SCHAEFFLER

OPTIME Ecosystem: Condition monitoring

OPTIME Gateways and OPTIME Sensors

User Manual

Contents

1 About the manual

The original language of the manual is German. All other languages are translations from the original language.

1.1 Symbols

The warning and hazard symbols are defined in accordance with ANSI Z535.6-2011.

1 Warning and hazard symbols

Signs and descriptions	
⚠ DANGER	In case of non-compliance, death or serious injury will occur.
⚠ WARNING	In case of non-compliance, death or serious injury may occur.
⚠ CAUTION	In case of non-compliance, minor or moderate injury may occur.
NOTICE	In case of non-compliance, damage or malfunctions in the product or the adjacent construction may occur.

1.2 Availability

A current version of this manual can be found at:
https://www.schaeffler.de/std/1F40

1.3 Legal guidelines

The information in this manual reflects the status at the time of publication.

Unauthorised modifications to or improper use of the product are not permitted. Schaeffler accepts no liability in these cases.

Apps and functions may not be available in all countries and regions. The availability of apps and functions may change.

More detailed information, particularly about the OPTIME Mobile App and OPTIME dashboard, is available in the OPTIME online manual, which is regularly updated.

1.3.1 Advice on third party products and services

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1.3.1.1 Licences

The OPTIME sensor software uses the following open source components:

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The original language of the licence texts is English. All other languages have been translated from the original English text.

1.4 Images

The images in this manual may be schematic representations and may differ from the delivered device.

2 General safety regulations

This chapter provides an overview of all the important safety regulations.

Any person charged with working on the system must read this user manual and observe the guidelines.

2.1 Principles

The OPTIME condition monitoring system corresponds to the current level of technology and the recognised rules of safety practice. If the safety guidelines are not observed, risks to life and limb for the user or third parties and extensive damage to other material assets may nevertheless arise during use.

2.2 Marking

Every sensor and every OPTIME Gateway of the OPTIME condition monitoring system is marked with a serial number. The serial number, information on the manufacturer and valid certification markings for countries and regions are printed on the OPTIME gateway nameplate and on the OPTIME sensor.

2.3 Usage for the intended purpose

The OPTIME condition monitoring system is approved for use in indoor and outdoor industrial environments. The OPTIME condition monitoring system may only be used in accordance with the technical data. Unauthorised structural modifications to the system are not permitted. We assume no liability for any damage to machinery or injury to persons arising from such actions.

Special versions (Ex) of OPTIME sensors and gateways are available for use in environments with an explosion risk. The corresponding markings are printed on the devices. Further information on Ex classification can be found in the Technical Data section together with the available international and regional certifications ➤70|12.

Usage for the intended purpose also includes the following:

- all guidelines in the user manual are observed
- compliance with all relevant specifications on occupational safety and accident prevention during the entire product life cycle of the Schaeffler OPTIME system
- the necessary specialist training and authorisation of your company for carrying out the necessary work on the system

2.4 Usage not for the intended purpose

The OPTIME condition monitoring system does not provide machine protection. It must not be used as a component of safety systems.

The OPTIME condition monitoring system is not classified as a safety component in accordance with Machinery Directive 2006/42/EG.

2.5 Warranty

The manufacturer shall assume liability for warranties in relation to operational security, reliability and performance only under the following conditions:

- Installation and connection must be carried out only by authorised and skilled personnel.
- The system must be used in accordance with the information in the technical data sheets. The limit values indicated in the technical data must not be exceeded under any circumstances.
- Conversion and repair work on the system may only be carried out by the manufacturer.

2.6 Qualified personnel

Obligations of the operator:

- Ensure that only qualified and authorised personnel perform the activities described in this manual.
- Ensure that personal protective equipment is used.

Qualified personnel must:

- Ensure adequate product knowledge, e.g. through training on proper handling and use of the product
- be fully familiar with the contents of this manual, particularly all safety instructions
- be aware of any relevant country-specific regulations

2.7 Work on electrical devices

Do not repair any damaged system components. Please arrange for any necessary repairs to be carried out by Schaeffler Monitoring Services GmbH.

Any work on wiring, opening or closing of electrical connections may only be performed while disconnected from the power supply and in a voltage-free condition.

2.8 Working in potentially explosive environments

Ex devices may only be installed by experienced personnel who have also received instruction on the various types of explosion protection, the associated installation procedures, the relevant guidelines and the general principles of hazard zone classification. These personnel must receive regular, appropriate training or instruction.

2.9 Safety regulations

This section summarises the most important safety regulations relating to working with the OPTIME condition monitoring system.

2.9.1 Safety during installation

Before installing the components, check for any external damage. If damage or some other defect is found the system must not be commissioned.

Commissioning may only be carried out by qualified personnel.

2.9.2 Handling the lithium batteries in the sensors

The sensors contain non-replaceable lithium thionyl chloride batteries which are not dangerous provided the batteries remain in the sensor housing. Never expose the batteries to excessive mechanical, thermal or electrical loads, as this may activate the safety valves and cause electrolyte leakage. Do not open the sensor. Avoid temperatures of more than +100 °C. Dispose of the sensor in accordance with the legal regulations.

Improper handling of sensors may lead to leaks or the emission of evaporated electrolyte, potentially causing fire or explosion and resulting in serious injury or death.

Do not open the sensor housing.

Sensors must be deactivated during transport and storage.

2.9.3 Handling the backup battery in the OPTIME Gateway

The OPTIME Gateway contains a replaceable backup battery, which is not hazardous provided it remains enclosed in the housing. Never expose the batteries to excessive mechanical, thermal or electrical loads, as this may activate the safety valves and cause the battery container to rupture. Avoid temperatures of more than +70 °C. Dispose of the battery in accordance with the statutory provisions.

2.9.4 Safe handling of information interfaces

This product has the following information interfaces:

- GSM, UMTS, LTE
- Wirepas Mesh network
- WLAN
- Ethernet

The product can be connected to other devices, components and internal or external networks (for example the internet) via any information interface. Devices (like data carriers) connected via information interfaces may contain malware or execute malicious functions undetected. This product, or potentially your company infrastructure (e.g. IT infrastructure) can be damaged due to the use of these kinds of information interfaces. In addition, your company's data security may be compromised.

Before using our product and its information interfaces, please familiarise yourself with the following points:

- the safety precautions offered by the product and its information interfaces
- the security provisions of your company, e.g. in relation to IT security

Before commissioning please clarify with your relevant points of contact whether and which security measures are to be taken when using the product and its associated information interfaces.

2.9.5 Protection against unauthorised use

Data encryption and secure login with individual login data are the tools used to protect against unauthorised use of the OPTIME Mobile App and the OPTIME dashboard. Software users (users) must log in with their username and password. The password should be changed at regular intervals. A secure password must be used.

The user is responsible for keeping their login data secure.

3 Product description

3.1 Structure of the OPTIME condition monitoring system

This user manual provides general information on condition monitoring. Detailed information about the smart lubricators can be found in BA 70.

The overall system comprises the following components for condition monitoring and predictive maintenance:

- OPTIME gateway
- OPTIME sensors
- OPTIME lubricators
  - for further information on this product, please refer to BA 70
- Schaeffler OPTIME dashboards in the cloud
  - OPTIME training courses are available through the Schaeffler Training Campus
- optional software components
  - Schaeffler OPTIME API as the interface to external systems
  - OPTIME ExpertViewer (diagnostic tool for specialists)
  - Ask the OPTIME Expert to receive technical support from Schaeffler's condition monitoring experts
  - tailored service packages available for every operation phase
  - OPTIME Basic and Advanced Live Training available in national languages through the Schaeffler Training Campus.
- OPTIME Mobile App

1 Condition monitoring system

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The Schaeffler OPTIME sensors and lubricators automatically form a mesh network that transfers data directly or via other sensors to the OPTIME gateway. In the network, the sensors transfer raw vibration data as well as key performance indicators (KPI) via the OPTIME gateway to the OPTIME cloud, where the data are analysed and the results sent to the OPTIME Web App and OPTIME Mobile App. All analyses are also available in the OPTIME dashboard. Directly after commissioning on the machine, the sensor starts to collect information and, depending on its operating mode, define the thresholds for this specific machine ➤22|3.4.3.

The mesh network organises itself automatically, when Schaeffler OPTIME sensors, lubricators or gateways are added or removed. Depending on the circumstances, existing Schaeffler OPTIME installations can also be expanded subsequently to up to 50 OPTIME sensors per OPTIME Gateway. The use of several OPTIME gateways in the same network is possible.

Since an independent network is used to transfer the measured data to the Schaeffler OPTIME cloud and wireless technology is used for other communication (pre-set, optionally also WLAN or Ethernet), there is normally no need for a connection to the local IT infrastructure.

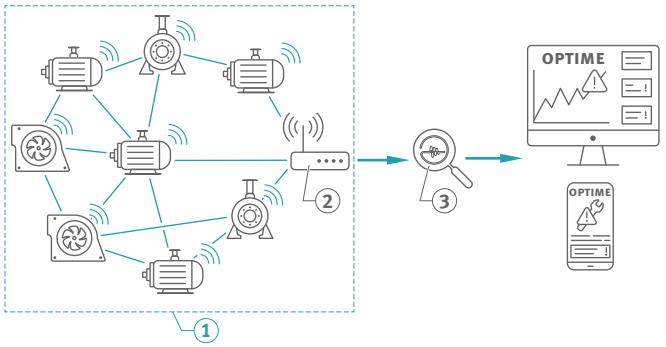
Further information

BA 70 | OPTIME Ecosystem: Lubricators | OPTIME C1 |
https://www.schaeffler.de/std/1F8B

3.1.1 Communication interfaces and data transfer

Mesh technology was chosen to enable effective condition monitoring of machines in large industrial plants, where large distances also have to be covered and difficult to access machines need to be accessed. The actively managed mesh network can establish contact with sensors in a line of sight of up to 100 m, ensures reliable communication and at the same time optimises the battery service life of the sensors.

2 Communication between OPTIME condition monitoring system components



1	Mesh network	2	OPTIME gateway
3	OPTIME cloud		

The standard version of the OPTIME gateway already has an integrated SIM card for use exclusively in conjunction with the OPTIME condition monitoring system. If the proposed mobile phone connection is not to be used, alternative options for connecting to the OPTIME cloud include using a separate SIM card, a WLAN connection or a network cable.

3.2 Planning

A system structure, which maps the allocation of sensors to machines and assets, does not necessarily have to be created beforehand. However, for an entire plant, creating one significantly simplifies the installation process, as only the relevant machine needs to be selected during sensor installation.

The system structure is created directly in the OPTIME dashboard using the Hierarchy Assistant menu. The Hierarchy Assistant allows for easy, user-friendly creation and adjustment of existing system structures. More complex system structures can be imported in the form of an Excel table. An appropriate template is available on request.

3.2.1 Logging in to the OPTIME Mobile App and OPTIME dashboard

Every customer receives an administration user account when purchasing the OPTIME condition monitoring system and associated services. This administrator is able to create additional users. There is no limit to the number of possible users. All created users will receive their login data by e-mail.

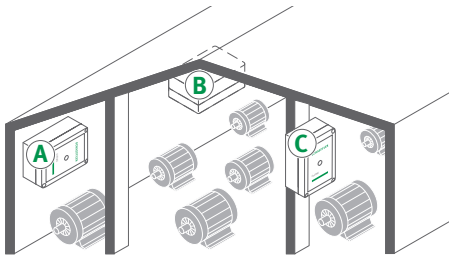
3.3 OPTIME gateways

All OPTIME Gateway versions are fitted in a rugged protective housing suitable for wall or ceiling mounting. As a result of their protection rating and UV resistance, all OPTIME Gateway versions are also suitable for outdoor use.

Positioning of the OPTIME gateway

If possible the OPTIME Gateway should be positioned centrally within the area of the installed OPTIME sensors. Ideally there should be a line of sight to 5 or 6 OPTIME sensors. These can then be used as repeaters for the remaining OPTIME sensors. For optimum coverage it can be helpful to install the OPTIME Gateway above the sensor level. It is recommended that the OPTIME gateway be installed and activated before the OPTIME sensors.

3 OPTIME Gateway in the system, suitable mounting locations



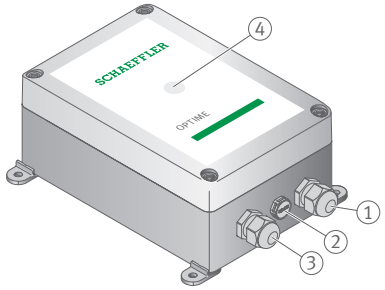
When choosing the mounting location, it should be noted that reinforced concrete or larger metal objects can block signal transmission in this area. This also means that an OPTIME Gateway may not be installed in a metal switch cabinet.

If a mobile phone connection is used for data transfer we recommend checking the LTE reception at the mounting location beforehand with a mobile phone.

3.3.1 OPTIME Gateway (2019)

The OPTIME Gateway has 2 cable glands for routing the cable to the power supply and, optionally, for feeding through the network cable. If the network cable is not used, the unused cable gland is sealed with a plug, which is already fitted as provided.

4 Connections and indicators: OPTIME Gateway (2019)



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1	Power supply input	2	Pressure compensation valve
3	Network connection input	4	LED for indicating operating status

The pressure compensator valve must not be removed.

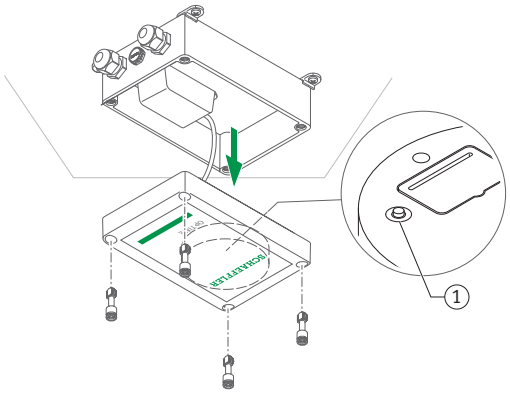
The OPTIME Gateway is equipped with an LED indicator that shows the various operating states.

2 LED indicator

LED	Function
Lights up green	The gateway is connected to the internet.
Lights up blue	The gateway is trying to connect to the internet. Please remember that if conditions are unfavourable it can take 15 min to establish a connection to the internet.
Flashing blue	The gateway is in configuration mode.
Lights up red	An error has occurred. Further information is provided in the web interface used for configuring the gateway.

Pay attention to the LED indicator on the LTE stick. The LED should light up turquoise or blue, depending on the model, to confirm the internet connection.

5 Button for gateway configuration



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1	Push button		

Put the gateway into configuration mode by pressing the push button ➤38|7.

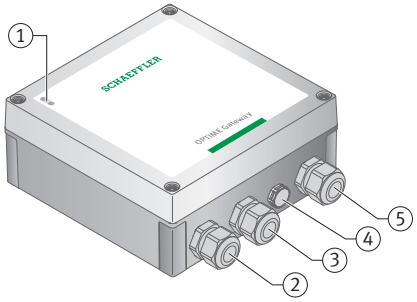
3.3.2 OPTIME Gateway 2 (2023)

The gateway is equipped with 3 cable glands for routing the cable to the power supply and, optionally, for feeding through the cable for the external network connection or external antennas. The cable gland used to feed the cable through to the external antenna is sealed with a plug, which is already fitted as provided.

Antennas with SMA connectors, a max. cable length of 3 m and local LTE certification can be used.

For detailed enquiries about alternative antennas, please contact our experts.

6 Connections and indicators: Gateway 2 (2023)



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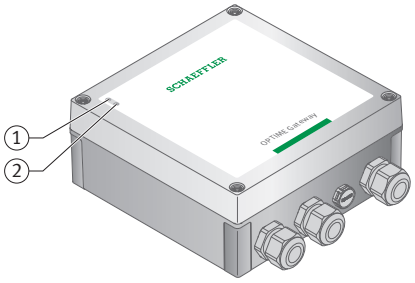
1	LED indicators	2	Network connection/external LTE antenna
3	Network connection/external LTE antenna	4	Pressure compensation valve
5	Power supply input		

The pressure compensator valve must not be removed.

The gateway is equipped with an LED indicator that shows the various operating states.

7 LEDs: Gateway 2



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1	LED 2	2	LED 1

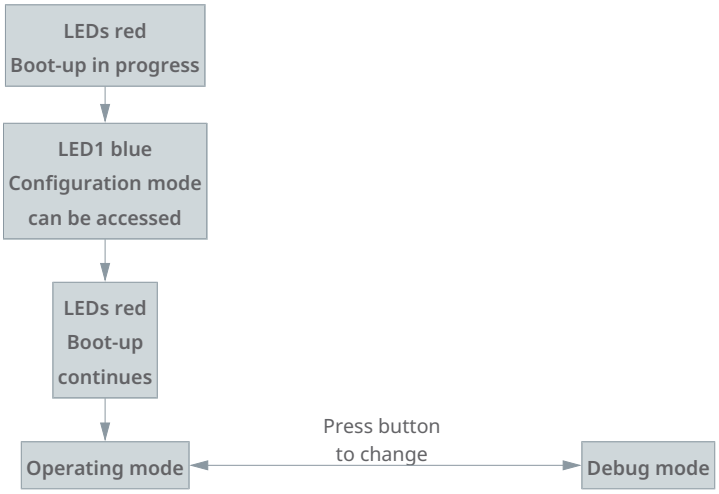
There are 2 different modes for the LED indicator:

- operating mode
- debug mode

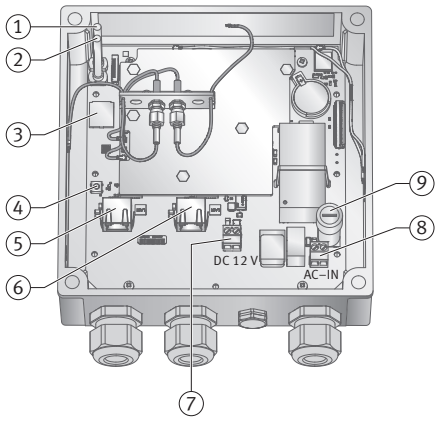
In addition to the two operating modes, the LED indicators show the time window in which access to the gateway configuration can be enabled by pressing the push button [BTN] in the housing (only available during commissioning of the gateway, indicated by a blue LED 1 ➤17|9).

