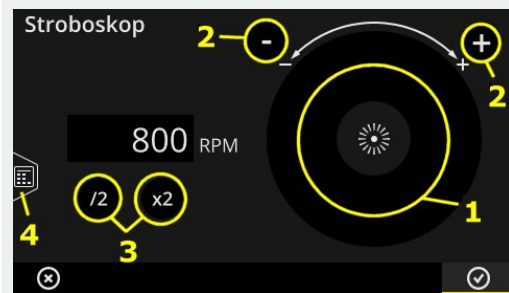


The RPM measurement using the stroboscope is possible in the following situations:

- Verification of the determined speed. This takes place usually after a vibration measurement with the machine speed finder activated.
- Speed measurement at a vibration measurement location.
- Speed measurement at a speed measurement location.

Procedure

- ▶ Point the measuring device with the stroboscope onto the rotating component.
Pay attention to a sufficient safety clearance and good illumination.

- ▶ Execute one of the following actions:
 - To **verify** the determined speed:
 - ▶ Tap  [**Strobe**] in the context line.
 - To **measure** the speed at the vibration measurement location:
 - ▶ Tap  [**MENU**] in the context line.
 - ▶ Tap [**Strobe / Speed**].
 - To **measure** the speed at the speed measurement location:
 - ▶ Tap on the measurement location icon or press the Enter key.
- ▶ The stroboscope switches on. The flashing frequency corresponds to the frequency of the selected speed (e.g. 1200 rpm = 20 Hz). The screen for **setting the flashing frequency** appears:

Flashing frequency adjustment	Operation	
	1: Change frequency continuously.	
	2: Change frequency by ± 1 Hz (cpm).	
	3: Halve/double the frequency.	
	4: Enter speed manually.	

- ▶ Adjust the flashing frequency such that the illuminated objects appear static. Alternatively, the speed can also be entered manually in the number editor (4).
- ▶ Click on **OK** to apply the adjusted frequency as speed value.



Notes

Objects suitable for stroboscopic measurements: Fan blades, coupling screws, measurement marks on the shaft.

If several identical objects pass by the stroboscope during a revolution (e.g., coupling screws), make sure that the still does not “flicker”. Only if the still is absolutely static and sharp, the flashing frequency corresponds to a full revolution and/or an integer multiple of it.

Example: In the case of coupling screws, the different position of the screw heads causes flickering. The flashing frequency only corresponds to a multiple of the spacing, different screws are illuminated, whose screw heads are tightened at different positions. The still flickers and is blurred.

Tip: The accuracy of the stroboscope frequency can be improved using the decimal places setting for the “RPM (1/min)” measured value [**Settings > Units > Machine speed**].

4.7 Route options

This section provides information about the following topics:

4.7.1 Measurement status	78
4.7.2 Displaying measurement values	79
4.7.3 Remeasuring	80
4.7.4 Moving measurement into history	81
4.7.5 Deleting a measurement	82
4.7.6 Cleaning the route	83
4.7.7 Deleting route from the measuring device	84
4.7.8 Skipping a measurement	84
4.7.9 Documenting the event	84
4.7.10 Route status report	86

4.7.1 Measurement status

After a measurement, VIBSCANNER 2 shows the status of the results as follows:

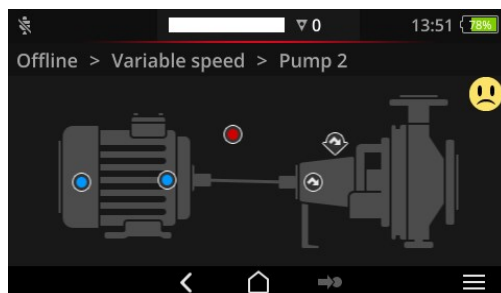
On the measurement location:



The measurement location icon changes the color (red, yellow, green), when a measurement task exceeded a threshold. Measurement locations with a blue icon are normal.

On the machine train

A smiley indicates the measurement status on the machine train.

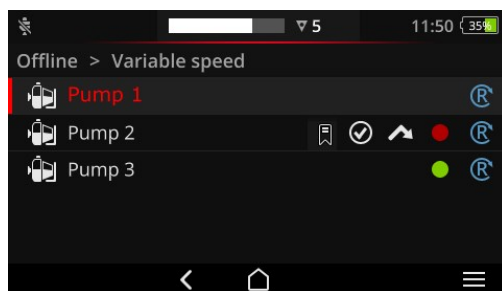


The most critical status is considered as criterion for the smiley (in the example: alarm).

This function can be activated in the device settings: **[Settings > Route settings > Machine train evaluation]**.


On the site or at higher levels


Hierarchies via a machine train are presented in a list. The measurement status is shown using icons:



 : Bookmark (event)

 : finished

 : skipped

 : exceeds threshold (red, yellow, green)

 : contains baseline measurement

 : contains line speed

Entries in **red font** are due for measurement.

4.7.2 Displaying measurement values

VIBSCANNER 2 can display the results of **overall readings**¹-Measurements on a machine train graphically as a bar chart. This gives you the option of comparing current measurement data, directly on-site, with previous measurements and any limit values that may be set.

