FAG SmartQB

User manual

SCHAEFFLER

Imprint

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Translation of the original user guide.

Contents

1 General

1.1 About this guide

This guide describes how to install and use the FAG SmartQB and the built-in touchscreen display and contains important information about using the devices safely and correctly. Please read through this guide carefully before commissioning the device, and keep it for future reference.

Make sure that

- This guide is available to all users of the device.
- If the product is passed on to other users, that this guide is also passed on with it.
- Additions and amendments provided by the manufacturer 87 are always attached to this guide.

Further information

The FAG SmartQB is preconfigured and can be used with up to 6 FAG SmartQB sensors. The FAG SmartQB sensors are documented in a separate manual.

The FAG SmartQB sensor is similar in design to the FAG SmartCheck. For detailed instructions on how to install the sensors, see the user documentation FAG SmartCheck on the supplied SD card.

Definitions

- Product: the FAG SmartQB described in this manual with the built-in touchscreen display.
- User: person or organisation capable of putting the product into operation and using it.
- Qualified person: a person who, by virtue of their relevant training and experience, is qualified to identify risks and avoid potential hazards that may be caused by the operation or maintenance of a product.

Symbols used

This symbol indicates

- *Helpful additional information and*
- *Device settings or practical tips that will help you to perform activities more efficiently.*

Cross-reference symbol 5: this symbol refers to a page in the manual that provides further information. If you are reading the manual in PDF format on screen, clicking the word to the left of the cross-reference symbol will take you straight to the section in question.

1.2 Hazard symbols and signal words

Hazard symbols used in this guide

Safety information and warnings are identified by specific, standardised hazard symbols. If no specific symbol applies, a general hazard symbol is used.

General hazard symbol

DANGER

The nature and source of the hazard are specified here

Actions to prevent the hazard are explained here.

Specific hazard symbols

DANGER

DANGER FROM ELECTRICAL CURRENT!

This symbol indicates a danger from electric shock that can cause personal injury or even death, or damage to property.

Signal words used in this guide

Signal words indicate the severity of the hazard that occurs if the actions to reduce the hazard are not taken.

- **Caution**: Minor damage to property may occur.
- **Warning**: Minor personal injury or severe damage to property may occur.
- **Danger**: Personal injury may occur. There is a risk of fatal injury in particularly severe cases.

1.3 Safety information

The FAG SmartQB is manufactured in accordance with the recognised standards and guidelines (see the Declaration of Conformity in the Appendix 88) and is safe to operate. Nevertheless, the device can pose unavoidable residual hazards to users and third parties or to property, therefore it is imperative that all of the safety information given in this guide is observed. The generally applicable safety and accident prevention regulations must also be taken into account. Failure to do so may result in the health and life of persons being put at risk, or cause damage to property. The safety information in this guide applies in the Federal Republic of Germany. In other countries, the relevant national regulations apply.

According to its intended use, the FAG SmartQB does not fall under EC Machine Directive 2006/42/EC.

The FAG SmartQB may only be used for information purposes. It may not be used to deactivate or control any processes.

Safety-relevant regulations

During project planning, installation, commissioning, maintenance and inspection of theFAG SmartQB, the applicable regulations relating to safety and accident prevention must be observed for the specific application scenario. Please observe the following regulations in particular (not exhaustive):

- **VDE regulations**
  - VDE 0100 Regulations for setting up high-voltage systems with a nominal voltage up to 1000 V
  - VDE 0105 Operation of high-voltage systems
  - VDE 0113 Electrical systems with electronic equipment
  - VDE 0160 Electrical systems with electronic equipment
  - VDE 0550/0551 Regulations for transformers
  - VDE 0700 Safety of electrical equipment for domestic and similar purposes
  - VDE 0860 Safety regulations for mains-operated electronic equipment and associated accessories for domestic and similar use
- **Fire prevention regulations**
- **Accident prevention regulations**
  - VBG no. 4: Electrical systems and equipment

This guide differentiates between

- **General safety information**, which applies to the whole guide and is listed in this chapter

and

- **Specialised safety information**, which you will find in each chapter, either at the start or accompanying individual actions.

Operating personnel

The FAG SmartQB may only be installed, operated and maintained by authorised qualified electricians who have received training in accordance with the applicable, relevant regulations.

General safety information

The following hazard warning notes are to be viewed as a general guideline for use of the FAG SmartQB. It is essential to observe these notes for project planning, installation and operation of the FAG SmartQB.

DANGER:

- *Observe the safety and accident prevention regulations that apply for the specific application scenario. Before installing, connecting and opening the assemblies, components and devices, ensure that the system is de-energised.*
- *For devices with a fixed mains connection, a mains isolator switch for all of the pins and a fuse must be installed in the building.*
- *Check the live cables and lines to which the devices are connected regularly for insulation faults and signs of breakage. Should a fault be detected in the wiring, the devices and their cables must be de-energised immediately and the defective wiring must be renewed.*
- *Before bringing the equipment back into operation, check whether the permissible mains voltage range correlates with the local mains voltage.*
- *Take the necessary measures to ensure that an interrupted program can be started again in the correct manner following voltage dips and power failures. No hazardous operating conditions may occur even for a short period.*
- *Earth leakage protection devices compliant with DIN VDE 0641 part 1-3 are inadequate as sole protection in the event of indirect contact in conjunction with programmable logic controllers. Here, additional or other protective measures must be taken.*
- *EMERGENCY STOP devices compliant with EN60204/IEC 204 VDE 0113 must remain effective in all operating modes of the FAG SmartQB. Unlocking or releasing the EMERGENCY STOP device must not result in the system being restarted in an uncontrolled or undefined manner.*
- *To ensure that a line or wire breakage on the signal side cannot lead to undefined conditions in the controller, relevant safety measures must be taken on the hardware and software side.*
- *The FAG SmartQB and the touchscreen display must not be used for safety-relevant tasks or for critical switching operations! This applies in particular when these tasks or switching operations have health and safety implications.*

Notes for avoiding damage from electrostatic discharge

Electrostatic discharge from the human body to components of the FAG SmartQB or to the touchscreen display can damage modules and assembly groups of the FAG SmartQB as well as the touchscreen display. When handling the device, observe the following notes:

CAUTION:

- *Touch an earthed metallic object to discharge yourself of any static charge before touching the modules of the FAG SmartQB or the touchscreen display.*
- *Wear insulating gloves to touch the activated FAG SmartQB or the display, e.g. when performing a visual inspection as part of the maintenance routine.*
- *If the air humidity is low, do not wear clothes made from synthetic fibres as these become electrostatically charged easily in such conditions.*

2 Product description

About the FAG SmartQB system

The FAG SmartQB is a preconfigured complete solution for monitoring the status of motors, pumps, fans and other systems. The system uses plug&play, which means it is easy to integrate into the condition monitoring part of your existing system without any expert knowledge. The FAG SmartQB is easy to operate and manage via the touchscreen display. Messages appear there in plain text, along with troubleshooting suggestions, as soon as an abnormality occurs on the machine being monitored.

The system consists of a switch cabinet with a controller, a touchscreen display and up to six offset FAG SmartQB sensors. The controller evaluates the input signals of the connected FAG SmartQB sensors and automatically calculates the alarm status. The analysis results are shown on the touchscreen display for each individual FAG SmartQB sensor and as the overall alarm status. The plain text messages regarding potential abnormalities are easy to access and understand.

Information on the variable speed can be fed in as additional process parameters via two analogue inputs. The alarm status of each individual FAG SmartQB sensor can be read via digital outputs. To show the overall alarm status, you can connect the FAG SmartLamp (optional).

With FAG SmartQB, Schaeffler offers status monitoring that is optimised to suit your requirements.

As soon as you switch on the FAG SmartQB, the device is ready for use. To ensure optimum vibration monitoring from the outset, we recommend that you do not start the FAG SmartQB until you have ensured the following:

- *All connections have been made correctly.*
- *The machine to be monitored is in a normal operating state.*

2.1 Intended use

The FAG SmartQB is intended exclusively for the following functions:

- Connection of up to six FAG SmartQB sensors via PoE (Power over Ethernet)
- Display of the alarm status, plain text messages and various settings options on the separate touchscreen display
- Connection of two analogue input signals to the voltage measuring range
- Connection of digital outputs for transferring the overall alarm status of the FAG SmartQB sensors

- Using the Modbus TCP server for virtual output signals
- Connection of a FAG SmartLamp with a display of the overall alarm status

- *The FAG SmartQB must not be used to switch safety-relevant applications.*
- *Only FAG SmartQB sensors may be connected to the Ethernet switch and supplied by PoE. Connecting other PoE devices is contrary to the intended use of this product.*

The FAG SmartQB complete with touchscreen display may be operated only within the limitations of use as specified under Technical data 10.

Any other or additional use of the device is deemed to be not intended; the user bears sole risk for such use. The user is responsible for the intended use of the device. This also includes observing this guide.

2.2 Modifications by the user

The user must not make any modifications to the FAG SmartQB or touchscreen display.

The user bears responsibility for any modifications! In the event that you detect a fault on your FAG SmartQB or on the FAG SmartQB sensor, please contact our support team.

2.3 Technical data

- *The FAG SmartQB must not be used in measurement voltage categories II, III or IV!*
- *Ensure the following:*
  - *Any M12 sockets that are not in use on the sensor are covered with the locking screws provided.*
  - *All of the openings in the cable gland system must be closed using the cable sleeves and dummy sleeves supplied; the cable gland system must be securely screwed in place using the required tightening torque and fixed to the housing.*
  - *The service interface is closed using a cover.*
  - *The outlet is covered with the supplied stopper assembled in the delivery state.*
  - *The all-round foam-filled PU door seal is intact and the door is closed as soon as the device is in use.*
- *This is the only way to ensure that the degree of protection is maintained!*

General	
Housing	Sheet metal Door with all-round foam-filled PU seal
Surface	RAL 7016/anthracite grey, powder-coated
Door opening angle	95° downwards
Lock	Lock insert with double-bit key
Means of attachment	Wall-mounted
Power supply	100-240 VAC 50/60 Hz
Power supply cable	2-m connection cable (Schuko plug on open cable end) Wire cross-section: 3x1.5 mm2
Power draw	max. 40 VA
Humidity	10-90 % non-condensing
Operating temperature	0-45 °C
Operating altitude	<2000 m
Safety class	IP65
Dimensions	300 mm x 340 mm x 225 mm (WxHxD)
Weight	Approx. 9.7 kg
Display	Touchscreen display, see below
Interfaces	• 2 reverse-polarity protected M12 plug connectors for the power supply and the input (for the optional FAG SmartLamp) • Ethernet 10/100 Mbit
Cable gland	Cable gland system with cable sleeves for sensor cable, analogue input cable, digital output cable and power supply cable
Inputs and outputs	
Inputs	• 2 analogue inputs (0-10 VDC) • Input value min./max.: -0.5 V/+15 V • Input resistance: 115.7 Ohm • Maximum resolution: 2.5 mV
Outputs	• 12x alarm status of the FAG SmartQB sensors via digital outputs (5-30 VDC, 2 A/channel) • Alarm status and values via virtual outputs, Modbus TCP • Overall FAG SmartQB alarm status via the optional FAG SmartLamp
Touchscreen display	
Display	Flat screen with the following characteristics: • Colour screen • 7" with 800x480 pixels
Control element	Touchscreen
Program language	German, English, Chinese (simplified), Spanish, French, Japanese, Finnish, Italian, Dutch, Norwegian, Polish, Portuguese (Brazilian), Russian, Swedish, Slovenian, Czech, Turkish

Humidity	10-90 % non-condensing
Operating temperature	0-45 °C
Operating altitude	< 2000 m
Safety class	IP65

- *Subject to technical modifications!*
- *For the technical data on the FAG SmartQB sensor, see the FAG SmartCheck user manual.*

2.4 Scope of delivery

Scope of delivery

The handbook describes the scope of delivery for the FAG SmartQB variant 2, i.e. a FAG SmartQB base unit with a FAG SmartQB sensor.

Basic unit FAG SmartQB consisting of:

- 1 switch cabinet housing with
  - 1 touchscreen display
  - 1 controller
  - 1 PoE switch (Power over Ethernet)
  - 1 mains unit (24 V)
  - 1 power supply cable (2 m, Schuko plug on free cable end)
  - 1 circuit breaker
  - 1 switch cabinet key
  - 15 sleeves for the cable gland system
    - 4 slotted cable sleeves with two 5 mm holes to take 4-5 mm diameter cables
    - 2 slotted cable sleeves with 9 mm hole to take 8-9 mm diameter cables
    - 1 slotted cable sleeve with 7 mm hole to take 6-7 mm diameter cables
    - 8 closed dummy sleeves
- 1 SD card containing the FAG SmartQB sensor configurations and other information (on delivery, the card is already in the slot on the touchscreen display)
- User documentation FAG SmartQB (German, English, Chinese, Spanish, French and Japanese) in PDF form on SD card
- Pocket guideFAG SmartQB (German, English, Chinese, Spanish, French and Japanese) in printed format

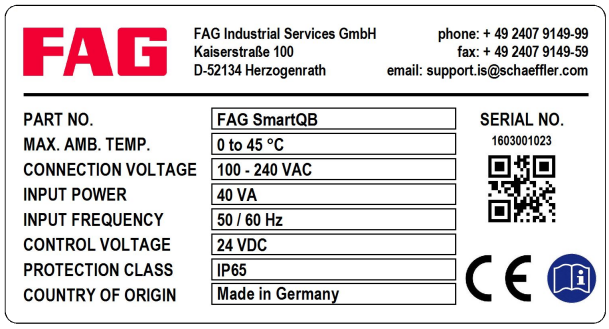
FAG SmartQB Sensor #1 (also referred to as FAG SmartCheck) with

- 1 fixing screw (M6x45 hex socket head screw)
- 1 O-ring to secure the fixing screw in position
- 1 plug with logo to cover the mounting aperture
- 3 plugs to cover unused M12 connections
- 1 Ethernet cable for connecting to FAG SmartQB; M12 on RJ45; 10 m
- User documentation FAG SmartCheck (German, English, Chinese, Spanish, French and Japanese) in PDF form on SD card
- Pocket guide FAG SmartCheck (German and English) as PDF on the SD card and in printed format

If you need to contact us, always quote your serial number and the program version of the FAG SmartQB including the number of the FAG SmartQB sensors if applicable.

FAG SmartQB:

The nameplate and serial number (SERIAL NO.) are on the underside of the FAG SmartQB housing:



The serial number is a 10-digit number, e.g. `1603001023`*. Beneath the serial number there is a QR code (Quick Response Code), which includes the serial number. You can scan the QR code using a mobile end device and a QR code scanner. To do this, point the camera of your mobile end device at the QR code. As soon as the code is detected, the serial number appears.*

You can find the program version (e.g. 2.6.0*) on the main screen* 50 *of the touchscreen display.*

FAG SmartQB sensor:

The nameplate and serial number (S/N) are located on the side of the FAG SmartQB sensor. The serial number is a 12-digit alphanumeric combination, e.g. `f43d80001c99`.

Optional accessories

An extensive range of optional accessories for the FAG SmartQB is available from FAG Industrial Services GmbH:

- FAG SmartQB sensors 1 to 6: preconfigured
- Ethernet cable for FAG SmartQB sensor; M12 plug on RJ45; length: 10, 20 and 30 metres
- Sensor mounting plate M6 for installing the FAG SmartQB sensor
- FAG SmartUtility software with user documentation on CD-ROM; this software features enhanced functionality compared with the FAG SmartUtility Light
- FAG SmartLamp for displaying the overall alarm status of the FAG SmartQB, with two extension cables; M12, 8-pin, socket plug; length: 10 metres
- Extension cable for FAG SmartLamp; M12, socket plug; length: 10, 20 and 30 metres

For an overview of the optional accessories, see **Information and support > Accessories** 51 for the FAG SmartQB touchscreen display and on the supplied SD card.

Further information is available from your customer support representative 87.

3 Installing the FAG SmartQB

Important details about installation of the FAG SmartQB can be found in the following sections.

Ensure that the device is free from damage prior to installation.

In case of doubt, consult a qualified electrician or contact your customer support representative at FAG Industrial Services GmbH.

3.1 Installation details

Installation site

Install the FAG SmartQB at eye level on a wall that is as level and vibration-free as possible, next to the machine to be monitored. When doing so, make sure that all of the environmental conditions for operation are adhered to, good ventilation is ensured for cooling, and all components are easily accessible for maintenance purposes. There is no need to open the housing of the FAG SmartQB during installation.

Installation material

You need the following materials to install the FAG SmartQB:

- Tool for creating the bore holes
- Fastening material (dependent on the surface)
- 4 mounting screws: cylinder hex screws, M6x40
- Washers, if necessary
- Cable ties for routing the cables
- Tool and materials for connecting the input/output signal cables (optional):
  - Ferrules, 0.25 mm^2 (colour: purple (French colour code))
  - Ferrule pliers (crimp pliers)
  - Flat-head screwdriver 2x0.4 mm

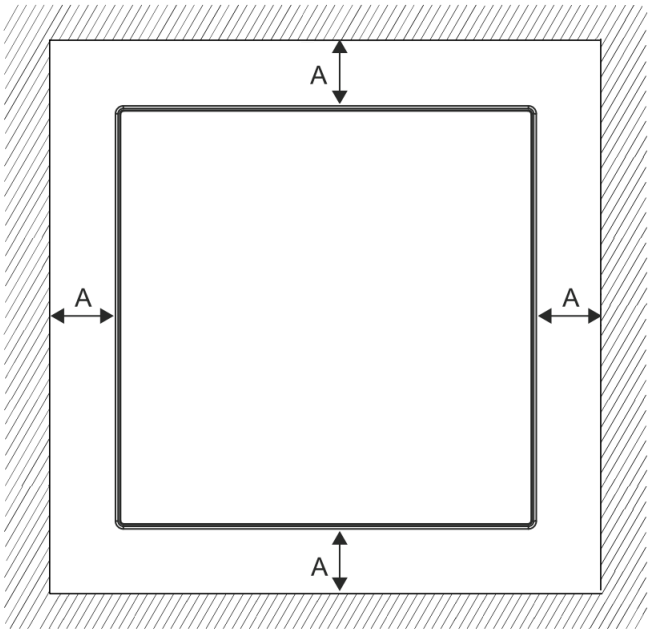
Environmental conditions at the installation site

Note the following environmental conditions for the FAG SmartQB:

- The ambient temperature must be between 0°C and +45 °C.
- The humidity must be between 10 % and 90 % of the relative atmospheric moisture.
- Avoid the following installation sites:
  - Locations where condensation accumulates due to sudden temperature changes
  - Locations with easily flammable gases
  - Locations with a high level of conductive dust (iron filings, oil mist, mist, salt vapours or organic solvents)
  - Locations with direct sunlight
  - Locations with strong magnetic fields or high voltage fields
  - Locations at which powerful sound waves and shock waves can make their way directly into the FAG SmartQB
- When using mobile phones, maintain a minimum distance of 25 cm to the FAG SmartQB.

Item

To ensure good ventilation and to make it easier to maintain/service the device, the following minimum distances should be adhered to between the FAG SmartQB and other components:



Distance to other components [mm]
A
300

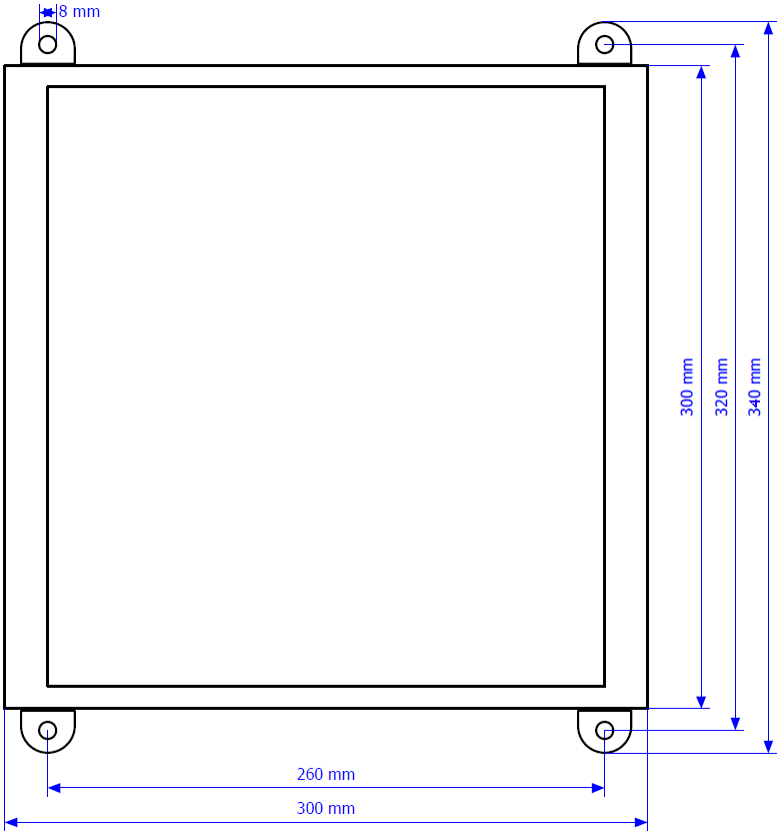
When installing the FAG SmartQB, make sure you leave enough space under the housing for the cabling.

3.2 Dimensions

The following illustrations show the FAG SmartQB from different perspectives with dimensions accurate to the millimetre.

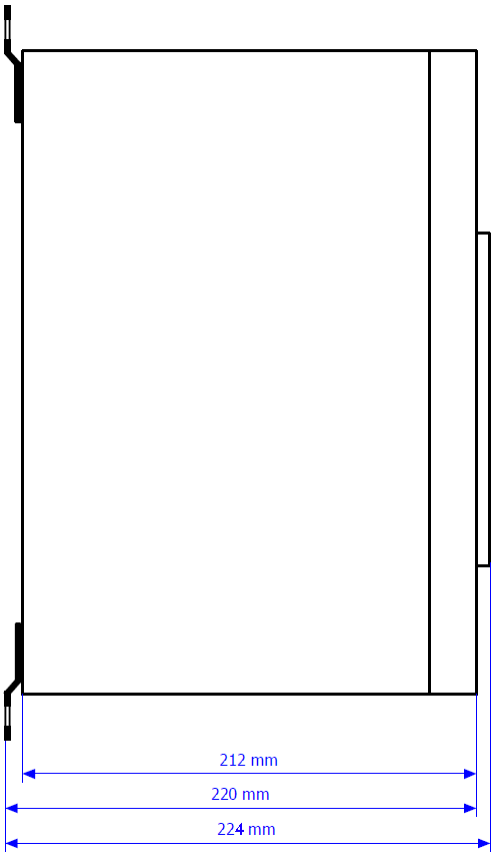
Basic dimensions of the FAG SmartQB, front view

From the front you can see the door with integrated touchscreen display and the wall brackets.



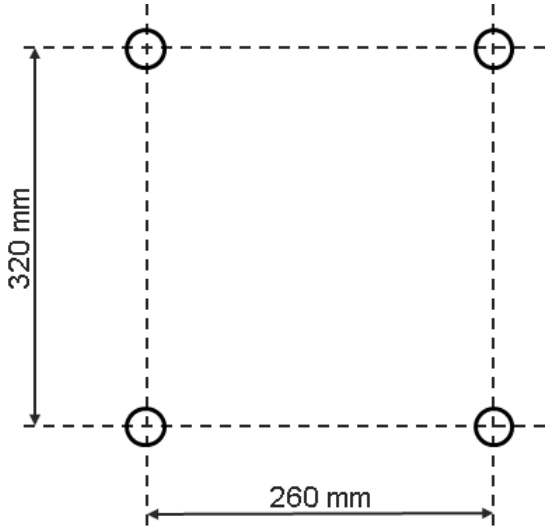
Basic dimensions (side view) of the FAG SmartQB

The side view shows how far the brackets protrude and how large the side area of the FAG SmartQB is.



Bore hole template for mounting theFAG SmartQB housing

The bore hole template illustrates the required distances between bore holes when wall-mounting the FAG SmartQB housing.



Use a drilling depth of 50 mm (or 10 mm longer than the length of the screws) for the fixing screws.

3.3 Mounting the FAG SmartQB

The FAG SmartQB is delivered with pre-mounted wall brackets and you can install it without opening the housing. During installation, note the distance specifications 13 to other components.

- *The scope of delivery of the FAG SmartQB does not include fixing materials. Please use materials that are suitable for the surface.*
- *Mount the FAG SmartQB such that the display is at eye level.*

Installing the FAG SmartQB

Proceed as follows to install the FAG SmartQB:

- Mark the required position of the FAG SmartQB.
- Create the four bore holes according to the bore hole template 15.
- Install the FAG SmartQB using 4 mounting screws (use suitable washers).
- Tighten the mounting screws using a maximum torque of 4.2 kN.

You can now connect the FAG SmartQB sensors, the optional FAG SmartLamp analogue inputs and digital inputs, then connect the device to the power supply.

- *When installing the FAG SmartQB, make sure you leave enough space under the housing for the cabling.*
- *To remove the FAG SmartQB, repeat the steps described above in reverse order.*

4 Installing the FAG SmartQB sensors

The following sections contain important details about installing the FAG SmartQB sensor on a machine you want to monitor.

- *Before installation, make sure that the sensor is not damaged.*
  In case of doubt, consult a qualified electrician or contact your customer support representative atFAG Industrial Services GmbH.
- *Make sure that the FAG SmartQB sensor is de-energised while work is being performed.*

Installing FAG SmartQB sensors

Install the FAG SmartQB sensors as described in the FAG SmartCheck manual.

The FAG SmartQB sensor is similar in design to the FAG SmartCheck. For detailed installation instructions, see the user documentation for FAG SmartCheck on the supplied SD card.