The gateway itself has only one main operating mode. Once the gateway has started in normal operation mode, it transfers data between the mesh network and the OPTIME cloud, regardless of whether the LED indicators are in operation mode or debug mode, or whether the configuration interface was accessed in the starting phase.

8 LED operating modes and status display



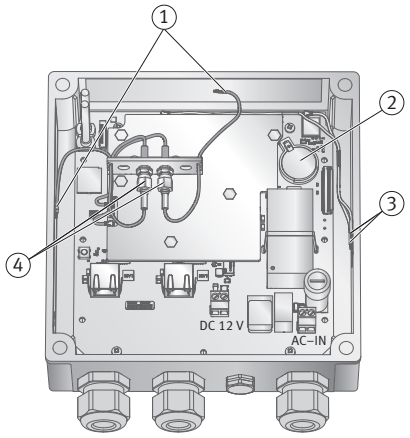
9 OPTIME Gateway 2 (2023) with open cover



001A0C6A

1	LED 2	2	LED 1
3	SIM card slot	4	Push button [BTN]
5	LAN 2 (inactive)	6	LAN 1
7	12 V DC voltage	8	Standard supply (mains voltage)
9	Fuse		

10 OPTIME Gateway 2 (2023) with open cover



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1	LTE antennas	2	Backup battery
3	Combined antenna (Bluetooth, WLAN)	4	SMA connectors LTE

3.3.2.1 Operating mode

When the LED indicator is in operating mode, the LEDs show the connection status.

3 LED indicators in operating mode

LED 2	LED 1	Function
Lights up green		A connection has been established between the OPTIME gateway and the OPTIME cloud.
	Lights up green	The OPTIME gateway is connected to the internet.
Lights up red		No connection between the OPTIME gateway and the OPTIME cloud
	Lights up red	No connection to the internet

3.3.2.2 Debug mode

Check the quality of the internet connection by pressing the push button during operation. The LED indicators show the quality of the connection.

4 LED indicators in debug mode

LED 2	LED 1	Function
Flashing green		Good internet connection
Flashing yellow		Poor internet connection
Flashing red		No internet connection
	Flashing pink	4G internet connection
	Flashing blue	3G internet connection
	Flashing yellow	2G internet connection

3.3.2.3 Status display for gateway configuration

Access to the configuration interface is only possible immediately after switching on the gateway.

When you switch on the gateway, both LED indicators are red. When LED 1 turns blue (for 5 s), you can enable access to the configuration interface by pressing the push button on the gateway ➤40|7.2.

The gateway continues the start-up process and switches to operating mode regardless of whether you enter the configuration interface or not.

When you start configuration mode in the gateway, the LED indicators show the status of the gateway acting as a WLAN access point.

5 LED indicators for configuration mode

LED 2	LED 1	Function
	Lights up blue	You can start configuration mode in the gateway by pressing the push button.
	Flashing green	Indicates that the gateway is providing a WLAN access point.

3.3.3 OPTIME Ex Gateway

The Ex variants of the OPTIME Gateway are technically identical to the standard variants. The components are installed in type-tested housings and are delivered with country-specific or region-specific certifications.

Please note that, in the case of the Ex variants, the QR code for provisioning the gateway is located inside the housing.

3.4 Sensors

The OPTIME sensors are assigned to the machines and activated using near-field communication (NFC) via the OPTIME Mobile App. The OPTIME sensors are also suitable for use outdoors.

3 different types of OPTIME sensor are available for the measurements.

The OPTIME 3 sensor has a bandwidth of 2 Hz to 3 kHz, making it suitable for monitoring applications such as:

- motors
- generators
- fans
- plummer block bearings

The OPTIME 5 and OPTIME 5 Ex sensors have a bandwidth of 2 Hz to 5 kHz and are therefore suitable for monitoring the following applications:

- pumps
- geared motors
- gearboxes
- compressors

OPTIME 3 sensors can monitor machine speeds from 120 min^{-1} to 3000 min^{-1}, while OPTIME 5 and OPTIME 5 Ex sensors can monitor speeds up to 5000 min^{-1}. When selecting the appropriate combination of machines and OPTIME sensors, there are certain factors that need to be considered.

6 Combination of machines and sensors

Application [1]	Other characteristic	Sensor type [2]	Quantity	Mounting location
Electric motor	< 0,5 m	OPTIME 3	1	• Bearing position on motor drive side • Centrally on the motor • In the centre at the base of the motor
	> 0,5 m	OPTIME 3	2	• Drive side and non-driven side of motor • Base of drive side and non-driven side of motor
Fans	Overhang	OPTIME 3	1	• Plummer block housing
	Between bearings	OPTIME 3	2	• Plummer block housing
	Directly coupled	OPTIME 3	1	• Drive side of motor
Compressor		OPTIME 5	2	• Bearing position
Plummer block bearings		OPTIME 3	1	• Bearing position
Pump		OPTIME 5	2	• Bearing position
Geared motor	< 0,5 m	OPTIME 5	1	• Gearbox
	> 0,5 m	OPTIME 3 OPTIME 5	1 1	• Motor • Gearbox
Extruder		OPTIME 3	2	• Bearing position
Calenders		OPTIME 3	2	• Bearing position
Belt drive		OPTIME 3	2	• Bearing position
Saws		OPTIME 5	1	• Saw blade bearing arrangement
Shaft		OPTIME 3	1	• Bearing housing
Gearbox		OPTIME 5	2	• Input and output

1) Please consult Schaeffler if your machine is not listed.

2) In potentially explosive areas, OPTIME 5 Ex must be used in all positions.

The measurement mode of the OPTIME condition monitoring system can be matched to the manner in which the target machine is operated ➤36|6.4.9.

3.4.1 Mounting position on machine

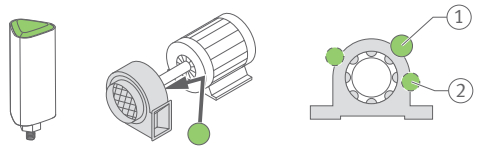
Ideally the sensors should be mounted near the machine's bearing arrangements, preferably in a radial orientation (in the load zone). The precise mounting location is not highly critical; a sensor can still be located effectively at some distance from the ideal position. For instance, if the bearing area of a motor is inaccessible, the sensor can be mounted on a suitable flat area on the motor housing or even at the base of the motor. Where possible, avoid shielding the sensor with metal parts on several sides to ensure reliable signal transmission.

The vibration monitoring process measures the structure-borne vibrations of machines, making a rigid connection to the bearing positions essential. This means that machine enclosure panels are not suitable as a mounting location.

When attaching sensors to the machine it helps to use the examples.

Please note that in potentially explosive areas, OPTIME 5 Ex must be used for all applications.

11 Examples of mounting positions with sensor OPTIME 3



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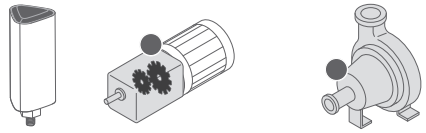
1	Mounting position	2	Alternative mounting position

12 Examples of mounting positions with sensor OPTIME 5



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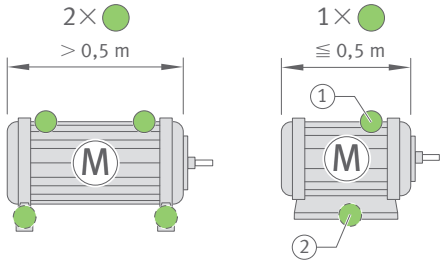
13 Examples of mounting positions for small and large motors



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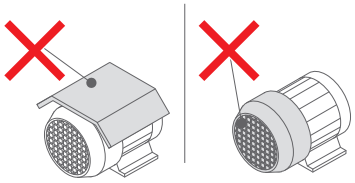
1	Mounting position	2	Alternative mounting position

In the case of machines that are significantly larger than 0,5 m, it is recommended that at least 2 sensors be used so that potential damage can be readily identified. The same applies if 2 machine components are separated by a coupling, as in this case the vibrations cannot be transmitted adequately via the coupling.

14 Examples of unsuitable mounting positions



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For applications such as gearboxes or pumps, we recommend using sensor OPTIME 5 or OPTIME 5 Ex.

3.4.2 Technical characteristics of the sensors

In addition to vibrations, both sensors continuously measure the temperature trend as a characteristic value.

Sensor characteristic values measured

The following characteristic values (KPI) are determined:

- RMS_{low}
  - RMS value of acceleration < 750 Hz
- RMS_{high}
  - RMS value of acceleration > 750 Hz
- $Kurtosis_{low}$
  - kurtosis of acceleration < 750 Hz
- $Kurtosis_{high}$
  - kurtosis of acceleration > 750 Hz
- $ISO_{velocity}$
  - RMS value of velocity 2 Hz to 1000 Hz
- DeMod
  - RMS value of demodulation curve, HP 750 Hz
- Temperature

Sensor battery service life

The battery service life depends on various parameters and operating conditions:

- ambient temperature as main influencing factor
- quality of wireless connection
- number of wireless connections to downstream sensors
- frequency of measuring intervals
- manual activation of individual measurements

The calculated sensor life for OPTIME sensors at the pre-set measuring intervals and an ambient temperature of 20 °C is more than 5 years.

3.4.3 Sensors in learning mode

The system has to learn the normal machine condition using the vibration and temperature KPIs recorded by the sensor, before the threshold values for alarm notifications are defined.

During the first phase of learning mode, 90 KPI data samples are retrieved from a running machine. As the system takes 6 KPI data samples within 24 h, the first phase lasts at least 15 d (days). After this initial phase the alarm notifications are determined provisionally. For safety purposes during the learning phase, very high alarm thresholds are activated.

Subsequently, the learning mode is continued in a second phase during which the alarm thresholds are continually adjusted for a further 15 d (days).

In learning mode the system uses absolute alarms. An absolute alarm is triggered if a pre-set standard ISO value (7,1 mm/s to 9,3 mm/s, depending on the machine type) or the pre-set admissible temperature range (up to 80 °C) is exceeded at a sensor.

When Dynamic/Highly Dynamic mode is activated, it will take the sensor a week to determine the activation threshold. This takes place before the alarm levels are learned.

Please note that in [Dynamic]/[High dynamic] mode, vibration monitoring of the device is disabled during this first week.

Using [Dynamic]/[High dynamic] mode may slightly reduce battery life.

After any modification, service or repair carried out on the machine, it is extremely important to restart the learning period from the OPTIME Mobile App, so that new alarm thresholds can be learned.

4 Scope of delivery

The OPTIME condition monitoring system is available in various combinations.

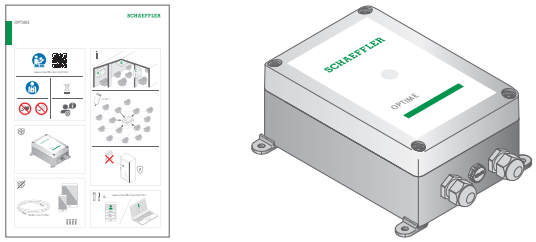
4.1 OPTIME Gateway

4.1.1 OPTIME Gateway (2019)

Scope of delivery OPTIME Gateway (2019):

- 1 OPTIME Gateway (2019)
- 1 built-in LTE stick (depending on the region)
- 1 OPTIME Gateway quick guide manual BA 68-02

15 Scope of delivery OPTIME Gateway (2019)



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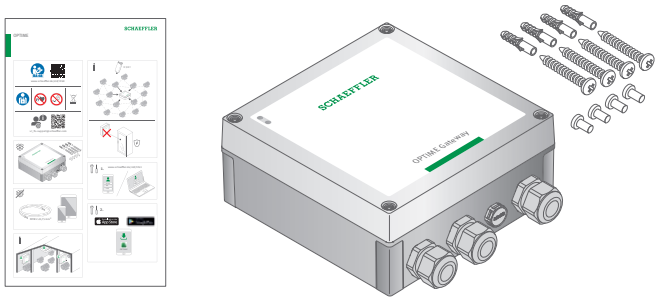
4.1.2 OPTIME Gateway 2 (2023)

Scope of delivery OPTIME Gateway 2 (2023):

- 1 OPTIME Gateway 2 (2023)
- 1 built-in global LTE modem
- 4 screws
- 4 dowels
- 4 blind plugs
- 1 OPTIME Gateway 2 quick guide manual BA 68-06

16 Scope of delivery OPTIME Gateway 2 (2023)



001AA092

4.1.3 OPTIME Ex Gateways

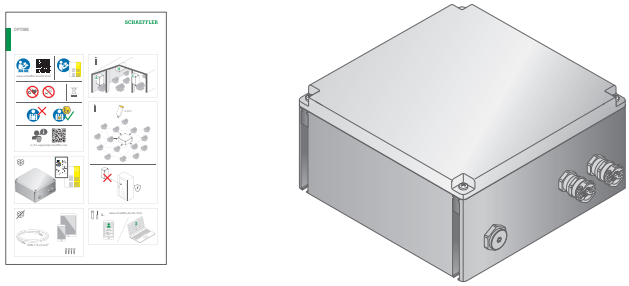
Scope of delivery OPTIME Ex Gateway (2019):

- 1 OPTIME Ex Gateway (2019)
- 1 built-in LTE stick (depending on the region)
- 1 OPTIME Ex Gateway quick guide manual BA 68-07
- 1 manual OPTIME Ex Gateway housing with type approval

Scope of delivery OPTIME Ex Gateway 2 (2023):

- 1 OPTIME Ex Gateway 2 (2023)
- 1 built-in global LTE modem
- 1 OPTIME Ex Gateway 2 quick guide manual BA 68-08
- 1 manual OPTIME Ex Gateway housing with type approval

17 Scope of delivery OPTIME Ex Gateway



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4.2 Sensor kits

Scope of delivery OPTIME 3:

- 10 OPTIME 3 sensors (green cap)
- 10 M6 mounting plates
- 1 OPTIME 3 sensor quick guide manual BA 68-01

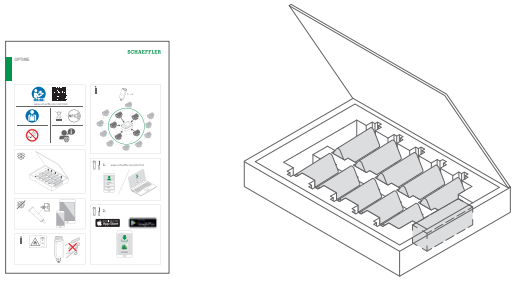
Scope of delivery OPTIME 5:

- 10 OPTIME 5 sensors (black cap)
- 10 M6 mounting plates
- 1 OPTIME 5 sensor quick guide manual BA 68-01

Scope of delivery OPTIME 5 Ex:

- 10 OPTIME 5 Ex sensors (yellow cap)
- 10 M6 mounting plates
- 1 OPTIME 5 Ex sensor quick guide manual BA 68-04

18 Scope of delivery of sensor kit



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An EU Declaration of Conformity is included with the delivery.

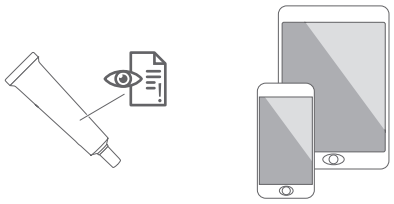
The enclosed quick guide manuals contain the following link to this BA 68 user manual, which always provides the latest version: https://www.schaeffler.de/std/1F40

4.3 Required accessories

To ensure the system is ready-to-use, the following devices and accessories need to be provided by the customer in addition to the gateway and sensors:

- mobile phone or tablet (each with LTE and NFC technology) with installed OPTIME Mobile App
- connection cable to supply power to the gateway
  - max. wire diameter 1,5 mm
  - use wire ferrules with multi-wire cables
  - outside diameter of power cable between 7 mm and 13 mm
- mounting material for the gateway if required
- depending on the type of installation, a suitable adhesive for fixing the mounting plates for the sensors

19 Required accessories for the sensors



00170718

A suitable adhesive for fixing the mounting plates for the sensors is LOCTITE AA 330 with activator, LOCTITE SF 7387 or a product with comparable properties.

- Please follow the instructions and observe the safety data sheet for the adhesive.
- In particular, follow the instructions for substrate preparation, permissible operating temperatures and curing times.

4.4 Damage during transit

1. Check the product immediately upon delivery for any damage during transit.
2. Report any damage during transit promptly as a complaint to the carrier.

4.5 Defects

1. Check the product immediately upon delivery for visible defects.
2. Report any defects promptly as a complaint to the distributor of the product.
3. Damaged products should not be used.

5 Transport and storage

The packaging of the sensor and gateway does not protect the items against damage during transport.

The storage life of the battery-powered sensors is 10 years. Store the sensors at a temperature of +0 °C to +30 °C to protect the batteries.

The sensors contain non-replaceable lithium thionyl chloride batteries which are not dangerous provided the batteries remain in the sensor housing.

⚠ WARNING

Risk of serious injury or death due to improper handling

Improper handling of the sensors may result in leaks or the emission of evaporated electrolyte, which can pose a fire or explosion risk.

- Avoid temperatures of more than +100 °C.
- Never open the sensor housing.
- Avoid damaging the sensors.
- Leave the sensors in the original packaging until use.

The sensors are classified as dangerous goods during transport due to the non-replaceable lithium thionyl chloride batteries they contain.

⚠ WARNING

Risk of fire due to improper handling during transport

Fires may occur if the sensors are not transported in accordance with the statutory provisions.

- Defective sensors must not be sent by air freight.

NOTICE

Risk of strong vibrations due to improper handling

Damage or destruction of the electronics and plastic components of gateways and sensors

- Avoid dropping the gateways and sensors.
- Avoid severe impacts.

6 Commissioning

6.1 Registering in the OPTIME dashboard

To configure the OPTIME gateway and OPTIME sensors it is necessary to register in the OPTIME cloud, so that OPTIME sensors and OPTIME gateways are automatically associated with your company. You can configure the components of your system, i.e. OPTIME gateway and OPTIME sensors, for your system layout. This can be done after registration is complete, either in the OPTIME dashboard or in the OPTIME Mobile App.