Prerequisites

The following options need to be activated or configured in the device settings:

- ▶ Activate the **Machine train evaluation** option:
[Device > Route settings > Machine train evaluation > ON].
- ▶ Configure the **Results display (bar chart)** option:
[Device > Route settings > Machine train evaluation > Results display (bar chart)]

Further details can be found in the section entitled "Machine train evaluation" on page 46

Opening the results display

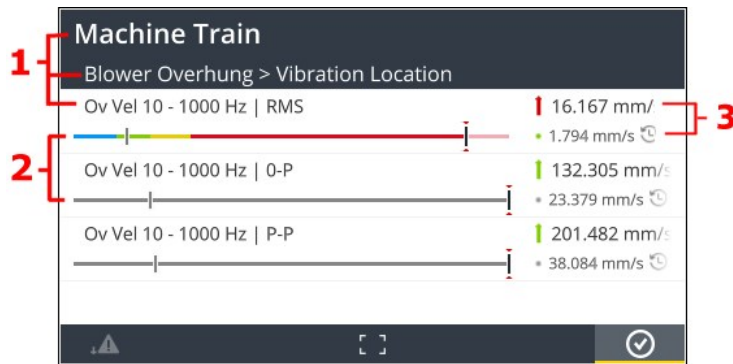
Following completion of all measurement tasks on a machine train, a smiley or an OK icon appears in the top right of the screen.





Note: Measurement tasks at omitted measurement locations are also regarded as completed.





- ▶ Tap on the smiley/OK icon. The results display appears:

¹broad band, narrow band, RPM, manual input



#	Description
1	Information about the machine train, machine, measurement location, measurement task
2	Visualization of the current () and the last historical () measurement value using level marks. Limit value ranges are marked in color. Grey or white bars indicate that no limit values have been stored. Pre-defined rules apply to the scaling of bar charts ("Scaling of the results display" on page 93).
3	Current measurement value (top) and last historical measurement value (bottom) in numerical values. A preceding color circle indicates the limit value range in which the measurement value lies.

With regard to **Operation**, the following elements are available in the **Context line**:



	Sort measurement tasks according to exceedance of the limit value. If no limit values have been exceeded, the highest measurement value appears in first position.
	Sort measurement tasks according to sequence in the machine tree.
	Full screen view. Return to standard view by means of a double-tap.
	OK. Close the results display.

4.7.3 Remeasuring

You can repeat a measurement during a route at any time.

Procedure

- ▶ Connect the sensor to the measuring device and the measurement location.
- ▶ Navigate to the respective machine.
- ▶ Activate the measurement location on the machine image.

- ▶ Start the measurement by tapping on the active measurement location icon or using the ENTER key. A dialog window appears prompting you to save the measurement data.
- ▶ Execute one of the following two actions:
 - ▶ Tap on **[Append]**  to append the current measurement to the previous measurement.
 - ▶ Tap on **[Overwrite]**  to overwrite the previous measurement with the current measurement.

After measurement completion, the next measurement location on the machine is called.



Notes

The **measurement location status** in the status bar is updated accordingly ("Status bar" on page 34).

A repeat measurement has no influence on the **historical** measurement data record.

4.7.4 Moving measurement into history

Historical measurement data contains the results of older inspection runs. They are stored on the device for comparison with current measurements. When transferring the measurement data to OMNITREND Center software, historical measurement data is included as well.

Measurement data can be moved into the history manually at different hierarchy levels (route, machine train, measurement location).

Move measurements into the history in the following cases:

- **After** a route is finished and the measurement data transferred for analysis to OMNITREND Center.
- **Before** newly starting a route.
- **During** a route, when an individual machine train should be measured under changed operating conditions.

Procedure

- ▶ Navigate to the screen, where you would like to move elements into the history:
 - **Machine image view** for measurement data at a measurement location
 - **Machine train list** for measurement data on a machine train
 - **Route menu** for measurement data on a route
- ▶ Mark the element, whose measurement data you would like to move into history (e.g., route).

- ▶ Open the context menu (“tap and hold” the element).
- ▶ Tap on **[Unmeasured]**.
- ▶ Confirm the security prompt. The current measurement data record is moved into the historical measurement data record.



Notes

When moving into the history at the route or machine train level, all lower-level elements are included.

All status information regarding threshold violations is deleted in the machine image view (color in measurement location icon, smiley).



The **measurement location status** in the status bar is updated accordingly.

Current measurement data record = last measurement + appended measurement(s).

4.7.5 Deleting a measurement

Current measurement data can be deleted from different hierarchy levels (route, machine train, measurement data). For this purpose, proceed as follows:

Procedure

- ▶ Navigate to the screen, where you would like to delete elements (see the section above).
- ▶ Mark the element with measurement data (e.g., route).
- ▶ Open the context menu.
- ▶ Tap on **[Delete]**. A dialog window appears for deletion of the results.
- ▶ Execute one of the following two actions:
 - ▶ Tap on **[Delete last]**  to delete the last result from the current data record.
 - ▶ Tap on **[Delete all]**  to delete all results from the current data record.



Notes

Historical measurement data **cannot** be deleted with this option. For this purpose, use the **Clean Route** option..

When deleting at the route or machine train level, all lower-level elements are included.

4.7.6 Cleaning the route

Delete the historical measurement data from the route if you no longer require such data.