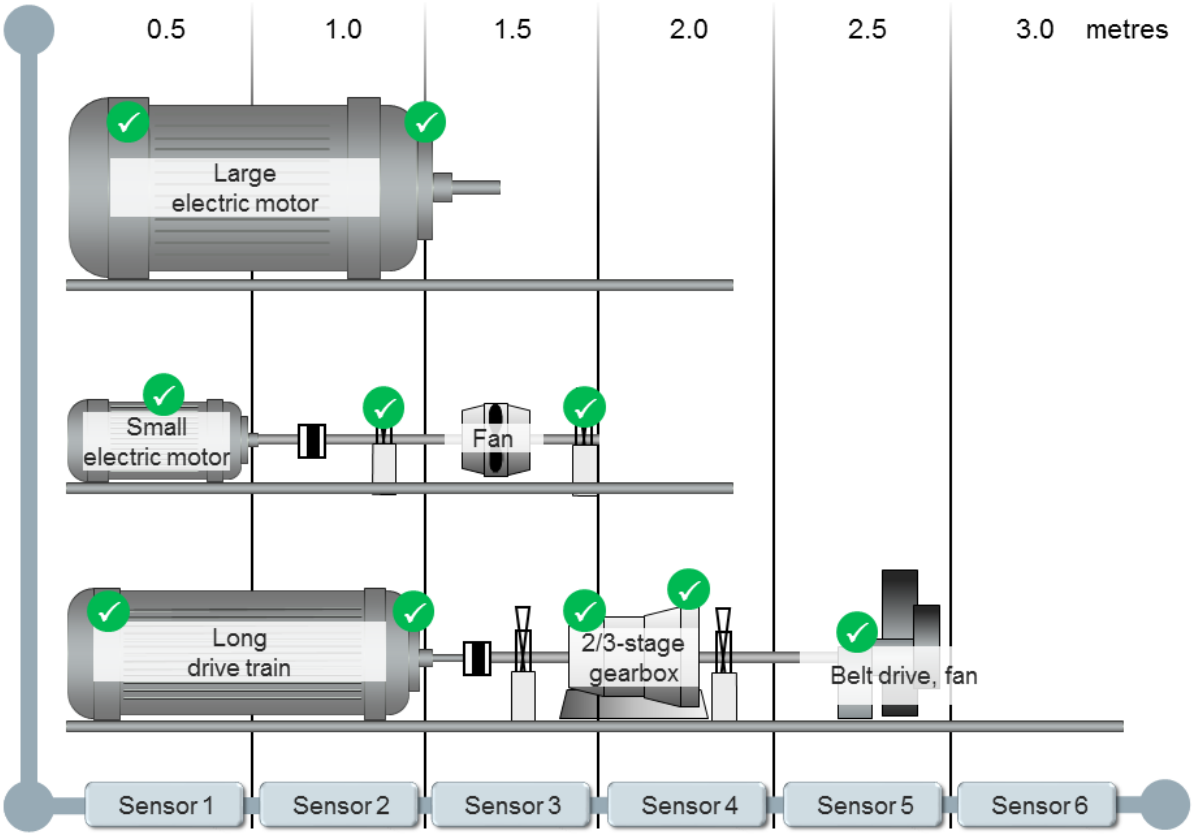
4.1 Installation details

Installation site

To install theFAG SmartQB sensor, select a site with optimum vibration transfer. To monitor a bearing for example, this would be near the roller bearing you wish to monitor and radial to the axis of rotation. It is recommended to consult a vibration expert for this step to ensure optimum condition monitoring. FAG Industrial Services GmbH offers a service that is tailored to your specific requirements. Details of this can be obtained from your customer support representative 87.

Determine the position and number of FAG SmartQB sensors

The following illustration shows various use cases and recommendations for the installation site and number of FAG SmartQB sensors:



Example:
If you want to monitor a small electric motor (up to 0.5 metres long), a FAG SmartQB sensor is usually sufficient. For larger electrical motors with monitored areas around 1 metre apart, you should plan two FAG SmartQB sensors. With a long drive train and monitoring of multiple assembly groups, position the FAG SmartQB sensors at all the points to be monitored, as shown in the illustration.

Please also note the following:

- The FAG SmartQB sensor must be mounted vertical to the installation surface.
- The installation surface must not be curved or uneven.
- The surface should exhibit a mean roughness index of Ra = 3.2 µm and should be free from impurities.
- The FAG SmartQB sensor can be operated at ambient temperatures from -20°C to +70°C.

Installation type

To ensure the FAG SmartQB sensor is installed safely and permanently, it should be mounted on the machine or component that you wish to monitor.

The device can be screwed directly into a hole on the component. To do this, you will need to drill a tapped hole at least 9 mm deep at the selected position; the surface must exhibit a mean roughness index of Ra = 3.2 µm.

If this is not possible, you can bond an M6 sensor mounting plate to the installation surface and then screw the device to the mounting plate. The sensor mounting plate is available as an optional accessory from FAG Industrial Services GmbH.

Materials

The following materials are also required to install the FAG SmartQB sensor:

- Tool for creating the tapped M6 hole or an M6 sensor mounting plate including an adhesive suitable for vibration measurement (e.g. Loctite 330)
- Some lubricant (oil, grease)
- Offset screwdriver for M6 hex socket head screw
- Torque wrench (tightening torque: 10 Nm) with socket for a M6 hex socket head screw

Optional items:

- Vibration-resistant screw locking compound (e.g. Loctite 243 medium-strength threadlocker)
- Cable ties for securing the cable

You can find further information in the FAG SmartCheck manual on the supplied SD card.

4.2 Installing the FAG SmartQB sensor

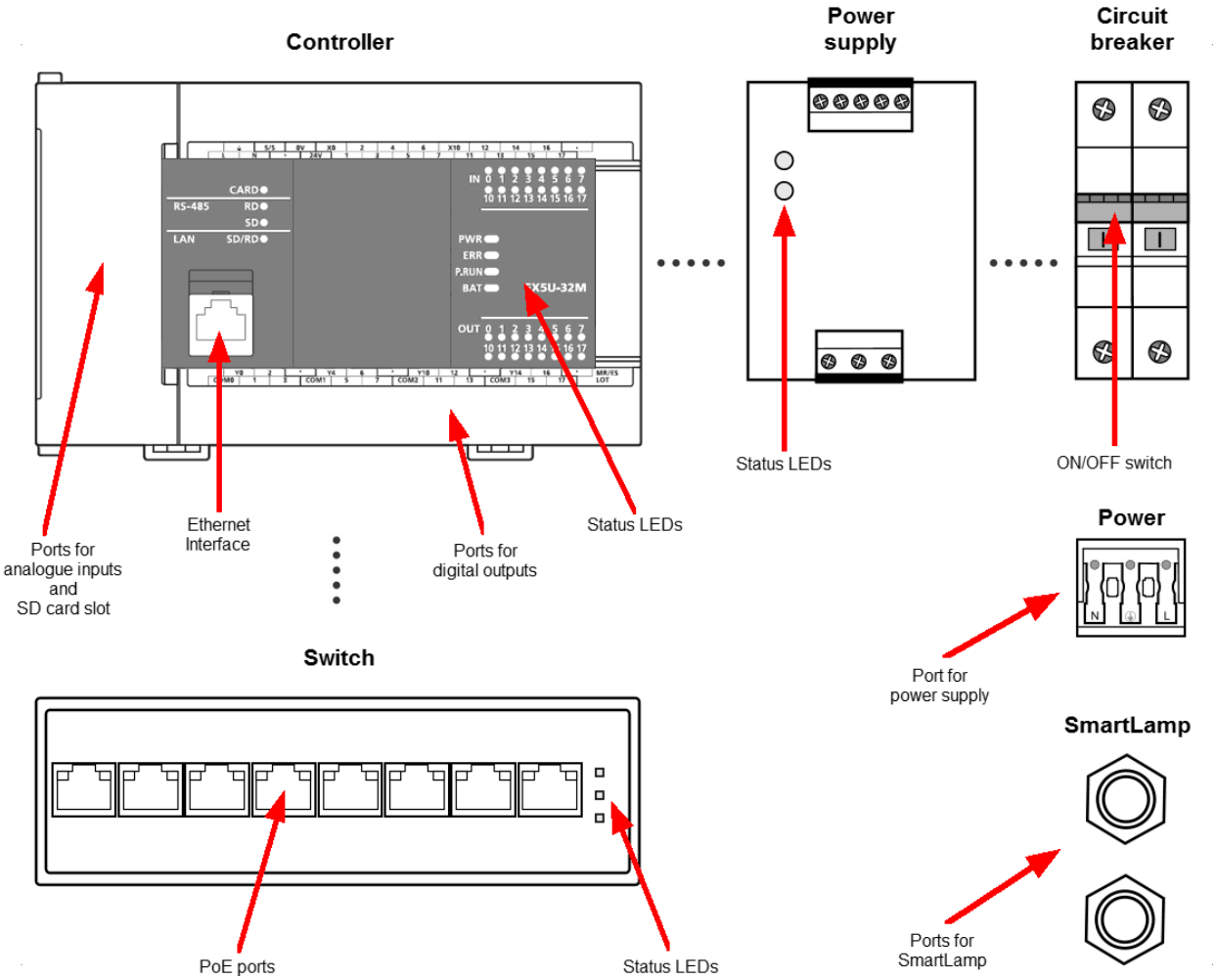
Install the FAG SmartQB sensor on the component you want to monitor, as described in the FAG SmartCheck manual 18 .

You can now connect 20 the FAG SmartQB sensor to the FAG SmartQB .

5 Layout, connections and fittings

Using the connections on the FAG SmartQB you can power the device and connect FAG SmartQB sensors, analogue input signals and digital output signals. Settings options and system responses can be found in the separate Touchscreen display 45.

The following diagram shows an overview of the device layout, its individual modules and the position of the connections and control elements:



The FAG SmartQB features the following components and functions:

- **Controller**

  You will find the analogue input and digital output ports on the controller. As standard, the Ethernet interface is there for communication with the FAG SmartQB sensors and touchscreen display. LEDs also show the status of the controller and the digital outputs. The SD card slot is located behind the left cover.
- **Power supply**

  Two LEDs show the status of the power supply.
- **Circuit breaker**

  The power ON/OFF switch is located on the circuit breaker.
- **Switch**

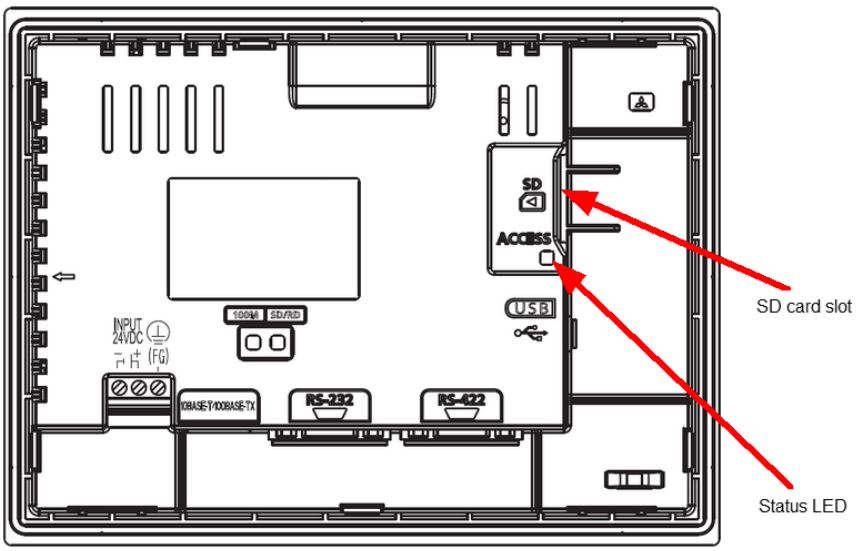
  You can connect up to six FAG SmartQB sensors on the switch. You can optionally establish a network connection. LEDs show the status of the switch.
- **Connecting the power supply**

  You can connect the power supply to the network connection terminal.
- **Connections FAG SmartLamp**

  Here you can connect the power supply and analogue input cable for the FAG SmartLamp from the optional accessories.

- **Separate touchscreen display (not shown above)**

  You can use the touchscreen display to set various program parameters and call up the system status. On the display there is a slot for the SD memory card. The card is already inserted on delivery and must remain there. The following image shows an overview of these connections on the rear of the touchscreen display:



An overview of how you can connect the FAG SmartQB can be found in the section **Overview of connections and fittings** 22.

Important notes that must be observed when connecting the inputs can be found in the section **Connection notes** 24.

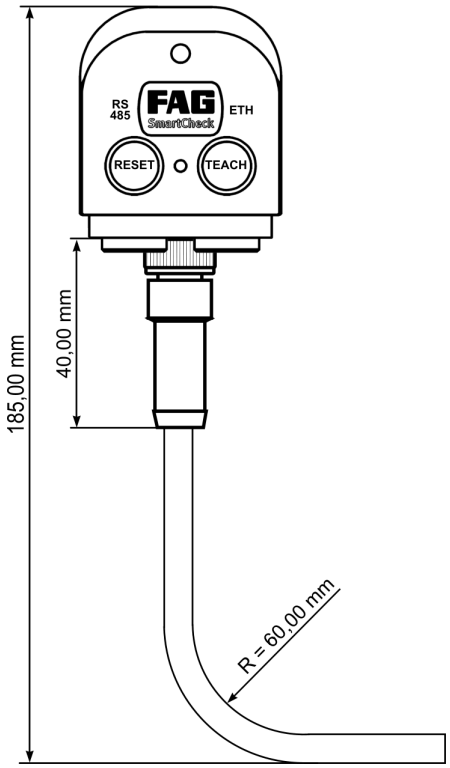
Details about the assignment of the individual connections can be found in the section **Connection details** 25.

Notes and details on the touchscreen display can be found in the section **Connecting the touchscreen display** 45.

General

Please note the following information when connecting cables:

- Ensure that the sockets for the plug connections are clean and free from impurities. Dirt or moisture in plug connections can impair signal quality.
- When securing cables, ensure that they are not subjected to any mechanical strain. If necessary, fit strain relief accessories.
- Observe the minimum permissible bending radii for the cables. These can be found in the data sheets from the cable manufacturer. A minimum bending radius of 60 mm is recommended for cables from the standard range of accessories from FAG Industrial Services GmbH.
- Attach the cables in such a way that they are laid firmly and cannot be knocked.
- Do not lay signal cables parallel to high-power lines.



Example

5.1 Overview of connections and fittings

To use the functions and connections of the FAG SmartQB, proceed as follows:

1. Install the FAG SmartQB 17 close to the machine to be monitored.
2. Plan how to connect up to six FAG SmartQB sensors and (optionally) the analogue inputs, digital outputs, network connection and the FAG SmartLamp.
3. Once you know how you want to use the connections and functions of the FAG SmartQB, prepare the relevant accessories for the connections. You can find details on the various connection options in the following sections:
   - **Connecting the FAG SmartQB sensor** 31
   - **Connecting analogue inputs (optional)** 32
   - **Connect digital outputs (optional)** 34
   - **Establish network connection (optional)** 36
   - **Connecting the FAG SmartLamp (optional)** 37
   - **Connecting the power supply** 38
4. When you have started up the FAG SmartQB, you can use the control elements on the SmartQB and the touchscreen display 45.
5. Register 54 and configure 55 the connected FAG SmartQB sensors.

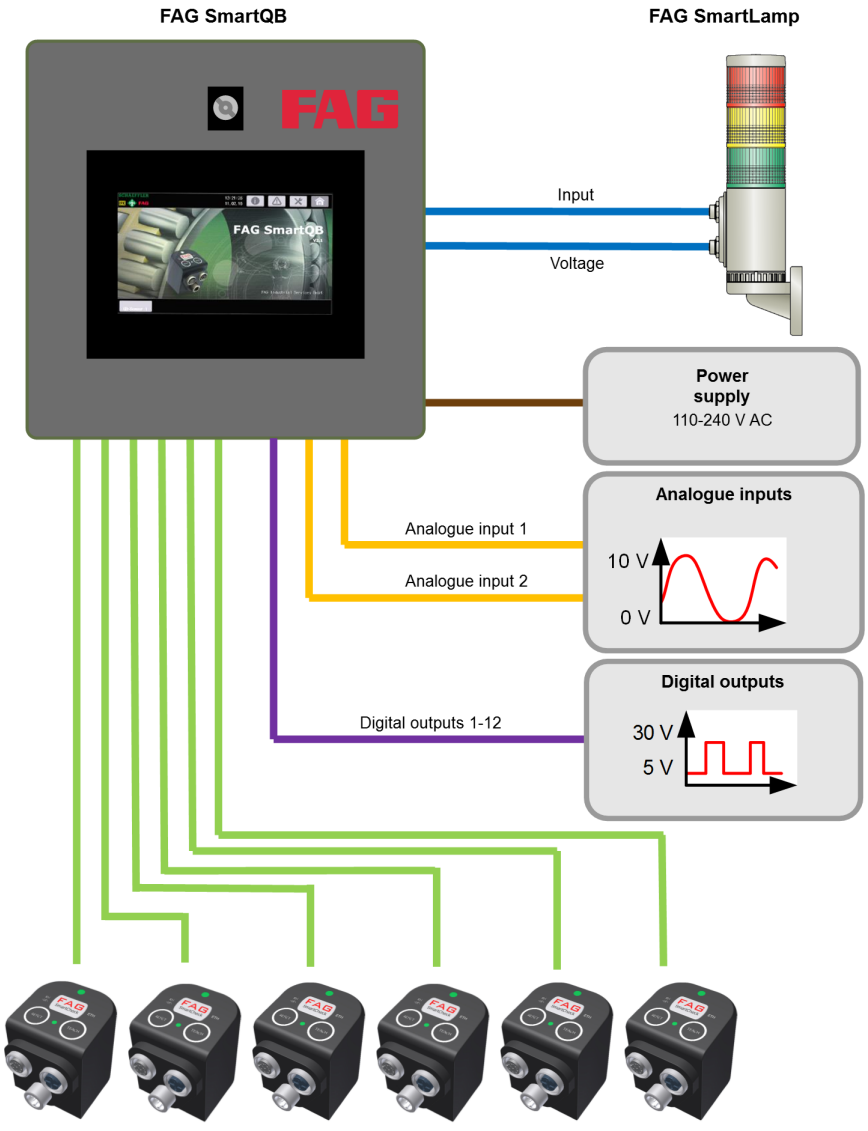
Important notes that must be observed when connecting the inputs can be found in the section **Connection notes** 24.
Details about the pin assignment of the individual connections can be found in the section **Connection details** 25.

- *The FAG SmartQB may only be prepared for use by persons who are verifiably qualified to do so in accordance with the relevant regulations.*
- *Ensure that the FAG SmartQB is de-energised while work is being performed on it.*

Connection overview

The following graphic is a detailed circuit diagram with information concerning all of the connection options for the FAG SmartQB, i.e. the SmartQB sensors 31, the analogue inputs 32, the digital outputs 34, the FAG SmartLamp 37 (optional), as well as the power supply 38.

Use standard cables to connect external sensors, control signals and the power supply to the FAG SmartQB. These cables are available from FAG Industrial Services GmbH or from your supplier.



FAG SmartQB sensors 1-6
Connected via Power over Ethernet

The service partner can access the FAG SmartQB via the service interface on the underside of the FAG SmartQB housing. The interface is connected to the switch internally. Please note the following:

- *If you are using all six FAG SmartQB sensors and want to use the service interface, disconnect one of the sensors briefly and connect the network cable.*
- *When using the virtual outputs of the Modbus TCP 72, only 5 FAG SmartQB sensors can be connected, as one port is needed for the network connection.*

5.2 Connection notes

When creating the connections, please observe the notes detailed below.

Connecting the power supply

- For configuration of a circuit breaker or fuse, take account not only of the rated current draw but also the activation current of the mains unit module. The triggering current of the circuit breaker should be selected in a such a way that the system is isolated from the power supply network safely in the event of an excessive current draw. If a single FAG SmartQB is used, the deactivation current of the circuit breaker or fuse is approx. 10 A.
- The mains lines and the power supply lines must not be routed in a strand together with the lines of the main circuit or the I/O signal lines (high voltages, high currents). Where possible, a minimum distance of 100 mm between the lines should be observed.
- If faults occur in the voltage supply network due to activation surges or other line-related malfunctions, an isolating transformer must be connected in between for the purposes of insulation.
- Mount or close all protective covers once the connections have been made. Do not touch any live parts of the modules.
- To protect against excess voltage (e.g. lightning strike), overvoltage suppressors should be used.

CAUTION

Select the type of overvoltage protection so that the permissible voltage fluctuations do not trigger the safety feature.

Earthing

The FAG SmartQB is earthed via the power supply cable and the safety plug.

Connection of external peripherals to the inputs and outputs

- The signals wires for the inputs and outputs should be galvanically isolated from each other.
- The wires for the inputs and outputs should always be routed separately from each other.
- Routing of the I/O signal lines must be such that a minimum spacing of 100 mm to mains voltage and high-voltage lines of the main circuits is maintained. If this is not possible, shielded lines must be used. Earthing of the shielding is usually on the module side.
- If the connections run through metallic pipes or cable trays, these must be earthed.
- Lines that carry input or output signals must be routed separately from lines that carry AC voltage.

Where lines are longer than 200 m, performance loss may be experienced as a result of the line capacity, which could falsify the input signals.

Analogue signal transmission

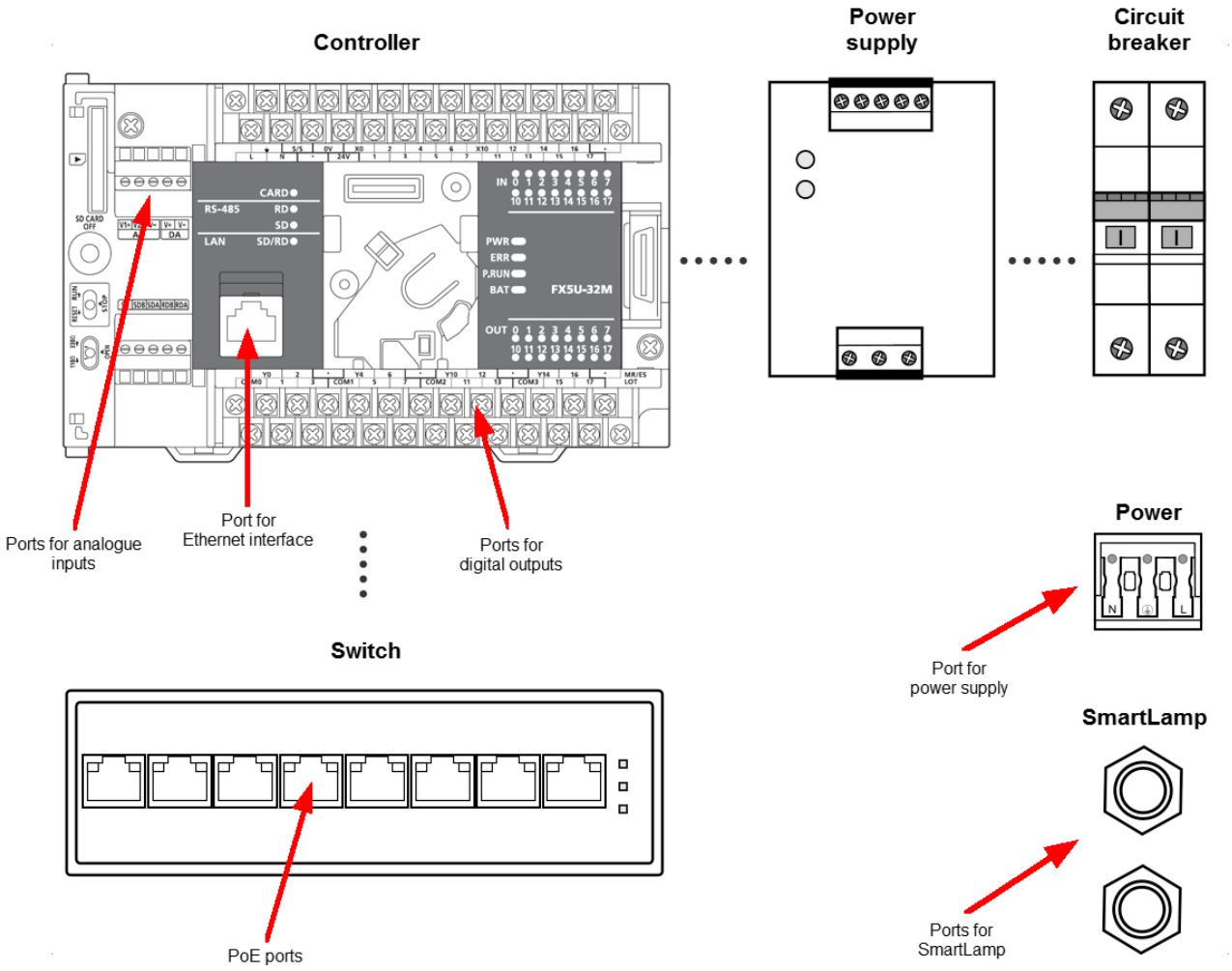
Perform a low-frequency, analogue signal transmission over short distances using a two-wire, shielded cable. Potential differences are possible between the reference conductors of the sender and receiver, which is why potential isolating components are used (transformer, optocouplers etc.).

Digital signal transmission

For digital signal transmission, note the technical data of the interface in relation to the transmission rate and transmission distance to ensure uninterrupted signal transmission.

5.3 Connection details

Use the connections on the FAG SmartQB to connect the FAG SmartQB sensors, analogue inputs, digital outputs, the FAG SmartLamp (optional) as well as the power supply:

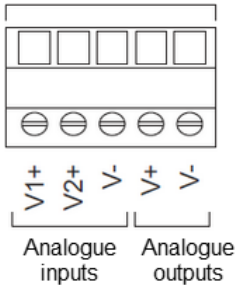


Details about the assignment of cables required for the analogue inputs 25, the digital outputs 26, the FAG SmartLamp and the power supply 28 can be found in the following sections.

For information on the cable gland system 29, see the section of the same name.

Analogue inputs

You can access the analogue inputs via terminal block **AD** on the FAG SmartQB controller in the housing:



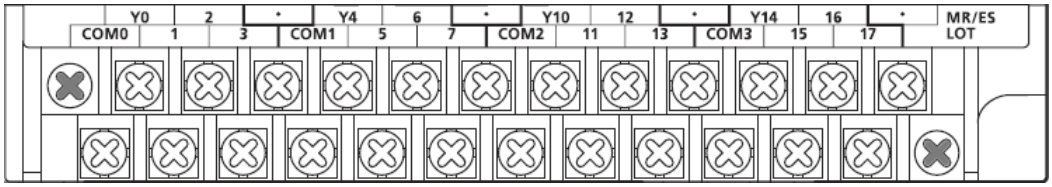
The terminals are defined as follows:

Signal		Description
Analogue inputs	**V1+**	Analogue input channel 1 (+)
	V2+	Analogue input channel 2 (+)
	V-	Analogue input (-)*
Analogue outputs (not used)	**V+**	Analogue output (+)
	V-	Analogue output (-)*

* The 'V-' terminals are connected with one another internally.

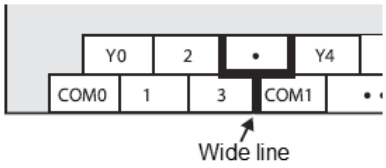
Digital outputs

You can access the digital outputs via the lower terminal block on the FAG SmartQB controller in the housing:



The digital outputs are arranged in groups of 4. Each group shares a port for the voltage to be switched. These terminals are indicated by "COM".

The individual groups are separated from one another on the modules by a thick line. The outputs within one such area belong to the same COM port.