6.2 Installing the OPTIME Mobile App

Before installing the components of the OPTIME condition monitoring system, you will need to install the OPTIME Mobile App on your mobile phone or tablet. The OPTIME Mobile App can be downloaded free of charge from the App Store (iOS) or Google Play. You will need login data to be able to log on to the OPTIME Mobile App ➤54|8.1.

6.3 OPTIME Gateway

When installed for the first time, the OPTIME gateway serves as the core of the mesh network. The OPTIME gateway is integrated into the customer's system structure first, followed by the OPTIME sensors. Mounting is then carried out at the desired location and the electrical installation is completed.

6.3.1 SIM card in the OPTIME Gateway

The SIM card is usually pre-installed in the OPTIME gateway at the factory.

In the case of OPTIME Gateway (2019), the SIM card is inserted into the LTE stick. In the case of OPTIME Gateway 2, the SIM card slot is located on the circuit board ➤17|9.

When inserting a new SIM card, it may be necessary to change the Access Point Name (APN). In the case of OPTIME Gateway (2019), the user interface of the LTE stick must be accessed in order to make the change ➤38|7.1. For OPTIME Gateway 2, the APN is also set ➤48|7.2.2.4.

6.3.2 Adding an OPTIME Gateway

To add the OPTIME to the customer's system structure, follow the step-by-step instructions in the OPTIME Mobile App.

1. Open the OPTIME Mobile App.
2. Tap the [Login] button.
3. Enter your login data.
4. Go to the menu symbol and tap on the [Provision gateway] button.

20 Registering the OPTIME gateway

5. Follow the instructions in the OPTIME Mobile App to scan the QR code of the OPTIME gateway.
   The QR code is located on the side of the device, on the product data sticker featuring the Schaeffler or Treon logo.

In Ex versions of the OPTIME gateway, the relevant QR code is located within the housing.

6.3.3 Mounting location of the OPTIME gateway

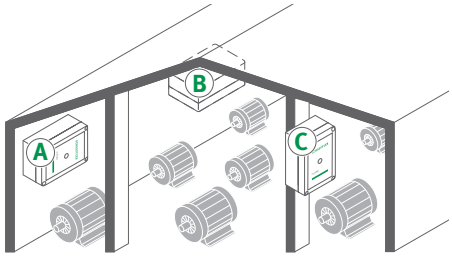
The OPTIME Gateway should be installed at a central location in the overall system.

Please take note of the following for the mounting location:

- The OPTIME Gateway should be positioned centrally within the area of the installed OPTIME sensors. There should be a line of sight to 5 or 6 OPTIME sensors. In most cases these OPTIME sensors will then act as repeaters for the remaining OPTIME sensors.
- The OPTIME Gateway must be mounted on a fixed structure, such as a wall or ceiling.
- For optimum coverage in the mesh network, it is best to mount the OPTIME Gateway above several OPTIME sensors distributed within an area.
- If possible, avoid mounting the OPTIME Gateway at the end of a chain of several OPTIME sensors, as this may reduce the battery life of the last OPTIME sensor in the series.

- Reinforced concrete or larger metallic objects can significantly impede signal transmission in this area. Under no circumstances should the OPTIME Gateway be installed in a metal switch cabinet. Choose a mounting location that will allow stable data transmission.
- If a mobile phone connection is used for data transfer we recommend checking the LTE reception at the mounting location beforehand with a mobile phone.
- The OPTIME Gateway may only be opened in environments with a pollution level of 1 or 2.

21 Mounting location of the OPTIME gateway



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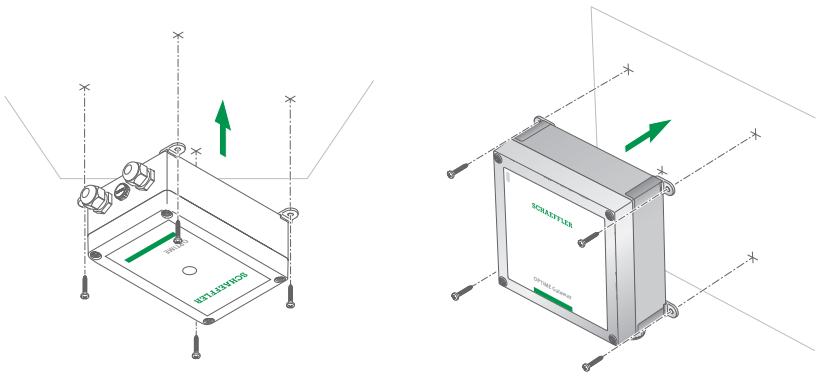
6.3.4 Mechanical mounting of the OPTIME gateway

Suitable fixing material must be selected to match the surface quality of the substrate (screws and dowels for mounting on concrete are already included in the scope of delivery of OPTIME Gateway 2). The OPTIME gateway is fitted using the pre-assembled mounting brackets. Once the gateway has been attached at the chosen mounting location, the electrical connection must be carried out by a qualified electrician.

▸ Attach the OPTIME Gateway at the mounting location.

22 Attaching the OPTIME gateway



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6.3.5 Electrical connection of the OPTIME gateway

For the electrical connection the customer has to provide a sufficiently long connection cable with the appropriate specifications.

⚠ WARNING

Danger to life from electric shock

Failure to adhere to the safety regulations can result in a life-threatening electric shock.

▸ Ensure that all electrical connections are carried out exclusively by a qualified electrician.

⚠ WARNING

Danger to life from electric shock

A defective connection cable can cause a life-threatening electric shock.

- Arrange for any defective connection cables to be replaced immediately by a qualified electrician.

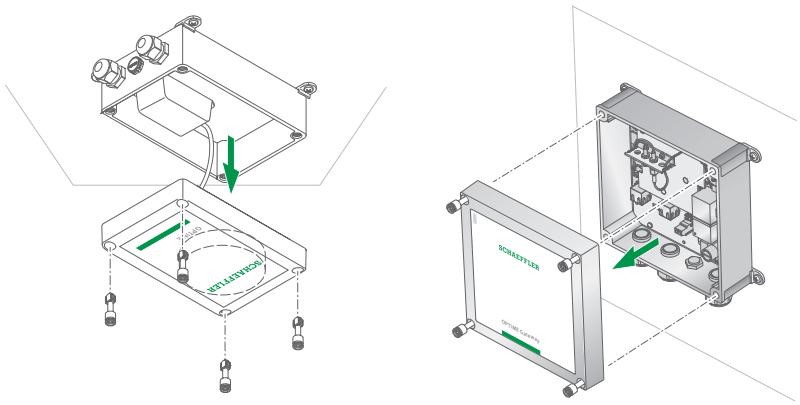
⚠ WARNING

Danger to life from electric shock

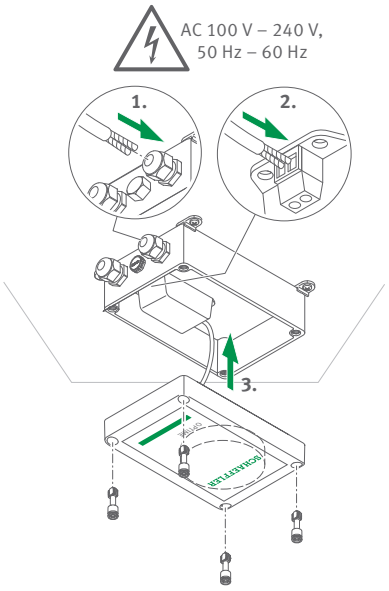
Connecting the device with a protective contact plug is not permitted and can result in a life-threatening electric shock.

- Only connect the device to the mains power supply using a permanent connection.
- Provide a suitable and easily accessible facility for disconnecting all mains power supply lines to the device.

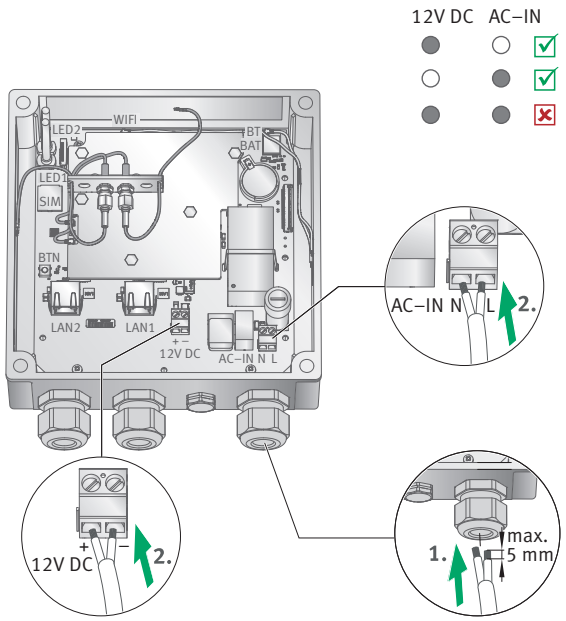
23 Open cover



24 Connecting the OPTIME Gateway (2019) to the electricity supply



25 Connecting the OPTIME Gateway 2 (2023) to the electricity supply



OPTIME Gateway 2 (2023) only: The mains input (AC-IN) and the alternative DC 12 V input must not be used simultaneously. L (line) and N (neutral) for AC-IN must be connected as marked on the printed circuit board ➤17|9 (8). Do not use cables with a cross-section exceeding 1,5 mm² or 16 AWG and an outside diameter between 7 mm and 13 mm. Strip no more than 5 mm of insulation from the cable. A ferrule must be used when using a flexible cable.

OPTIME Gateway 2 (2023) only: Network connection LAN1 is disabled by default. LAN1 can be enabled via the OPTIME gateway configuration interface.

The LAN2 is not currently available for use.

The screws in the connection terminal (AC-IN and DC 12 V) require a tightening torque of 0,5 Nm. The screws in the housing cover are tightened to 1,2 Nm. The tightening torque for the cable gland is 3 Nm.

When the OPTIME gateway's mobile phone connection is used (default setting), the OPTIME Gateway automatically connects to the OPTIME cloud. Please note that it may take a few minutes to establish the connection.

If the OPTIME Gateway is to be connected via the Ethernet, communication with the OPTIME Gateway can optionally be established by connecting a network cable to the corresponding router socket. For this communication connection, the OPTIME gateway configuration must be adjusted accordingly ➤38|7.

When the LED on the OPTIME Gateway (2019) lights up green, the connection to the Internet has been established successfully. The OPTIME Gateway will appear in the customer section within the OPTIME cloud.

The OPTIME Gateway 2 features 2 LEDs to confirm connectivity, both of which must light up green to indicate a successful connection to the OPTIME cloud.

If the mobile phone connection via the installed SIM card is not to be used, there are other options available:

- SIM card provided by the customer
- connection via WLAN
- connection via network cable

OPTIME Gateway 2 (2023): once fully commissioned, insert the plugs provided to close off access to the cover screws.

6.4 OPTIME sensor

⚠ WARNING

Risk of fire and explosion due to mechanical damage

- Take the OPTIME sensor out of operation immediately.
- Dispose of the OPTIME sensor properly ➤80 | 13.

Please take note of the following for the mounting location:

- Do not cover OPTIME sensors to avoid impeding data transmission.
- When choosing the mounting location, take care to avoid areas exposed to stronger vibrations, such as the natural oscillation of thin-walled housing covers or cooling fins.

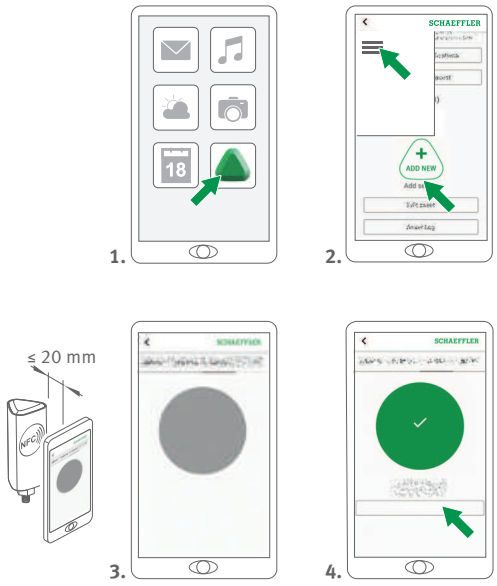
6.4.1 Activating the OPTIME sensor

To activate the OPTIME sensor, you need an NFC-enabled mobile phone or tablet. The OPTIME Mobile App must be installed on your mobile phone or tablet.

You should activate the OPTIME sensor before mounting to rule out any potential defects in advance.

1. Open the OPTIME Mobile App.
2. Tap the [Login] button.
3. Enter your login data.
4. Go to the [Menu] symbol and tap on the [Provision sensors] button.
5. Follow the instructions in the OPTIME Mobile App to activate the OPTIME sensor via NFC.
   The NFC receiver is located at the back of the device beneath the NFC logo.

26 Activating the OPTIME sensor



Activation is completed in 2 steps. First, the OPTIME sensor is switched on. Then the network parameters are transferred. For final confirmation the user is prompted to save the settings. Depending on the mobile device used, each separate NFC contact is acknowledged, for example, by a vibration.

For more information about sensor deployment, please refer to the dashboard ➤64|8.6.

⚠ WARNING

Risk of fire and explosion due to improper handling

Improper handling of OPTIME sensors can lead to leakage or the emission of evaporated electrolyte, which poses a risk of fire or explosion and may result in serious injury.

- Deactivate the OPTIME sensor before handing it over for proper disposal.
- OPTIME sensors must also be deactivated during transport and storage.
- Defective OPTIME sensors must not be sent by air freight.

6.4.2 Deactivating the OPTIME measuring point

1. Navigate to the relevant measuring point in the OPTIME Mobile App: Scroll down to sensor level and select [Installation].
2. Tap the [Deactivate measuring point] button.
3. Follow the instructions in the OPTIME Mobile App to deactivate the OPTIME sensor via NFC.

› Depending on the mobile device used, each separate NFC contact is acknowledged, for example, by a vibration.

» The OPTIME sensor is deactivated.

6.4.3 Moving the OPTIME sensor (reprovisioning)

If an OPTIME sensor is to be moved to a different measuring point, it must first be deactivated (see above). Once deactivated, the OPTIME sensor can be assigned to a new measuring point.

6.4.4 Replacing the OPTIME sensor

If the battery is empty or defective, the OPTIME sensor must be replaced. Proceed as follows:

1. Navigate to sensor management for the relevant machine in the OPTIME Mobile App and select the OPTIME sensor.
2. Tap the [Installation] button. located at the bottom of the sensor page.
3. Tap the [Replace sensor] button.
4. Follow the instructions in the OPTIME Mobile App to activate the new OPTIME sensor via NFC.

› Depending on the mobile device used, each separate NFC contact is acknowledged, for example, by a vibration.

» The OPTIME sensor for this measuring point has been successfully replaced. The trend will continue with the new OPTIME sensor.

6.4.5 Mounting location of the OPTIME sensors

NOTICE

Risk of damage due to incorrect mounting

- To ensure optimum condition monitoring, seek assistance from a vibration expert for this step.

When mounting the OPTIME sensor on a monitored machine, it is important to consider both the position of the OPTIME sensor and the contact between the OPTIME sensor and the machine.

6.4.6 Contact surface for OPTIME sensors on the machine

NOTICE

Risk of damage due to incorrect mounting

Screwing the OPTIME sensor onto a highly curved surface can cause the threaded bolt to twist, permanently damaging the OPTIME sensor.

- ▸ Ensure that the mounting surface is even.

The OPTIME sensor is mounted on the base using an M6 threaded bolt. To ensure optimum measuring quality, the contact surface on the machine must be completely flat and smooth. Additionally, the contact surface area on the machine should be larger than the base of the OPTIME sensor. It is recommended that the OPTIME sensors be mounted directly on the machine housing using an existing M6 threaded hole. Adapters for other thread sizes are available as accessories.

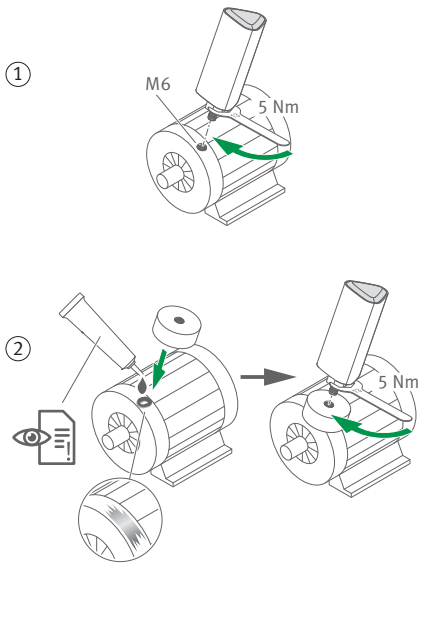
If there is no suitable threaded hole on the machine, one can be machined to directly screw in the OPTIME sensor. For slightly curved or uneven machine surfaces, the use of a suitable adhesive with gap-filling properties is recommended to ensure a secure installation. Alternatively, if possible, the surface can be machined flat using a suitable tool.

The OPTIME sensors also come with mounting plates that can be glued on if there is no screw-in thread on the machine.

Furthermore, please note the following:

- The OPTIME sensor must be fitted perpendicular to the mounting surface.
- The mounting surface must not be excessively curved or uneven.
- The surface should be free of contamination.
- The OPTIME sensor can be operated at ambient temperatures of –40 °C to +85 °C.

27 Mounting variants



1	Mounting the OPTIME sensor in a thread	2	Mounting the OPTIME sensor with a mounting plate

Further mounting options: with adapter M6 on M8 (accessories).

6.4.7 Mounting the OPTIME sensor in a thread

NOTICE

Risk of damage due to incorrect mounting

Too low a torque can lead to a weak connection between the OPTIME sensor and the machine, while too high a torque can damage the OPTIME sensor and the threaded bolt.

- Always adhere to the specified tightening torque.

Mounting a sensor into an existing thread on the machine requires a flat surface and an M6 screw-in thread:

1. Clean the machine surface.
2. Insert the threaded bolt into an M6 screw-in thread.
3. Tighten the threaded bolt to a maximum of 5 Nm.

6.4.8 Mounting the OPTIME sensor with a mounting plate

The mounting plate allows the OPTIME sensor to be attached to machines that do not have an existing thread. This requires a mounting plate, suitable adhesive and a surface with a diameter of 32 mm.

⚠ CAUTION

Risk of injury from adhesive.