Procedure

- ▶ Open the Route menu.
- ▶ Tap and hold on the route until the context menu appears.
- ▶ Tap on **[Clean]**. The **Clean route** menu appears:





- The first line specifies the **Time period** in which the historical measurement data is stored.
- The second line indicates the **Storage space** that was released as a result of the cleanup.

Carry out the following procedure to clean the measurement data based on a **Time period**:

- ▶ Use the slide control to set the time interval in which you wish to retain the historical measurement data.
- ▶ Move the control to the left of the scale to delete all of the historical measurement data.
- ▶ Click  to apply the settings.

Carry out the following procedure to clean the measurement data based on a **Quantity** of measurement data records:

- ▶ Tap on  on the left of the screen.
- ▶ Set the slide control to the number of past measurement data records you wish to retain (e.g. "...the last 2 measurements..").
- ▶ Move the control to the right of the scale to delete all of the historical measurement data.
- ▶ Click  to apply the settings.

4.7.7 Deleting route from the measuring device

Delete a route from the measuring device, if you do not need it anymore or must free up storage space.


Procedure

- ▶ Open the Route menu.
- ▶ Tap and hold on the route, until the context menu appears.
- ▶ Tap on **[Delete]**.
- ▶ Confirm the security prompt. The route is deleted from the measuring device.

4.7.8 Skipping a measurement

If a machine is not operational, you can skip all measurements on the respective machine. The machine is still considered finished.

Procedure

- ▶ Mark the element you would like to skip (e.g., measurement location).
- ▶ Open the context menu.
- ▶ Tap on **[Skip]**. The element is marked with the skip icon .



Notes

When skipping at the location or machine train level, all lower-level elements are included that have not been measured yet.

You can add skipped elements again to route guidance. For this purpose, select the **[Unskip]** option in the context menu or tap on the measurement location icon to directly start the measurement.

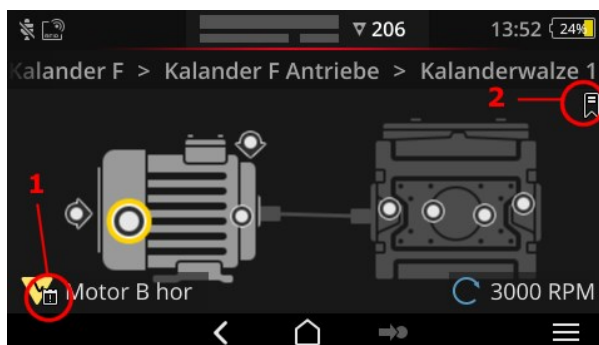
4.7.9 Documenting the event

Additional information about special events can be documented with every measurement during data acquisition. Beyond that, the device stores measuring irregularities, such as event incomplete, frequency band not in measuring range, etc.

Documenting event at a measurement location

- ▶ Mark the respective measurement location in the machine image view.
- ▶ Open the context menu.
- ▶ Tap on **[Event & comment]**. A menu appears, where the following event lists can be selected:
 - **[PRÜFTECHNIK standard]**
 - **[Recent events]**.

- ▶ If events have already been documented, call the event lists as follows:
 - ▶ Open the context menu.
 - ▶ Tap on **[Add event]**.
- ▶ Tap on an **event list**. A menu appears, where recently used events or the categories of PRÜFTECHNIK events are listed – depending on the previous selection.
- ▶ Tap on the event category as needed (e.g. **[Anti-friction bearing problem]**).
- ▶ Tap on the respective event in the list (e.g. **[Anti-friction bearing replaced]**).
- ▶ Tap on **← BACK** in the context line to return to the machine image view. Now, the measurement location information icon contains an event mark (1).



Event (1) and bookmark (2) in the machine image view.

Documenting event on a machine train (bookmark)

Events that are not documented at the measurement location level, are referred to as **[Bookmark]**.

Procedure

- ▶ Navigate to the element, a bookmark should be created for (e.g., machine train).
- ▶ Open the context menu.
- ▶ Tap on **[Bookmark]**. A menu with the event lists appears (see the section above).
- ▶ Follow the procedures in the section above. A bookmark icon (2) signals that an event is documented for the respective route element.

Displaying event

If an event is documented at a measurement location or a higher-level element (machine train, location, etc.), this is indicated by the overlaid event icon (see section above).

Procedure

- ▶ Open the context menu.
- ▶ Tap on **[Event & comment]** resp. **[Bookmark]**. The documented event is displayed.



Note

For measurement locations, the documented event can also be reviewed in the **measurement location information** ("3: Measurement location info" on page 37).

Deleting event

Procedure

- ▶ Open the context menu.
- ▶ Tap on **[Event & comment]** resp. **[Bookmark]**. The documented event is displayed.
- ▶ Tap on the event you would like to delete. The event is marked with a red bar on the left side of the screen.
- ▶ Open the context menu.
- ▶ Tap on **[Delete event]**.
- ▶ Confirm the security prompt to delete the event.

Entering a comment

A comment containing e.g. additional explanations can be entered for every event.

Procedure

- ▶ Open the context menu.
- ▶ Tap on **[Event & comment]** or **[Bookmark]**. The documented event is displayed.
- ▶ Tap on the event you would like to enter a comment for.
- ▶ Open the context menu.
- ▶ Tap on **[Edit comment]**. The text editor appears.
- ▶ Enter the comment in the text editor ("Text editor" on page 53).