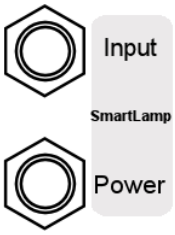


The terminals are defined as follows:

Signal		Description
Digital outputs	**COM0**	+30 VDC (max.)
	Y0	Digital output FAG SmartQB sensor 1 - No alarm
	1	Digital output FAG SmartQB sensor 1 - Alarm (pre-alarm and/or main alarm)
	2	Digital output FAG SmartQB sensor 2 - No alarm
	3	Digital output FAG SmartQB sensor 2 - Alarm (pre-alarm and/or main alarm)
	COM1	+30 VDC (max.)
	Y4	Digital output FAG SmartQB sensor 3 - No alarm
	5	Digital output FAG SmartQB sensor 3 - Alarm (pre-alarm and/or main alarm)
	6	Digital output FAG SmartQB sensor 4 - No alarm
	7	Digital output FAG SmartQB sensor 4 - Alarm (pre-alarm and/or main alarm)
	COM2	+30 VDC (max.)
	Y10	Digital output FAG SmartQB sensor 5 - No alarm
	11	Digital output FAG SmartQB sensor 5 - Alarm (pre-alarm and/or main alarm)
	12	Digital output FAG SmartQB sensor 6 - No alarm
	13	Digital output FAG SmartQB sensor 6 - Alarm (pre-alarm and/or main alarm)

FAG SmartLamp

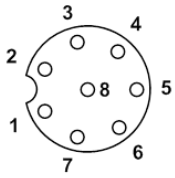
Connect the FAG SmartLamp via the **I/O** and **Power** M12 connectors in the housing:



Controlling the FAG SmartLamp

You can control the FAG SmartLamp with the input port.

The pins are defined as follows:

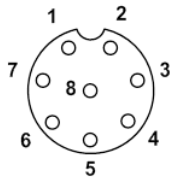
Pin assignment (socket)	No.	Signal	Colour*
 Front view	1	Not connected	White
	2	Not connected	Brown
	3	Not connected	Green
	4	Not connected	Yellow
	5	GND output	Grey
	6	Analogue output	Pink
	7	Not connected	Blue
	8	Not connected	Red

* Colours apply for standard cables from the accessories for the FAG SmartLamp.

Power supply for the FAG SmartLamp

The power supply for the FAG SmartLamp can be connected via the power port.

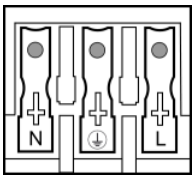
The pins are defined as follows:

Pin assignment (socket)	No.	Signal	Colour*
 Front view	1	Power supply, earth	White
	2	Power supply, positive	Brown
	3	Not connected	Green
	4	Not connected	Yellow
	5	Not connected	Grey
	6	Not connected	Pink
	7	Not connected	Blue
	8	Not connected	Red

* Colours apply for standard cables from the accessories for the FAG SmartLamp.

Power supply

The power supply for the FAG SmartQB can be connected via the network connection port in the FAG SmartQB housing:



The pins are defined as follows:

Name	Signal	Colour*
L	Network voltage connection (phase)	Black
N	Network voltage connection (neutral)	Blue
PE	Protective earth	Green/yellow

* Colours are for standard cables from the accessories for the FAG SmartQB.

To release the connection cable, press the appropriate buttons on the network terminal and pull the cable ends out.

5.4 Cable gland system

On the underside of the FAG SmartQB housing there is a cable gland system which you can use to feed through the pre-prepared cables without undoing the connections into the SmartQB housing. The sealing frame meets the requirements of IP65. It is designed so that you can insert the required cable with minimal effort.

Structure of the cable gland system

The cable gland system comprises the following elements:

- Frame with moulded seal: The frame is fixed to the housing. It can be unscrewed and opened on one side.
- Cable sleeves and dummy sleeves: The sleeves are located in guide rails within the frame. They can be removed when the frame is detached and opened.

When properly installed, the cable gland system provides an IP65-standard seal and relieves tension on the pre-prepared cables. Use the supplied dummy sleeves to seal unused channels. For an overview of the supplied cable sleeves and dummy sleeves, see the following table:

Quantity	Type	Type	For cable
4	Cable sleeve	Slotted, with 2 x 5 mm hole	Sensor cable (PoE cable)); cable for FAG SmartLamp (optional) 4-5 mm diameter
2	Cable sleeve	Slotted, with 1 x 9 mm hole	Digital output cable; power supply cable 8-9 mm diameter
1	Cable sleeve	Slotted, with 1 x 7 mm hole	Analogue input cable 6-7 mm diameter
8	Dummy sleeve	Closed, no holes	-

Feeding the cable through the cable gland system

To unscrew the cable gland system and the end cover strip, use a 4-mm screwdriver with a hex ball head or a hex key.

If you want to feed the pre-prepared cables through the cable gland system, proceed as follows:

- Unscrew the cable gland system from the FAG SmartQB housing.
- Loosen the three screws on the end cover strip of the cable gland system and remove the end cover strip.

- Push out the cable sleeves from the guide rail. You can also remove any dummy sleeves which you intend to replace with cable sleeves.
- Place a slotted sleeve on each cable that matches the cable's diameter. Depending on how your FAG SmartQB is equipped, you may have to replace dummy sleeves with the supplied cable sleeves.

- Sort the cables according to their planned end position (see Connection details 25). Then push the cable sleeves with the cables and the remaining dummy sleeves back into the guide rails of the cable gland system.

Insert the cable and dummy sleeves such that the sealing lips are aligned towards the frame. This is the only way to ensure that the degree of protection is maintained!

- Place the end cover strip back on the frame and secure using the three screws (recommended tightening torque: 2-3 Nm).
- Feed all of the cables through the opening in the FAG SmartQB housing.
- Screw the cable gland system back onto theFAG SmartQB housing (tightening torque: max. 1.5 Nm).
- Now connect all the cables to the individual devices (see Connection overview 22).

Ensure the following:

- *Cable sleeves and dummy sleeves are aligned evenly and flush in the frame.*
- *The cable diameter matches the holes in the cable sleeves.*
- *The cable gland system is closed with the supplied cable sleeves and dummy sleeves.*
- *The end cover strip for the cable gland system must be re-inserted and screwed in tightly (note the tightening torque!).*
- *The seal must be affixed between the housing and the cable gland system.*
- *The cable gland system must be tightly screwed onto the housing (note the tightening torque!)*

This is the only way to ensure that the degree of protection is maintained!

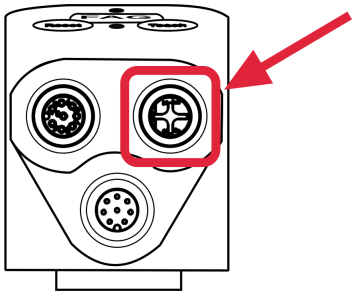
5.5 Connecting the FAG SmartQB sensor

You can use the ports on the FAG SmartQB sensor to set up an Ethernet connection to the FAG SmartQB. To do this, you need the following supplied connection cable:

- Ethernet connection cable (Ethernet/PoE); M12 on RJ45.

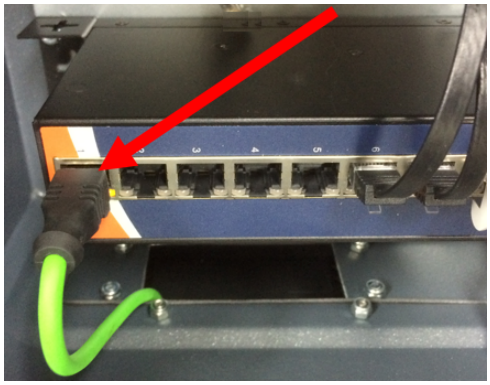
To establish the connection, proceed as follows:

1. Take the Ethernet cable and plug the connector into the Ethernet port (top right).



4. Lay the Ethernet cable to the FAG SmartQB housing.
5. Feed the Ethernet cable through the cable gland system 29 into the housing.
6. Connect the Ethernet cable to any PoE switch port.

Make sure that the plug clicks into place.



Repeat these steps for all other FAG SmartQB sensors.

To connect six FAG SmartQB sensors, remove the cable for the service partner's network interface from the switch.

When you start the FAG SmartQB, you can register the FAG SmartQB sensors 55 on the main screen in the **Settings** area.

An illustration of all the connection options for the FAG SmartQB can be found in the Connection overview 22.

5.6 Connecting analogue inputs

With the FAG SmartQB controller, you can use up to two analogue inputs to create process parameters, such as variable speed. The measuring range of the analogue inputs is 0-10 V.

The resolution of the input channels is as follows:

Measurement range	Value range	Resolution
0–10 V	0-4,000	2.5 mV

Please note the following regarding the input channels:

- The input resistance of powered inputs is 115.7 kOhm.
- The maximum permissible short-term voltage range of the inputs is -0.5 V to +15 V

Connect the analogue inputs to the terminal block 25 of the FAG SmartQB controller.

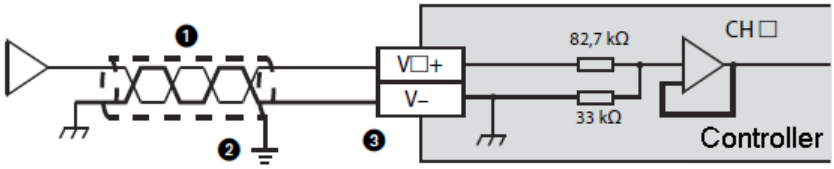
Important notes that must be observed when connecting the inputs can be found in the section **Connection notes** 24.
Details about the pin assignment of the individual connections can be found in the section **Connection details** 25.

Please observe the following instructions when connecting to a terminal block: non-observance can lead to electric shock, short circuit, loose connections or damage to the controller.

- *When stripping the wires, please note the dimensions specified below.*
- *Twist the ends of flexible cables (strands). Make sure that no single wires are sticking out.*
- *The ends of flexible cables must not be tin-coated.*
- *Only use cables with the correct cross-section.*
- *Tighten the screws of the terminals using the tightening torque indicated below.*
- *Attach the cables so that there is no tension on the terminals or connected cables.*

Circuit diagram for voltage signals

The following illustration shows how to connect voltage signals to the analogue inputs of the FAG SmartQB controller.



□ stands for the channel number

Number	Description
1	Two-wire, shielded and twisted-pair cable
2	Earth (class D, earth resistance ≤100 Ohm)
3	If a channel is not in use, its 'V+' terminal must be connected to the 'V-' terminal.

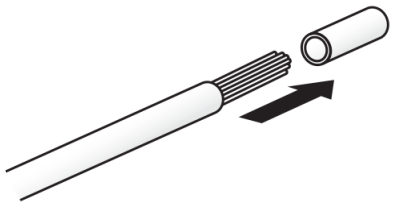
Connecting analogue inputs

To connect the analogue inputs, you will need the following connection cables, which are not supplied as standard:

- Analogue input cables

Proceed as follows:

1. Strip the insulation off the end of the wire.



2. Push a ferrule onto the stripped end of the cable and firmly press it in place.
3. Open the left cover flap 20 on the FAG SmartQB controller.
4. Feed the cable through the cable gland system 29 into the housing.
5. Attach the cable to the relevant terminal on the terminal block 25 with the screw (screw tightening torque: 0.22 to 0.25 Nm).
6. Feed the cable down and out and close the cover flap on the controller.

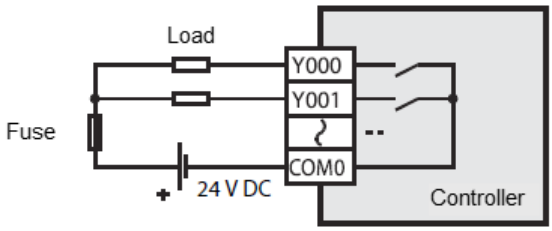
When you start the FAG SmartQB, you can configure the analogue inputs 55 on the main screen in the **settings** area.

5.7 Connecting digital outputs

Via the FAG SmartQB controller, you can use digital outputs to transmit the alarm status of up to six FAG SmartQB sensors. The digital outputs indicate the overall alarm status of the individual FAG SmartQB sensors as **No Alarm** or **Alarm** (pre-alarm and/or main alarm).

Connect the digital outputs to the terminal block 26 on the FAG SmartQB controller. The status of the digital outputs is displayed on the controller status LEDs 41.

Example of switching the relay outputs



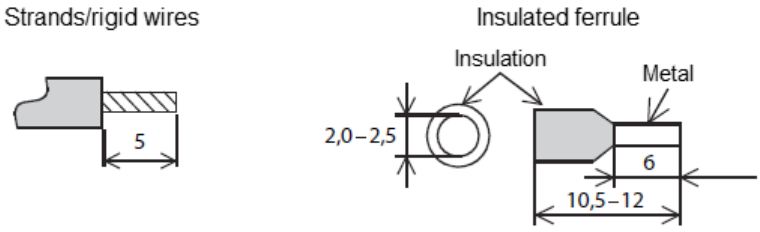
Important notes that must be observed when connecting the inputs can be found in the section **Connection notes** 24.

Details about the assignment of the individual connections can be found in the section **Connection details** 26.

Connection to the terminal block

Only use wire with a cross-section of between 0.2 and 0.5 mm^2. When two wires need to be attached to one terminal, use wires with a cross-section of 0.2 mm^2. Screw tightening torque is between 0.22 Nm and 0.25 Nm.

For braided wires, remove the insulation and twist the individual wires. Rigid wires are only stripped prior to connection. If insulated wire end sleeves are used, their dimensions must match those in the following diagram.



Unit: mm

Please observe the following instructions when connecting to a terminal block: non-observance can lead to electric shock, short circuit, loose connections or damage to the controller.

- *When stripping the wires, please note the dimensions specified below.*
- *Twist the ends of flexible cables (strands). Make sure that no single wires are sticking out.*
- *The ends of flexible cables must not be tin-coated.*
- *Only use cables with the correct cross-section.*
- *Tighten the screws of the terminals using the tightening torque indicated below.*
- *Attach the cables so that there is no tension on the terminals or connected cables.*

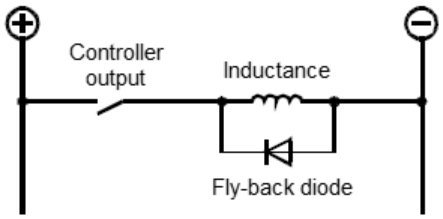
Notes about connecting the outputs

External power supply: For switching the load, connect an external supply of maximum 30 VDC.

Notes about protecting the outputs

Protection from short circuits: The outputs are not protected from overcurrents internally. A short circuit in the load circuit risks damage to the device or a fire. For this reason, protect the load circuit externally with a fuse.

Switching inductive loads: for inductive loads, such as contactors or solenoid valves controlled by DC voltage, fly-back diodes should always be used.



Choose a diode with the following specifications:

- Withstand voltage: at least 5x the switching voltage
- Current: at least as high as the load current

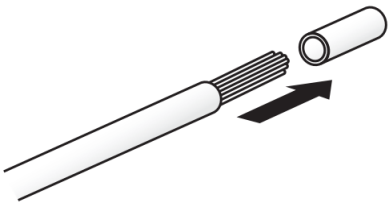
Connecting digital outputs

To connect the digital outputs, you will need the following connection cables, which are not supplied as standard:

- Cable for digital outputs

Proceed as follows:

1. Strip the insulation off the end of the wire.



2. Push a ferrule onto the stripped end of the cable and firmly press it in place.
3. Open the lower cover flap 20 on the FAG SmartQB controller.
4. Feed the cable through the cable gland system 29 into the housing.
5. Secure the wire at the respective terminal of the terminal block 26 using the screw.
6. Feed the cable down and out and close the cover flap on the controller.

When you start the FAG SmartQB, the alarm status of the connected FAG SmartQB sensor is automatically outputted and displayed via the controller status LED 41.

5.8 Connecting to the network

You can connect the FAG SmartQB to your network and use virtual outputs to read process parameters such as the overall alarm status, the alarm status of individual sensors, and other parameters. You can find further information about virtual outputs in the section Modbus registers and functions 72.

Please note that a maximum of 5 FAG SmartQB sensors can be used via the PoE switch in this case. The remaining sixth port on the PoE switch is needed for the network connection.

The network parameters of the FAG SmartQB are pre-set to the following default values in the factory:

Component	Description	Value
Controller (FX5CPU)	IP address	192.168.1.240
	Subnet mask	Undefined (0.0.0.0)
	Gateways	Undefined (0.0.0.0)
Display (GOT IP Address)	IP address	192.168.1.18
	Subnet mask	255.255.255.0
	Standard gateway	0.0.0.0
FAG SmartQB sensors 1 to 6	IP address	192.168.1.101 to 192.168.1.106

If you wish to connect the FAG SmartQB to your network and thereby change the network parameters, please contact your service partner or Schaeffler support. Further information can be found in the section ***Connecting FAG SmartQB to your network*** 65.

Connect the Ethernet cable

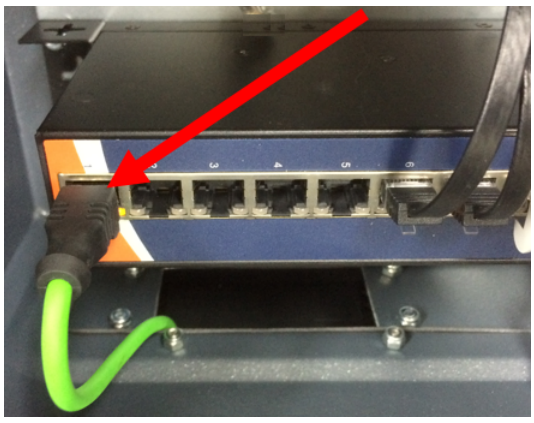
To connect the FAG SmartQB to your network, you will need the following connection cables, which are not supplied as standard:

- Ethernet cable; RJ45

Proceed as follows:

1. Lay the Ethernet cable to the FAG SmartQB housing.
2. Feed the Ethernet cable through the cable gland system 29 into the housing.
3. Connect the cable to any PoE switch port.

Make sure that the plug clicks into place.



To connect six FAG SmartQB sensors, remove the cable for the service partner's network interface from the switch.

An illustration of all the connection options for the FAG SmartQB can be found in the Connection overview 22.

5.9 Connecting the FAG SmartLamp

To display the overall alarm status, you have the option to install the FAG SmartLamp and connect it to the FAG SmartQB.

For detailed instructions on how to install the FAG SmartLamp, see the user documentation FAG SmartLamp on the SD card.

To establish the connection, proceed as follows:

1. Remove both extension cables (M12, 8-pin, socket plug) from the accessories of the FAG SmartLamp.
2. Feed both cables through the cable gland system 29 into the housing of the FAG SmartQB.
3. Take an extension cable and connect the inputs/outputs of the FAG SmartLamp to the I/O port in the FAG SmartQB housing.
4. Take the second extension cable and connect the power supply of the FAG SmartLamp to the lamp power port in the FAG SmartQB housing.
5. Refer to the General information 21 on laying cables.

When you start the FAG SmartQB and you can see the first readings, the FAG SmartLamp automatically shows the overall alarm status of the system.

Details on the assignment of the cables can be found under Connection details 25.

An illustration of all the connection options for the FAG SmartQB can be found in the Connection overview 22.

5.10 Connecting the power supply

Within the FAG SmartQB housing you will find the terminal (Power) for connecting the power supply.

Safety information

DANGER ***Contact with hazardous voltages can be dangerous to life!***

- *The FAG SmartQB may only be prepared for use by persons who are verifiably qualified to do so in accordance with the relevant regulations.*
- *Make sure that all poles of the FAG SmartQBare isolated while work is in progress. Operate the main switch (or emergency switch) and/or disconnect the device at the plug and secure the system from being switched back on.*
- *Ensure that the power cable insulation is laid to just before the network connection terminal. The loose wires of the power cable must be kept as short as possible so that they do not come into contact with the secondary lines.*
- *If the plug connection used with the FAG SmartQB cannot be disconnected, it must be possible to disconnect the device using a dedicated separator (e.g. a main switch) installed on the outside of the device. The separator must comply with standards IEC 60947-1 and IEC 60947-3 and must disconnect all live conductors.*
- *The separator must be permanently mounted at a freely accessible position 1 to 1.5 metres away from the device to enable the power supply to be disconnected immediately in the event of a hazard.*

DANGER ***Damage to the FAG SmartQB as a result of an unsuitable power supply!***

- *Only use a power supply that meets the specifications set out in the Technical data* 10 *section as well as the relevant and applicable statutory requirements governing such components.*
- *You must observe the power supply specifications on the nameplate of the FAG SmartQB.*
- *When connecting the device, you must ensure the polarity is correct. Incorrect polarity can damage the hardware.*

Connecting the FAG SmartQB to the mains

1. Check that the voltage and frequency of your mains connection match the values given on the nameplate of the FAG SmartQB.
2. Feed the cable through the cable gland system 29 into the housing of the FAG SmartQB. The free cable ends must then be located within the housing.
3. Push the cable ends into the Power supply terminal 28 within the FAG SmartQB housing.
4. Lay the cable to the supply unit. Refer to the General information 21 on laying cables.
5. When you have set up all the connections, connect the FAG SmartQB to the mains.

To release the connection cable, press the appropriate buttons on the network terminal and pull the cable ends out.

Details on the assignment of the cable can be found under Connection details 25.

An illustration of all the connection options for the FAG SmartQB can be found in the Connection overview 22.

5.11 Starting the FAG SmartQB

When you have connected the FAG SmartQB sensors, the analogue inputs (optional), the digital outputs (optional), the FAG SmartLamp (optional) and the power supply, you can start the FAG SmartQB.

IMPORTANT

Make sure that the supplied SD card is inserted all the way into the SD card slot of the touchscreen display. If it is not, you may have trouble programming the display.
We usually recommend that you only ever remove the SD card to make a backup copy or for program updates.

As soon as you switch on the FAG SmartQB, the device is ready for use. To ensure optimum vibration monitoring from the outset, we recommend that you do not start the FAG SmartQB until you have ensured the following:

- *All connections have been made correctly.*
- *The machine to be monitored is in a normal operating state.*

Proceed as follows:

- Open the housing door of the FAG SmartQB.
- Turn the ON/OFF switch on the circuit breaker 40 to **On (I)**.
- Close the SmartQB housing door.

As soon as the FAG SmartQB sensor is ready to measure, the internal sensors – the vibration sensor and temperature sensor – start to deliver signals. The basic measurement job already created in the factory default settings converts these signals into the following characteristic values:

- ISO 10816
- RMS broad band acceleration
- RMS broad band demodulation
- Peak-to-peak
- System temperature

If the machine you wish to monitor is not in a normal operating state, the SmartCheck device may issue an alarm after starting up.

You can configure further settings on the touchscreen display of the FAG SmartQB.

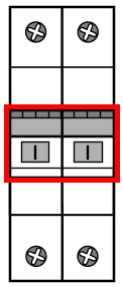
For further information, see the section **Control elements of the touchscreen display** 45.

6 Control elements on the FAG SmartQB

In addition to the means of connection that are described under **Layout, connections and fittings** 20, the individual components of the FAG SmartQB feature additional control elements, such as switches and LEDs. Relevant details can be found in the following sections.

6.1 Circuit breaker control elements

The following diagram provides an overview of the circuit breaker **L1**. The only control element here is the switch:

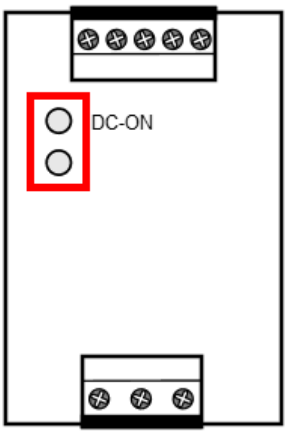


The switch position indicates the status of the power supply, as follows:

ON (I)	Electrical circuit is switched on.
OFF (0)	Electrical circuit is switched off.

6.2 Mains unit control elements

The following diagram provides an overview of the mains unit. The only control element here is the status LED on the top left-hand side of the front panel:

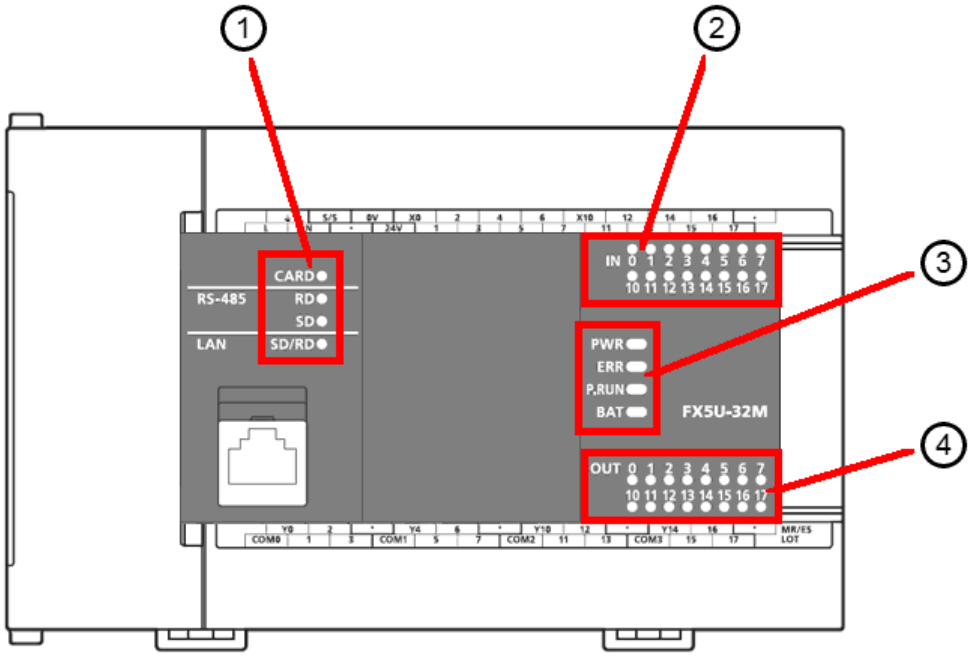


The status LED indicates the status of the mains unit as follows:

LED is on	The mains unit is working normally.
LED is off	There is no mains voltage or the hardware is faulty.

6.3 Controller control elements

The following diagram provides an overview of the controller and shows where the control elements are positioned:



The position numbers denote the following control elements. Details about the individual control elements can be found in the sections below.

Item	Control element
1	Status LEDs for the controller memory 41
2	Status LEDs for the digital inputs 42
3	Status LEDs of the controller 42
4	Status LEDs for the digital outputs 41

1. Status LEDs for the controller memory

The status LEDs of the controller memory are on the left-hand side:

You can find the following information here:

CARD	This LED indicates the status of the memory card: • **Lit:** normal mode • **Flashing:** the memory card is being prepared for use. • **Not lit:** the memory card is not being used or not installed.
SD/RD	These LEDs show the status of the data communication via RS485 (not currently supported): • **Lit:** data is being sent or received. • **Not lit:** normal mode (no communication taking place)

2. Status LEDs for the digital inputs

The digital inputs are not used in the current version. In normal mode, the status LEDs of the digital inputs are not lit.

The status LEDs under the plug connection for the digital inputs inform you of the status of each input:

You can find the following information here:

IN 0 to **IN 7** **IN 10** to **IN 17**	These LEDs indicate the input status of the digital inputs: • **Lit green:** The respective input signal has a high level. • **Not lit:** The respective input signal has a low level.