Incorrect handling of the adhesive may cause injury. Direct skin contact with the adhesive can lead to injuries.

- Use suitable protective gloves.
- Follow the adhesive instructions and the safety data sheet.

⚠ CAUTION

Risk of damage due to incorrect use

There is a risk of damage if the adhesive is used incorrectly. Once installed, the sensor fixing cannot be undone without causing damage.

- Select a suitable adhesive.
- Follow the adhesive instructions.

1. Clean the machine surface.
2. Stick mounting plate to the machine.

NOTICE

Incorrectly used adhesive

Incorrect use of the adhesive may lead to damage.

- Observe the curing times specified in the adhesive instructions.

3. Insert the threaded bolt into the screw-in thread of the mounting plate.
4. Tighten the threaded bolt to a maximum of 5 Nm.

⚠ CAUTION

Risk of damage due to incorrect tightening torque

Too low a torque can lead to a weak connection between the OPTIME sensor and the machine, while too high a torque can damage the sensor and the threaded bolt.

- Always adhere to the specified tightening torque.
- To tighten the sensor to a maximum of 5 Nm, always use a wrench on the sensor base rather than on the housing!

6.4.9 Configuring the OPTIME sensor

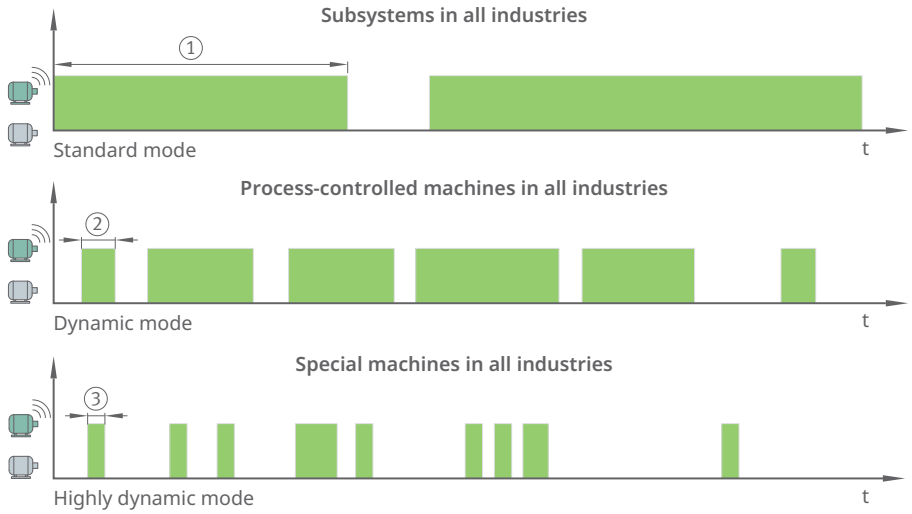
The OPTIME sensor automatically receives network parameters through the OPTIME Mobile App. When configuring, only the machine type (e.g. motor, pump, fan) needs to be specified. All other machine data (such as the speed, power, bearing types) are optional and primarily improve the result of the analysis.

These data can also be configured at a later time either via the OPTIME Mobile App or in the OPTIME cloud.

The OPTIME sensors can be operated in various modes, allowing them to be adapted to the machine on which they are used:

- In [Standard] mode, the OPTIME sensors take measurements at fixed time intervals of 4 h. This mode should be used when the machine is in continuous operation for at least 4 h. The battery life is at its longest in this mode.
- [Dynamic] mode enables monitoring of machines that are only activated occasionally and are switched on for at least 30 s. This mode can be used for machines that are active for a total of at least 7 h per week.
- The use of [High dynamic] mode is recommended for machines with very short activation or running periods of at least 5 s to 30 s. As with 7 mode, this also requires a minimum running time of <emphasis type="value">7</emphasis>h per week.

28 Measurement modes



1	Standard mode: Machine in continuous operation for at least 4 h	2	Dynamic mode: Machine in operation for at least 30 s per work cycle
3	Highly dynamic mode: Machine in operation from 5 s to 30 s per work cycle		

7 Modes

Mode	Operating conditions	Typical applications
[Standard]	Continuous operation (for a minimum of 4 h)	Process machinery (pumps, fans, gearboxes)
[Dynamic]	Occasional operation (min. of 30 s)	Process-controlled machinery (fans, pumps)
[High dynamic]	For short operation periods only (from 5 s to 30 s)	Cranes, conveyor systems

When [Dynamic] and [High dynamic] mode are used, a [Learning mode] is triggered to determine the correct wake-up threshold for the operating machine. To determine this threshold, the machine must be in operation for at least 7 h during the one-week learning phase, preferably spread across at least 3 different days. During the learning phase for [Dynamic] or [High dynamic] mode, vibration monitoring is temporarily suspended.

In all modes, a maximum of 6 characteristic value measurements and one time waveform signal form are sent per day in order to optimise battery life. If the above conditions cannot be met for a particular machine, it is recommended to switch to wired solutions from Schaeffler such as ProLink.

7 Configuration of the OPTIME gateway

Various interfaces are available for communication between the OPTIME gateway and the OPTIME cloud.

Normally, there is no need to change the default OPTIME gateway settings, however, for certain installations, adjustments or changes to some of the default settings may be necessary. These settings should only be performed by skilled personnel.

Configurable settings include:

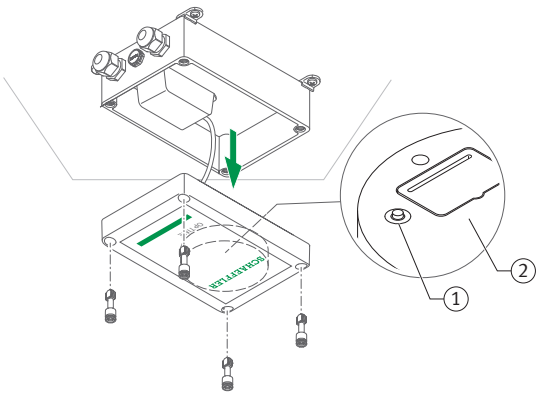
- WLAN
- Ethernet

7.1 OPTIME Gateway (2019)

The mobile connection to the OPTIME Gateway (2019) is established via the built-in LTE stick. As a result, the SIM settings can only be accessed via the LTE stick's user interface. The LTE sticks used may vary depending on the country or region. For assistance with configuration, contact our support team.

To access the user interface of the OPTIME Gateway configurator via a browser, proceed as follows:

29 Button on the OPTIME Gateway



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1	Push button	2	Nameplate with WLAN password

1. Press the push button on the OPTIME Gateway until the status LED flashes blue.

› The OPTIME Gateway enters [Configuration] mode.

› The OPTIME Gateway becomes a WLAN access point. The name of the WLAN access point is "OPTIME serial number", where "serial number" corresponds to the serial number of the OPTIME Gateway. The serial number is on the label on the side of the OPTIME Gateway.

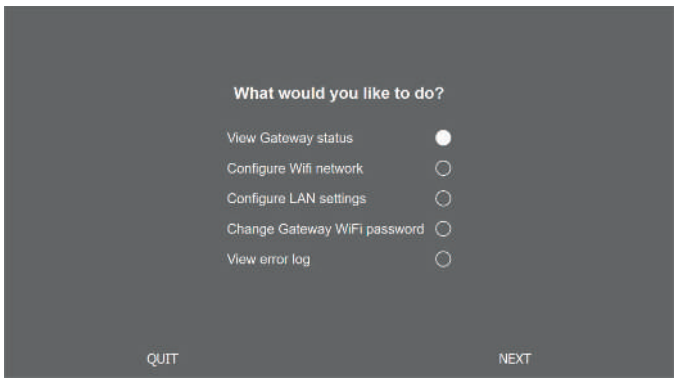
2. Establish a WLAN connection between your computer or mobile device and the WLAN access point. The WLAN password is on the nameplate.
3. Open the browser and enter the IP address 192.168.0.1. If the pre-set IP address does not work, check the TCP/IP values for the OPTIME Gateway. This can happen if the device was already connected to another network.

» The drop-down menu will open, displaying the setting options.

7.1.1 Settings

The menu items [View Gateway status] and [View error log] are not relevant for normal operation of the OPTIME Gateway. The information retrievable under these menu items can be used by specialist personnel if the OPTIME Gateway is not working properly.

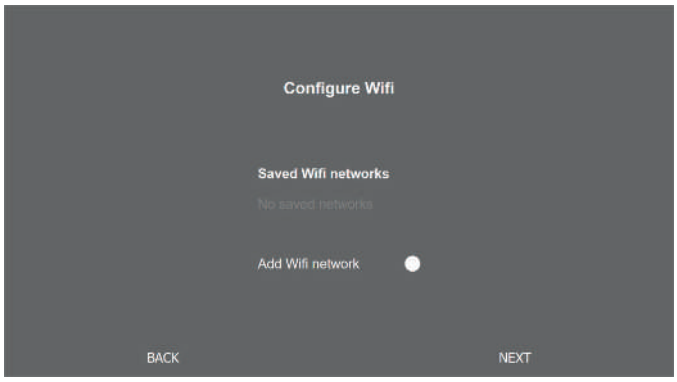
30 Drop-down menu for configuring the OPTIME Gateway



7.1.1.1 Configure WLAN

The WLAN settings for the OPTIME Gateway can be adjusted under the menu item [Configure WiFi network]. A known network can be selected or a new network can be added. If necessary, the WLAN password can be changed under the menu item [Change Gateway WiFi password].

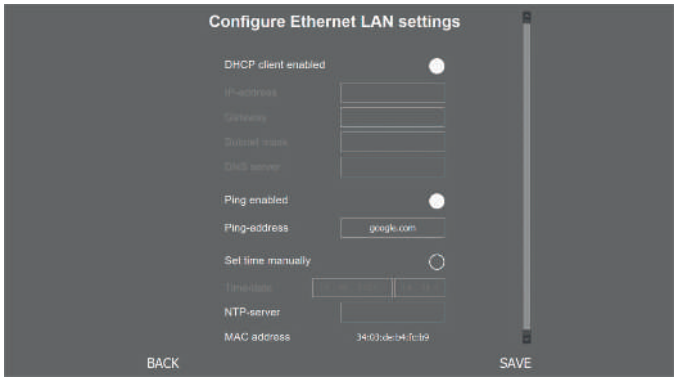
31 Settings for operation in WLAN network



7.1.1.2 Ethernet configuration

If the OPTIME Gateway is to be connected to a local network via the RJ45 port provided in the device, the necessary settings can be performed under the menu item [Configure LAN settings].

32 Settings for operation in the Ethernet



001A9BDF

7.2 OPTIME Gateway 2 (2023)

Normally, there is no need to change the default OPTIME Gateway 2 settings, however, for certain installations, adjustments or changes to some of the default settings may be necessary. These settings may only be performed by skilled personnel.

The OPTIME Gateway 2 can only be placed in configuration mode immediately after being switched on. If the OPTIME Gateway 2 is already in operation, you will need to restart it in order to enter configuration mode.

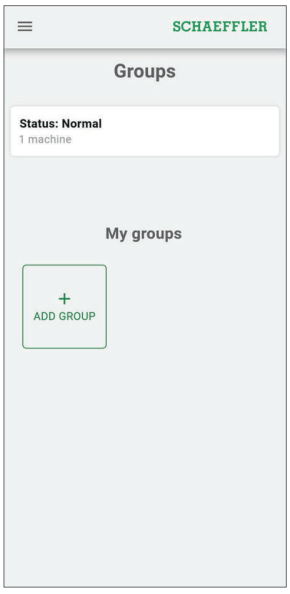
You can use the browser on a mobile device, e.g. mobile phone, tablet or computer to connect via WLAN (Wi-Fi) to the OPTIME Gateway 2 and make the necessary changes.

7.2.1 Accessing the configuration page

Before you start, you will need a Wi-Fi password.

1. To obtain the Wi-Fi password, start the OPTIME Mobile App on your mobile device and log in.
2. On the start page, select the [Menu] symbol in the upper-left corner.

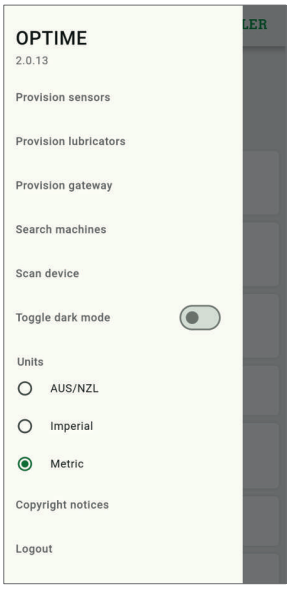
33 Start page



001AFA58

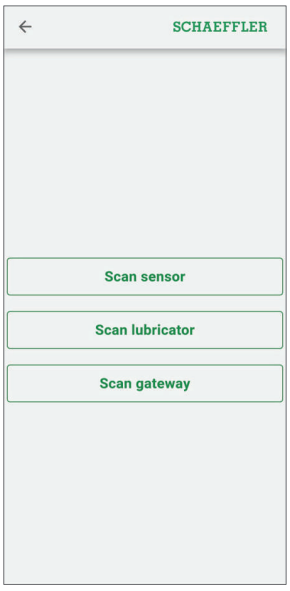
3. Select [Scan device] from the menu.

34 Menu



001AFA7B

4. Select [Scan gateway].

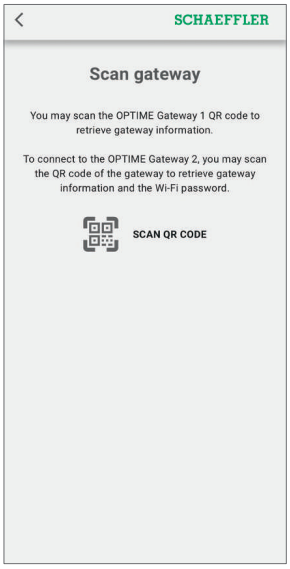


001B4006

The QR code scanner will open.

5. Select [Scan QR code].

35 Scan QR code



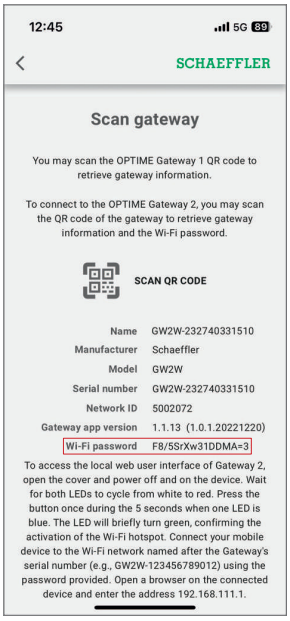
001AFA9F

The camera will open.

6. Scan the QR code on the nameplate of the OPTIME Gateway 2.

» The Wi-Fi password and additional information about the OPTIME Gateway 2 will be displayed.

36 OPTIME Gateway 2 information



001AFAA0

7. Copy the WiFi password.

Accessing the configuration UI

To access the gateway configuration user interface (UI) via a browser on a mobile device or computer, proceed as follows:

1. Switch on the OPTIME Gateway 2.

› Both LEDs will light up red.

2. Wait for LED1 to light up blue for approximately 5 s, then press the [BTN] button on the OPTIME Gateway 2 to enable access to the configuration UI ➤17|9.

› LED1 will light up green to confirm that the [BTN] button has been pressed.

› The OPTIME Gateway 2 will enter [Configuration] mode and provide a WLAN access point.

3. Select the WLAN access point from the WLAN list on your computer or mobile device to establish a Wi-Fi connection between your computer or mobile device and the WLAN access point. The name of the WLAN access point is “GW2W serial number”, where “serial number” corresponds to the serial number of the OPTIME Gateway 2, e.g. “GW2W-232740331510”.
4. Enter the Wi-Fi password.
5. Open the browser and enter the IP address http://192.168.111.1.

» The configuration start page for OPTIME Gateway 2 will open.

Some Android phones will automatically switch to mobile data when you connect to the configuration page via the WLAN access point. If this happens, disable mobile data before accessing the OPTIME Gateway 2 configuration.

If you use a Windows PC to access the OPTIME Gateway 2 configuration page, select the WLAN access point from the WLAN list and press [Connect].

The connection is terminated after 10 min of inactivity or by pressing the [Exit] symbol.

The hotspot is deactivated when you exit the configuration page. To reactivate the hotspot, reboot and repeat the procedure as described above.

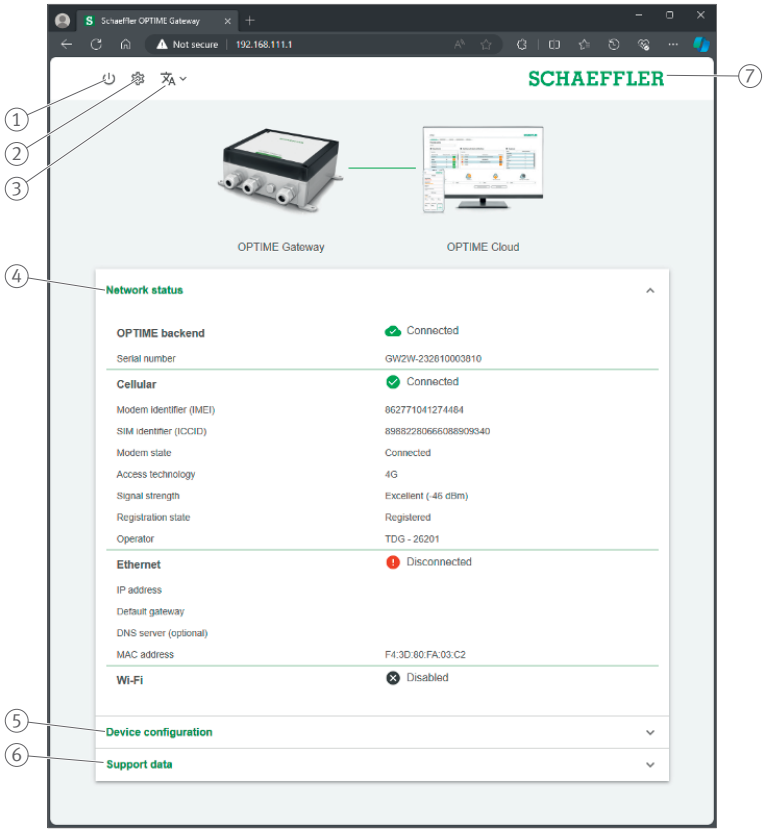
7.2.2 Settings

The following is displayed on the OPTIME Gateway 2 configuration start page:

- [Network status] and current settings
- Device configuration data
- [Support]

You can only view the network status and settings on the start page. To change the configuration, press the [Settings] symbol at the top of the ➤48|7.2.2.4 page.