Notes


The maximum text length is 144 characters.

4.7.10 Route status report

A route status report allows you to document the current measurements in a clearly arranged report.

Create report

- ▶ Tap on **[Route]** on the startup screen. The **Route menu** appears.
- ▶ Carry out one of the two following actions:
 - ▶ If you wish to document the entire route, tap on the relevant **Route** and keep your finger on the screen until the context menu appears.

- ▶ If you wish to limit the report to a **Location** or to a **Machine train**, navigate to the appropriate element in the hierarchy and tap  to open the context menu.
- ▶ Tap on **[PDF Report]** in the context menu. The report is created and stored on the measuring device as a PDF file. If a **USB pendrive¹** is connected, VIBSCANNER 2 automatically saves the report on the **USB pendrive²**.

Downloading a report from the measuring device

- ▶ Switch on VIBSCANNER 2.
- ▶ Connect VIBSCANNER 2 to the PC. Use the enclosed USB cable with Micro USB connection.
- ▶ Open **Windows Explorer**.
- ▶ Click under **[Devices and drives]** on the connected VIBSCANNER 2. The two drives on the measuring device appear: **[Measurement Data]** and **[System Data]**.
- ▶ On the **[Measurement Data]** drive, open the **[Reports]** folder. The reports are stored as a PDF file.
- ▶ Copy the report file from the VIBSCANNER 2 to the PC.

Report contents

The route status report contains information about the measuring device and the documented route **(1)**.

In the main table, each machine train can be uniquely identified by its path in the route hierarchy **(2)**. A line contains the measurement data and status information for a measurement task. If several parameters are configured for a measurement task, e.g. vibration acceleration in 0-peak and RMS, the respective data is shown in a separate line.



Note

The parameters that are included in the route status report is determined by the selection of the parameters for the result display. "Machine train evaluation" on page 46.

¹not included in the scope of delivery

²file system: FAT / FAT32

ROUTE STATUS REPORT
VIBSCANNER 2 Demo Route
24/01/2019
VIBSCANNER 2 EX - SN 52050012

VSC2 / DEMO ROUTE / TEST RIG VIBCODE

STATUS	MEAS. LOCATION	MEASUREMENT TASK	DATE	VALUE	UNIT	DELTA (%)
⊗	Motor / M NDE h					
⊗	Motor / M DE h					
⊗	Pump Overhung / P DE h					
⊗	Pump Overhung / P NDE v					

VSC2 / DEMO ROUTE / VENT-10

STATUS	MEAS. LOCATION	MEASUREMENT TASK	DATE	VALUE	UNIT	DELTA (%)
OK	Motor / M NDE h	Ov Acc 10 - 10 000 Hz RMS	24/01/2019	0.018	m/s²	-99
OK	Motor / M NDE h	Ov Acc 10 - 10 000 Hz 0-P	24/01/2019	0.126	m/s²	-97
OK	Motor / M NDE h	Ov Acc 10 - 10 000 Hz Crest	24/01/2019	6.904		383
OK	Motor / M NDE v	Ov Acc 10 - 10 000 Hz RMS	24/01/2019	1.966	m/s²	-43
---->	Motor / M NDE v	Ov Acc 10 - 10 000 Hz 0-P	24/01/2019	28.751	m/s²	485
OK	Motor / M NDE v	Ov Acc 10 - 10 000 Hz Crest	24/01/2019	14.623		> 500
OK	Motor / M NDE a	Ov Acc 10 - 10 000 Hz RMS	24/01/2019	0.557	m/s²	-84

Column	Explanation
STATUS	OK = Measurement OK ⊗ = Not measured ↗ = Omitted ----> + color = Threshold value has been exceeded; Severity level of the exceedance: -> / --> / ----> = Reading up to 20/40/60% above threshold ----> = Reading more than 60% above threshold Color code: Green / Yellow / Red = Prewarning / Warning / Alarm
MEAS. LOCATION	Name of the machine and measurement location
MEAS. TASK	Name of the measurement task parameter if applicable
DATE	Date of the measurement
VALUE	Reading
UNIT	Unit
DELTA (%)	Deviation of the current reading - last reading

Exchanging a report logo

The PRÜFTECHNIK company logo is stored in the route status report as standard. If necessary, you can replace it with a different logo in JPG format.

Procedure

- Change the file name of the new logo to "logo.jpg".

- ▶ Switch on VIBSCANNER 2.
- ▶ Connect VIBSCANNER 2 to the PC. Use the enclosed USB cable with Micro USB connection.
- ▶ Open **Windows Explorer**.
- ▶ Click under **[Devices and drives]** on the connected VIBSCANNER 2. The two drives on the measuring device appear: **[Measurement Data]** and **[System Data]**.
- ▶ On the **[System Data]** drive, open the **[Logo]** folder.
- ▶ Delete the logo file contained in this folder.
- ▶ Copy the new logo file from the PC to the **[Logo]** folder.

**Note**

It is not possible to overwrite the logo file in the measuring device with another file. The file to be replaced first needs to be deleted in the measuring device.

4.8 Transferring measurement data for analysis

Transfer the measurement data to PC software for analysis (OMNITREND Center) or to a web-based application (OMNITREND Asset View). Evaluation in VIBSCANNER 2 is only possible to a limited extent.