3. Status LEDs of the controller

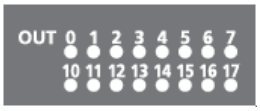
The status LEDs on the right-hand side of the controller tell you about the operating mode and status as well as any errors on the controller.

You can find the following information here:

PWR	This LED indicates the status of the controller: • **Lit:** normal mode • **Not lit:** the power supply is switched off or there is a hardware problem.
ERR	This LED indicates the error status of the controller: • **Lit:** there is a controller or hardware error. • **Flashing:** there is an error or the module is resetting itself. • **Not lit:** normal mode
P.RUN	This LED indicates the operating status of the controller: • **Lit:** normal mode • **Flashing:** the program is paused. • **Not lit:** the execution of the program on the controller was stopped or there is an error.
BAT	This LED indicates the status of the battery: • **Flashing:** battery is empty or not connected. • **Not lit:** normal mode

4. Status LEDs for the digital outputs

The status LEDs above the plug connection for the digital outputs inform you of the status of each output:

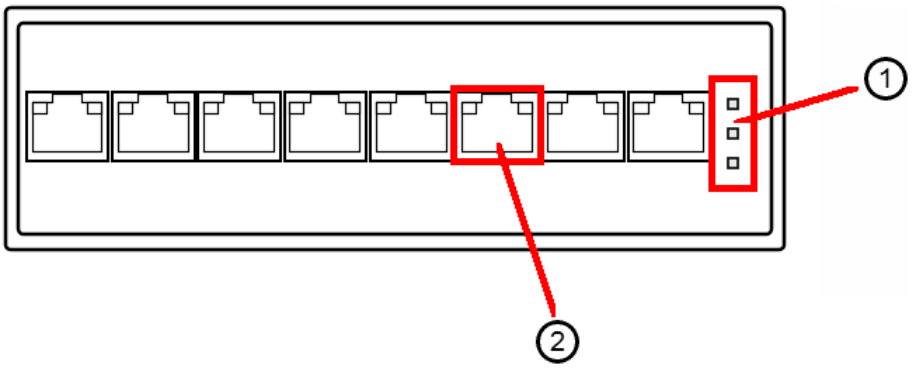


You can find the following information here:

OUT 0 to **OUT 7** **OUT 10** to **OUT 17**	These LEDs indicate the output status of the digital outputs: • **Lit green:** The respective output signal has a high level. • **Not lit:** The respective output signal has a low level.

6.4 Switch control elements

The following diagram provides an overview of the switch and shows where the control elements are positioned:



The position numbers denote the following control elements. Details about the individual control elements can be found in the sections below.

Item	Control element
1	Status LEDs of the switch 44
2	Status LED for each port and PoE indicator 44

1. Status LED P1/P2/Fault

The status LEDs on the right-hand side of the switch tell you about the operating mode and status as well as any errors on the switch.

You can find the following information here:

P1 / P2	These LEDs show the status of the switch: • **Lit:** normal mode • **Not lit:** the power supply is switched off.
Fault	This LED indicates the error status: • **Lit:** there is an error. • **Not lit:** normal mode

2. Status LED for each port and PoE indicator

The status LEDs above the Ethernet ports indicate the connection status and PoE status of each port.

You can find the following information here:

Link/Act	This LED indicates the connection status: • **Lit/flashing:** normal mode • **Not lit:** no data transfer taking place.
PoE	This LED indicates whether the connected devices are being powered via PoE (Power over Ethernet): • **Lit:** normal mode • **Not lit:** the connected devices are not powered via PoE.

7 Control elements of the touchscreen display

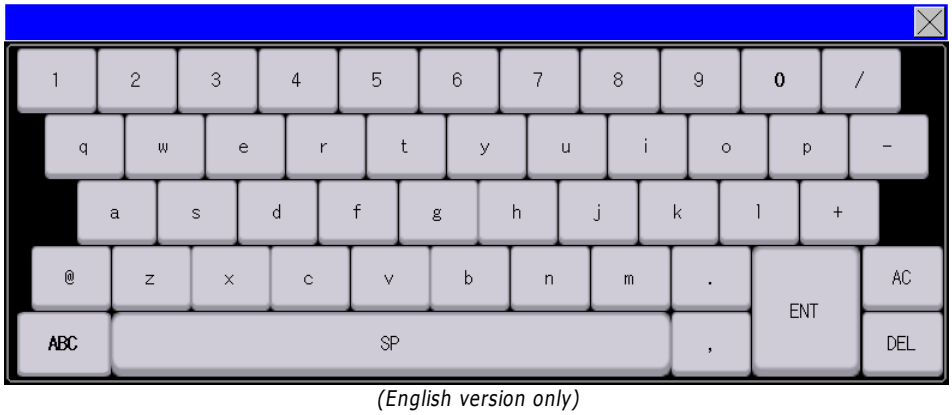
- *Do not tap the touchscreen display with a sharp object like a pen. as this could damage the display.*
- *After installation, remove the protective film from the touchscreen display, otherwise you may not be able to remove it at a later date.*

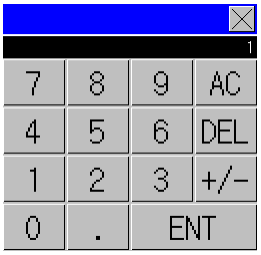
When you are start the FAG SmartQB for the first time, you will see the start-up screen. You can select the language here and edit the system time. The display then shows a menu containing different monitoring and settings options via its control elements.

General navigation options

The touchscreen display responds to touch. By touching the screen with your fingers, you can navigate through the pages of the menu and call up further settings options.

Depending on the location within the menu, the following general navigation options are available:

Control element	Description
	Press this button to jump to the main screen 50.
	If these symbols appear, there is a previous page and a next page. Tap on to display the next page. Tap on to return to the previous page
 	Grey areas indicate setting options. Tap this area to set a checkbox or open a keypad and configure the settings you want.
	Tap this button to reset values to zero.
	Tap this button to close the display without applying your changes.
Keypad	When you press a field for which you are able to select settings, a keypad opens:  *(English version only)* The following applies: • Tap a letter or number to display it in the text field. • Tap **ABC** to switch between lower case/upper case. • **+/-** changes the sign that precedes the number; use **.** to introduce decimal places. • **AC** deletes all the letters and numbers in the text field. • Use **DEL** to delete the last entry. • Use **ENT** to confirm and apply your changes.
Number pad	When you tap a configurable area, a keypad opens:



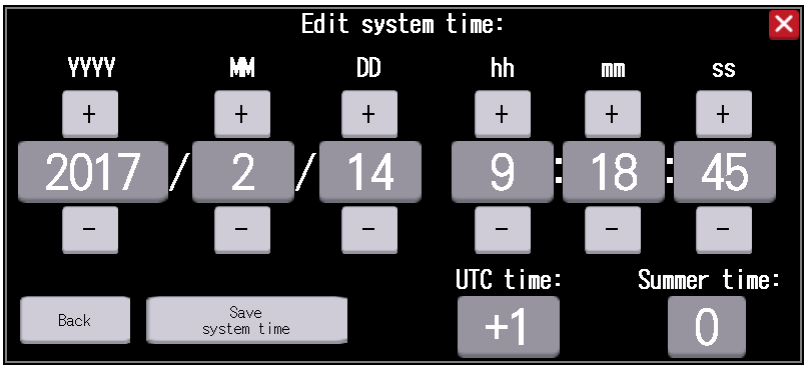
(English version only)

The following applies:

- Tap on a number to display it in the numbers field.
- **+/-** changes the sign that precedes the number; use **.** to introduce decimal places.
- **AC** deletes all numbers in the numbers field.
- Use **DEL** to delete the last entry.
- Use **ENT** to confirm and apply your changes.

Edit system time

Tap this button to change the date and time in a separate window:



Date and time are shown in the format 'year/month/day - hour:minute:second'.

The following applies:

- Tap on the **+/-** keys to change the date in the format 'year/month/day'.
- Tap on the **+/-** keys to change the time in the format 'hour:minute:second'.
- Tap on the **UTC time** button to set the difference between your local time and UTC. For Germany, this setting is **+1**.
- Tap on the **Summer time** button to switch summer time on or off. Inserting **+1** activates summer time, and **0** switches it off.
- Tap on the **Save system time** button to save the system time settings in the display, the controller and the FAG SmartQB sensor.

Please note that it takes one minute to apply the new system time settings and update them in the display.

- *The FAG SmartQB has an internal clock which works as long as the device is supplied with power. As there is no buffer battery, it will switch off if power is interrupted for longer than 10 days. When you restore power and select **Edit system time**, you can correct the system time.*
- *Once you have integrated the FAG SmartQB into your system, you also need to change the sensor IP addresses 70. Otherwise the system time cannot be passed on.*

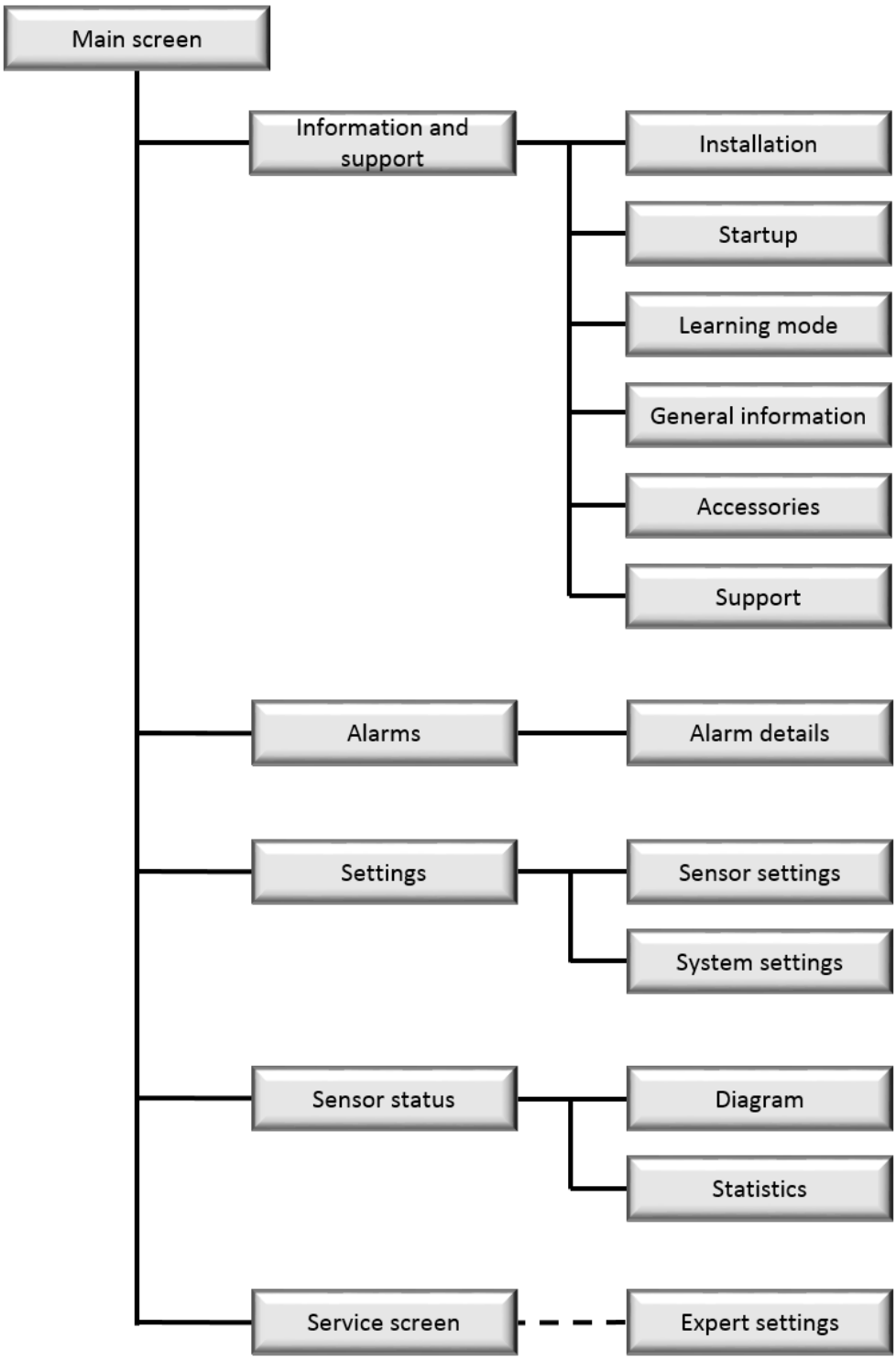
The specific control elements of the main screen 50, which is also the home screen, are described in detail in a separate section.

Key menu items

The main screen and its buttons provide you with direct access to the following menu items:

Menu item	Description
Start-up page 49	The start-up page appears when you power up the FAG SmartQB for the first time. You can define the basic system settings here.
Home screen 50	All other key menu items – along with their monitoring and settings functions – can be accessed from this screen. It also gives you an overview of the status of each FAG SmartQB sensor.
Information and support 50	Under **Information and support**, you can find tips and videos on installation and startup. It also gives you contact and support details.
Alarms 52	The menu item **Alarms** lists all the alarms and error messages.
Settings 54	Go to **Settings** to configure the sensor monitoring and general settings.
Sensor status 56	Under menu items **FAG SmartQB 1 to 6**, you can show the status of each FAG SmartQB sensor.
Service screen 61	On the **service screen**, you can edit the configuration version and the threshold for the operating hours counter. Service partners are able to access additional functions in a protected area.

Details on the menu items can be found in the following sections. The overall menu structure appears as follows:



7.1 Start-up page

The start-up page appears when you start up the FAG SmartQB and configure it for the first time. You can select the display language, edit the system time and define contact details.

The following information and functions can be found here:

Select language

Here you will find a national flag that functions as a button for every supported display language. Press this button to change the current language setting accordingly. The default setting is English.

Currently, the touchscreen display of the FAG SmartQB can be operated in the following languages:

- German
- English
- Japanese
- Chinese (simplified)
- French
- Spanish
- Italian
- Finnish
- Czech
- Portuguese (Brazilian)
- Polish
- Slovenian
- Swedish
- Russian
- Turkish
- Dutch
- Norwegian

Enter customer name

You can define the customer name here. Tap a button to edit the customer name.

Edit service contact

Here you can save the details of the service contact. Tap this button to edit the contact details in a separate window. The contact details appear *under System settings* 56.

Edit system time

Here you can edit the system time 46. Then apply the system time to the FAG SmartQB controller and connected sensors by pressing **Save system time**. Please note that it takes one minute to apply the new system time settings and update them in the display.

- *The FAG SmartQB has an internal clock which works as long as the device is supplied with power. As there is no buffer battery, it will switch off if power is interrupted for longer than 10 days. When you restore power and select **Edit system time**, you can correct the system time.*
- *Once you have integrated the FAG SmartQB into your system, you also need to change the sensor IP addresses* 70*. Otherwise the system time cannot be passed on.*

Tap on **OK** to apply your changes. Click on 'Cancel' to close the window without saving your changes.

You can edit any setting at any time, with the exception of the service contact details, under System settings 56.

7.2 Main screen

The main screen  appears as soon as you start the FAG SmartQB. All other key menu items – along with their monitoring and settings functions – can be accessed from this screen. The overall status of the system can also be seen at a glance:

The following information and functions can be found here:

Status of the FAG SmartQB sensors

In the lower part of the touchscreen display, you can see the status of the connected FAG SmartQB sensors. Besides the alarm status, this includes any communication problems on the FAG SmartQB sensors.

Specifically, the following is shown here:

Alarm status

The alarm status of the FAG SmartQB sensors depends on the analysis of the individual measurement values. For a pre-alarm, main alarm or communication error, the button is red:

- Grey, **no status**: the FAG SmartQB sensor is connected and registered on the FAG SmartQB; no characteristic value measured.
- Grey, **no alarm**: there are no alarm statuses or communication problems.
- Red, **communication error**: there is a communication problem.
- Red, **pre-alarm**: one or several characteristic values have triggered a pre-alarm.
- Red, **main alarm**: one or several characteristic values have triggered a main alarm.

If there is a communication problem, the alarm status button is red and a warning message appears.

This may happen, for example, if a registered QB sensor is not connected or available. For more details, see the FAQs 84*.*

The bell indicates that there is an alarm. This can be a communication error, a pre-alarm or a main alarm. Further information can be found in the 'Alarms' 52 section.

Customer name

The customer name (optional) appears at the bottom right-hand side of the display.

Program version

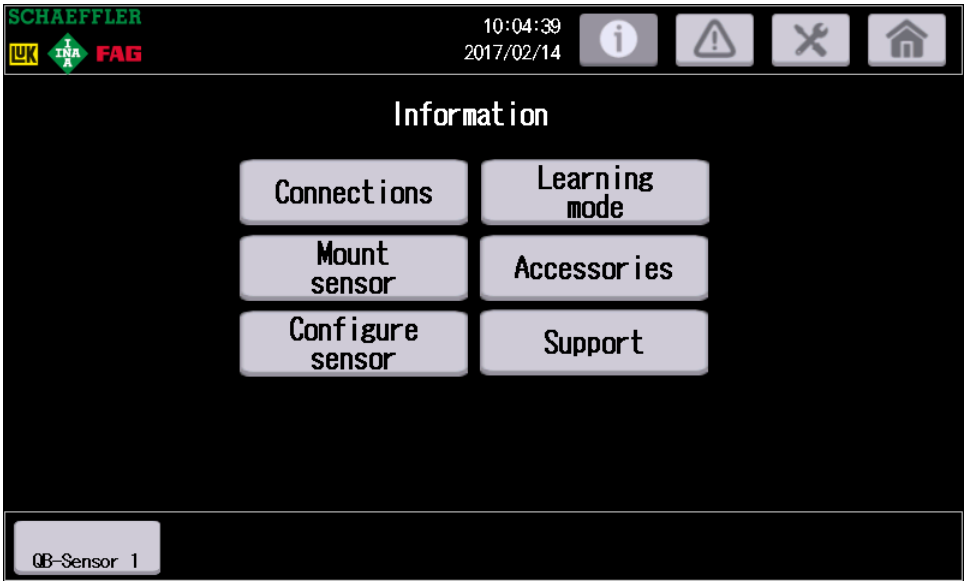
You can find the version number (e.g. '2.6.0') under the 'FAG SmartQB' lettering. Please include your program version in any support requests. Further details on program and firmware versions can be found on the Service screen 62.

Buttons

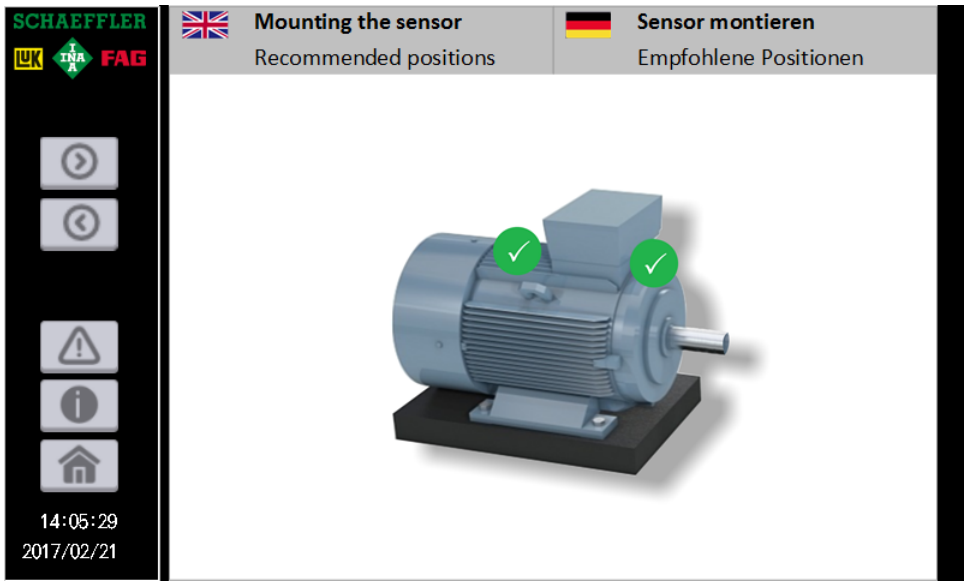
The top area shows the system time (in date format year/month/day) and various buttons 47 that take you to other monitoring and settings options. Details on using the individual monitoring and settings options can be found in the following sections.

7.3 Information and support

Press the **Information and support** button on the main screen to go to the following page:



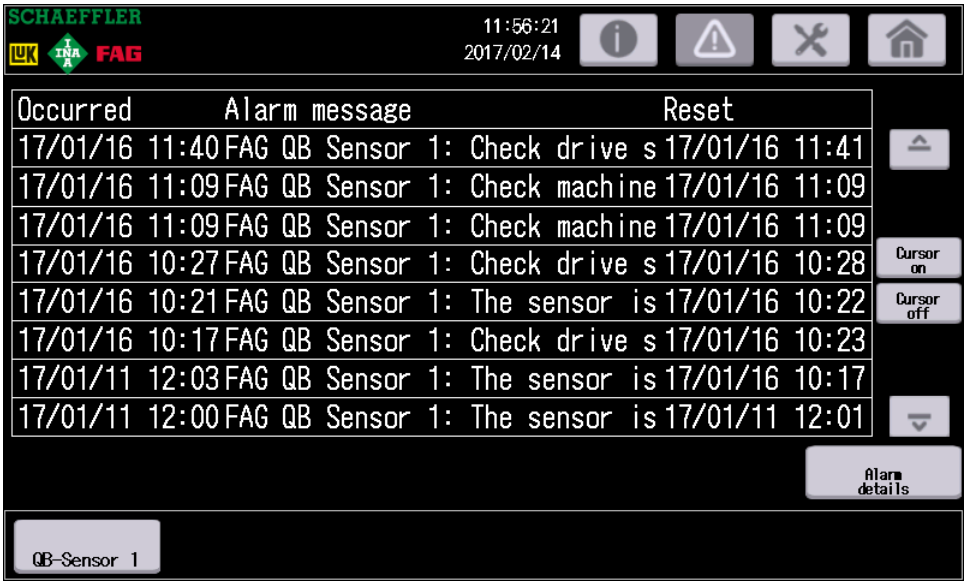
Here you can find information about the FAG SmartQB connectors, about assembly and configuration of the sensors and about learning mode. Lists of accessories and details of support are also available.



(Example from the **assembly** section)

7.4 Alarms

Press the **Alarms** button on the main screen to go to the following page:



This table contains all alarms created by the system, including the dates they were created or changed and the alarm message. New messages are shown in red until they are read or until changes are made and the message is no longer valid.

Here you have the following options:

Cursor on/off	You can activate a cursor and use the arrow keys to scroll through the messages.
Scrolling with the arrow keys	Use the arrow keys and to scroll through the rows.
Alarm details	This gives you plain text messages containing more details about the alarm.

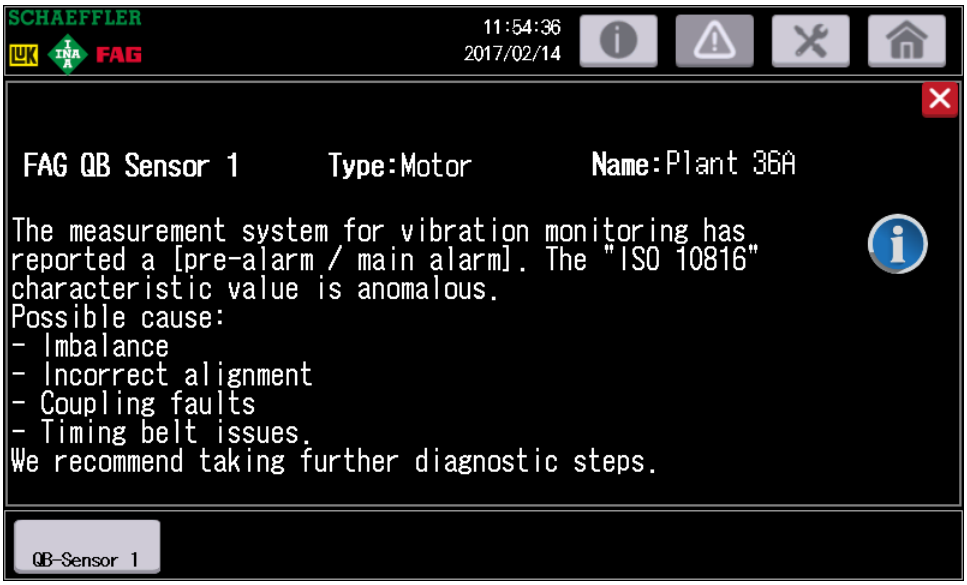
*If the alarm list entries are displayed in the wrong order, please check the system time on the FAG SmartQB. You can find this under **General settings** 56.*

The FAG SmartQB has an internal clock which works as long as the device is supplied with power. As there is no buffer battery, it will switch off if power is interrupted for longer than 10 days.

When you restore power, you should Correct system time 56.

Alarm details

Use the cursor to select a message and press **Alarm details**.



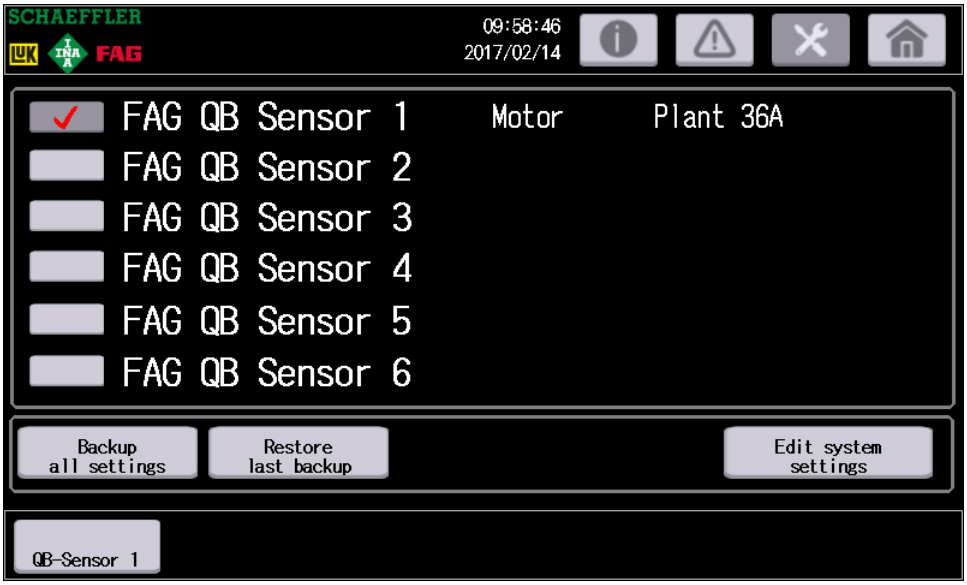
You can find the following information here:

FAG SmartQB sensor	This shows the number of the FAG SmartQB sensor.
Type	This shows the installed machine type for this sensor, i.e. motor, pump, fan or universal.
Name	Name of the machine.
Alarm msg.	Detailed alarm message with tips and recommended actions.