37 Configuration start page



001AFB1B

1	[Exit]	2	[Settings]
3	[Change language]	4	[Network status]
5	[Device configuration]	6	[Support]
7	Back		

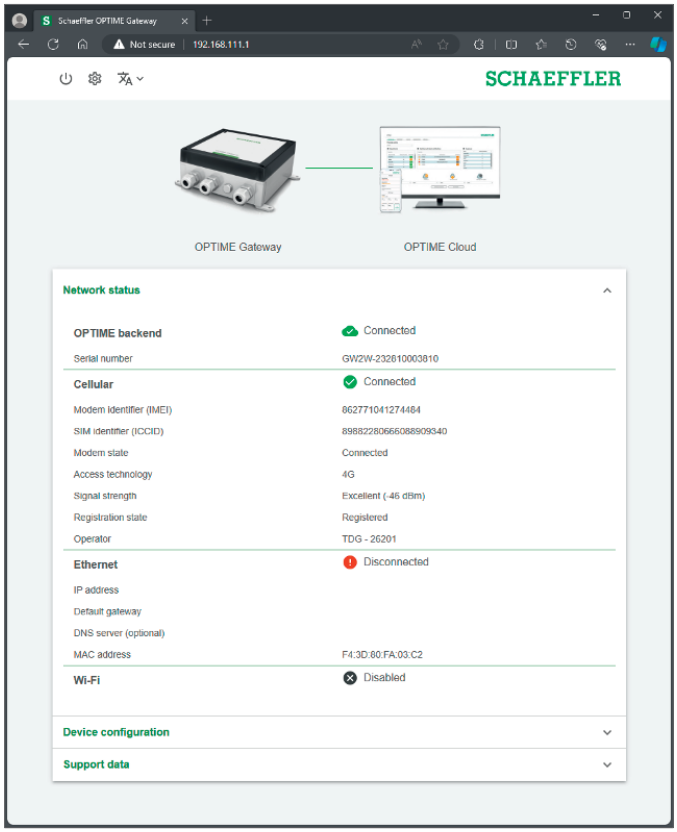
8 Configuration start page

1	[Exit]	Exits the configuration. The WLAN access point will no longer be accessible until the next reboot.
2	[Settings]	Click on the [Settings] symbol to access the OPTIME Gateway 2 settings.
3	Language selection	Select the language for the user interface.
4	[Network status]	Displays the current network connection status
5	[Device configuration]	Displays the current OPTIME Gateway 2 settings
6	[Support]	Download version information, log files and view licence information.
7	Back	Click on the Schaeffler logo to return to the start page.

7.2.2.1 Network status

The [Network status] section shows the status of the communication interface between the OPTIME Gateway 2 and the OPTIME cloud.

38 Network status

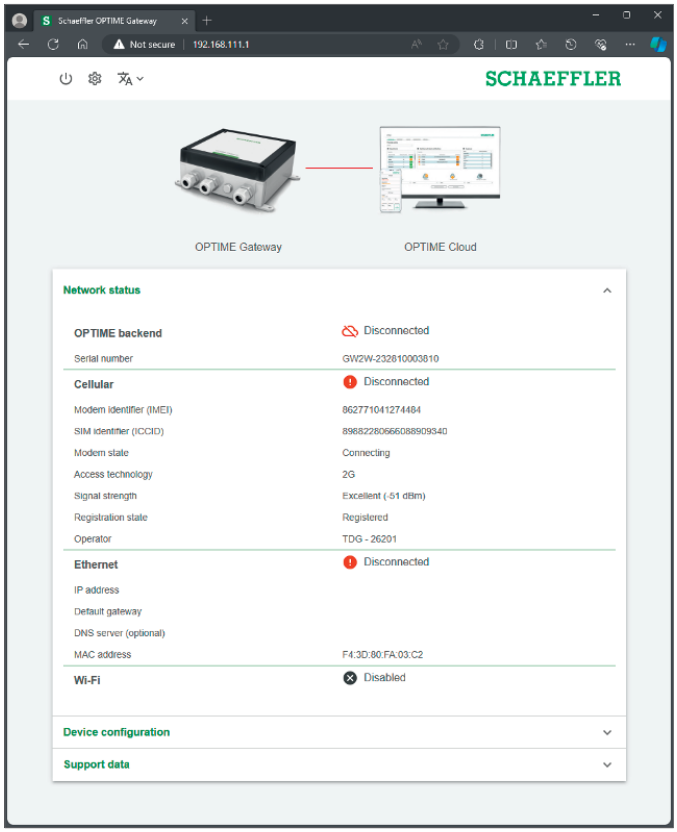


001AFAFB

The connection status is indicated by the line between the OPTIME Gateway 2 and OPTIME cloud images at the top of the page and the first line of the network status:

- green line: connected
- red line: disconnected

39 Network status, connection status: disconnected



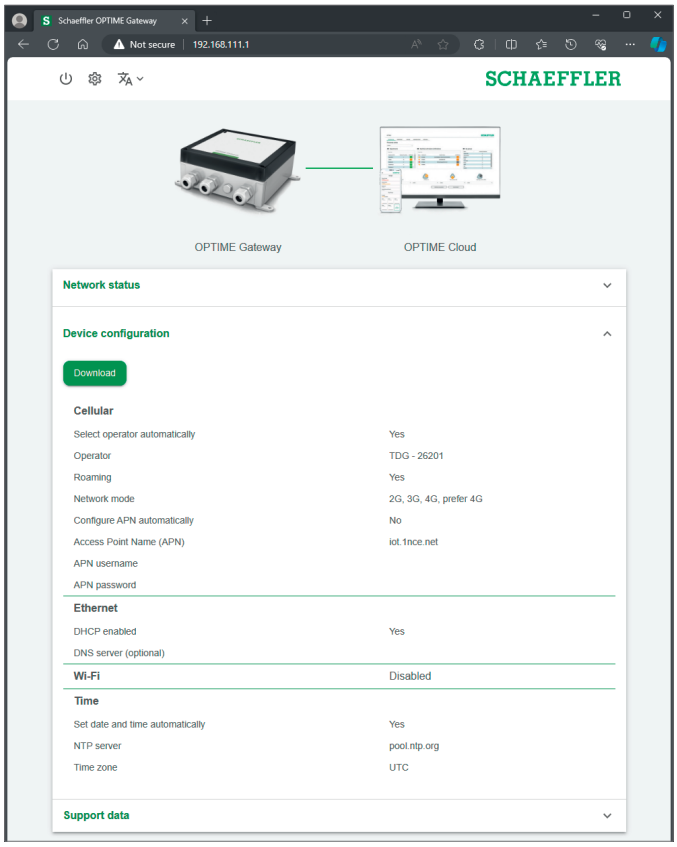
001AFB2B

7

7.2.2.2 [Device configuration]

The current OPTIME Gateway 2 settings are displayed in the [Device configuration] section.

40 Device configuration data



001AFB4B

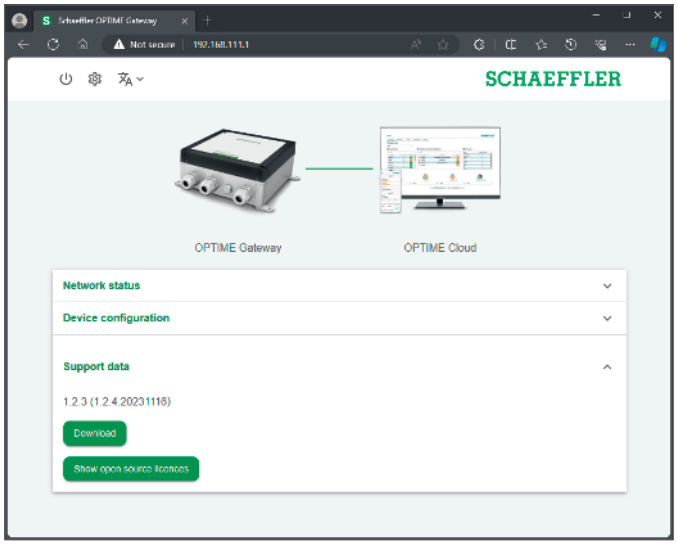
To download the OPTIME Gateway 2 configuration data in .txt format, press the [Download] button.

7.2.2.3 Support

In the [Support] section, you can perform the following actions:

- view version information
- download log files, to send to the Schaeffler support team for example
- view licence information

41 Support



001AFB6E

1. Click on [Download] to download a .zip file that contains the encrypted log files.
2. Click on [Show open source licences] to view the licence information in .html format.

Please note that this page also displays the firmware version installed on the device.

7.2.2.4 Configuring the OPTIME Gateway 2 settings

Normally, there is no need to change the default OPTIME Gateway 2 settings, however, for certain installations, adjustments to some of the default settings may be necessary. These settings may only be changed by skilled personnel.

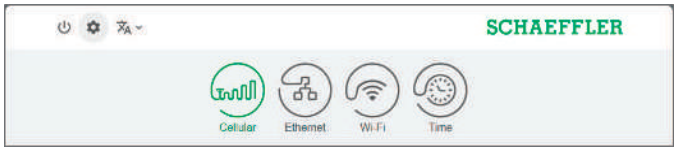
The OPTIME Gateway 2 settings are accessed as follows:

1. Click on the [Settings] symbol in the configuration interface.
2. Select the settings that are to be changed.

The following settings can be changed:

- [Cellular]
- [Ethernet]
- [Wi-Fi]
- [Time]

42 Symbols for OPTIME Gateway 2 settings



001AFB8E

9 OPTIME Gateway 2 settings

Designation	Description
[Cellular]	Opens the mobile network (SIM) settings.
[Ethernet]	Opens the Ethernet settings. If the OPTIME Gateway 2 is to be connected to a local network via the RJ45 port provided in the device, the necessary settings can be performed here.
[Wi-Fi]	Opens the Wi-Fi settings for OPTIME Gateway 2. Select a known network or add a new network.
[Time]	Opens the date and time settings.

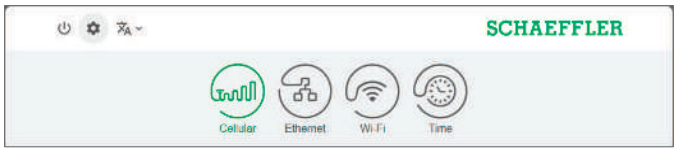
3. Click on the [Settings] symbol again to return to the start page from the settings.

Configuring the mobile settings (SIM)

The mobile phone connection is used as standard in the OPTIME Gateway 2.

Usually, there is no need to change the mobile settings. A SIM card is supplied with the OPTIME Gateway 2 which does not have to be replaced. Mobile settings may only be changed by skilled personnel.

43 Configure mobile settings



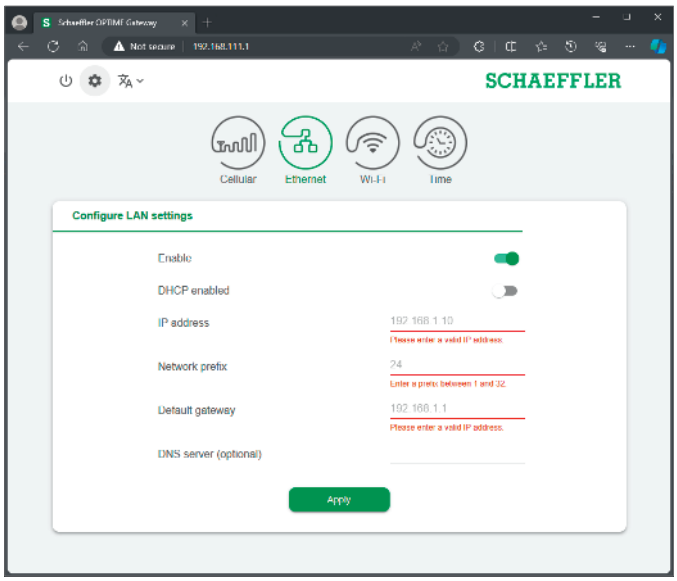
If you need to change the mobile settings, please follow these instructions:

1. Click on the [Cellular] symbol to access the mobile settings.
2. If the SIM card is locked, enter the SIM pin to access the mobile settings. In the default setting, the SIM card is not locked.
3. To add a specific provider, disable the [Select operator automatically] selection and select the operator manually from the [Operator] list.
4. To avoid roaming charges abroad, disable the [Roaming] selection.
5. To manually select the Access Point Name (APN) of your network provider, disable the [Configure APN automatically] selection. This option may be required if using your own SIM card.
6. Write the new APN on the line that opens.
7. Click on [Apply] to save the changes to the configuration.

Configuring the Ethernet settings

To use a wired company network, configure the Ethernet settings for LAN1 (LAN2 is currently unavailable).

44 Ethernet settings (LAN)



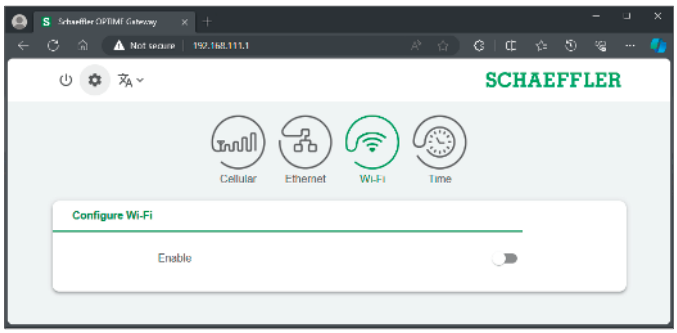
001AFBAE

1. Click on the [Ethernet] symbol to access the Ethernet settings.
2. It is recommended to keep DHCP enabled. If DHCP is disabled, enter the network IP address, network prefix and OPTIME Gateway 2 IP address.
3. If necessary, enter the DNS server address.
4. Click on [Apply] to save the changes to the configuration.

Configuring the Wi-Fi settings

1. To connect via WiFi, click on the [Wi-Fi] symbol to activate WiFi configuration mode.

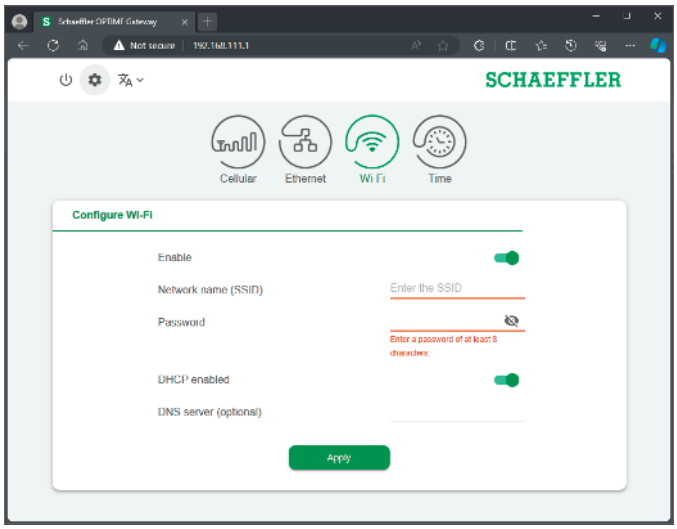
45 Configure WiFi



001AFBD0

2. Enable WiFi settings.

46 WiFi settings



001AFBF0

3. Change the WiFi settings as required.

10 Wi-Fi settings

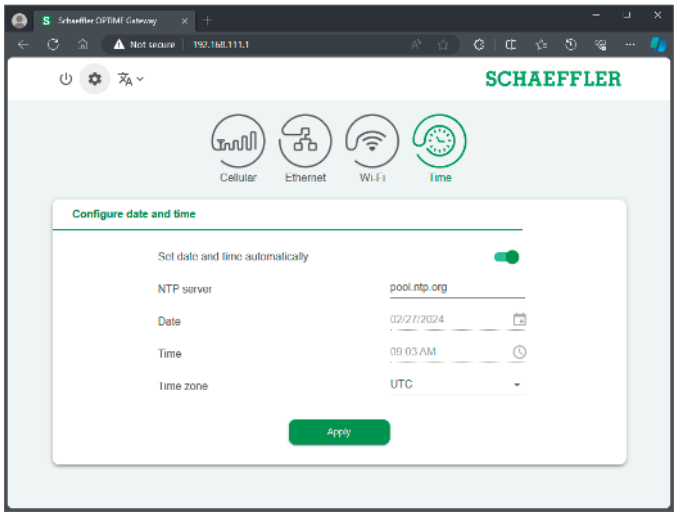
Designation	Description
[Network name (SSID)]	Enter the name of the network.
[Password]	Enter the password for the selected network.
[DHCP enabled]	It is recommended to keep DHCP enabled. If DHCP is disabled, enter the network IP address, network prefix and the gateway IP address.
[DNS server (optional)]	Enter the DNS server address if necessary.

4. Click on [Apply] to save the changes to the configuration.

Configuring the date and time

1. Click on the [Time] symbol to configure the date and time.

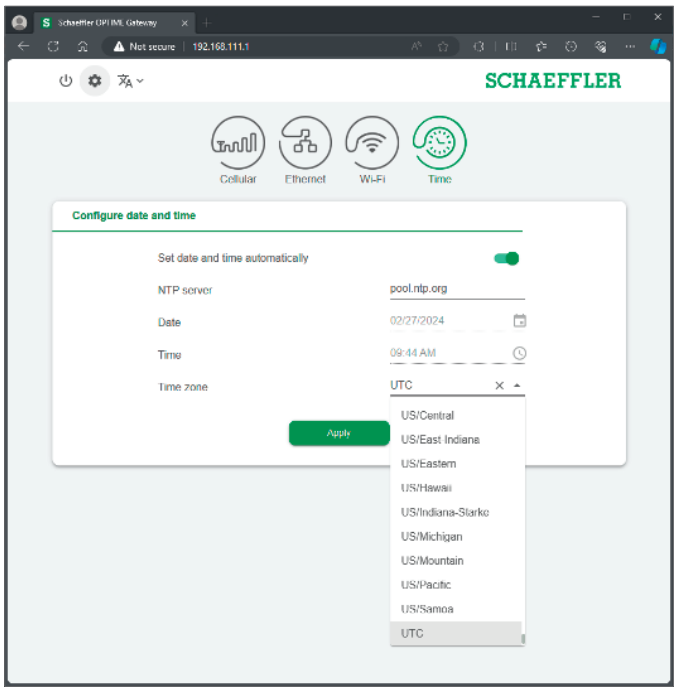
47 Configure date and time



001AFC20

2. Click on [Set date and time automatically] to enable or disable automatic setting of the date and time.
3. To change the Network Time Protocol, enter the name of the server in the [NTP server] field.
4. Select the time zone from the [Time zone] list. To narrow down the selection, start typing the name of the time zone.