The following channels are available for data communication:

- Direct connection between VIBSCANNER 2 and PC
- File-based data exchange via the Windows file system
- File-based data exchange via a USB pendrive
- Web-based data communication via a MQTT broker

4.8.1 Transferring measurement data via direct connection


- ▶ Switch on VIBSCANNER 2.
- ▶ Connect VIBSCANNER 2 to the PC. Use the enclosed USB cable with Micro USB connection.
- ▶ Start **OMNITREND Center**.

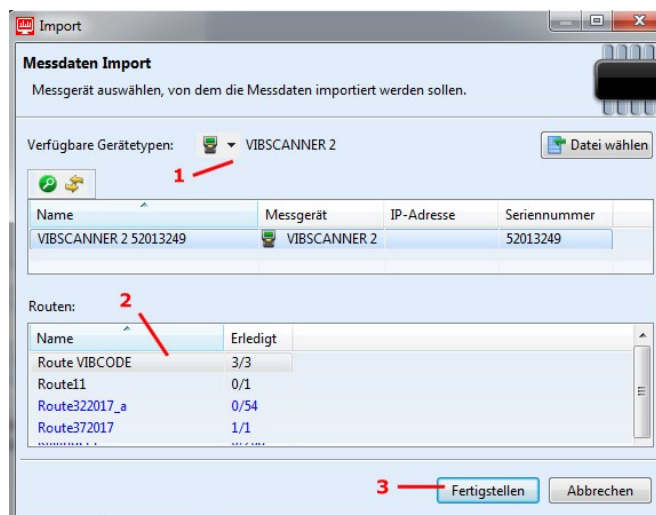


Notes

The following steps describe the sequences in OMNITREND Center.

Make sure that the database, where the route was created, is connected to the server.

- ▶ Click on  **[Upload to PC]** in the main icon bar. The **[Measurement Data Import]** dialog window appears:



- ▶ Under **[Available Device Types]** (1), set the measuring device filter to VIBSCANNER 2.

- ▶ Select the connected measuring device from the device list. The routes contained in the measuring device appear in the lower **[Routes]** (2) pane.
- ▶ Select the respective route (multiple selections possible) and click on **[Finish]** (3). A dialog window appears following the import. Here you can find out which routes have been imported successfully and which ones have not.

4.8.2 Transferring measurement data via the file system

EXPORTING the route file into the file system


- ▶ Switch on VIBSCANNER 2.
- ▶ Connect VIBSCANNER 2 to the PC. Use the enclosed USB cable with Micro USB connection.
- ▶ Open **Windows Explorer**.
- ▶ Click under **[Devices and drives]** on the connected VIBSCANNER 2. The two drives on the measuring device appear: **[Measurement Data]** and **[System Data]**.
- ▶ On the **[Measurement Data]** drive, open the **[Routes]** folder. The individual routes are stored as archive (*.tar). The name of the route is contained in the archive name.
- ▶ Copy the respective route file from VIBSCANNER 2 onto the PC. You can transfer the route with the measurement data onto a different PC, send it per e-mail, or read it into the OMNITREND Center software at a later time.

IMPORTING the route file into OMNITREND Center

Prerequisite

The route to be imported was created in the OMNITREND Center database.

Procedure

- ▶ Start OMNITREND Center (see the section above).
- ▶ Click on  **[Upload to PC]** in the main icon bar. The **[Measurement Data Import]** dialog window appears.
- ▶ Click on the **[Select file]** button.
- ▶ Select the respective route file (*.tar).
- ▶ Click on **[Open]**. The import starts.
- ▶ A dialog window appears following the import. Here you can find out which routes have been imported successfully and which ones have not.
- ▶ Click on **[OK]** to exit the import dialog.

4.8.3 Transferring measurement data via a USB pendrive

With this method, you load the route with the measurement data onto a standard USB pendrive and import it into the OMNITREND Center PC software if required.

**Notes**

Specification for USB pendrive: USB 2.0; file system FAT or FAT32

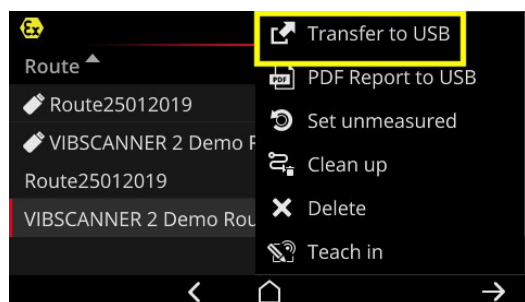
Adapter: USB 2.0 OTG (micro-b plug / a-coupling)



USB pendrive with adapter connected to the VIBSCANNER 2.

Loading a route onto a USB pendrive

- ▶ Switch on VIBSCANNER 2.
- ▶ Connect the USB pendrive to the USB port of the measuring device using a suitable adapter.
- ▶ Tap on **[Route]** on the startup screen. The **Route menu** appears.
- ▶ Tap the route to be transferred and keep your finger on the screen until the context menu appears.
- ▶ Tap on **[Transfer to USB]**:



- ▶ Remove the USB pendrive from the measuring device.

Importing a route from a USB pendrive to the OMNITREND Center

See section "Importing the route file into OMNITREND Center" on page 91 in this regard.