*The measurement data analysis is based on the parameters entered in the **Settings** 54 section. Check the settings for each sensor and verify the alarm message exactly before taking further steps.*

7.5 Settings

Press the **Settings** button on the main screen to go to the following page:



Tap on **Restore last backup** to read out the respective sensor settings.

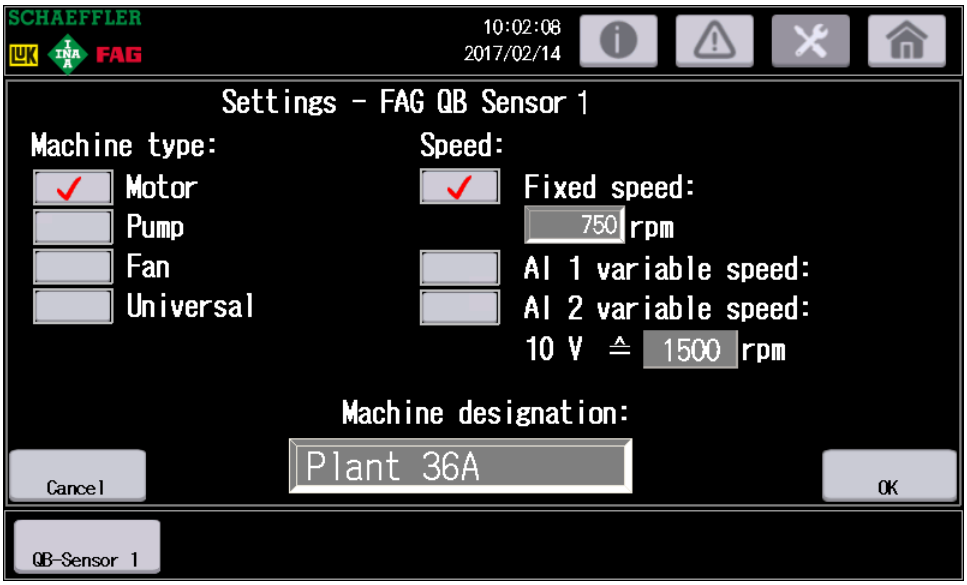
You can find the following options here:

FAG SmartQB sensor	Select the FAG SmartQB sensor you want to change the settings for. Select the checkbox in front of the respective sensor and edit the sensor settings 55.
Backup all settings	Press this button to save all the settings of the selected sensors.
Restore last backup	Press this button to load the following sensor settings: • Sensor settings • Language settings
Edit system settings	Here you can edit the system settings 56, such as the system time or language.

To deregister a registered FAG SmartQB sensor from the FAG SmartQB, deselect the checkbox in front of the relevant sensor box and save your settings.

Editing sensor settings

When you have selected a sensor, the following settings window opens:



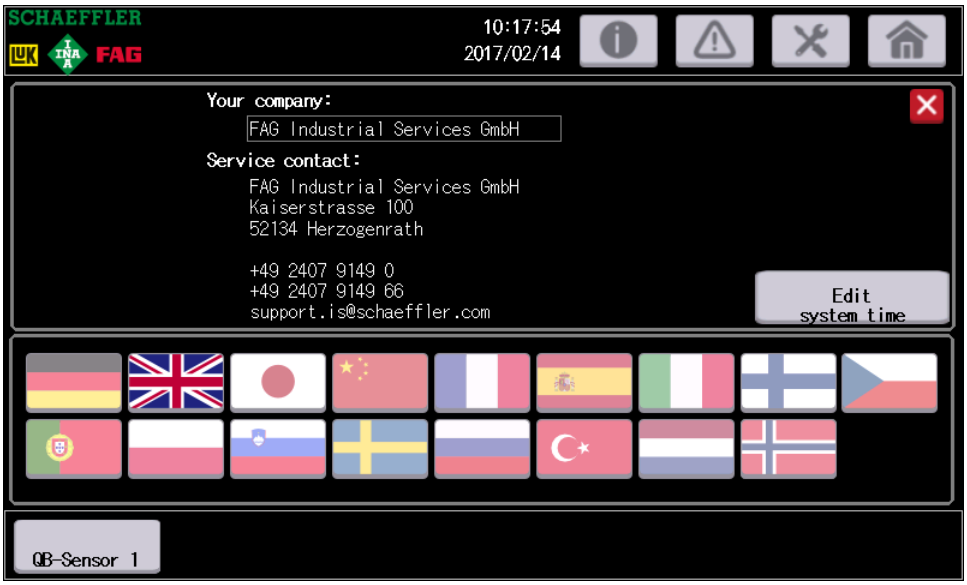
The following information and functions can be found here:

FAG SmartQBsensor settings	This shows the number of the FAG SmartQB sensor.
Machine type	Here you can define whether the monitored machine is a motor, pump, fan or universal machine. Based on this setting, you can also configure various other monitoring settings which are optimally designed for the relevant machine type.
Speed	You have the following setting options: • **Fixed speed**: tap the input field and enter a fixed speed in rpm (min.: 100 rpm, max.: 15,000 rpm). • **Variable speed via analogue input 1 or 2 (AI 1/2)**: if you have connected an analogue input signal 32, choose the analogue input to be used for the signal. Tap the input field and specify the rpm for a voltage input of 10 V.
Machine designation	Enter a name for the monitored machine.
OK	Tap on **OK** to apply your changes. Tap on **Cancel** to close the window without saving your changes.

Then, in the sensor settings, tap on **Save all settings** 54.

Edit system settings

Press this button to open the following settings window:



The following information and functions can be found here:

Your company	Tap the field to change the current setting.
Service contact	Service contact and support details.
Edit system time	Here you can edit the system time 46.
Language	You can change the language 49 here.

Then tap on **X** to leave the screen.

7.6 Sensor status

On the main screen, press one of the **SmartQB sensor**  buttons to open the overview page showing the status and measured values of the respective FAG SmartQB sensor. The example shows the overview page for **SmartQB sensor 1**:

The following information and functions can be found here:

Status of the FAG SmartQB sensor

This shows the number of the FAG SmartQB sensor, the machine type and the machine name (optional).

Status: 'No alarm'

This is the overall alarm status for the FAG SmartQB sensor, i.e. **No status**, **No alarm**, **Pre-alarm** or **Main alarm**. The alarm status remains valid until a change is made and the alarm is reset.

The colour of the alarm status also appears in the FAG SmartQB sensor diagram:

(Example)

Our example diagram shows the overall alarm status as pre-alarm (yellow). The red border around the status LED indicates that the last alarm was a main alarm (red).

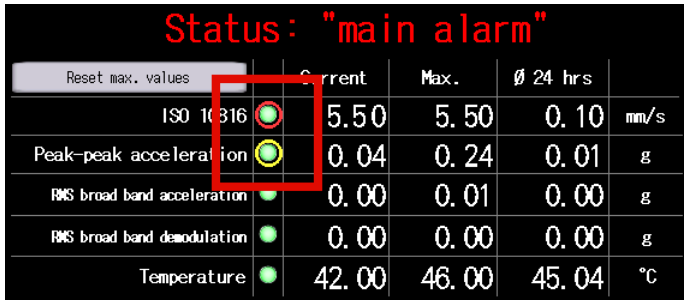
Value overview

The FAG SmartQB sensors measure the following characteristic values:

- ISO 10816
- Peak-peak acceleration
- RMS broad band acceleration
- RMS broad band demodulation
- System temperature

The following information is shown for each value:

- Current alarm status:
  - o Green: no alarm
  - o Yellow: pre-alarm
  - o Red: main alarm
- Last alarm status: displayed as a yellow (pre-alarm) or red (main alarm) border around the current alarm status:



- Current value
- Maximum value
- Daily average

Press **Reset max. values**, to reset the measured maximum values to zero. The last alarm status is also reset.

To reset the maximum values, press and hold the button for 5 seconds until the values are reset.

Connection status

If the Ethernet communication to the registered FAG SmartQB sensor is interrupted, the diagram of the FAG SmartQB sensor shows a red border around the **ETH** area.

Machine operating

This shows the operating hours of the monitored machine. The FAG SmartQB is based on

hours

characteristic value **ISO 10816** and starts the operating hours counter as soon as vibrations stronger than 0.1 mm/s are measured. You can adjust this threshold on the service screen 61.

: this symbol indicates which status the **Machine is running** measurement condition has identified for the machine. Depending on the status determined, the following symbol is displayed:

- : the **Machine is running** measurement condition is fulfilled: the machine is in operation.
- : the **Machine is running** measurement condition is not fulfilled: the machine is not in operation.

The **Machine is running** measurement condition is based on characteristic value **RMS broad band acceleration**: as soon as this characteristic value is greater than 0.01 g, the measurement condition is fulfilled. This threshold cannot be changed.

Speed

Here you will find the type of speed, i.e. 'fixed speed' with the set speed value or 'variable speed analogue 1 or 2' and the currently calculated speed of the respective channel. This calculation is the basis for setting the 'rpm at 10 V'. You can define and change this setting separately for each FAG SmartQB sensor. Relevant details can be found under Settings 54.

*If the variable speed signal **0 rpm** is displayed, either the machine is not in operation or there is an error in the analogue inputs. In this case, the variable speed signal **0** is also coloured red. However, the error is not displayed as an alarm message.*

Show diagram

Press this button to show more diagram 59 details.

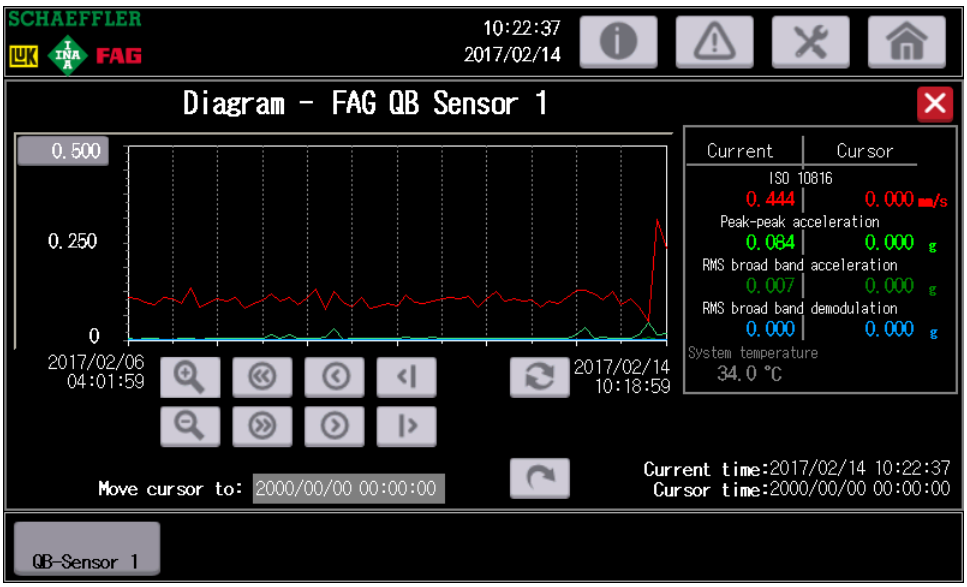
Show statistics

Tap this button to show more statistical 60 information.

Under Alarms 52, you can find more information with plain text messages and recommended actions.

Show diagram

Press **Show diagram** to open the corresponding area. The left side shows the trends of the measured characteristic values for an initial analysis. In the right-hand area, you can see the current measurement value and the value measured at the cursor position.



The following information and functions can be found here:

Diagram

On the left you can find a graph of the measurement values for the selected characteristic value. Every characteristic value is colour-coded. This allows you to differentiate between the characteristic values:

- Red: ISO 10816
- Light green: peak-to-peak acceleration
- Dark green: RMS broad band acceleration
- Blue: RMS broad band demodulation
- Grey: system temperature (not currently shown in the diagram)

Measurement value display

On the right of the diagram you can see the current measured value and the value at the cursor position for every characteristic value.

Diagram functions

You can use the buttons to navigate through the diagram and use zoom functions. You can also place a cursor at a specific point in a diagram. For more details, see the following section.

Current time

Under **Current time**, the X position is shown with the current date and time.

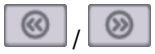
Cursor time

Under **Cursor time**, the X position is shown with the date and time of the cursor. The measurement value displays are adjusted automatically when you change the position of the cursor in the diagram.

How to work with the diagram:

Here you can adjust the upper limit of the Y axis in the diagram. Tap on the left side of the Y axis and set the maximum value.

Zooms in/out one stage.



Here you can fast forward/rewind a large step in the time range.

Here you can fast forward/rewind a small step in the time range.

Here you can jump one measurement point to the left/right using the cursor.

Set cursor to

You can place a cursor at a specific point in a diagram using this function. Tap on the date field on the right and set the year, month and day. Tap the time field to set the hours and minutes:

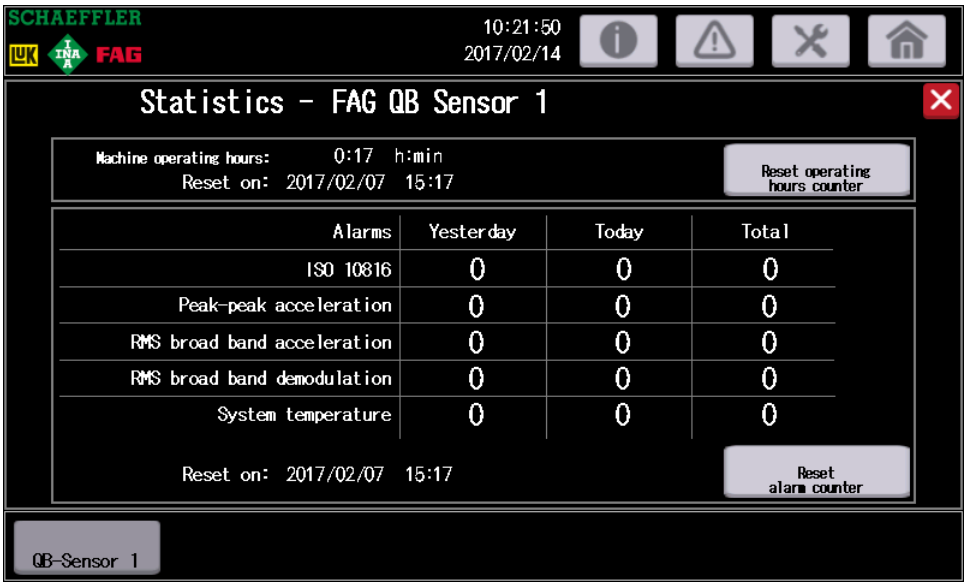
Then press  to execute the action. The cursor is shown as a red vertical line in the diagram. You can see the measurement values at the cursor position in the measurement display in the top right of the screen. The cursor time is set to the value of the cursor position.

Alternatively, you can tap in the diagram to move the cursor.

You can activate update mode here. The diagram is then reloaded at regular intervals and new measurement values appear in the window automatically.

Show statistics

Press **Show statistics** to open the corresponding area. Next to the operating hours counter, you can see an overview of the alarms that have occurred.



The following information and functions can be found here:

Machine operating hours

This shows the operating hours of the monitored machine. The FAG SmartQB sensor starts the operating hours counter as soon as vibrations larger than 0.1 mm/s are measured.

You can use the **Reset operating hours counter** button to reset the operating hours counter to zero. Under **Last reset** you can see when the operating hours counter was last reset.

Alarm overview

This gives you an overview of all the alarms that have occurred with the following characteristic values:

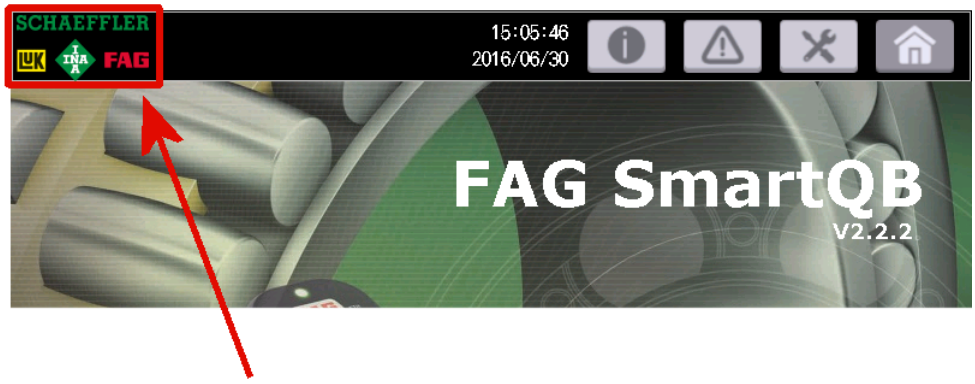
- ISO 10816
- Peak-peak acceleration
- RMS broad band acceleration
- RMS broad band demodulation
- System temperature

Press **Reset alarm counter** to reset the alarm counter to zero. Under 'Last reset' you can see when the alarms were last reset.

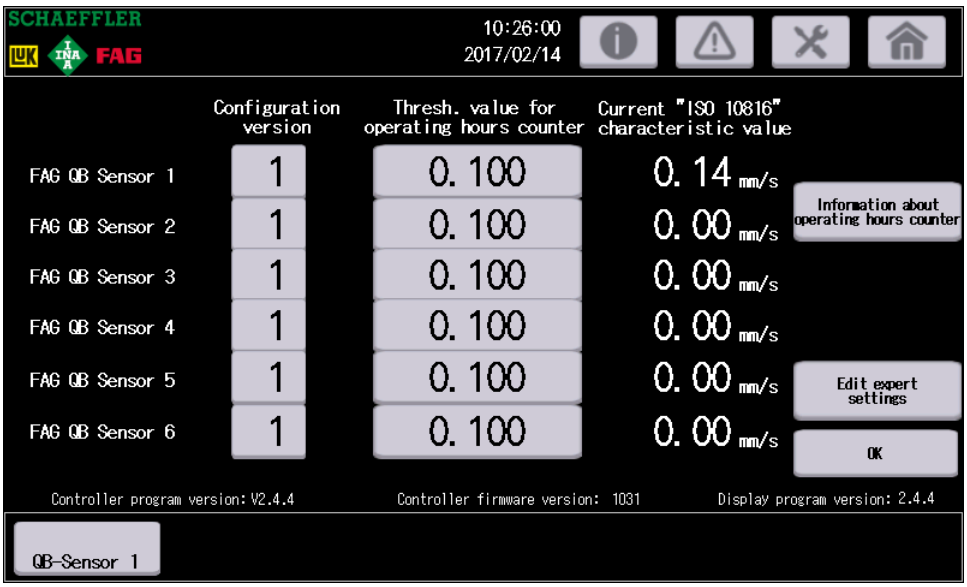
To reset the counter readings, press and hold the button for around 5 seconds until the values are reset.

7.7 Service screen

The Service screen appears when you press the Schaeffler logo in the top left-hand corner for 5 seconds.



Here you can define the configuration version and specifications for the operating hours counter, edit the system time and configure other settings.



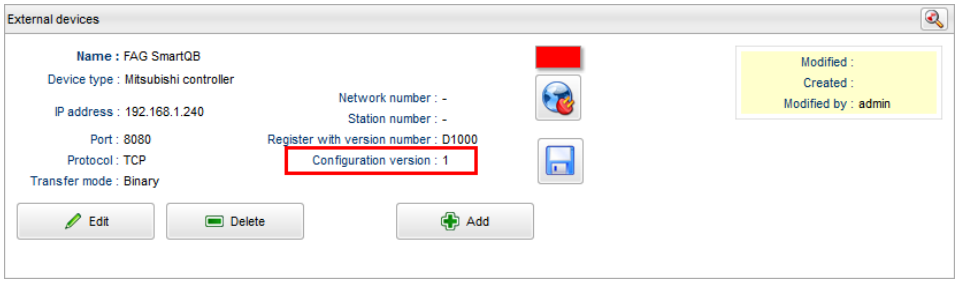
The following information and functions can be found here:

Configuration version

This shows the current configuration version of each FAG SmartQB sensor. This version number must be the same as the one in the FAG SmartQB sensor. This is necessary for communication between the controller and the sensor and for status analysis.

The default setting is **1**. Tap on the number and enter the desired value with the number block 45.

You can find the sensor configuration version in the FAG SmartWeb software under **External devices**:



Threshold for the operating hours counter

Here you can set the threshold from which the operating hours counter responds and starts counting. The default setting is **0.10 mm/s**. Tap on the field to change the value. As a rule, a threshold of 0.10 mm/s is sufficient.

To change the value, please note the following information:

- When the machine is switched off, the threshold should be approx. 3x higher than the current characteristic value **ISO 10816**.
- At the same time, when the machine is switched on, the threshold should be significantly below the current characteristic value **ISO 10816**.

Current characteristic value "ISO 10816"

This shows the current measured characteristic value **ISO 10816**.

Information about the operating hours counter

This gives more details about the threshold for the operating hours counter.

Edit expert settings

You can edit the Expert settings 61 of the FAG SmartQB here.

Access to the expert settings is password-protected. Please contact the service partner or support.

Version information

Here you can find information on the following installed program and firmware versions:

- Controller programme version
- Controller firmware version
- Display programme version

OK

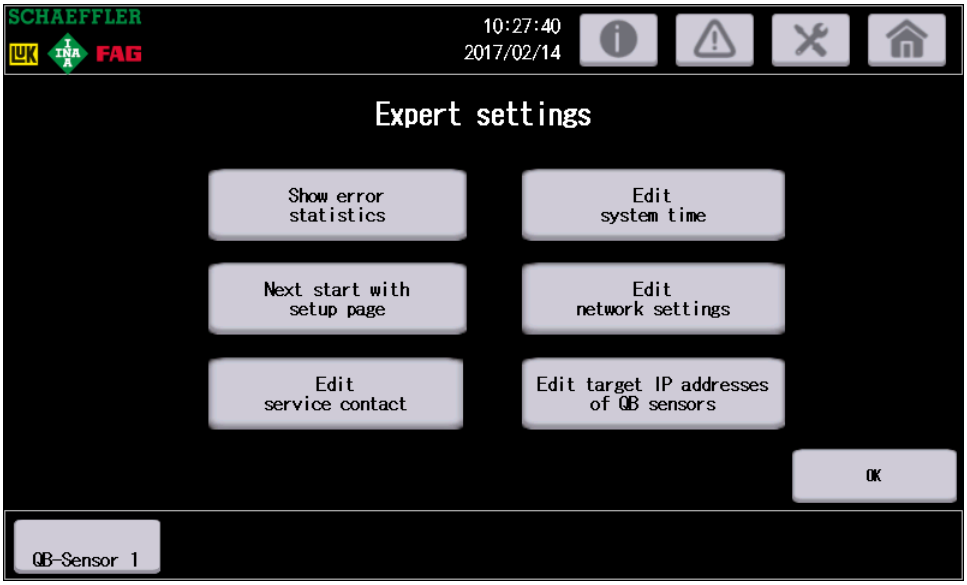
Press this button to save all the settings you have configured and go back to the main menu.

Alternatively, press **Home** to go back to the main screen without saving.

7.8 Expert settings

This area is password-protected. Please contact your service partner or Schaeffler support to edit the expert settings.

You open this area by tapping in the service screen 61 on the **Edit expert settings** button. Enter the password that you received from Support. You will then see the following settings window:



The following information and functions can be found here:

Show error statistics — Error statistics are displayed here. The individual columns show the number of the respective events.

Next start with setup page — Here you can configure that the start-up screen 49 appears the next time you start the FAG SmartQB. The system language automatically changes to English.

Edit service contact — Here you can edit the contact details of the service contact. Tap this button to edit the contact details in a separate window. The contact details are displayed under System settings 56.

Edit system time — Here you can edit the system time 46.

Edit network settings — Here you can edit the network settings 65. By default, the controller has the IP address `192.168.1.240`. If you wish to connect the FAG SmartQB to your network, you need to change all the network parameters.

Edit target IP addresses of the SmartQB sensors — Here you can edit the target IP addresses of the SmartQB sensors 70. When you change the network settings, you must also change the target IP addresses of the sensors so that the date/time values are synchronised between the controller and the sensors.

OK — Press this button to go to the Service screen.

8 Further information

In the following sections, you can find detailed information about integrating the FAG SmartQB into your network, the SD card, the virtual outputs and the registers of the Modbus TCP server.

8.1 Information on the SD card

The SD card is already inserted in the SD card slot 74 of the FAG SmartQB touchscreen display on delivery. The SD card contains the FAG SmartQB sensor configurations and other information 64. Before starting the device up for the first time, make a backup copy of the data on the SD card and transfer it to a local drive. Then you can access the information saved on the SD card at any time.

Make sure that the FAG SmartQB is de-energised before you insert or remove 74 the SD card.

The SD card contains the following information:

Directory	Description
Accessories	Here you can find lists of optional accessories for the FAG SmartQB.
Connections	Here you can find information on the cable gland system and an overview of the FAG SmartQB.
Information	This directory contains the following information: Software: • FAG SmartUtility Light • FAG SmartUtility (60-day demo version) Videos on the following topics: • Startup • Network integration • Learning mode • Starter kit Technical information: • FAG SmartQB manual and pocket guide • FAG SmartCheck manual and pocket guide • FAG SmartUtility manual • FAG SmartUtility Light manual • FAG SmartLamp manual • Connection diagrams Technical information on the installed components: • Circuit breaker • Mains unit module • Ethernet switch • Mitsubishi controller • Mitsubishi touchscreen display
Mounting	Here you can find a series of illustrations showing how to install the FAG SmartQB sensors.
Package1	This is where your user-defined settings, e.g. sensor settings and alarm and log files, are saved.
Settings	Here you can find information about configuring the sensors on the FAG SmartQB.
Support	Here you can find support information.
Teachmode	Here you can find information about the learning mode of the FAG SmartQB sensors.

8.2 Connecting the FAG SmartQB to your network

If you wish to connect the FAG SmartQB to your network, you need to change the network parameters of the individual system components to suit your network environment.