48 Time zone selection



001AFC40

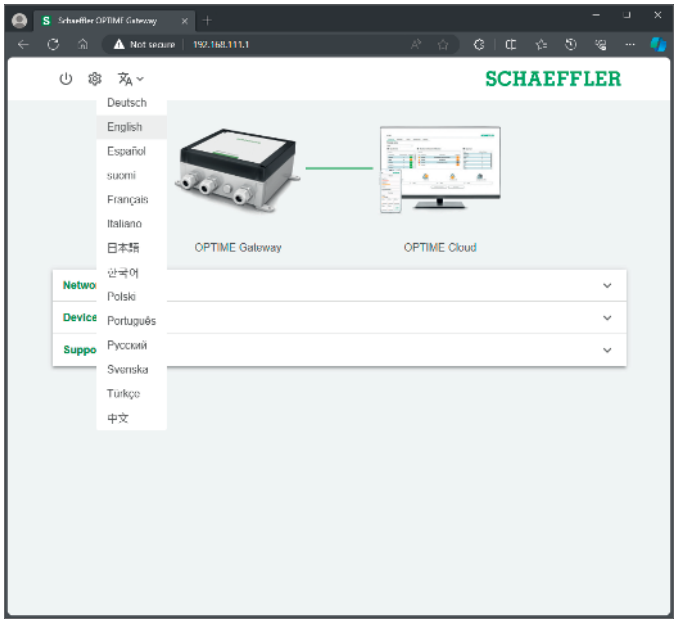
5. Click on [Apply] to save the changes to the configuration.

Changing the user interface language

1. Click on the [Change language] symbol and select the language from the list.

» The user interface language changes immediately.

49 Language selection



001AFC59

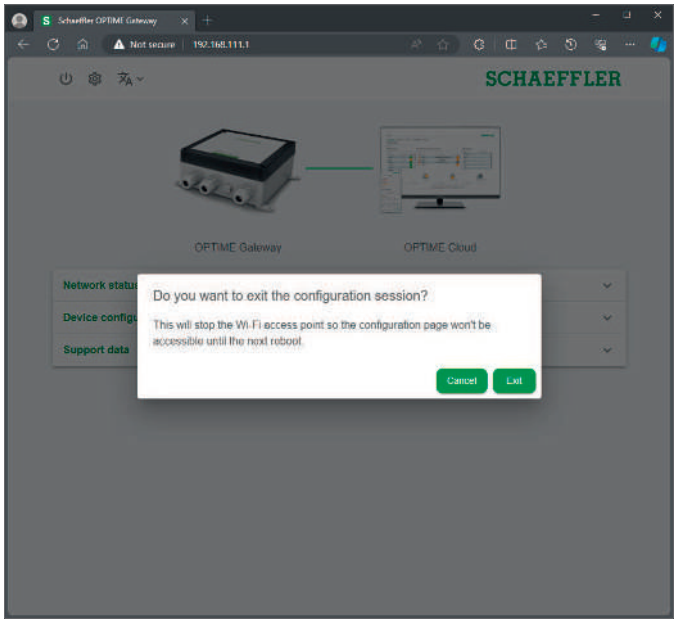
Terminating the configuration session

The connection terminates automatically after 10 min of inactivity.

Alternatively, you can terminate the session manually:

1. Click on the [Exit] symbol.
2. Select [Exit] to confirm.

50 Terminate the configuration session



001AFC79

If you terminate the configuration session, you will need to reboot the OPTIME Gateway 2 to return it to configuration mode and reactivate the WLAN access point.

8 Using the OPTIME Mobile App

The OPTIME Mobile App is an integral part of the OPTIME solution, providing easy access to data from the OPTIME condition monitoring system. The app is used to create and maintain the environment for the OPTIME condition monitoring system, receive up-to-date information on the condition data and react to changes in the condition data.

The app allows OPTIME sensor data to be retrieved locally via a wireless connection. You will be informed of the status of the machine and its latest operating values. In addition, the OPTIME sensors are commissioned and configured with the aid of the app. The menu navigation guides the user in adding, configuring and managing new OPTIME sensors.

As with all software, the app is being continuously improved. Up-to-date information and further details about the app can be found in the online help facility in the OPTIME dashboard ➤66|9.1.

8.1 Login and logout

To log in to the OPTIME Mobile App as a user, you will need login data. Every customer receives an administration user account when purchasing the OPTIME condition monitoring system. The administrator is able to create additional users. All created users will receive their login data by e-mail.

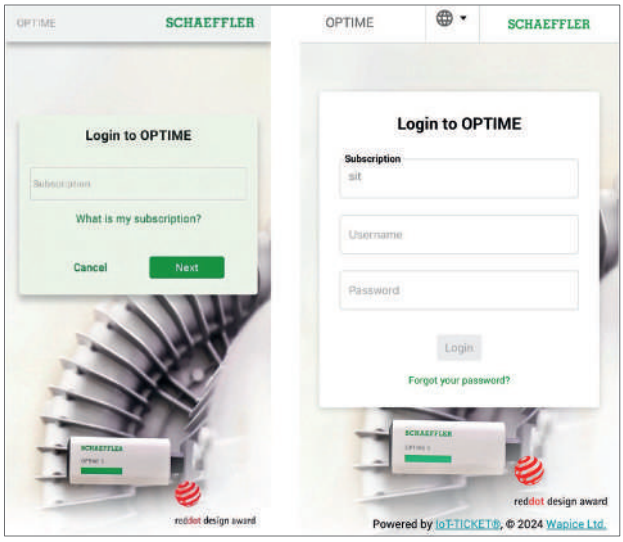
The customer administrator receives their login data by registering on the OPTIME dashboard.

Logging in

To log in:

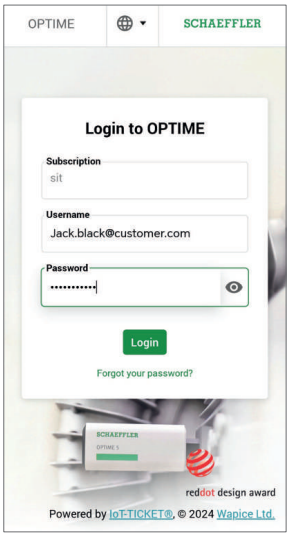
1. Start the app.

51 Logging in to the OPTIME Web App



001B69E2

52 Logging in to the OPTIME Mobile App



001B4026

2. Enter the login data.
3. Tap the [Login] button.

» After you have logged in successfully, the start screen will appear.

Logging out

To log out:

1. Go to the [Menu] symbol and tap on the [Logout] button.

8.2 General navigation

There are central navigation elements and setting options for running the app, which can be found in the various screens.

The following areas of the app allow specific monitoring of the machines in the asset:

- group
- machine
- sensor
- lubricators

8.2.1 User roles

The structure of the OPTIME Mobile App is consistent for all users. Permissions may vary depending on the user role.

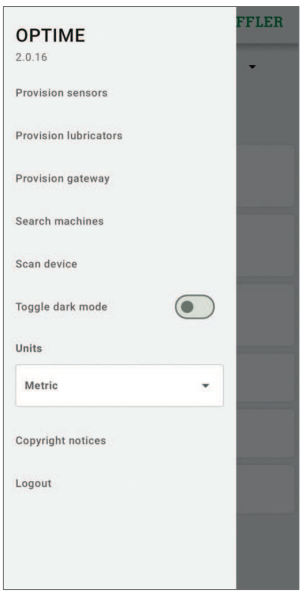
8.2.2 Languages

The language used on the OPTIME Mobile App is determined by the language of the mobile device's operating system.

8.2.3 Buttons

The drop-down menu, which can be accessed via the [Menu] symbol, and the main buttons are used for navigation.

53 Direct access via navigation elements



001AD5D5

11 Symbol [Menu]

Button, symbol	Description
[Provision sensors]	Direct access for installing and configuring a sensor
[Provision lubricators]	Direct access for installing and configuring a lubricator
[Provision gateway]	Direct access for installing and configuring an OPTIME gateway
[Search machines]	Direct access to the machine search function with various filtering options
[Scan device]	Direct access to the scan function for reading sensor, lubricator or OPTIME gateway settings
[Toggle dark mode]	Enables or disables dark mode, in which the OPTIME Mobile App is displayed in a darkened layout.
[Units]	Direct access to the unit system, which can be changed to “Metric”, "Imperial" or “AUS/NZL” (for Australia and New Zealand)
[Copyright notices]	Direct access to copyright information
[Logout]	Logs the user out

12 Navigation elements

Button, symbol	Description
	Returns to the previous screen
	Closes the screen
	Adds the selection to [Favourites]
	Confirms the update after the screen was swiped down, for example at group, machine or sensor level.

8.2.4 Search function and filters

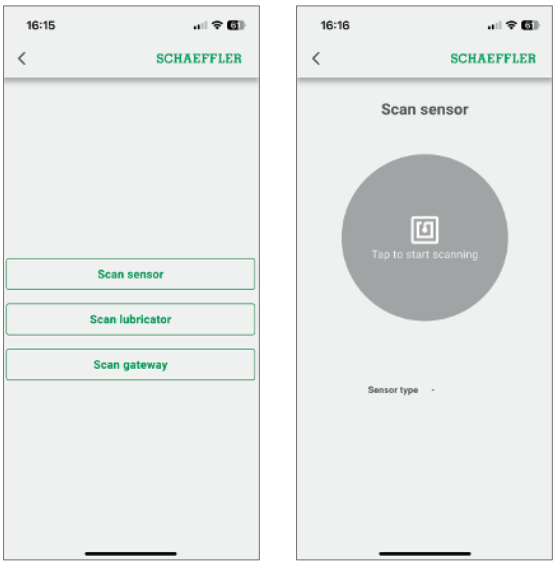
The search function can be used in various areas of the OPTIME Mobile App to help refine search results for assets, machines or sensors based on specific criteria.

Filters can be set based on an entered search string, the criticality of the machine and the machine type. The filters can be reset using the [Clear search filters] button.

8.2.5 [Scan device]

The device settings for sensors, lubricators and OPTIME gateways can be read using the [Scan device] button.

54 [Scan device]



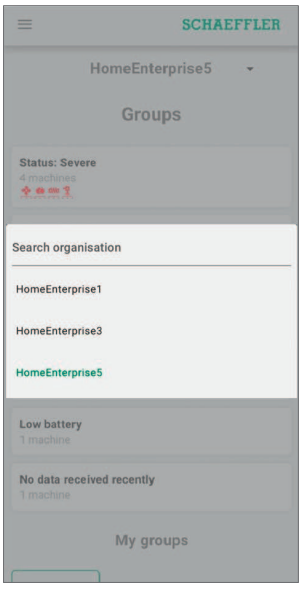
001B6EE8

8.3 Organisation selector

A user with access to more than one organisation (company) will be shown the first organisation in the list. This can be changed to the organisation the user wishes to view by selecting a different organisation in the list.

The organisation selector is located at the top of the display under the menu bar.

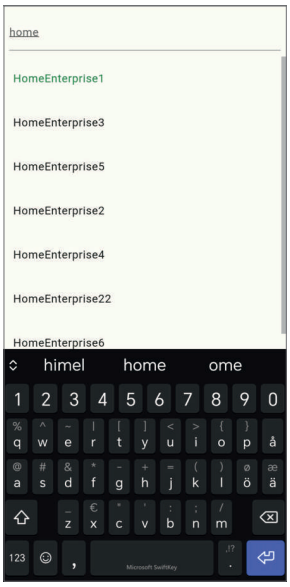
55 Organisation selector



001B6A4E

The down arrow enables the user to open a dialogue for selecting a different organisation. If the list is long, the user can scroll through it by swiping the screen up or down. Alternatively, the [Search organisation] field at the top of the list can be used to search for the required organisation. By selecting a line in the list, the chosen organisation is assigned for display. The OPTIME Mobile App view, deployment options and scanning options in the menu are also aligned with the respective organisation's data.

56 Organisation selector, search function



001AD5B8

8.4 Manage groups

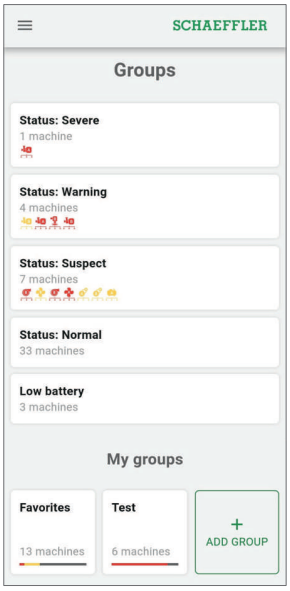
The start screen for group management is displayed immediately after login.

Alarm-based groups are pre-set:

- alarm status based on the alarm level
- lubricator status
- battery status
- data reception status

The fields for alarm-based groups take up the whole width of the screen, while the fields for user-defined groups are square.

57 Start screen for group management



001B4096

13 Start screen for group management with group fields

Input	Group field	Description
[Groups] Alarm status	Status: [Normal] or [Suspect]	A grey symbol indicates a normal or suspect status, i.e. no alarm or a low alarm level. no immediate response required
	Status: [Warning]	A yellow symbol indicates a pre-alarm, i.e. a high alarm level. Inspect the asset and schedule repairs for the next regular servicing interval.
	Status: [Severe]	A red symbol indicates a main alarm, i.e. the highest alarm level. Inspect the asset, and depending on the result, schedule a repair as soon as possible.
[Groups] All lubricators	Status: All	displays the status of all lubricators
[Groups] battery status	[Battery low]	displays the battery status
[Groups] Data reception status	[No data received recently]	indicates that the sensor is offline and has not transmitted any data in the last 24 h
[Groups] Filtered groups	[Learning mode]	Displays the groups compiled on the basis of search filters
[My groups]	[Favourites] Other user-defined groups, e.g.: [Pumps]	displays user-defined groups

A machine can appear in a group with other machines in a normal state but still display a red symbol. This suggests that the machine has previously encountered alarms that triggered a critical alarm status. Check and confirm the machine's status.

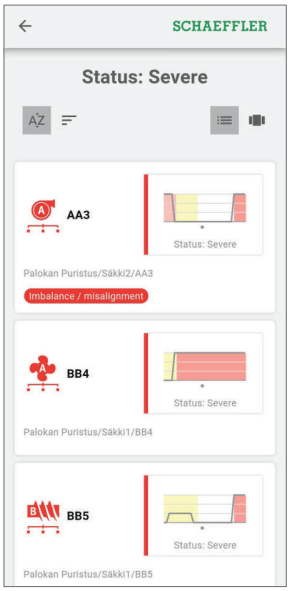
8.4.1 Group details

After clicking on a group, the detailed view provides the user with a simple means of viewing a group of interesting machines.

Here, for example, the red machine symbol indicates an active main alarm and the “Imbalance/Misalignment” fields beneath it suggest that imbalance or misalignment is the likely cause.

The machine can belong to a certain group if the machine status matches it. Machine status is updated with a delay once the recovery activity has been performed, the alarm has been acknowledged and the data support the change in machine status.

58 Machine status



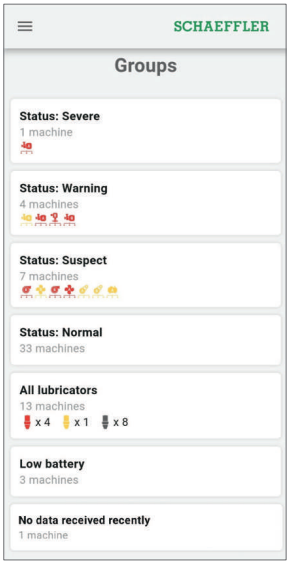
001AD4E0

8.4.2 [All lubricators] group

The [All lubricators] group is a special quick-access list for operators running lubricators with the OPTIME condition monitoring system. The aim of this view is to enable lubrication experts to perform rapid status checks on OPTIME condition monitoring system.

In the main group view, the [All lubricators] button lists the number of lubricators with main alarms (red), the number of lubricators with pre-alarms and warnings (yellow), and the number of lubricators operating with a normal status (grey).

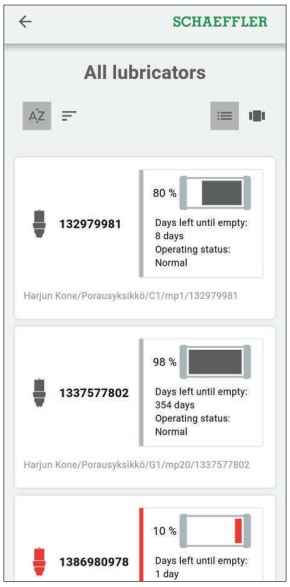
59 [Groups]



001AD4F0

When the user accesses the group details for the [All lubricators] view, the group view is optimized for easy viewing of the lubricator data.

60 [All lubricators]



001AD500

8.4.3 Manage favourites

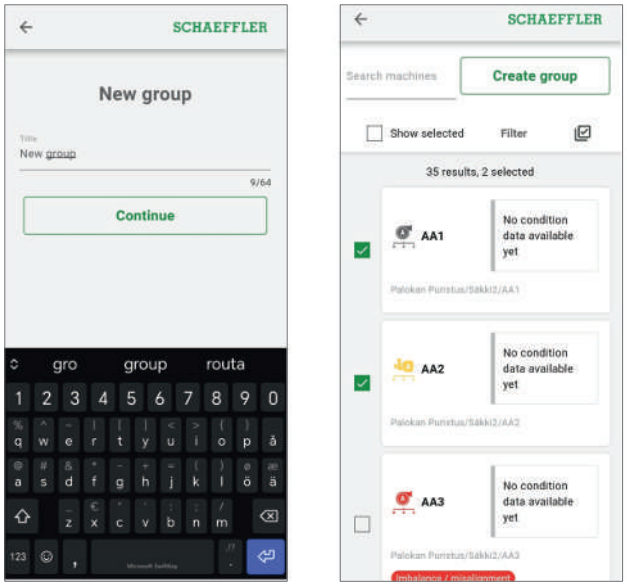
You can add any machine to your [Favourites] group using the machine management function.