4.8.4 Transferring measurement data via MQTT

In this method, the VIBSCANNER 2 transfers the measurement data **automatically** to a server in a network (referred to as the MQTT broker) during data acquisition on the route. Transfer takes place wirelessly via a WiFi network. The MQTT broker then distributes the measurement data to the data subscribers for visualization and evaluation. PRUFTECHNIK provides the **OMNITREND Asset View** application for this purpose.



Notes

Only the following measurement data is transferred via MQTT:

- **Overall readings** such as vibration acceleration in 0-p or RMS
- **Process parameters** such as voltage, pressure, temperature

OMNITREND Asset View functions independently of the OMNITREND Center.

Prerequisite

- **WiFi function** is switched on and VIBSCANNER 2 is registered on the WiFi network.
- **MQTT function** is switched on and the MQTT broker is configured (see "MQTT broker" on page 48)



Empty page

5 - Appendix

This section provides information about the following topics:

5.1 Technical data	88
5.2 Upkeep and maintenance	91
5.2.1 Storage	91
5.2.2 Cleaning	91
5.2.3 Warranty	91
5.2.4 Spare parts, accessories	91
5.2.5 Checking the measuring accuracy	91
5.2.6 Disposal	92
5.3 Scaling of the results display	93
5.4 Machine speed finder	97
5.4.1 Function	97
5.4.2 Level of confidence	97
5.4.3 Limits	97
5.5 Kinematic Model	99
5.5.1 Reference speed	99

5.1 Technical data

Parameter	VIBSCANNER 2
	Measurement Channels
Number	3 synchronous analog channels (X/Y/Z)
Z channel (0 ... 50 kHz)	-20 .. +20 V, input impedance: 78 kOhm IEPE Current Linedrive
X/Y channel (0 ... 10 kHz)	-20 .. +20 V, input impedance: 78 kOhm IEPE
Dynamic range	109.5 dB (total)
Sampling rate	up to 131 kHz per channel
Signal processing	3 x 24 bit ADCs
Measuring range/ Accuracy	Vibration acceleration: dependent on used sensor Shock pulse: -10 dBsv to 80 dBsv +/- 2 dBsv
Fulfilled standard	DIN ISO 2954:2012 (2-1 kHz, 10 Hz -1 kHz, 10-10 KHz)
	Display
Type	Capacitive touchscreen Optically bonded for high contrast and increased shock resistance
Active area	95 x 54 mm (3 3/4" x 2 1/8")
Size	10.9 cm (4 1/3")
Color depth	16 million colors
Viewing angle	< 140°
Operation	Multi touch – gesture control Glove-compatible
Illumination	Background lighting, adjustable
Ambient light sensor	Yes
	Supply
Type	Li ion rechargeable battery

Parameter	VIBSCANNER 2
Nominal voltage	7.2 V (Ex device: 7.3V)
Energy density	72 Wh (Ex device: 50 Wh)
Charge time, typical	5.0 h (0 ... 100 % @ 25 °C / 77 °F); Ex device: 3.5 h 3.5 h (0 ... 80 % @ 25 °C / 77 °F); Ex device: 2.5 h
Charging temperature	10 °C ... 40 °C [50 °F ... 104 °F]
Operating time, typical	12 h (cont. operation, rech. battery 100 %); Ex device: 10h 6 h (cont. operation, rech. battery 50 %); Ex device: 5h
Power adapter	100-240 V~, 50-60 Hz (input) 12 V 3 A (output)
Energy saving mode	Yes
	Computer
Processor	ARM A9 - Quadcore 1 GHz
Operating elements	Touchscreen, ON/OFF key, Enter key
Memory	microSD card, 32 GB for measurement data, permanently installed 2 GB RAM
USB	1 x USB 2.0, device interface
RFID	RFID reader module for PRÜFTECHNIK transponder - ALI 50.628-25 (non-Ex device) Complies with ISO 14443a and ISO 15693 Reading distance: 2...3 cm (13/16" ... 1 3/16")
WiFi	IEEE 802.11a/b/g/n/ac Throughput: < 200 Mbps Security: WPA2
Stroboscope	Frequency range: 0.1 – 1000 Hz Resolution: 0.06 1/min. LEDs: Risk group 1 per IEC 62471
LED	1x RGB LED (display for battery status and charging process)

Parameter	VIBSCANNER 2
	Environment / mechanical system
Connections	Socket for power adapter Micro USB for data cable Plug-in connector (8-pole) for signal cable
Housing, non-EX device	2-component housing: PC and ABS Sheath: TPE, black
Housing, EX device	Housing: PC Sheath: TPE, black, antistatic, conductive
Dimensions	203 x 143 x 76mm (LxWxH) (8 x 5 5/8 x 3")
Weight	approx. 1.0 kg (35.3 oz)
Degree of protection	IP65, dust-proof and spray water-protected
Temperature range	Operation: -10 °C ... +50 °C [14 °F ... 122°F] Storage: -20 °C ... +60 °C [-4 °F ... +140°F]
Air humidity	0 ... 90 %, non-condensing
Certifications	CE, RoHS, FCC, FCC/IC, ATEX, IECEx, NEC 500/505, CEC Annex J18, CEC sect. 18

5.2 Upkeep and maintenance

VIBSCANNER 2 is a precision instrument and should be handled with greatest care.