The network parameters of the FAG SmartQB are pre-set to the following default values in the factory:

Component	Description	Value
Controller (FX5CPU)	IP address	192.168.1.240
	Subnet mask	Undefined (0.0.0.0)
	Gateways	Undefined (0.0.0.0)
Display (GOT IP Address)	IP address	192.168.1.18
	Subnet mask	255.255.255.0
	Standard gateway	0.0.0.0
FAG SmartQB sensors 1 to 6	IP address	192.168.1.101 to 192.168.1.106

Assign each of the above components an address within your network range and adjust the network parameters as follows:

1. Edit controller network settings 65

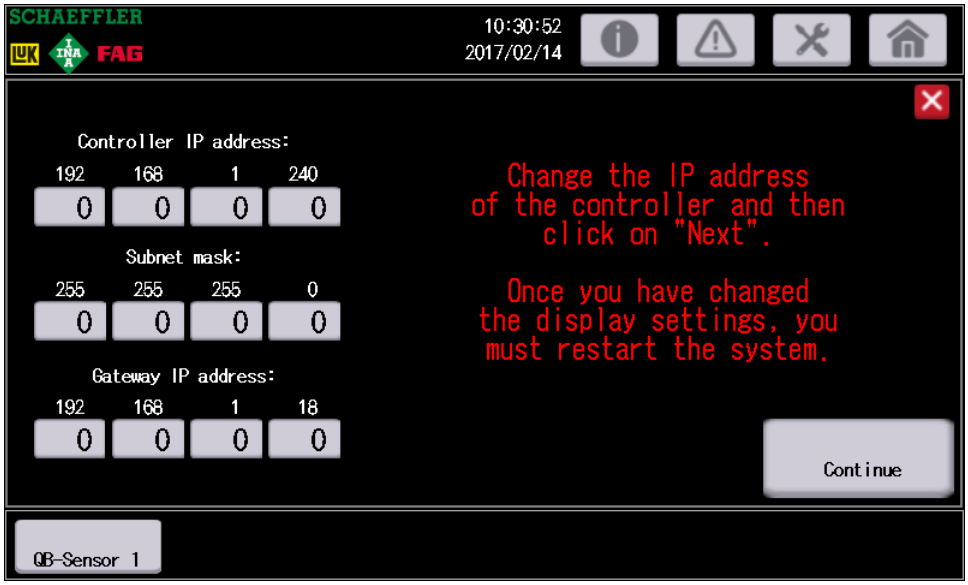
2. Edit display (GOT) network settings 67

3. Edit the target IP addresses of the FAG SmartQB sensors 70

- *The network settings can be found in the password-protected area of the Expert settings* 63*. Please contact your service partner or Schaeffler support to edit the expert settings.*
- *Please ensure that the network parameters for the FAG SmartQB controller, the display and the FAG SmartQB sensors are located in the same network group. If they are not the same, there may be communication problems.*
- *Ask your system administrator for the network parameters.*
- *Towards the end of the process, you must switch off the power to the FAG SmartQB so that the program can be started properly with the new network parameters.*

1. Edit controller network settings

- In the Service screen 61 of the FAG SmartQB, open the **Expert settings** and tap on **Edit network settings**.



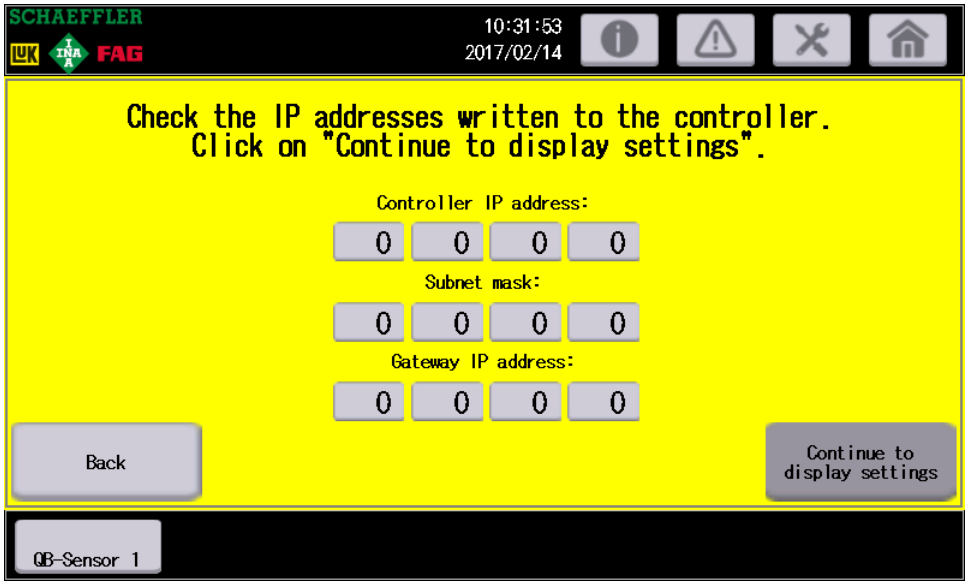
The addresses currently set in the controller will be displayed in the input fields.

- Edit the **controller IP address**.
- Enter the **subnet mask** and the **gateway IP address**.

- *If you do not enter a subnet mask and gateway address, communication between the display and controller will no longer be possible.*
  *If your system administrator has not provided a gateway address, enter the IP address of the display under **Gateway IP address**.*
- *The subnet mask may only comprise the values 0, 128, 192, 224, 240, 248, 252, 254 and 255. No other numbers are valid.*

Tap on **Continue**.

- Check the entered addresses on the next screen:



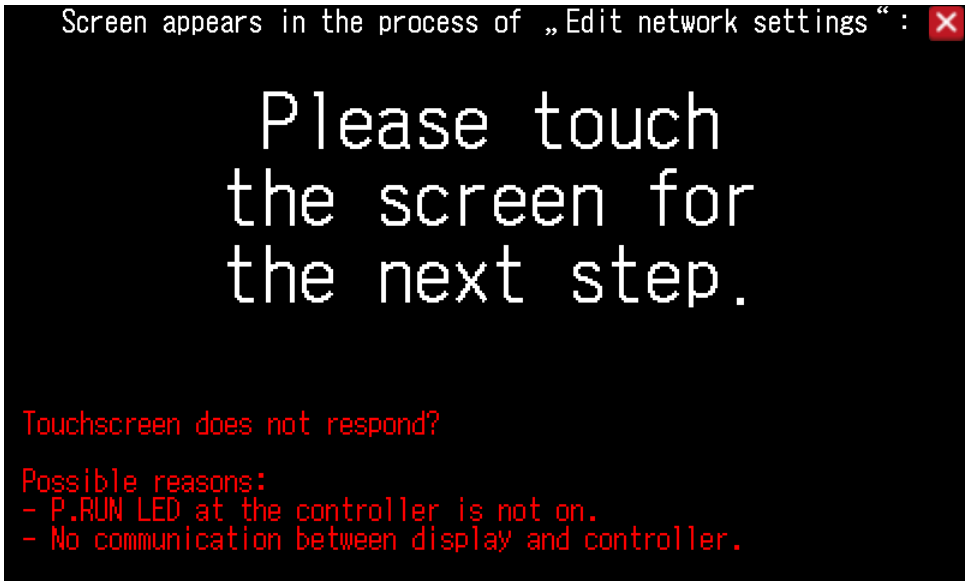
*When you click on **Continue to display settings**, a screenshot of this page is automatically saved to the SD card. If you later find out that your entries here are incorrect or communication between the display and controller is interrupted, you can send this screenshot to Support.*

You can find the screenshot on the SD card in the "Package1" directory. The name of the screenshot is "SNAP0001.bmp". Whenever the IP addresses are changed, a new screenshot is created, numbered consecutively.

- Tap on **Continue to display settings** and proceed with step 2.

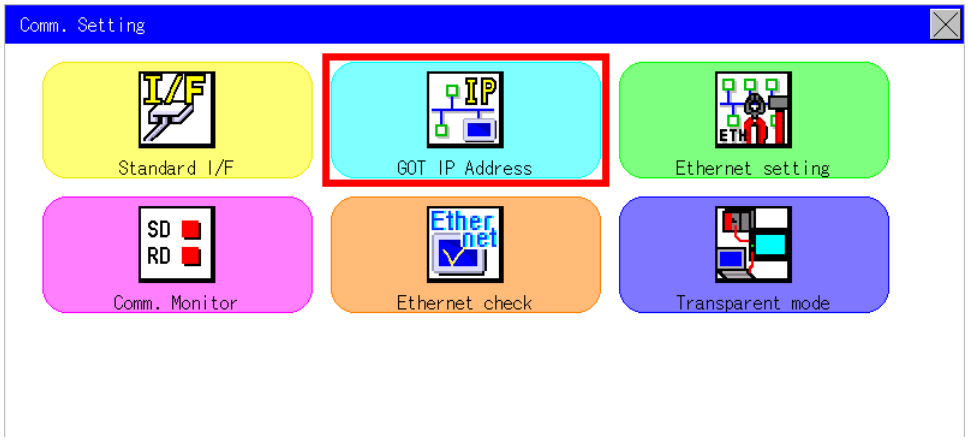
2. Edit display (GOT) network settings

Once you have tapped on **Continue to display settings**, the following information page opens:

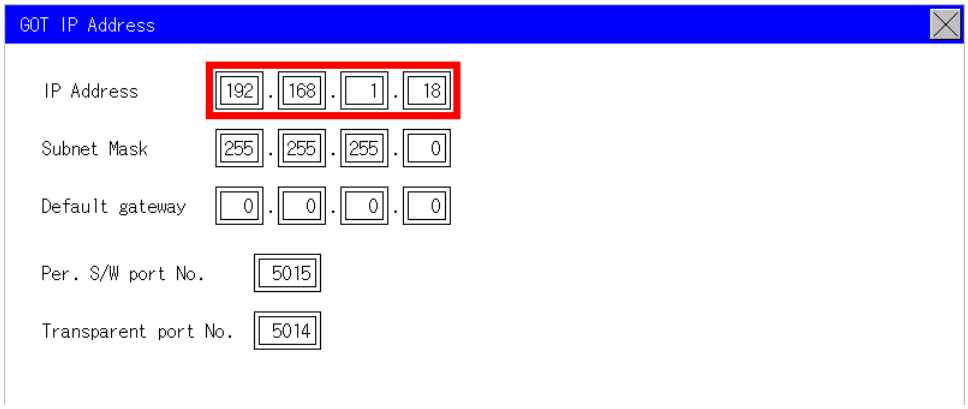


- Tap on the screen to edit the network settings for the display.

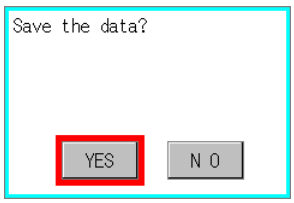
The screen **Com. Settings** is displayed:



- Tap on **GOT IP Address** .



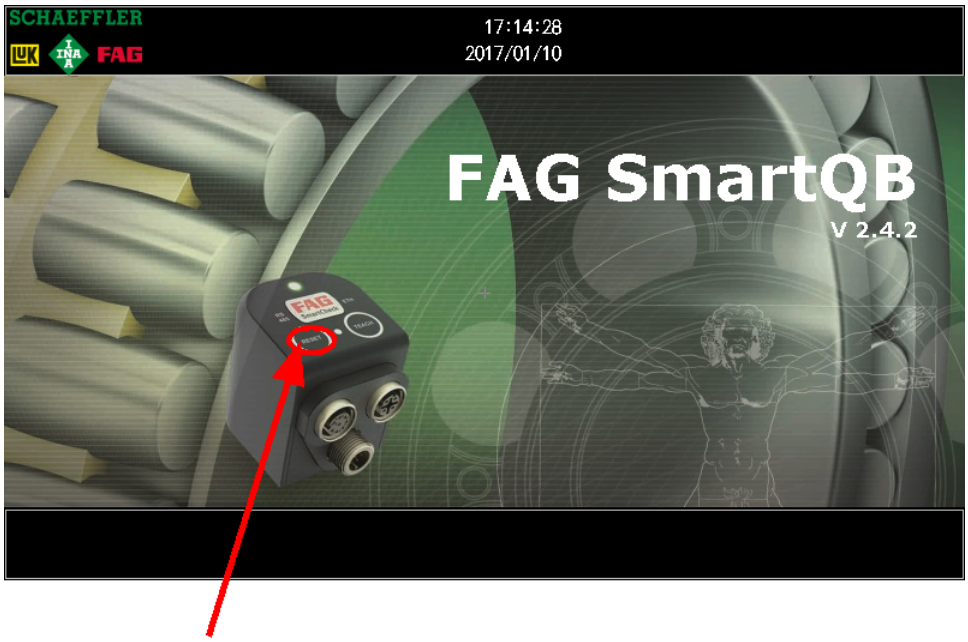
- Edit the **display IP address** (e.g. 192.168.1.18).
- Where necessary, edit the **Subnet Mask** and the **Default gateway**.
- Tap on **X** to save the changes.



- Confirm the save prompt with **Yes**.

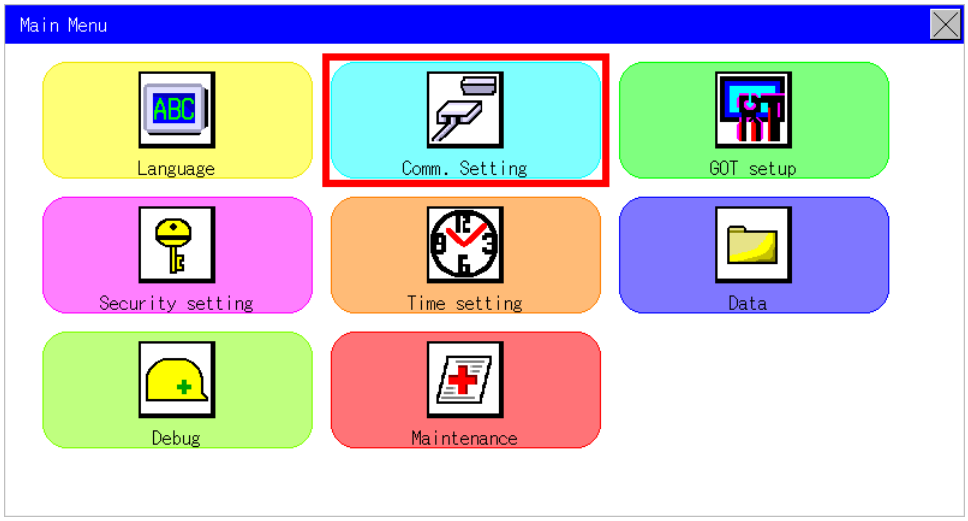
The settings are saved and the program is restarted.

After restarting, the main screen is displayed:

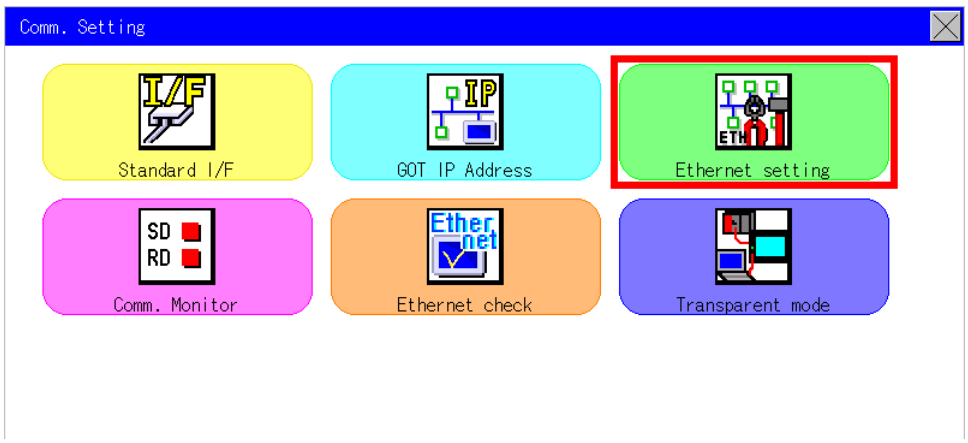


- On the main screen, press and hold the **Reset** button for 5 seconds then enter the password for the expert settings.

The **Main Menu** screen is displayed:

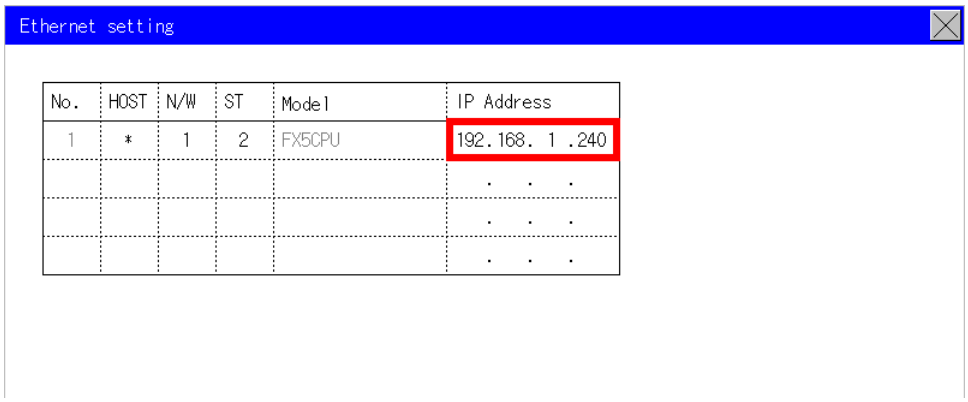


- Tap on **Com. Settings** .

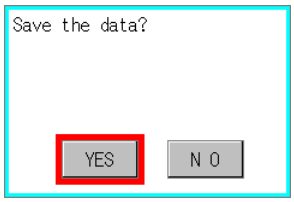


- Tap on **Ethernet setting**.

- Tap on **CH 1**.



- Edit the IP address of the model **FX5CPU** and enter the **IP address of the controller** (e.g. 192.168.1.240).
- Tap on **X** to save the changes.



- Confirm the save prompt with **Yes**.

The settings are saved and the program is restarted. The settings will not yet have been transferred following this restart. To complete the process, please restart the device as follows:

- Wait for the main screen to be displayed and switch the power supply to the FAG SmartQB off.
- After 10 seconds, switch the power supply to the FAG SmartQB back on.

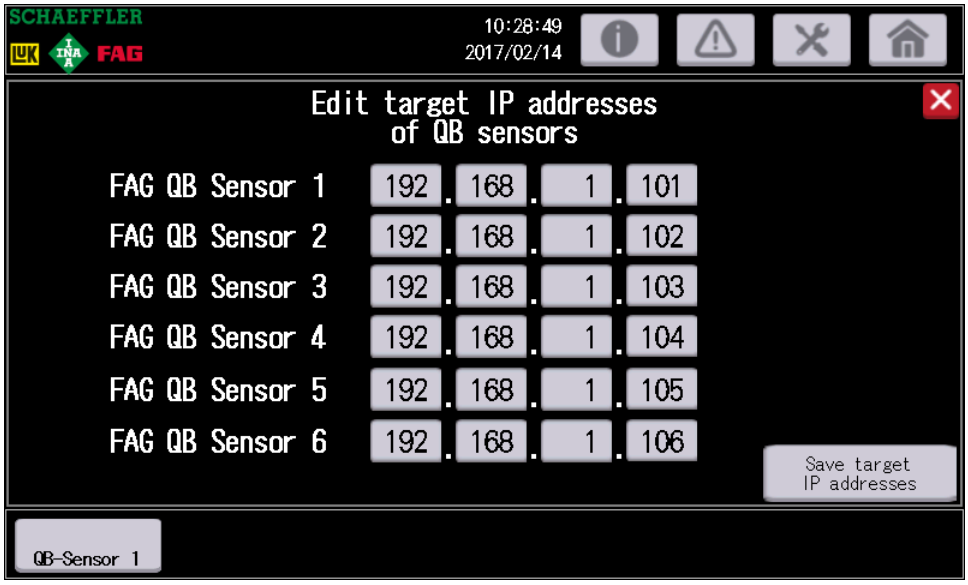
The FAG SmartQB program is restarted.

Proceed with step 3.

3. Edit target IP addresses of the FAG SmartQB sensors

You must now edit the target IP addresses in the FAG SmartQB and on every connected SmartQB sensor.

On the FAG SmartQB, open the **Expert settings** and tap on **Edit target IP addresses of SmartQB sensors**.



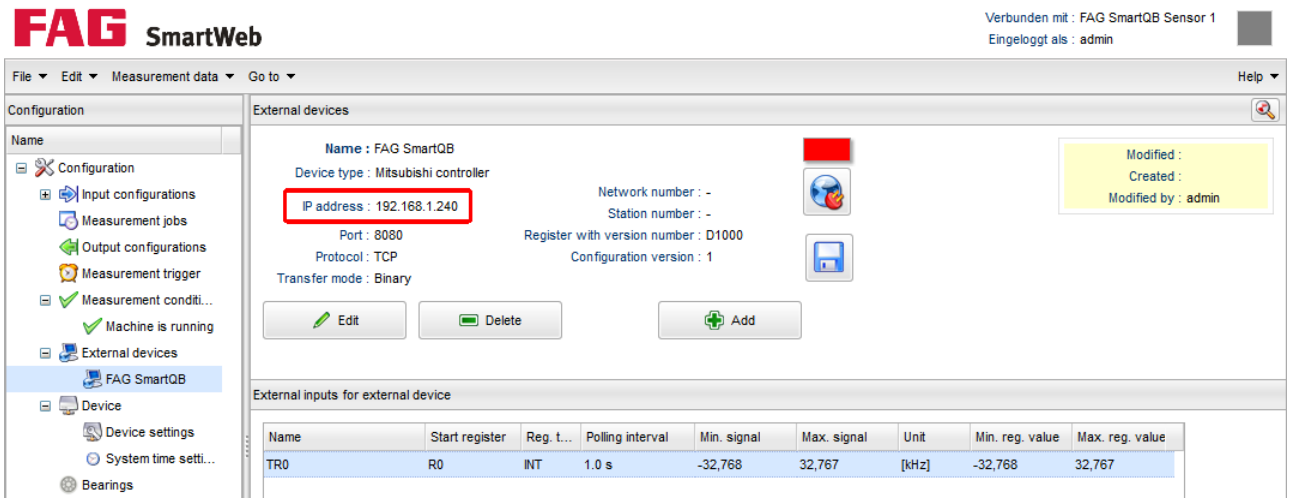
- Edit the target IP addresses for the connected FAG SmartQB sensors.
- Tap on **Save target IP addresses**.
- Close the dialogue box and return to the main screen.

Then edit the configuration of the individual FAG SmartQB sensors:

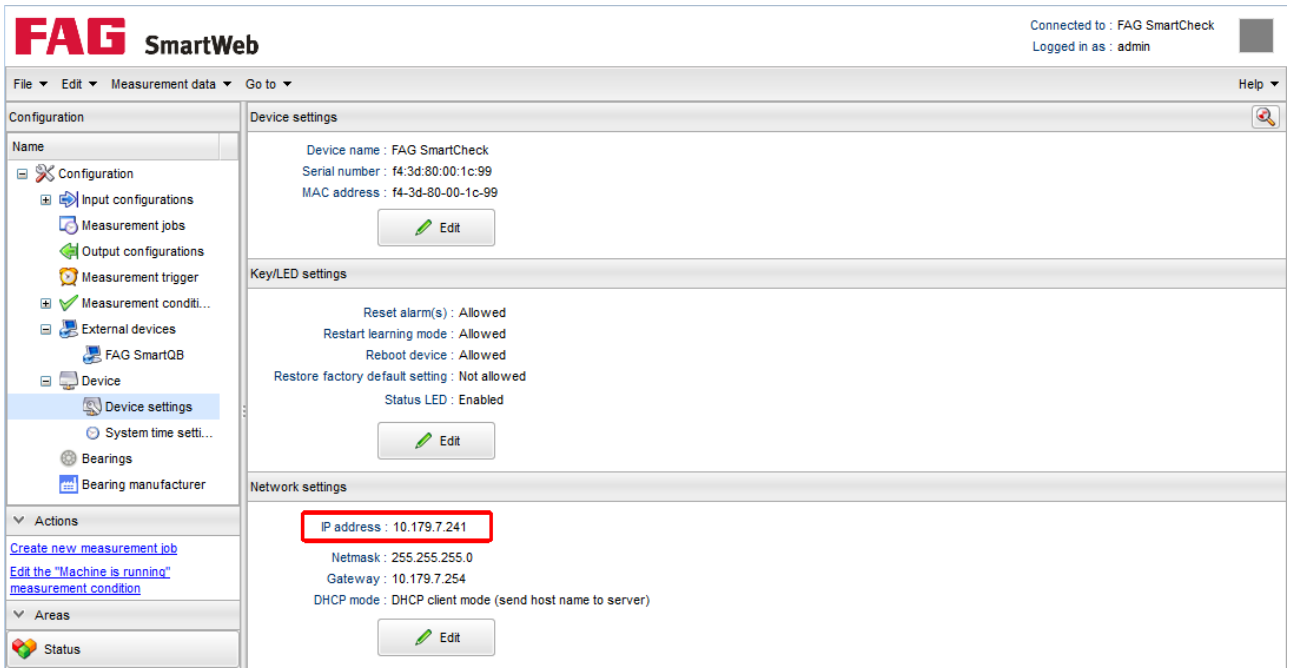
- Connect the FAG SmartQB sensor to your PC via Ethernet.
- Start the FAG SmartWeb software of the sensor.

*Further information can be found in the manuals for the FAG SmartCheck device and the FAG SmartWeb software. The manuals can be found in the **Information** 64 directory on the supplied SD card.*

- Open the area **Configuration > External devices > Device settings** and edit the IP address of the SmartQB controller (Mitsubishi controller):



- Open the area **Configuration > Device > Device settings** and edit the IP address of the SmartQB sensor:



- Repeat this step for all connected FAG SmartQB sensors.

8.3 Modbus register and functions

If you wish to use the virtual outputs of the controller, you must first establish a network connection 36. In the controller, port 502 is used for Modbus TCP.