8.4.4 Add new group

For the latest details on adding new groups, please refer to the OPTIME Online Help ➤67|9.3.

- Tap [Add group].

61 Adding a new group

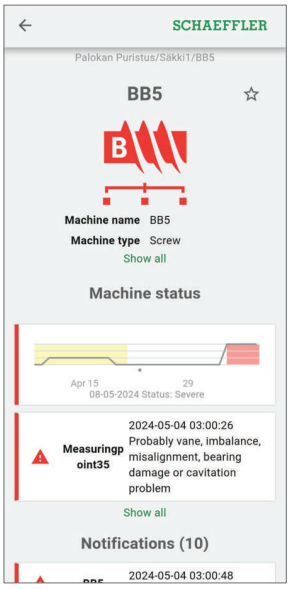


001B40E6

8.5 Machine view

The machine view displays a machine along with related information, such as machine details, a machine status diagram with highlighted alarm colours, a list of active and inactive alarm notifications, and measurement points and lubrication points connected to the machine.

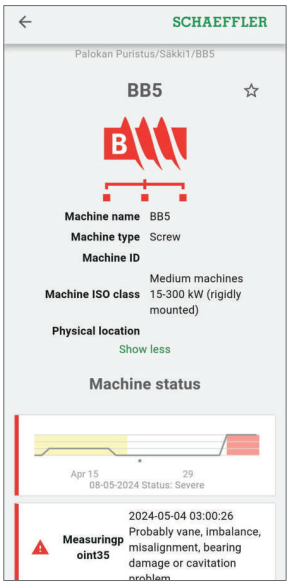
62 Machine view



001AD565

Inactive alarms, where the alarm conditions are no longer met, appear greyed out when the user clicks on [Show all] in the list. Inactive alarms are hidden as standard in the OPTIME Mobile App to shorten the list. The user can hide less important information using the [Show less] button. This also applies to the machine details.

63 Expanded machine overview

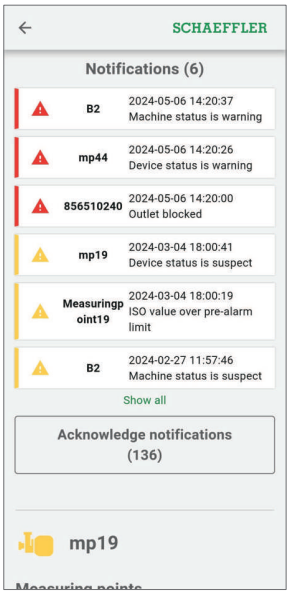


001AD568

The user can acknowledge alarms using the [Acknowledge notifications] button at machine level.

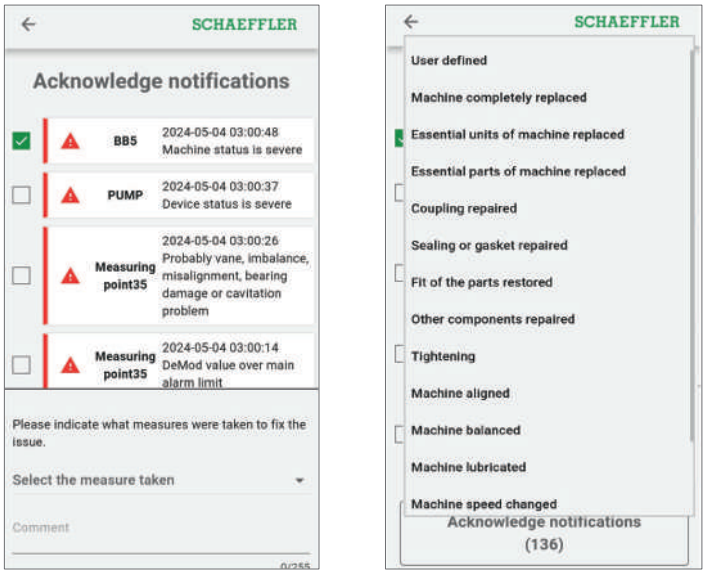
This function is typically used after inspecting or repairing machines that triggered an alarm from the OPTIME condition monitoring system. Alarm acknowledgement should always take place for alarms that are no longer relevant.

64 [Notifications]



001AD56A

65 [Acknowledge notifications]



001AD56B

For more information about the machine view, please refer to the online help in the OPTIME Web App ➤67|9.3.

8.6 Manage sensors

The sensors are part of the measuring point view. When a sensor is selected, the measuring point view displays the active alarm notifications, KPIs and raw data relating to the specific sensor.

The following functions are available to the user in the measuring point view:

- Installation options
  - [Edit monitoring settings]
  - [Replace sensor]
  - [Trigger learning mode]
  - [Deactivate measuring point]
- Data
  - [Get latest KPIs]
  - [Get latest raw data]
- Metadata
  - [Edit metadata] (including sensor and bearing information)
- View annotations

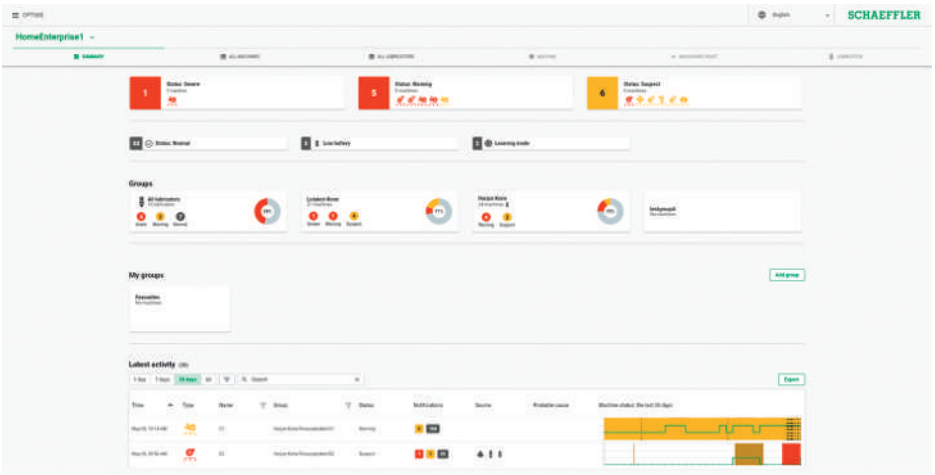
For more information about the measuring point view, including sensor information and the management of measuring points, please refer to the online help.

9 Using the OPTIME dashboard

The OPTIME dashboard is the central user interface for use in control rooms where KPIs and alarm notifications for condition monitoring of the asset can be controlled.

The OPTIME dashboard helps users and administrators to actively monitor machine status and display alarm messages based on learned KPI limit values and potential defect indicators for the machines in a control-room-type environment. Users are able to view and create asset log entries for machines, as well as acknowledge alarms. Additionally, KPI data and raw data from the OPTIME sensors can be analysed.

66 OPTIME dashboard



001B6A80

In management mode, administrators can add, edit and delete users and profiles as well as send notifications to users. At corporate and mesh network level, administrators can also manage process areas, department and machine structures (assets) and mesh networks (devices).

The following functions can be performed from the OPTIME dashboard:

- active monitoring of machines and their KPIs
- display of alarm notifications based on learned KPI thresholds as indicators of potential machine defects
- acknowledgement of alarm notifications
- display and creation of machine log entries
- display of sensor KPI data and raw data
- communication with experts for analysing potential machine defects

Other functions are only available to administrators:

- user management:
  - add, edit and delete users and profiles
  - send notifications to users
- asset management: add, move and delete OPTIME gateways and sensors

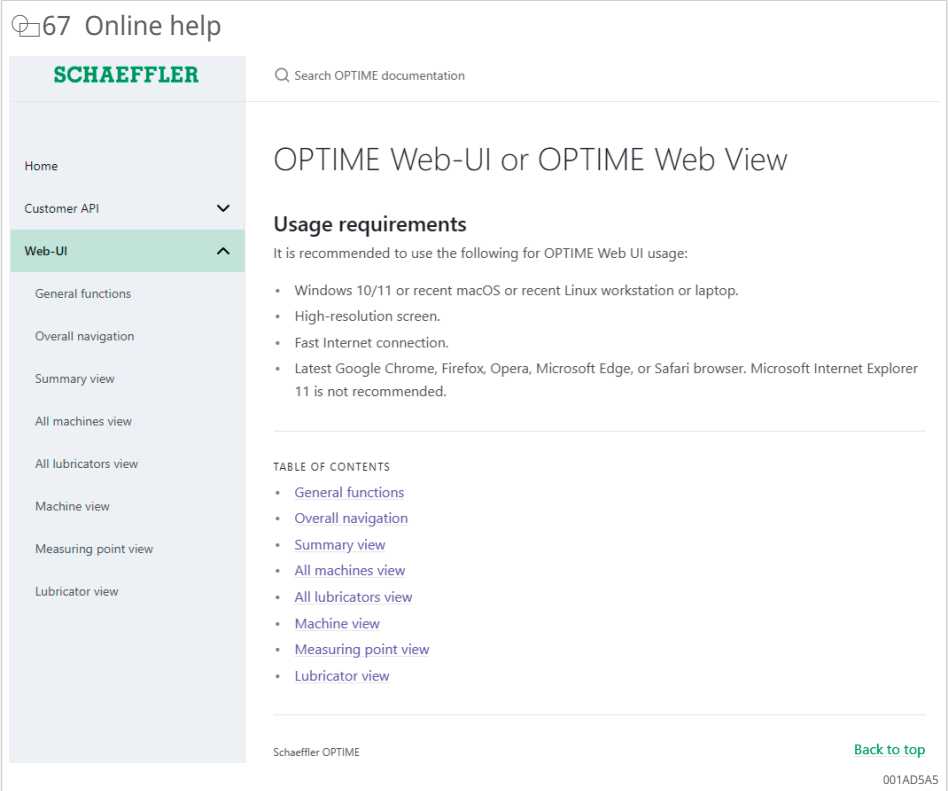
Reliable alarm notifications are only displayed after completion of the learning phase during which each sensor is “trained” to establish and respond to threshold values.

9.1 System requirements

System recommendations for using the OPTIME dashboards:

- Windows 10/11 or current macOS or current Linux work station or Linux laptop
- high-resolution screen
- rapid internet connection
- latest Google Chrome, Firefox, Opera, Microsoft Edge or Safari browser. Microsoft Internet Explorer 11 is not recommended.

67 Online help



9.2 Registration, login and logout

The administrator account is created automatically as part of the order process. The administrator is responsible for managing additional users. All new users created by the administrator will receive their login data by e-mail.

9.2.1 Login

To log in:

1. Visit the OPTIME dashboard: Use the link provided in the e-mail you received when you activated your account.
2. In the “Log in to OPTIME” dialogue, enter the following: subscription, username, password.
3. Click on [Login].

68 Login

001B4166

NOTICE

Unauthorised use of the OPTIME condition monitoring system

Unauthorised use can result in serious material damage to connected and surrounding systems and assets

- Assign a new, secure password when logging in for the first time.
- Memorise your username and password; do not write them down.

› Your username and password are required for logging in to both the OPTIME Mobile App and the OPTIME dashboard.

9.2.2 Logout

To finish a session, you will need to log out again:

1. Click on the menu at the top left of the OPTIME dashboard
2. Click on the [Logout]button.

9.3 Online help

The online help provides comprehensive guidance on using the OPTIME Web App and on its contents. It includes detailed descriptions of the dashboard functions, as well as information on the OPTIME Mobile App, the API, training options and support topics. We also keep your informed about our current releases and updates. Please note that the online help is currently only available in English.

To access the online help, log in to the OPTIME dashboard and navigate to the menu at the top left of the OPTIME dashboard home page.

10 Troubleshooting

The online help section of the OPTIME dashboard also contains a list of Frequently Asked Questions (FAQ) which can assist with troubleshooting.

11 Decommissioning

The OPTIME gateway and sensors are maintenance-free and cannot be repaired.

The sensors need to be deactivated for decommissioning ➤34|6.4.2.

⚠ WARNING

Risk of fire and explosion due to improper handling

Improper handling of the sensors may lead to leaks or the emission of evaporated electrolyte, which can cause fire or explosion, resulting in serious injury or death.

- If there is a battery fault, shipping of the device is not permitted in accordance with the hazardous goods regulation.
- Sensors may only be returned following consultation with Schaeffler.
- It is imperative that sensors are deactivated for return shipment.
- The sensor must be properly disposed of on site in accordance with national disposal regulations.

12 Technical data

12.1 Technische Daten OPTIME gateways

Nameplate

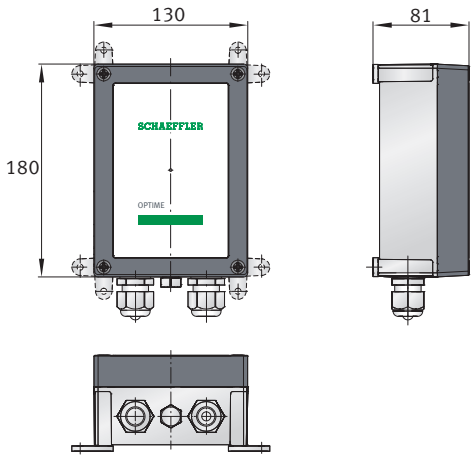
The nameplate complete with serial number (S/N) is located on the side of the housing. The serial number is also encrypted in the applied QR code.

14 Technical data for OPTIME Gateway (2019) and OPTIME Ex Gateway

Designation		Value	Unit
Wirepas Mesh (ISM band)		2,4	GHz
LTE, UMTS, GSM (via the built-in LTE stick)		•	
WLAN		2,4	GHz
Ethernet RJ45		•	
SIM card format		Micro-SIM (3FF*)	
Power consumption		30	VA
Power supply AC		100 ... 240	V
Frequency		50/60	Hz
Protection class		IP66 IP66, NEMA 4X (Ex)	
Operating temperature		–20 ... +50 –20 ... +55 (Ex)	°C
Storage	Temperature	–40 ... +85	°C
	Humidity	20 ... 90	%
Length		180 300 (Ex)	mm
Width		130 270 (Ex)	mm
Height		81 140 (Ex)	mm
Weight		≈ 1,2 ≈ 2,5 (Ex)	kg
CE (EU Directive 2014/53/EU), FCC, SRRC, IC, RCM, Anatel, NTC, NBTC, SIRIM, WPC		Current certifications https://www.schaeffler.de/std/1F8A	

* depending on the LTE stick used

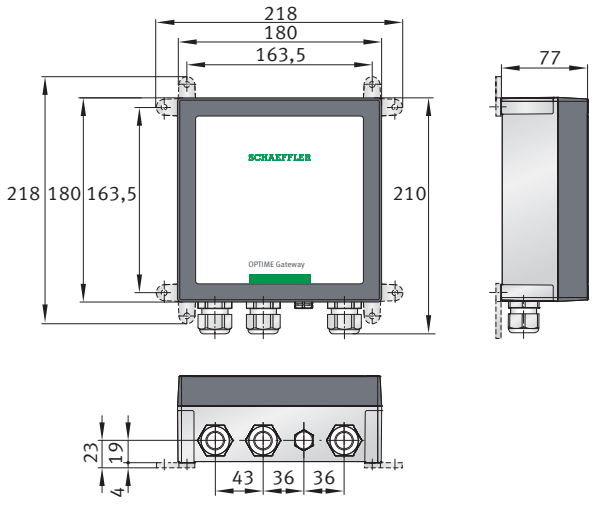
69 OPTIME Gateway dimensions



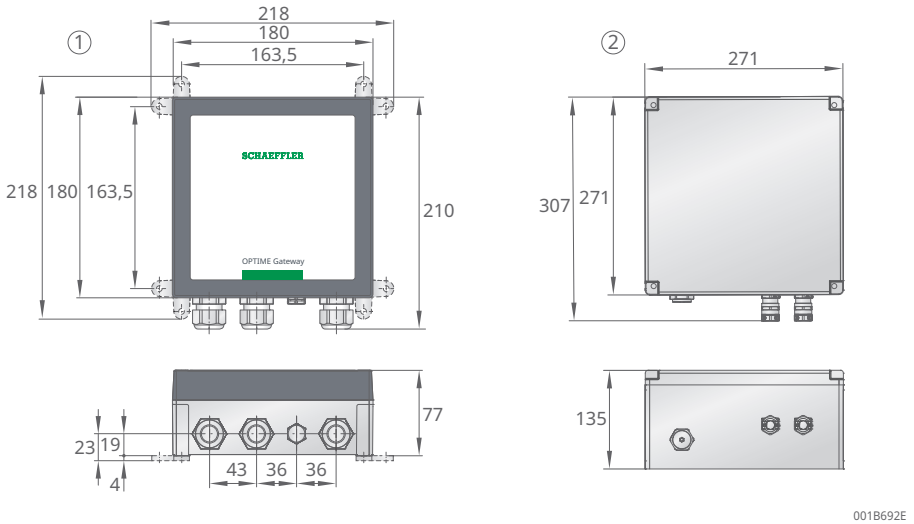
15 Technical data for OPTIME Gateway 2 and OPTIME Ex Gateway 2

Designation		Value	Unit
Wirepas Mesh (ISM band)		2,4	GHz
LTE, UMTS, GSM		•	
WLAN		2,4	GHz
Ethernet RJ45		•	
SIM card format		Micro-SIM (3FF)	
Protection class		⧈	
Power consumption		20	VA
Power supply AC		100 ... 240 (±10 %)	V
Frequency		50/60	Hz
Power supply DC		12 (±10 %)	V
Fuse		T 1,25 A H 250 V	
Backup battery for RTC		CR2032, lithium 3,0 V	
Protection class		IP66, NEMA 4X	
Max. elevation		5000	m
Operating temperature		–20 ... +70 –20 ... +55 (Ex)	°C
Storage	Temperature	–40 ... +85	°C
	Humidity	20 ... 90	%
Length		210 300 (Ex)	mm
Width		180 270 (Ex)	mm
Height		77 140 (Ex)	mm
Weight		≈ 0,9 ≈ 2,5 (Ex)	kg
CE (EU Directive 2014/53/EU), UKCA, FCC compliant		Current certifications	
Ex version: ATEX, CCC, IECEx		https://www.schaeffler.de/std/1F8A	

70 OPTIME Gateway 2 dimensions



71 OPTIME Ex Gateway dimensions



1	OPTIME Gateway 2 dimensions	2	OPTIME Ex–Gateway dimensions

12

12.2 Technical data for OPTIME sensors

Nameplate

The serial number and a number of other details are printed on the sensor.