5.2.1 Storage

If the VIBSCANNER 2 is not used for an extended period of time, store the measuring device in the case. Connect it regularly to the power supply to avoid complete discharge of the rechargeable battery.

Make sure that the following conditions are met at the storage location:

- Dry, air humidity < 90 %.
- No strong electromagnetic fields present.
- Temperature range: -20 °C ... + 60 °C [-4 °F ... +140°F].

5.2.2 Cleaning

In the case of minor contaminations, you can wipe off the housing with a wet cloth. Remove persistent contaminations using a commercially available mild cleaning agent.

Use a soft, dry cloth to clean the display.



ATTENTION!

Using non-suitable cleaning agents can lead to damage to the device.

Thinners, spirit, isopropyl alcohol, or aggressive cleaning agents (power cleaners) are not suited for cleaning!

5.2.3 Warranty

There is 2 years of warranty for the measuring device. Any warranty claims become invalid if unauthorized service is performed on the measuring device.

The transport case comes with lifetime warranty.

5.2.4 Spare parts, accessories

Only original spare parts and accessories may be used. Information can be found in the product catalog, which can be requested free of charge from PRÜFTECHNIK.

5.2.5 Checking the measuring accuracy

To ensure a high measuring accuracy, it should be checked every two years. The date of the next check is indicated on the sticker next to the charge socket. Send the measuring device to your PRÜFTECHNIK representative for the check. Transfer the measurement

data to the OMNITREND Center software prior to sending the device for repair or checking.



The sticker indicates the next check date (here: 09-2019).

5.2.6 Disposal

VIBSCANNER 2 and any accessories must be disposed of according to the environmental regulations applicable in your country.



Note

The rechargeable battery must be completely discharged when submitting the measuring device for disposal.

5.3 Scaling of the results display

If **limit values** are set up for the measurement tasks, the following fundamental rules of scaling apply:

- **Measurement value < Alarm value (red)**, therefore:

Alarm value = **90%** of the maximum display area.



- **Measurement value > Alarm value (red)**, therefore:

Measurement value¹ = **90%** of the maximum display area.

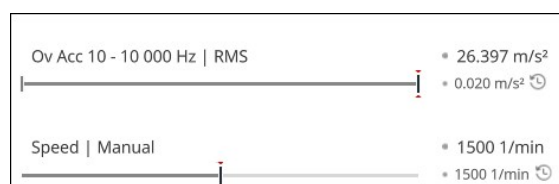
All remaining bars are then scaled relative to this authoritative bar.



If **no limit values** are set up for the measurements, the scaling of the bar charts is preset to the values listed in the table. If a measurement exceeds the preset range, the limits are adjusted. The measurement value in question then corresponds to **100%** of the display area.

Example:

- The vibration measurement exceeds the preset range (0...10 m/s²). The reading is 26.397 m/s². This value corresponds to 100% on the scale.
- Speed measurement lies within the preset range (0...3000 rpm): Measurement value is scaled accordingly (50%)



¹If several measurement values exceed one alarm value, the rule applies to the measurement value with the greatest percentage exceedance

Measurement type	Overall value type	Parameter	Scaling	Unit
acceleration	Total overall value (broadband)	RMS	0...10	m/s ²
		O-P	0...60	m/s ²
		P-P	0...120	m/s ²
		Crest	0...10	-
	Band overall value (narrow band)	Power in Band	0...100	m/s ²
		Peak in Band	0...60	m/s ²
		RMS	0...10	m/s ²
		O-P	0...60	m/s ²
		P-P	0...120	m/s ²
		Crest	0...10	-
		Calc. O-P	0...60	m/s ²
		Calc. P-P	0...120	m/s ²
	Envelope-Band overall value (narrow band)	Power in Band	0...6.25	m/s ²
		Peak in Band	0...20	m/s ²
		RMS	0...2.5	m/s ²
		O-P	0...20	m/s ²
		P-P	0...25	m/s ²
		Crest	0...10	-
		Calc. O-P	0...20	m/s ²
		Calc. P-P	0...25	m/s ²

Measurement type	Overall value type	Parameter	Scaling	Unit
Speed	Total overall value (broadband)	RMS	0...10	mm/s
		O-P	0...20	mm/s
		P-P	0...40	mm/s
		Crest	0...5	-
	Band overall value (narrow band)	Power in Band	0...100	mm/s
		Peak in Band	0...20	mm/s
		RMS	0...10	mm/s
		O-P	0...20	mm/s
		P-P	0...40	mm/s
		Crest	0...5	-
		Calc. O-P	0...20	mm/s
		Calc. P-P	0...40	mm/s
Path	Total overall value (broadband)	RMS	0...50	μm
		O-P	0...200	μm
		P-P	0...400	μm
		Crest	0...2.5	-
	Band overall value (narrow band)	Power in Band	0...2500	μm
		Peak in Band	0...200	μm
		RMS	0...50	μm
		O-P	0...200	μm
		P-P	0...400	μm
		Crest	0...2.5	-
		Calc. O-P	0...200	μm
		Calc. P-P	0...400	μm

Measurement type	Overall value type	Parameter	Scaling	Unit
acceleration	Shock pulse (roller bearing)	Peak	0...60	dBsv
		Carpet	-5...40	dBsv
		Peak	0...40	dBn
		Carpet	-5...20	dBn
RPM	-	-	0...3000	RPM
Temperature	-	-	0...100	°C
User-defined Size	-	-	Min. / max. value from the meas- urement task	ben.def.
Visual in- spection	-	-	Min. / max. value from the meas- urement task	-

5.4 Machine speed finder

Vibration-based condition diagnostics on speed-variable machines requires speed acquisition during the vibration measurement. In addition to the vibration sensor, an additional RPM sensor is always required to obtain a complete measurement data record for a comprehensive analysis and reliable diagnostics.