In the following sections, you can find information about the registers of the Modbus TCP server:

General Modbus registers and functions

Description	FAG SmartQB	Type	Values
Overall alarm status of the FAG SmartQB	R0	INT	1 = No alarm 2 = Pre-alarm 3 = Main alarm
An alarm is currently active	R1	INT	0 = No alarm 1 = Alarm
An alarm is active, but has not yet been viewed in the alarm list	R2	INT	0 = No alarm 1 = Alarm
Date of the FAG SmartQB	R4	INT	Value
Time of the FAG SmartQB	R7	INT	Value

Sensor-specific Modbus registers and functions

Description	SmartQB sensor 1	SmartQB sensor 2	SmartQB sensor 3	SmartQB sensor 4	SmartQB sensor 5	SmartQB sensor 6	Type	Values
Alarm status	R100	R200	R300	R400	R500	R600	INT	1 = No alarm 2 = Pre-alarm 3 = Main alarm
Machine type	R101	R201	R301	R401	R501	R601	INT	1 = Motor 2 = Pump 3 = Fan 4 = Universal
Machine designation	R102-R111	R202-R211	R302-R311	R402-R411	R502-R511	R602-R611	String	[20-byte string]
Speed	R112	R212	R312	R412	R512	R612	INT	Value
Last reset of alarm statistics	R113-R117	R213-R217	R313-R317	R413-R417	R513-R517	R613-R617	INT	x13 = Year x14 = Month x15 = Day x16 = Hour x17 = Minute
Machine operating hours	(R118, R119) R120	(R218, R219) R220	(R318, R319) R320	(R418, R419) R420	(R518, R519) R520	(R618, R619) R620	(DINT) INT	Value
ISO 10816: status	R121	R221	R321	R421	R521	R621	INT	1 = No alarm 2 = Pre-alarm 3 = Main alarm
ISO 10816: actual value	R122-123	R222-223	R322-323	R422-423	R522-523	R622-623	REAL	Value
ISO 10816: maximum value	R124-125	R224-225	R324-325	R424-425	R524-525	R624-625	REAL	Value
ISO 10816: average	R126-127	R226-227	R326-327	R426-427	R526-527	R626-627	REAL	Value
ISO 10816: pre-alarm value	R128-129	R228-229	R328-329	R428-429	R528-529	R628-629	REAL	Value
ISO 10816: main alarm value	R130-131	R230-231	R330-331	R430-431	R530-531	R630-631	REAL	Value
ISO 10816: alarms – yesterday	R132	R232	R332	R432	R532	R632	INT	Value
ISO 10816: alarms – today	R133	R233	R333	R433	R533	R633	INT	Value
ISO 10816: alarms – overall	R134	R234	R334	R434	R534	R634	INT	Value
Peak-peak acceleration: status	R135	R235	R335	R435	R535	R635	INT	1 = No alarm 2 = Pre-alarm 3 = Main alarm
Peak-peak acceleration: actual value	R136-137	R236-237	R336-337	R436-437	R536-537	R636-637	REAL	Value
Peak-peak acceleration: maximum value	R138-139	R238-239	R338-339	R438-439	R538-539	R638-639	REAL	Value
Peak-peak acceleration: average	R140-141	R240-241	R340-341	R440-441	R540-541	R640-641	REAL	Value
Peak-peak acceleration: pre-alarm value	R142-143	R242-243	R342-343	R442-443	R542-543	R642-643	REAL	Value
Peak-peak acceleration: main alarm value	R144-145	R244-245	R344-345	R444-445	R544-545	R644-645	REAL	Value
Peak-to-peak acceleration: alarms – yesterday	R146	R246	R346	R446	R546	R646	INT	Value
Peak-to-peak acceleration: alarms - today	R147	R247	R347	R447	R547	R647	INT	Value

Description	SmartQB sensor 1	SmartQB sensor 2	SmartQB sensor 3	SmartQB sensor 4	SmartQB sensor 5	SmartQB sensor 6	Type	Values
Peak-to-peak acceleration: alarms – overall	R148	R248	R348	R448	R548	R648	INT	Value
RMS broad band – acceleration: status	R149	R249	R349	R449	R549	R649	INT	1 = No alarm 2 = Pre-alarm 3 = Main alarm
RMS broad band – acceleration: current value	R150-151	R250-251	R350-351	R450-451	R550-551	R650-651	REAL	Value
RMS broad band – acceleration: maximum value	R152-153	R252-253	R352-353	R452-453	R552-553	R652-653	REAL	Value
RMS broad band – acceleration: average	R154-155	R254-255	R354-355	R454-455	R554-555	R654-655	REAL	Value
RMS broad band – acceleration: pre-alarm value	R156-157	R256-257	R356-357	R456-457	R556-557	R656-657	REAL	Value
RMS broad band – acceleration: main alarm value	R158-159	R258-259	R358-359	R458-459	R558-559	R658-659	REAL	Value
RMS broad band – acceleration: alarms – yesterday	R160	R260	R360	R460	R560	R660	INT	Value
RMS broad band – acceleration: alarms – today	R161	R261	R361	R461	R561	R661	INT	Value
RMS broad band – acceleration: alarms – overall	R162	R262	R362	R462	R562	R662	INT	Value
RMS broad band – demodulation: status	R163	R263	R363	R463	R563	R663	INT	1 = No alarm 2 = Pre-alarm 3 = Main alarm
RMS broad band – demodulation: current value	R164-165	R264-265	R364-365	R464-465	R564-565	R664-665	REAL	Value
RMS broad band – demodulation: maximum value	R166-167	R266-267	R366-367	R466-467	R566-567	R666-667	REAL	Value
RMS broad band – demodulation: average	R168-169	R268-269	R368-369	R468-469	R568-569	R668-669	REAL	Value
RMS broad band – demodulation: pre-alarm value	R170-171	R270-271	R370-371	R470-471	R570-571	R670-671	REAL	Value
RMS broad band – demodulation: main alarm value	R172-173	R272-273	R372-373	R472-473	R572-573	R672-673	REAL	Value
RMS broad band – demodulation: alarms – yesterday	R174	R274	R374	R474	R574	R674	INT	Value
RMS broad band – demodulation: alarms – today	R175	R275	R375	R475	R575	R675	INT	Value
RMS broad band – demodulation: alarms – overall	R176	R276	R376	R476	R576	R676	INT	Value
System temperature: status	R177	R277	R377	R477	R577	R677	INT	1 = No alarm 2 = Pre-alarm 3 = Main alarm
System temperature: actual value	R178-179	R278-279	R378-379	R478-479	R578-579	R678-679	REAL	Value
System temperature: maximum value	R180-181	R280-281	R380-381	R480-481	R580-581	R680-681	REAL	Value
System temperature: average	R182-183	R282-283	R382-383	R482-483	R582-583	R682-683	REAL	Value
System temperature: pre-alarm value	R184-185	R284-285	R384-385	R484-485	R584-585	R684-685	REAL	Value
System temperature: main alarm value	R186-187	R286-287	R386-387	R486-487	R586-587	R686-687	REAL	Value
System temperature: alarms – yesterday	R188	R288	R388	R488	R588	R688	INT	Value
System temperature: alarms – today	R189	R289	R389	R489	R589	R689	INT	Value
System temperature: alarms - overall	R190	R290	R390	R490	R590	R690	INT	Value

- *Please note that the controller's R registers are mapped to the holding registers in Modbus.*
- *The register value matches the start register.*
- *Register type REAL = 4 Byte (32 Bit); 1 Register = 2 Byte*
- *Register type INT/WORD = 2 Byte (16 Bit)*
- *Bytes are saved in the controller according to the Little Endian system.*

9 Maintenance and repair

Should you detect a fault with the FAG SmartQB, please contact our Support team.

Cleaning the FAG SmartQB and the touchscreen display

When cleaning the outside of the FAG SmartQB and the display, note the following:

- Disconnect the device from the mains.
- Clean the device using a clean, lint-free cloth. For the touchscreen display, a neutral detergent or ethanol can be used as an alternative.

CAUTION ***Damage to the device from improper handling!***

Do not use chemical solvents such as acetone, nitro thinners or similar products as these solvents may damage the device housing.

Do not use solvent sprays. These solvents can cause the touchscreen display or the peripheral devices to malfunction.

9.1 Inserting/removing the SD card

The SD card contains the FAG SmartQB sensor configurations and other information. Before starting the device up for the first time, make a backup copy of the data on the SD card and transfer it to a local drive. You can also use the SD card to update the program 76 if necessary.

Before inserting/removing the SD card, make sure:

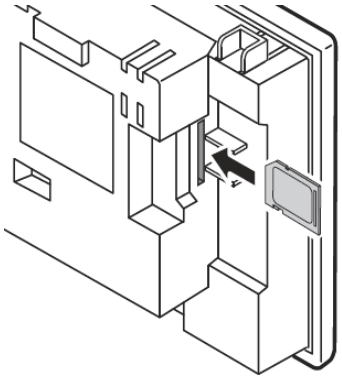
- The ACCESS LED on the touchscreen display is not lit.
- The FAG SmartQB is de-energised.

- *The SD card containing the program is already in the SD card slot of the FAG SmartQB touchscreen display on delivery.*
- *While in use, the SD card must be in the SD card slot on the touchscreen display. If applicable, copy all of the data contained on the SD card to a local drive before use.*
- *If the power supply is switched off or the SD card is removed while the data on the card is being accessed, data may be lost or become illegible.*
- *When inserting the SD card, ensure that it is fully inserted. Poor contact can lead to malfunctions.*
- *The SD card must have a capacity of at least 4 GB and be formatted with FAT32.*

Display: inserting/removing the SD card

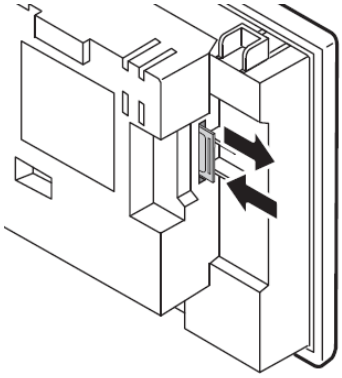
Inserting the SD card

1. Insert the SD card in the card slot with the notches facing upwards.
2. Push the card in gently until it clicks into place.



Removing the SD card

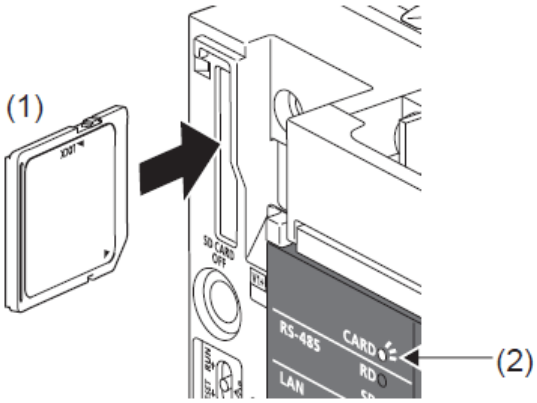
1. Push the SD card gently into the card slot to release it.
2. Remove the SD card.



Controller: inserting/removing the SD card

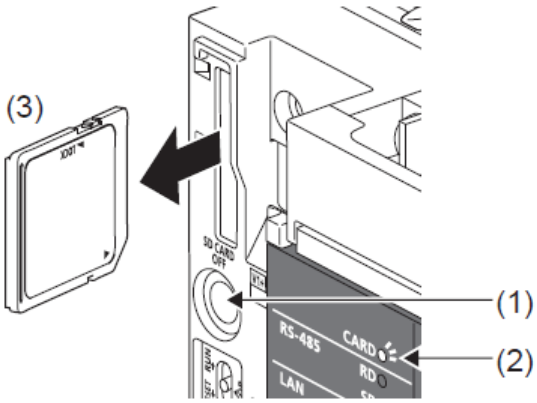
Inserting the SD card

1. Open the slot cover.
2. Insert the SD card in the card slot with the notches facing downwards.
3. Push the card in gently until it clicks into place.



Removing the SD card

1. Open the slot cover.
2. Push the SD card gently into the card slot to release it.
3. Remove the SD card.



9.2 Updating the FAG SmartQB program

To update the program on the FAG SmartQB, you will need the update files from your service partner and a computer with an SD card slot.

Proceed as follows:

1. Check version information 76

2. Document network parameters 76

3. Create a backup copy of the data on the SD card 79

4. Update the program on the FAG SmartQB 79

5. Edit the network parameters of the FAG SmartQB display 80

6. Check program version 83

- *The settings applied to the FAG SmartQB, such as sensor settings, contact details etc., are saved on the SD card in the "Package1" folder. If you wish to keep your settings, copy the "Package1" folder to the SD card together with the new update files.*
- *If you have integrated the FAG SmartQB into your network, you must edit the network parameters on the display after updating. The controller's network parameters are retained.*

1. Check version information

You can update the FAG SmartQB from program version 2.4.2 and controller firmware version 1031.

Version information can be found on the service screen 62:

- Note the controller and display version numbers.

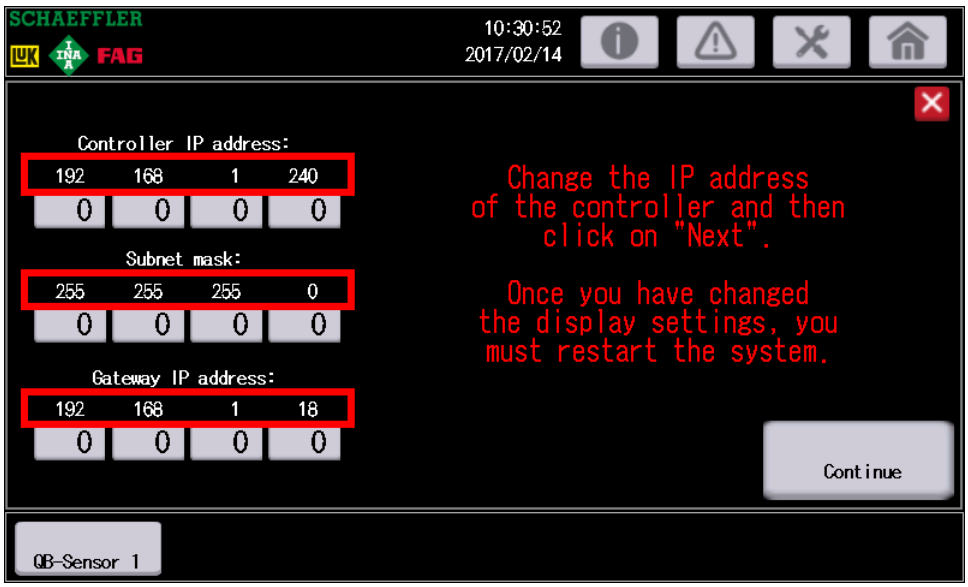
2. Document network parameters

The IP addresses of the display are reset to factory defaults when updating. The IP addresses of the controller are retained.

If you have not changed the IP addresses, proceed with step 3. Otherwise please check and document the IP addresses of the controller and display as follows:

Controller IP address:

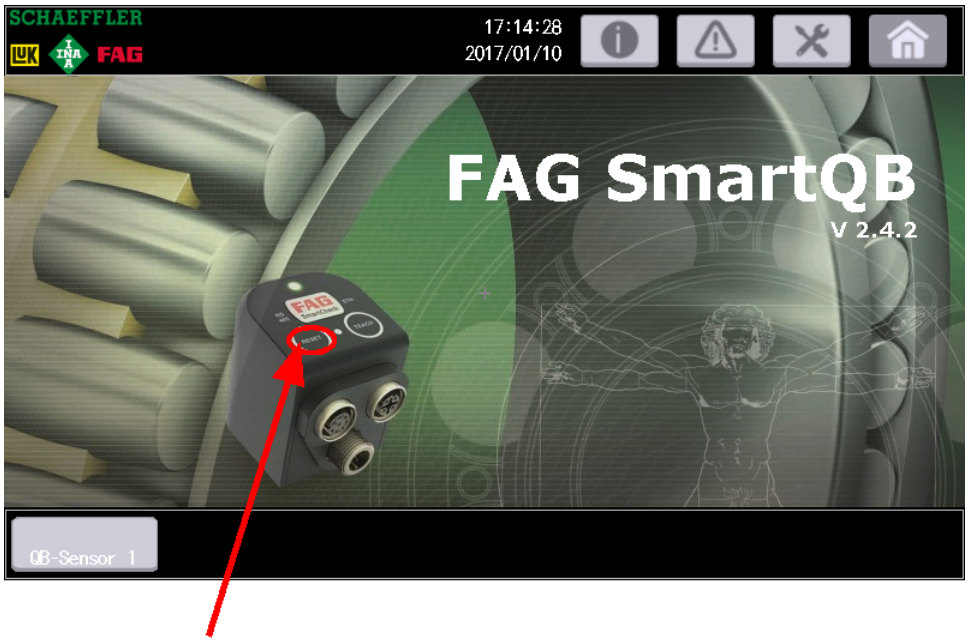
You can find the controller IP address on the Service screen 61 under **Edit expert settings** > **Edit network settings**:



- Note the details under **Controller IP address**, **Subnet mask** and **Gateway IP address**.

Display IP address:

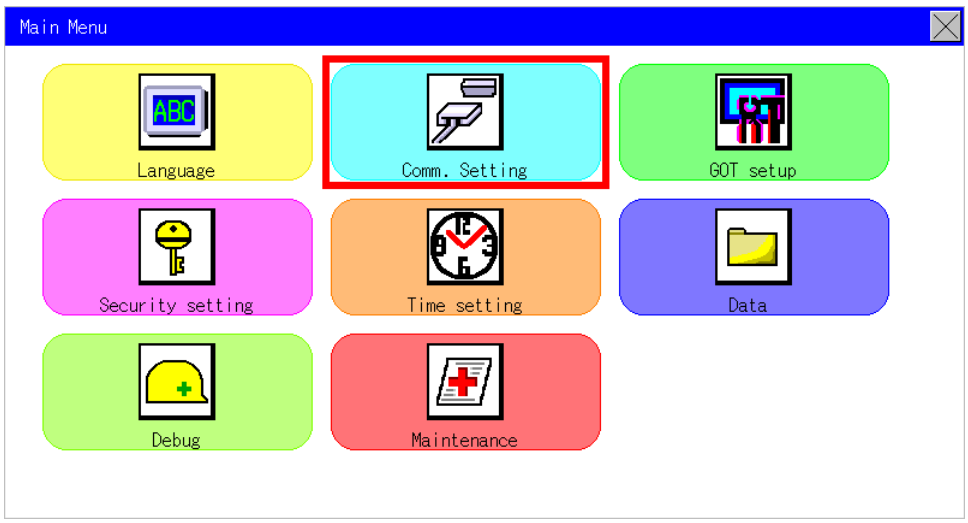
The display IP address can be found in the display communication settings:



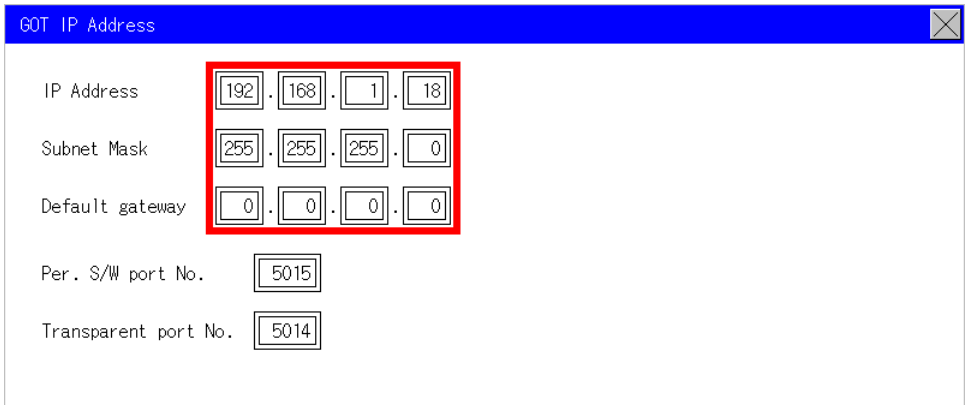
- On the main screen, press and hold the **Reset** button for 5 seconds then enter the password for the expert settings.

The "Expert settings" area is password-protected. If you do not have the password, contact your service partner or Schaeffler support.

The **Main Menu** screen is displayed:

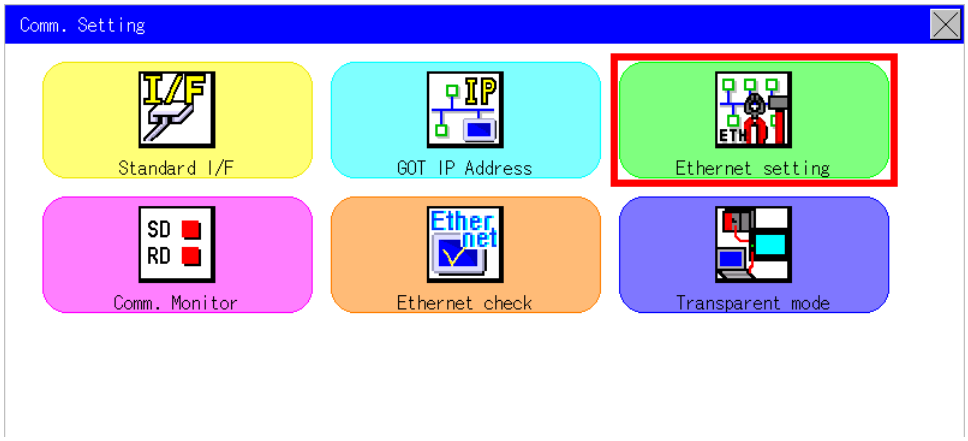


- Tap on **Com. Settings** .
- Tap on **GOT IP Address** .

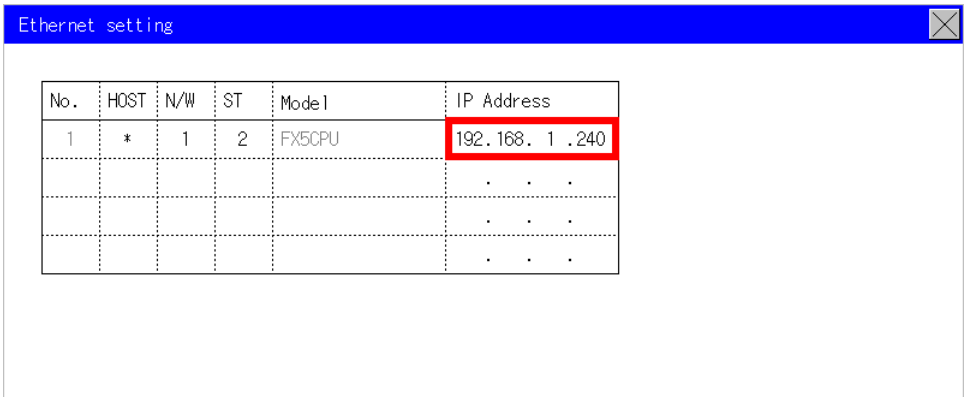


- Note the details next to **IP Address**, **Subnet Mask**, **Default gateway**.
- Tap on **X** to close the dialogue box.

The screen **Com. Settings** is displayed:



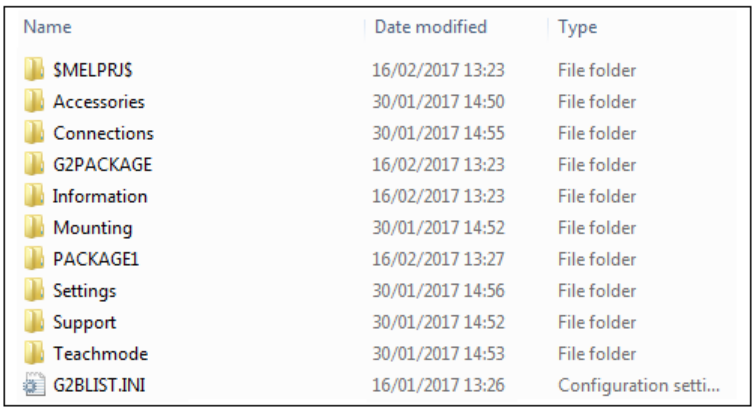
- Tap on **Ethernet setting**.
- Tap on **CH 1**.



- Note the IP address **FX5CPU**.
- Keep tapping on **X** until you are back at the Service screen of the FAG SmartQB.

3. Create a backup copy of the data on the SD card

1. Switch the power supply of the FAG SmartQB off.
2. Remove 74 the SD card from the card slot of the touchscreen display.
3. Insert the SD card into the card slot on your computer.
4. Create a backup copy of the data on the SD card and archive this version.
5. Copy the new update files to the SD card.
6. If necessary, copy the "Package1" from your backup to the SD card folder. The "Package1" folder contains the settings applied on the FAG SmartQB, such as sensor settings, contact details etc.

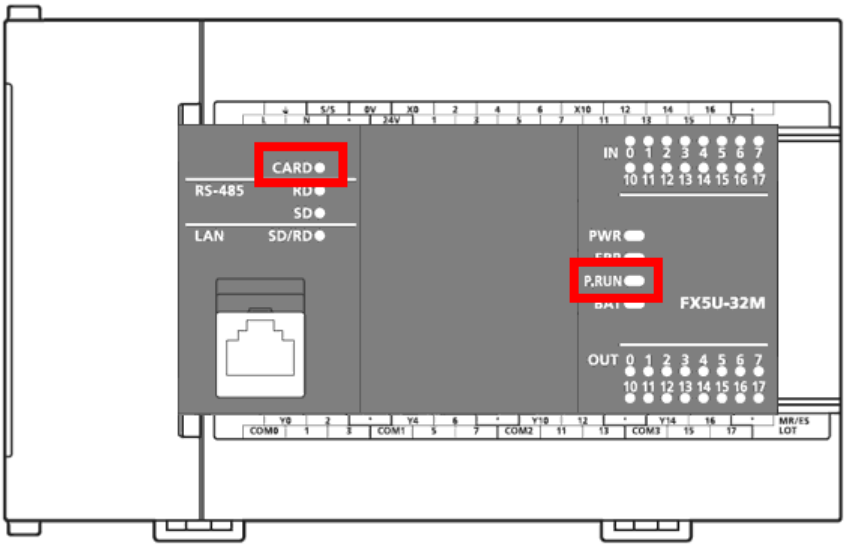


Files on the SD card

4. Update the program on the FAG SmartQB

1. Take the SD card and insert it into the SD card slot of the controller 74.
2. Switch the power supply 39 of the FAG SmartQB on.

The program is updated.

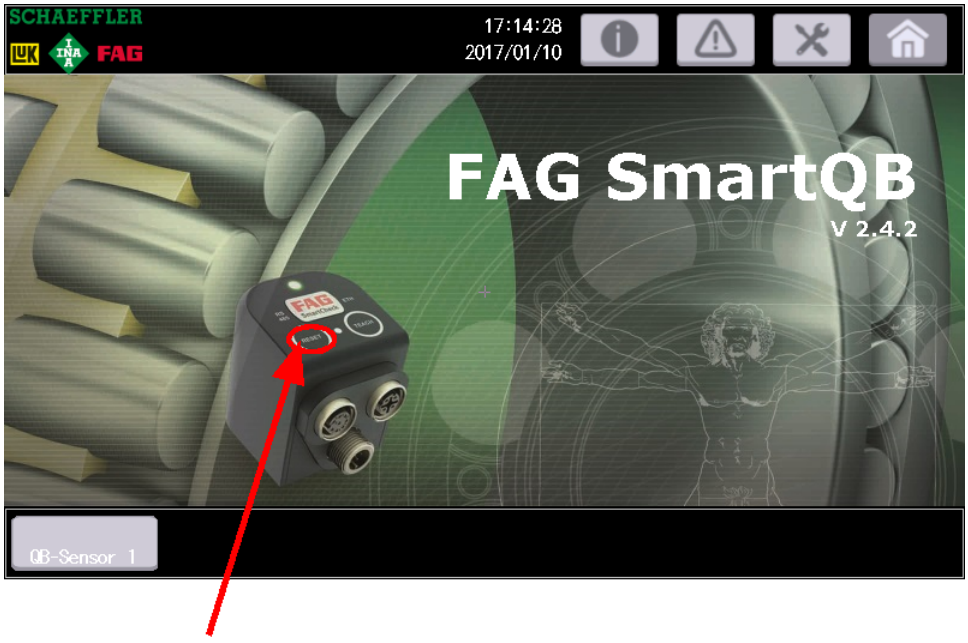


3. Wait until the **CARD** LED and the **P.RUN** LED are lit.
4. Switch the power supply [39] of the FAG SmartQB off.
5. Insert the SD card into the SD card slot of the touchscreen display [74].
6. Switch the power supply [39] of the FAG SmartQB on.

The FAG SmartQB starts with the new program version [50].