16 Technical data for OPTIME 3

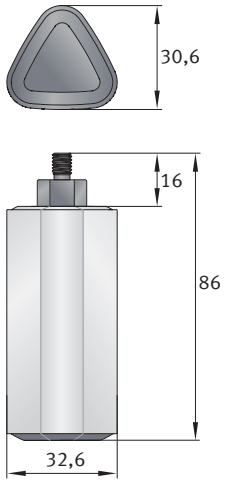
Designation	Value	Unit
Temperature	–40 ... +85	°C
Vibration, calculated KPI	• RMS_{low} • RMS_{high} • DeMod	m/s^2
	• $ISO_{velocity}$	mm/s
	• $Kurtosis_{low}$ • $Kurtosis_{high}$	
Bandwidth	2 ... 3000	Hz
Amplitude	±16	g
Measuring interval KPI (mode selectable)	4	h (mode-dependent)
Measuring interval time signal	24	h
Sensor activation NFC (Near Field Communication)	•	
Wirepas Mesh (ISM band)	2,4	GHz
Line of sight range	100	m
Non-replaceable Li-$SOCl_2$ battery	•	
Typical battery life (depending on the operating conditions)	5	years
Protection class	IP69K	
Operating temperature	–40 ... +85	°C
Storage temperature (recommended)	0 ... +30	°C
Length	86	mm
Width	32,6	mm
Height	30,6	mm
Threaded bolt (adapter available)	M6	
Mounting base	Steel AISI 316	
Housings	Polycarbonate	
Certificates		
CE (EU Directive 2014/53/EU), FCC, SRRC, IC, RCM, Anatel, NTC, NBTC, SIRIM, WPC	Current certifications https://www.schaeffler.de/std/1F8A	

17 Technical data for OPTIME 5 and OPTIME 5 Ex

Designation	Value	Unit
Temperature	–40 ... +85	°C
Vibration, calculated KPI	• RMS_{low} • RMS_{high} • DeMod	m/s^2
	• $ISO_{velocity}$	mm/s
	• $Kurtosis_{low}$ • $Kurtosis_{high}$	
Bandwidth	2 ... 5000	Hz
Amplitude	±16	g
Measuring interval KPI	4	h (mode-dependent)
Measuring interval time signal	24	h
Sensor activation NFC (Near Field Communication)	•	
Wirepas Mesh (ISM band)	2,4	GHz
Line of sight range	100	m

Designation	Value	Unit
Non-replaceable Li-$SOCl_2$ battery	•	
Typical battery life (depending on the operating conditions)	5	years
Protection class	IP69K	
Operating temperature	–40 ... +85	°C
Storage temperature (recommended)	0 ... +30	°C
Length	86	mm
Width	32,6	mm
Height	30,6	mm
Threaded bolt (adapter available)	M6	
Mounting base	Steel AISI 316	
Housings	Polycarbonate	
CE (EU Directive 2014/53/EU), FCC, SRRC, IC, RCM, Anatel, NTC, NBTC, SIRIM, WPC	Current certifications https://www.schaeffler.de/std/1F8A	
Ex (OPTIME 5 Ex only)	Zone 1/21	

72 Sensor dimensions



00194910

12

12.3 Declarations of Conformity

12.3.1 Declaration of Conformity for OPTIME Gateway 2

SCHAEFFLER

EU-Konformitätserklärung
EU Declaration of Conformity

Hiermit erklären wir in alleiniger Verantwortung, dass die mit CE gekennzeichneten Produkte
We declare under our sole responsibility that the CE marked products.

Typenbezeichnung *Type Description*	OPTIME GATEWAY 2
Beschreibung *Description*	NETWORK GATEWAY
Hersteller *Manufacturer*	Schaeffler Monitoring Services GmbH

die grundlegenden Schutzanforderungen der folgenden Richtlinien erfüllen *Comply with the essential protection requirements of the directives*		Harmonisierte Normen *Harmonized Standards*
2014/53/EU	Funkanlagenrichtlinie (RED) *Radio Equipment (RED)*	EN 300 328 V2.2.2 EN 301 511 V12.5.1 EN 301 908-1 V15.1.1
2011/65/EU	Gefährliche Stoffe (RoHS) *Hazardous substances (RoHS)*	EN IEC 63000:2018
2014/35/EU	Niederspannungsrichtlinie (LVD) *Low Voltage Directive (LVD)*	EN 62368-1:2014 EN 62368-1:2014/AC:2015 EN 62311:2008 (1)
2014/30/EU	Elektromagnetische Verträglichkeit (EMV) Electromagnetic Compatibility (EMC)	EN 301 489-1 V1.9.2 (2) EN 55032:2012 EN 55032:2012/AC:2013 EN 55022:2010, EN 55022:2010/AC:2011 EN 55011:2016, EN 55011:2016/A1:2017, EN 55011:2016/A11:2020

(1) Schutzziele aus EN 62311:2008 erfüllt durch Einhaltung von EN IEC 62311:2020
Safety objectives of EN 62311:2008 fulfilled by compliance with EN IEC 62311:2020
(2) Schutzziele aus 2014/30/EU erfüllt durch Einhaltung von EN 55016-2-1, EN 301 489-1 V2.2.3 (2019-11)
Safety objectives of 2014/30/EU fulfilled by compliance with EN 55016-2-1, EN 301 489-1 V2.2.3 (2019-11)

Datum: 16.02.2023
Date:

Unterschrift:
Signature

Dr. Philipp Jussen
Geschäftsführer
Managing Director

Unterschrift:
Signature

i.V. Dipl. Ing Götz Langer
Leiter Entwicklung
Development Manager

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, beinhaltet jedoch keine Zusicherung von Eigenschaften. Das Produkt ist entsprechend der Inbetriebnahme-Vorschriften des Benutzerhandbuchs fachgerecht und korrekt zu installieren. Die Sicherheitshinweise der Betriebsanleitung sind zu beachten.
This declaration certifies the compliance with the mentioned regulations but does not include any assurance of properties. The product must be installed correctly and professionally in accordance with the commissioning instructions in the user manual. The safety instructions in the operating manual must be observed.

Schaeffler Monitoring Services GmbH ● Kaiserstrasse 100 ● D-52134 Herzogenrath
PUBLIC

12.3.2 Declaration of Conformity for OPTIME Sensor AW3, AW5

SCHAEFFLER

CE

EU Declaration of Conformity

in accordance with the *Radio Equipment and repealing Directive 2014/53/EU*

We hereby declare that the product described below, complies with the relevant fundamental health and safety requirements of the EU directives mentioned below, due to its design and construction as well as in the version we have placed on the market.
This declaration is issued under the sole responsibility of the manufacturer.

Product: Wireless Vibration and Temperature Sensor

Optime AW3 & AW5

The product complies with following directives and standards:

- Radio Equipment and repealing Directive (2014/53/EU)
- Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS) (2011/65/EU)
- Low Voltage Directive (2014/35/EU)
- Directive relating to Electromagnetic Compatibility 2014/30/EU

The conformity assessment procedure referenced to article 10 and detailed in Annex III of the Radio Equipment Directive 2014/53/EU has been followed and preformed with the involvement of the following notified body - Name and Number: SGS Fimko Ltd / 0598

Applied harmonized norms, which are published in the Official Journal of the EU:

- EN62368-1:2014+A11:2017
- EN60950-22:2017
- EN62479:2010
- EN301489-1 v2.1.1
- EN301489-3 v2.1.1
- EN301489-17 v3.1.1
- EN300328 v2.2.1
- EN300330 V2.1.1

Date:01/07/2020

Signature:

Dr. Ing. Hans-Willi Keßler
Managing Director

Schaeffler Monitoring Services GmbH
Kaiserstrasse 100,
52134 Herzogenrath

Signature:

p.p. Dipl. Ing Götz Langer
Leiter Entwicklung (CE-Representative)

Schaeffler Monitoring Services GmbH
Kaiserstrasse 100,
52134 Herzogenrath

This declaration certifies the compliance with the directives mentioned, but it does not include any assurance of properties.
The product needs to be installed correctly in accordance with the commissioning instructions in the user manual.
The safety instructions in the operating instructions must be observed.

Schaeffler Monitoring Services GmbH ● Kaiserstrasse 100 ● D-52134 Herzogenrath

12.3.3 Declaration of Conformity for OPTIME Sensor AW-3A, AWX-3, AW-5A, AWX-5

CE

SCHAEFFLER

EU Declaration of Conformity

in accordance with the *Radio Equipment and repealing Directive 2014/53/EU*

We hereby declare that the product described below, complies with the relevant fundamental health and safety requirements of the EU directives mentioned below, due to its design and construction as well as in the version we have placed on the market.
This declaration is issued under the sole responsibility of the manufacturer.

Manufacturer: Schaeffler Monitoring Services GmbH, Kaiserstrasse 100, 52134 Herzogenrath

Product: Wireless Vibration and Temperature Sensor

Optime AW-3A, AWX-3, AW-5A, AWX-5

The product complies with following directives and standards:

- Radio Equipment and repealing Directive (2014/53/EU)
- Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS) (2011/65/EU)

Applied harmonized norms, which are published in the Official Journal of the EU:

- EN IEC 62368-1:2020+A11:2020
- EN62479:2010
- EN301489-1 V2.2.3
- EN301489-3 V2.1.1
- EN301489-17 V3.2.4
- EN300328 V2.2.2
- EN300330 V2.1.1

Date: 10/06/2022

Signature:

Dr. Philipp Jussen
Managing Director

Schaeffler Monitoring Services GmbH
Kaiserstrasse 100,
52134 Herzogenrath

Signature:

p.p. Dipl. Ing Götz Langer
Head of R&D (CE-Representative)

Schaeffler Monitoring Services GmbH
Kaiserstrasse 100,
52134 Herzogenrath

This declaration certifies the compliance with the directives mentioned, but it does not include any assurance of properties.
The product needs to be installed correctly in accordance with the commissioning instructions in the user manual.
The safety instructions in the operating instructions must be observed.

Schaeffler Monitoring Services GmbH ● Kaiserstrasse 100 ● D-52134 Herzogenrath
PUBLIC

12.3.4 Declaration of Conformity for OPTIME Sensor AWX-5 IoT

SCHAEFFLER

EU-Konformitätserklärung
EU Declaration of Conformity / Déclaration UE de conformité

Hiermit erklären wir in alleiniger Verantwortung, dass die mit CE gekennzeichneten Produkte
We declare under our sole responsibility that the CE marked products
Nous déclarons sous notre seule responsabilité que les produits marqués CE

Typenbezeichnung ***Type Description / Modèle du produit***	OPTIME AWX-5 IoT Device / Wireless CM Sensor
Beschreibung ***Description***	Batteriebetriebenes Vibrations- und Temperaturüberwachungsgerät *Battery Powered vibration and temperature monitoring device.* *Appareil à batterie pour surveillance de vibrations et température*
Hersteller ***Manufacturer / Fabricant***	Schaeffler Monitoring Services GmbH

die grundlegenden Schutzanforderungen der folgenden Richtlinien erfüllen *comply with the essential protection requirements of the directives* *sont conformes aux exigences essentielles de protection des directives*		Harmonisierte Normen *Harmonized Standards* *Normes harmonisées*
2014/35/EU	Niederspannungsrichtlinie (LVD) *Low Voltage Directive/ Directive basse tension (LVD)*	IEC 62368-1:2018 (1) EN 62479:2010 (2)
2011/65/EU	Gefährliche Stoffe (RoHS) *Hazardous substances / Substances dangereuses (RoHS)*	EN IEC 63000:2018
2014/53/EU	Funkanlagenrichtlinie (RED) *Radio Equipment/ Equipement Radio (RED)*	EN 300 328 V2.2.2(2) EN 300 330 V2.1.1(2)
2014/30/EU	Elektromagnetische Verträglichkeit (EMV) *Electromagnetic Compatibility/ compatibilité électromagnétique (EMC)*	EN 301 489-1 V1.9.2 (2)
2014/34/EU	Explosionsgefährdete Bereiche (ATEX) (3) *Explosive atmospheres / Atmosphères explosives (ATEX)* (3)	EN 60079-0:2018 EN 60079-11 2012

(1) Entsprechend der SGS-Report SZES220100004501 ausgestellt von SGS-CSTC, Shenzen China
According to the SGS-Report SZES220100004501 issued by SGS-CSTC, Shenzen China
Selon le rapport technique SZES220100004501 délivré par SGS-CSTC, Shenzen Chine
(2) SGS-Berichte SZCR220100005101, SZCR220100005102, SZCR220100005103, SZCR220100005104, SZCR220100005105 ausgestellt von SGS-CSTC, Shenzen China
SGS-Reports SZCR220100005101, SZCR220100005102, SZCR220100005103, SZCR220100005104, SZCR220100005105 issued by SGS-CSTC, Shenzen China
Selon les rapports SZCR220100005101, SZCR220100005102, SZCR220100005103, SZCR220100005104, SZCR220100005105 délivrés par SGS-CSTC, Shenzen Chine
(3) Entsprechend der EU-Baumusterbescheinigung SGS20ATEX0093X ausgestellt von SGS Fimko Oy, Takomotie 8 FI-00380 Helsinki, Finland, Kennnummer 0598
According to the EU Type Examination SGS20ATEX0093X issued by SGS Fimko Oy, Takomotie 8 FI-00380 Helsinki, Finland, code number 0598
Selon l'examen de type de l'UE SGS20ATEX0093X délivré par SGS Fimko Oy, Takomotie 8 FI-00380 Helsinki, Finland, numéro d'identification 0598.
Prüf- und Zertifizierungsstelle / Testing and certification body / Organisme de contrôle et de certification: TÜV SÜD Product Service GmbH, D- 80339 München
Kennnummer / Code number / Numéro d'identification: 0123 - Zertifikatsnummer / certificate number / certificat numéro: TPS 21 ATEX Q 109536 0001

Datum: 08.12.2023
Date:

Unterschrift:
Signature

Dr. Philipp Jussen
Geschäftsführer
Managing Director/Directeur Général

Unterschrift:
Signature

i.V. Dipl. Ing Götz Langer
Leiter Entwicklung
Development Manager/Directeur technique

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, beinhaltet jedoch keine Zusicherung von Eigenschaften. Das Produkt ist entsprechend der Inbetriebnahme-Vorschriften des Benutzerhandbuchs fachgerecht und korrekt zu installieren. Die Sicherheitshinweise der Betriebsanleitung sind zu beachten.
This declaration certifies the compliance with the mentioned regulations but does not include any assurance of properties. The product must be installed correctly and professionally in accordance with the commissioning instructions in the user manual. The safety instructions in the operating manual must be observed.
Cette déclaration certifie la conformité aux directives mentionnées, mais n'implique aucune garantie quant aux propriétés. Le produit doit être installé correctement et dans les règles de l'art, conformément aux prescriptions de mise en service du manuel d'utilisation. Les consignes de sécurité du manuel d'utilisation doivent être respectées

Schaeffler Monitoring Services GmbH ● Kaiserstrasse 100 ● D-52134 Herzogenrath

12.3.5 Declaration of Conformity for OPTIME C1 lubricator

en

SCHAEFFLER

EU Declaration of Conformity

We declare herewith that the product designated below complies with the relevant fundamental health and safety requirements of the EU directives specified below, in terms of its design and type, and in the format we introduced into circulation.
This declaration of conformity is issued under the sole responsibility of the manufacturer.

The manufacturer

Schaeffler Technologies AG & Co. KG
Georg-Schäfer-Strasse 30
D-97421 Schweinfurt, Germany

declares that the product

OPTIME-LW-C1 (wireless pressure booster for automatic lubrication system)

complies with the following directives of the European Parliament and Council, in terms of its design and type, and in the format introduced into circulation:

- Electromagnetic Compatibility Directive (2014/30/EU)
- Low Voltage Directive (2014/35/EU)
- Radio Equipment Directive (2014/53/EU)
- Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (2011/65/EU)

Applicable harmonized standards:

- EN 61000-6-2:2019 (EMC)
- EN 61000-6-4:2019 (EMC)
- EN 301 489 -1:2020, -3:2019, -17:2021 (EMC-RED)
- EN 62368-1:2014 (Safety requirement, LVD)
- EN 300 328 V2.2.2 (RF)
- EN 300 330 V2.1.1 (NFC)
- EN/IEC 63000:2018 (RoHS)

Date: 19.01.2022

Signature:

p.p. Dipl.-Ing. Götz Langer
Head of R&D Devices Industry 4.0 (CE authorized representative)

Schaeffler Monitoring Services GmbH
Kaiserstrasse 100
52134 Herzogenrath, Germany

Signature:

ppa.

Rauli Hantikainen
Head of Strategic Business Field Industry 4.0

Schaeffler Technologies AG & Co. KG
Georg-Schäfer-Strasse 30
D-97421 Schweinfurt, Germany

This declaration assures conformity with the directives cited, but does not represent any guarantee of specific features. The safety advice in the user manual must be observed.

Schaeffler Technologies AG & Co. KG • Georg-Schäfer-Straße 30 • D-97421 Schweinfurt, Germany • Phone: +49 (0) 9721 91-0
PUBLIC

13 Disposal

Devices with used batteries can be returned directly to Schaeffler or an authorised local sales partner.

Observe the locally applicable regulations for disposal.

Schaeffler Monitoring Services GmbH
Kaiserstraße 100
52134 Herzogenrath
Germany
www.schaeffler.de/en/services

Technical support:
www.schaeffler.de/en/technical-support

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