VIBSCANNER 2 follows a different approach and omits a RPM measurement sensor. The measuring device uses the vibration signal instead to determine the current speed value at the measurement location. This method is based on complex algorithms, numerous field tests and a lot of experience in the acquisition, processing, and analysis of vibration signals. The result of this development is implemented as the so-called “**machine speed finder**” in VIBSCANNER 2.

5.4.1 Function

Within the scope of the measurement configuration in OMNITREND Center, a speed is specified at the machine train level, which is to be expected during measurements on site. Machine speed finder evaluates the vibration signal with respect to rotational speeds, which may deviate by 15 % from the expected rotational speed value.

Machine speed finder is activated by default at the reference measurement location. The measuring device calculates the speed values for all other measurement locations on a machine train based on the configured kinematic model for the machine train.

5.4.2 Level of confidence

Machine speed finder determines three speed values based on the measured vibration signal. These are within the specified interval ($\pm 15\%$). A probability (in %) is assigned to every value. It indicates the trustworthiness of the value. The current rotational speed usually corresponds to the value with the highest percentage value – the so-called level of confidence.

The level of confidence can be verified and readjusted as needed using a stroboscopic measurement.

5.4.3 Limits

Machine speed finder reaches its limits in the following scenarios:

- The probability for the level of confidence is below 70 %.
Remedy: Verify the respective speed using the stroboscope.
- The rotational speed deviates at the measurement location by more than 15 % from the expected speed.
Remedy: Determine the speed using the stroboscope.
- Vibration entries from adjacent machines influence the vibration signal.
Remedy: Determine the speed using the stroboscope.

- The speed to be expected is less than 300 rpm. In this case, the machine speed finder is automatically deactivated.

Remedy: Determine the speed using a vibration measurement in the fast-running shaft.

5.5 Kinematic Model


The kinematic model maps the kinematic conditions in a machine train. VIBSCANNER 2 uses this modeling to calculate the rotational speed at every measurement location on the machine train based on a reference value. This method saves time and effort, as it reduces the number of measurements on site to a minimum.

A machine train is modeled during the configuration in the OMNITREND Center software. The gear ratios between the individual components (e.g., gear stages) are considered.

5.5.1 Reference speed

The speed calculation is based on the reference speed. It is recorded and/or determined at a reference measurement location on the machine train. Based on the known kinematic conditions in the machine train, the measuring device calculates the respective speeds for all measurement locations on the machine train.

Reference speed from vibration signal

VIBSCANNER 2 determines the reference speed from the vibration signal ("Machine speed finder" on page 97). During route configuration in OMNITREND Center, the measurement location for the reference speed is combined with the nearest vibration measurement location. The reference measurement location is marked in the machine image view with  ("2: Measurement location icon" on page 37).

Determining the reference speed by stroboscope

The integrated stroboscope is a reliable method for verifying the determined reference speed and for recording the speeds at all vibration measurement locations on the machines.

Entering the reference speed manually

If the reference speed cannot be determined using the mentioned methods, the value can be entered manually.

Empty page.

INDEX

B

Bluetooth 41, 50
Bookmark 85
Brightness 45

C

Calibration 49
Case lock 29
Color scheme 45

D

Date 41
Date format 43
Decimal places 43
Displaying measurement values 79

E

Event 84

F

Factory settings 49
Flashing frequency 76

H

Headphones 50

K

Keyboard 48

L

Language 48
Lock 29

M

Machine image view 36
Machine speed finder 47
Manual input 69
Measurement
delete 82

moving into history 81
repeat 80
skip 84
status 78

Measurement location
icon 37

Measurement location in-
formation 37

Measurement location
status 34

Measurement type 44

MQTT broker 48

N

Navigation path 37
Network 40

O

Offset 44

P

Power off 49
Production line 68

R

Rechargeable battery 49
Resonant frequency 44
Results display 46, 79
RFID 72
Route
clean 83
delete 84
guidance 47
menu 39
status 34
transfer 60

Route status report 86

Route summary 63

S

Sensitivity 44
Sensor
default 45

name 44
new 44
type 44

Sensor detection 45

Sleep mode 49

Smiley 38, 78

Speed information 38

Stroboscope 75

T

Technical data 88
Temperature 70
Text editor 53
Time 42
Time zone 43
Transferring meas-
urement data 90
Transport case 28
Triaxial sensor 69
TSA 29

U

Units 43

V

VIBCODE 71
Visual inspection 69
Volume 51

W

WiFi 40



Printed in Germany.LIT 52.200.EN 03.2019

PRUFTECHNIK

85737 Ismaning, Germany

www.pruftechnik.com



Productive Maintenance Technology