5. Edit the network parameters of the FAG SmartQB display

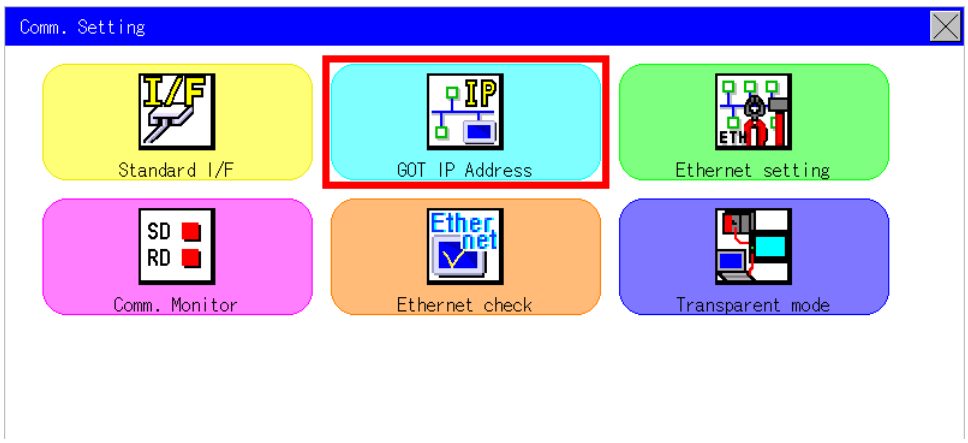
The IP addresses of the display were reset to factory defaults during the update. To keep the standard IP addresses [65], please proceed with step 6. Otherwise please edit the display IP addresses as follows:



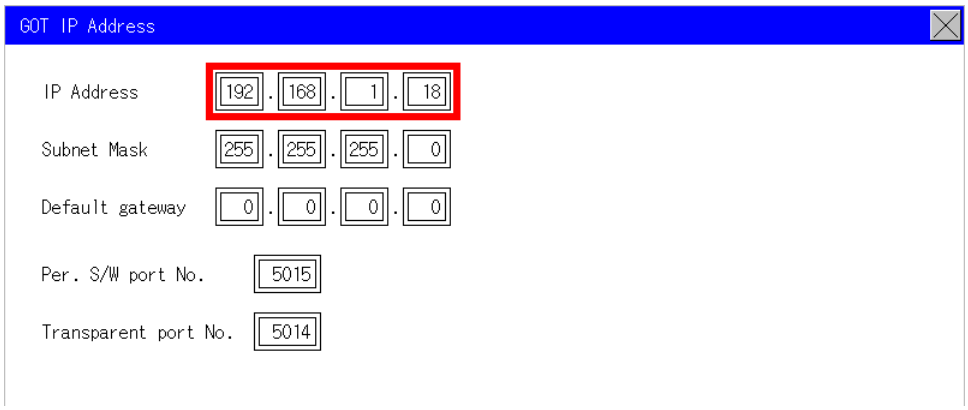
- On the main screen, press and hold the **Reset** button for 5 seconds then enter the password for the expert settings.

The "Expert settings" area is password-protected. If you do not have the password, contact your service partner or Schaeffler support.

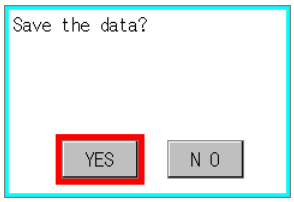
The screen **Com. Settings** is displayed:



- Tap on **GOT IP Address** .



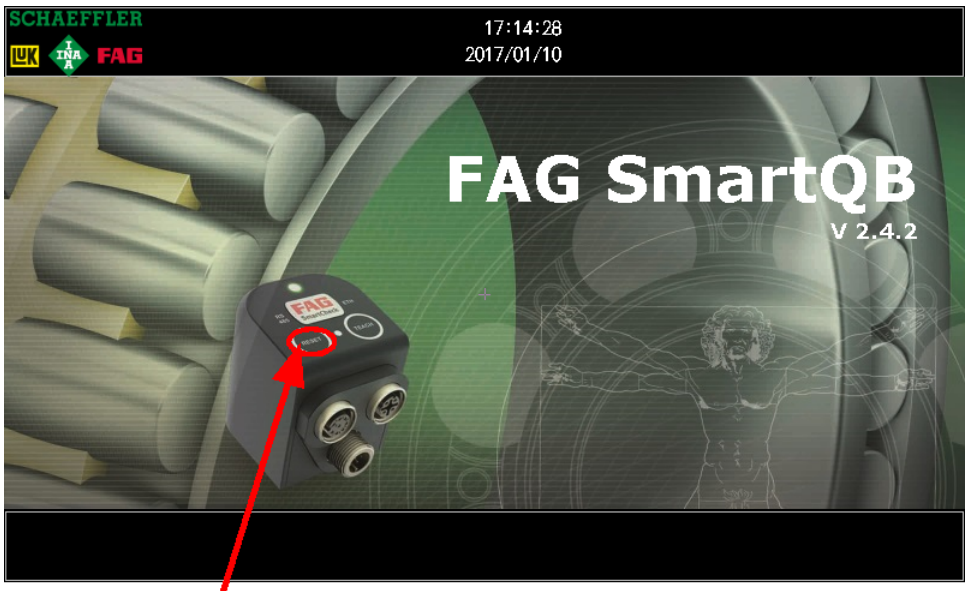
- Edit the **display IP address** (e.g. 192.168.1.18).
- Where necessary, edit the **Subnet Mask** and the **Default gateway**.
- Tap on **X** to save the changes.



- Confirm the save prompt with **Yes**.

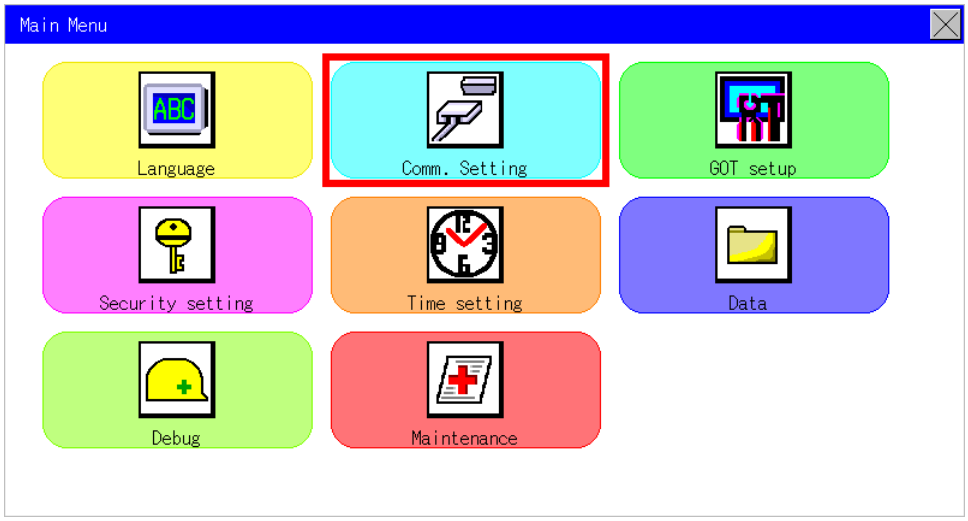
The settings are saved and the program is restarted.

After restarting, the main screen is displayed:

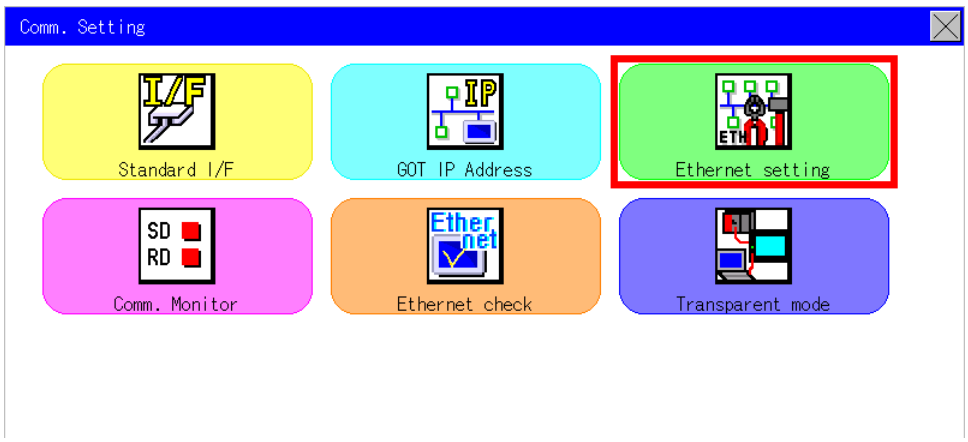


- On the main screen, press and hold the **Reset** button for 5 seconds then enter the password for the expert settings.

The **Main Menu** screen is displayed:

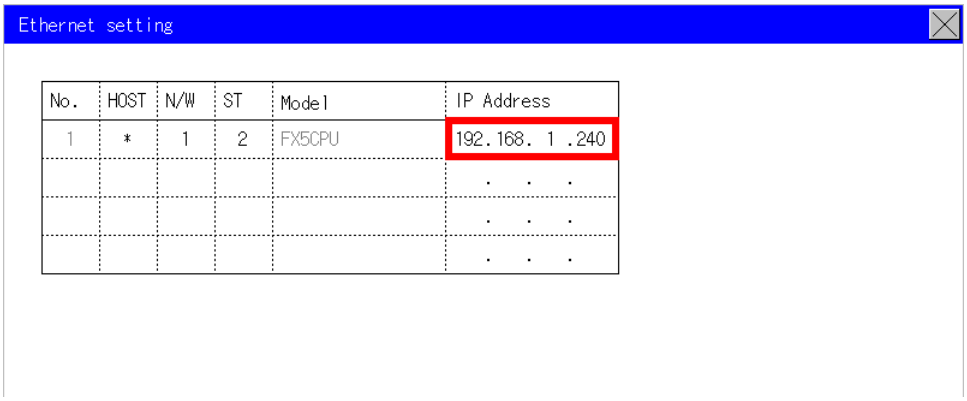


- Tap on **Com. Settings** .

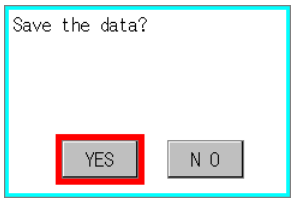


- Tap on **Ethernet setting**.

- Tap on **CH 1**.



- Edit the IP address of the model **FX5CPU** and enter the **IP address of the controller** (e.g. 192.168.1.240).
- Tap on **X** to save the changes.



- Confirm the save prompt with **Yes**.

The settings are saved and the program is restarted. The settings will not yet have been transferred following this restart. To complete the process, please restart the device as follows:

- Wait for the main screen to be displayed and switch the power supply to the FAG SmartQB off.
- After 10 seconds, switch the power supply to the FAG SmartQB back on.

The FAG SmartQB program is restarted.

6. Check the program version on FAG SmartQB.

On the main screen 50 of the FAG SmartQB you can see which program version is installed on your FAG SmartQB. On the service screen 61, you will see the version numbers of the controller and display.

To update the firmware version on your FAG SmartQB sensors, you need the current update files for sensors 1 to 6. These are available on our website (see Support) or from your service partner. Detailed instructions for updating the FAG SmartQB sensors can be found on the SD card in the software manual.

10 FAQs

This section provides information about diagnoses and problem-solving.

If you are still having problems, please contact your service partner or our Support team.

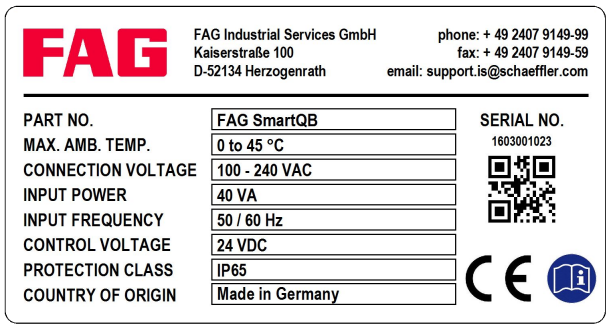
Question/problem	Check/action/background
The FAG SmartQB is not working.	• Check that the power cable [22] is connected to the FAG SmartQB and is supplied with power according to the technical data [10]. • Check that the circuit breaker [40] is set to 'ON (I)'. If the above points are met: • Check on the controller [41] that the control LEDs 'PWR' and 'P.RUN' are lit green. • Check on the mains unit [40] that the LED 'DC ON' is lit green for the 24 VDC power supply.
There is a communication problem [50]	• Check that the FAG SmartQB sensor on the FAG SmartQB is connected and registered [54]. • Check that the FAG SmartQB sensor is ready for use [84]. • Check that the status LED of the FAG SmartQB sensor is lit. • Check that the configuration version [61] set in the FAG SmartQB is the same as that of the FAG SmartQB sensor. • Check the network parameters [63] of the FAG SmartQB controller, the touchscreen display and the sensors. • Check whether the touchscreen display is connected with the Ethernet port on the controller on via the switch.
The alarm status of individual characteristic values is green but the overall alarm status is yellow or red.	The characteristic values are within the measuring range but an undefined error has occurred. Please call Support.
The main screen [50] is not showing any FAG SmartQB sensors.	Please see 'There is a communication problem'.
The buttons on the top right of the main screen [50] are missing.	Please see 'There is a communication problem'.
Is the FAG SmartQB sensor already ready for use?	As long as the status LED is alternating between red and yellow, the FAG SmartQB sensor is still booting up and cannot be accessed.
The status LED of the FAG SmartQB sensor is constantly flashing green.	The FAG SmartQB sensor is in learning mode. As soon as learning mode is completed, the alarm status appears.
The status LED of the FAG SmartQB sensor is not lit.	• Check that the Ethernet cable is correctly connected to the FAG SmartQB sensor and to the PoE switch in the FAG SmartQB. • Disconnect the SmartCheck device from the mains for approx. 10 seconds. The SmartCheck then reboots.
The FAG SmartQB shows an error message on the touchscreen display.	• Check that the SD card is fully inserted into the SD card slot [64] of the touchscreen display. • Check the write protect switch on the SD card [74] and ensure that it is not write-protected (it is unlocked). • Check whether the controller program is running. To do so, open the left controller cover and ensure that the operating mode switch is set to **RUN**.

The entries on the alarm list 52 are not in chronological order.	Check that the system time 56 is correct.
Date and time are wrong.	• Change the settings for the system time 56. • Check whether the target IP addresses of the SmartQB sensors 61 in the controller match those of the sensors in the FAG SmartWeb software. Date and time are synchronised at an interval of between 1 minute and max. 1 hour.
The sensor status 56 area displays a speed value of **0 rpm**.	• Check the speeds under sensor settings 55. • Check whether the machine is on. • Check whether the signal is related to the analogue inputs.
A system temperature of **0° C** is displayed.	The system temperature cannot be displayed, because the speed of the monitored machine is below 100 rpm and measurement was interrupted.
After updating the FAG SmartQB program, user-defined settings are missing.	• Check whether the "PACKAGE1" 76 folder exists on the SD card.

If you need to contact us, always quote your serial number and the program version of the FAG SmartQB including the number of the FAG SmartQB sensors if applicable.

FAG SmartQB:

The nameplate and serial number (SERIAL NO.) are on the underside of the FAG SmartQB housing:



The serial number is a 10-digit number, e.g. `1603001023`*. Beneath the serial number there is a QR code (Quick Response Code), which includes the serial number. You can scan the QR code using a mobile end device and a QR code scanner. To do this, point the camera of your mobile end device at the QR code. As soon as the code is detected, the serial number appears.*

You can find the program version (e.g. 2.6.0*) on the main screen 50 of the touchscreen display.*

FAG SmartQB sensor:

The nameplate and serial number (S/N) are located on the side of the FAG SmartQB sensor. The serial number is a 12-digit alphanumeric combination, e.g. `f43d80001c99`.

11 Decommissioning and disposal

Decommissioning

If the FAG SmartQB can no longer be operated safely, the device must be decommissioned and secured against inadvertent operation. The device can no longer be operated safely under the following conditions:

- The device is showing visible signs of damage.
- The device is not functioning.
- The device has been stored under damaging conditions.
- The device has been exposed to severe stresses in transit.

Disposal

FAG SmartQB and its associated components must not be disposed of as household waste as they contain electronic components that must be disposed of in the appropriate manner. Please return the device and/or components to us so that we can ensure they are disposed of in an environmentally friendly manner and in accordance with the relevant regulations. By returning old devices, you will be making an important contribution to protecting our environment.

12 Contact/support information

Contact

FAG Industrial Services GmbH

Kaiserstraße 100
52134 Herzogenrath
Germany

Tel.: +49 (0) 2407 9149-66
Fax: +49 (0) 2407 9149-59
Support: +49 (0) 2407 9149-99

Internet: www.schaeffler.com/services
For more information: www.FAG-SmartCheck.com
Contact: industrial-services@schaeffler.com

Please send all correspondence directly to FAG Industrial Services GmbH!

A subsidiary of
Schaeffler Technologies AG & Co. KG

PO Box 1260
97419 Schweinfurt
Germany

Georg-Schäfer-Straße 30
97421 Schweinfurt
Germany

Support

Tel.: +49 (0) 2407 9149 99

Email: support.is@schaeffler.com

We provide support services for the FAG SmartCheck device and related software products. You will find a detailed description of the nature and extent of our support services on the Internet at www.FAG-SmartCheck.com.

13 Appendix

Important note:
To maintain CE conformity, installation instructions and the manufacturer's protection measures must be followed in their entirety.

EC conformity declaration FAG SmartQB

EC Declaration of Conformity

The manufacturer

FAG Industrial Services GmbH, Kaiserstraße 100,
52134 Herzogenrath (Germany)

hereby declares that the product

FAG SmartQB

meets the protection requirements specified in the guideline on electromagnetic compatibility (2014/30/EU), provided that the product has been professionally and correctly installed in accordance with the commissioning instructions of this manual.

The following standards, among others, were referred to when assessing the product for electromagnetic compatibility:
EN 55011:2009+A1:2010
EN 61000-3-2:2014
EN 61000-3-3:2013
EN 61326-1:2013

The following standard was used to assess the product in terms of electrical safety according to the Low Voltage Directive (2014/35/EU):
EN 61010-1:2010

Measuring device mark: CE

Herzogenrath, 22/03/2017

Dipl.-Ing. Armin Kempkes
Managing Director
Head of Industrial Aftermarket Services

p.p. Dipl.-Ing. Götz Langer
Head of Industrial Electronics &
Software Development

This statement assures conformity with the named directives, but does not represent any guarantee of specific features. The safety instructions in the operating manual must be observed.

Components

Ethernet switch:

ATTESTATION OF CONFORMITY

CE

Date of Issue: 2011/03/29

Attestation Number: 1010193-A

Product: Industrial 8-port slim type unmanaged Gigabit PoE Ethernet switch with 8x10/100/1000Base-T(X) P.S.E. \
Industrial 5-port slim type unmanaged Gigabit PoE Ethernet switch with 8x10/100/1000Base-T(X) P.S.E. \
Industrial 5-port slim type unmanaged Gigabit PoE Ethernet switch with 4x10/100/1000Base-T(X) P.S.E. and 1x10/100/1000Base-T(X) \
Industrial 8-port slim type unmanaged Gigabit Ethernet switch with 8x10/100/1000Base-T(X) \
Industrial 8-port rack mount unmanaged Gigabit PoE Ethernet switch with 8x10/100/1000Base-T(X) P.S.E. \
Industrial 5-port rack mount unmanaged Gigabit PoE Ethernet switch with 4x10/100/1000Base-T(X) P.S.E. and 1x10/100/1000Base-T(X) \
Industrial 8-port rack mount unmanaged Gigabit Ethernet switch with 8x10/100/1000Base-T(X)

Model No.: IGPS-1080A, IGPS-1050A, IGPS-1041GTA, IGS-1080A, RGPS-1080, RGPS-1041GT, RGS-1080, IGPS-1080-24V

Applicant: ORing Industrial Networking Corp.

Address: 4F., No.3, Lane 235, Baociao Rd., Sindian City, Taipei County, Taiwan (R.O.C.)

And, in accordance to the following Applicable Directives

Applicable to EUROPEAN COUNCIL DIRECTIVE 2004/108/EC (The Information Technology Equipment)

That this product has been assessed against the following Applicable Standards

EN 55022:2006/A1: 2007 (Class A)
EN 61000-3-2 : 2006
EN 61000-3-3 : 1995/ A1:2001/ A2:2005
EN 55024 : 1998/ A1:2001/ A2:2003
IEC 61000-4-2 : 1995/ A1:1998/ A2:2000
IEC 61000-4-3 : 2006
IEC 61000-4-4 : 2004
IEC 61000-4-5 : 2005
IEC 61000-4-6 : 2006
IEC 61000-4-8 : 2001
IEC 61000-4-11 : 2004

CERPASS hereby acknowledges that:

The measurements shown in this test report may issue a DECLARATION of CONFORMITY and apply the CE mark in accordance to European Union Rules.

Attestation by: Hill Chen 2011/03/29

Hill Chen Date

EMC/RF B.U. Chief of Engineering Dept.

Cerpass Technology Corp.
2F-11, No. 3, Yuan Qu St. (Nankang Software Park), Taipei 11560, Taiwan
TEL: +886-2-26558100 FAX: +886-2-26558200
No.66, Tang Zhuang Road, Su Zhou Industrial Park, JiangSu 215006, China
TEL: +86-512-6917-5888 FAX: +86-512-6917-5666

ATTESTATION OF CONFORMITY

Date of Issue: 2011/03/29
Attestation Number: 1010193-A

Product: Industrial 8-port slim type unmanaged Gigabit PoE Ethernet switch with 8x10/100/1000Base-T(X) P.S.E. \
Industrial 5-port slim type unmanaged Gigabit PoE Ethernet switch with 8x10/100/1000Base-T(X) P.S.E. \
Industrial 5-port slim type unmanaged Gigabit PoE Ethernet switch with 4x10/100/1000Base-T(X) P.S.E. and 1x10/100/1000Base-T(X) \
Industrial 8-port slim type unmanaged Gigabit Ethernet switch with 8x10/100/1000Base-T(X) \
Industrial 8-port rack mount unmanaged Gigabit PoE Ethernet switch with 8x10/100/1000Base-T(X) P.S.E. \
Industrial 5-port rack mount unmanaged Gigabit PoE Ethernet switch with 4x10/100/1000Base-T(X) P.S.E. and 1x10/100/1000Base-T(X) \
Industrial 8-port rack mount unmanaged Gigabit Ethernet switch with 8x10/100/1000Base-T(X)

Model No.: IGPS-1080A, IGPS-1050A, IGPS-1041GTA, IGS-1080A, RGPS-1080, RGPS-1041GT, RGS-1080, IGPS-1080-24V

Applicant: ORing Industrial Networking Corp.

Address: 4F., No.3, Lane 235, Baociao Rd., Sindian City, Taipei County, Taiwan (R.O.C.)

And, in accordance to the following Applicable Directives

Applicable to ANSI C63.4 – 2003

(The Information Technology Equipment for Industrial Environment)

That this product has been assessed against the following Applicable Procedures

CISPR PUB. 22 and FCC Part 15 Subpart B Class A (Verification)

This Verification of Compliance is hereby issued to the above named company. The test Results of this report relate only to the tested sample identified in this report.

Attestation by: Hill Chen 2011/03/29

Hill Chen
EMC/RF B.U. Chief of Engineering Dept.
Cerpass Technology Corp.

2F-11, No. 3, Yuan Qu St. (Nankang Software Park), Taipei 11560, Taiwan
TEL: +886-2-26558100 FAX: +886-2-26558200
No.66, Tang Zhuang Road, Su Zhou Industrial Park, JiangSu 215006, China
TEL: +86-512-6917-5888 FAX: +86-512-6917-5666

Ethernet switch:

NSAI Certification

ECE TYPE-APPROVAL CERTIFICATE

Communication concerning the approval granted of an electrical/electronic sub-assembly with regard to Regulation No.10.

E24

Approval No: ***E24 10R-030719*** Extension No: ***N/A.***

Reason for extension: ***N/A.***

	Make (trade name of manufacturer):	*O ı °*
2.	Type and general commercial description:	*IGPS-1080-24V Ethernet Switch*
3.	Means of identification of type, if marked on the component:	***See 2. above.***
3.1	Location of that marking:	***On the housing of the unit.***
4.	Category of vehicle:	***See Appendix.***
5.	Name and address of manufacturer:	***ORing Industrial Networking Corp., 3F., No. 542-2, Zhongzheng Rd., Xindian District, New Taipei City 23148, Taiwan (R.O.C.)***
6.	In the case of components and separate technical units, location and method of affixing of the ECE approval mark:	***On the housing of the unit. Incorporated into a label.***
7.	Address(es) of assembly plant(s):	***ICP Electronics, Inc., 2-5F, No. 22, Chung-Hsing Rd., Shi-Chi City, Taipei Hsien, Taiwan (R.O.C.)***

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8.	Additional information (where applicable):	*See appendix.*
9.	Technical service responsible for carrying out the tests:	*TÜV SÜD AUTOMOTIVE GMBH,* *Westendstraße 199,* *D-80686 München,* *Germany.*
11.	Date of test report:	*15.07.2011.*
12.	Number of test report:	*11-00513-CX-GBM-00.*
13.	Remarks (if any):	*See Appendix.*
14.	Place:	*Dublin.*
	Date:	*25th July, 2011.*
15.	Signature:	

16. The index to the information package lodged with the approval authority, which may be obtained on request is attached.

16.1 Documentation: *41 pages.*

Approval No: *E24 10R-030719* Extension No: *N/A.*

Appendix

to type-approval communication concerning the type approval of an electrical/electronic sub-assembly under Regulation No.10.

1.	Additional information	
1.1.	Electrical system rated voltage:	*12/24 volts nominal.*
1.2.	This ESA can be used on any vehicle type with the following restrictions:	*I / V b e ' n g n e ''' body.*
1.2.1	Installation conditions, if any:	*Se manufacturer's specifications.*
1.3.	This ESA can only be used on the following vehicle types:	*N/A.*
1.3.1	Installation conditions, if any:	*N/A.*
1.4.	The specific test method(s) used and the frequency ranges covered to determine immunity were:	*N/A.*
1.5.	Laboratory accredited to ISO 17025 and recognized by the Approval Authority responsible for carrying out the tests:	*TÜV SÜD AUTOMOTIVE GMB**.
2.	Remarks:	*N/A.*

Appendix to type-approval communication concerning the type approval of a vehicle under Regulation No.10.

1. 3	Additional information	
2	Special devices for the purpose of Annex 4 to this Regulation:	
4	Electrical system rated voltage:	*N/A*
5	Type of bodywork:	*N/A.*
	List of electronic systems installed in the tested vehicle(s) not limited to the items in the information document:	
5. 1	Vehicle equipped with 24 GHz short-range radar equipment (yes/no):	*N/A.*
6.	Laboratory accredited to ISO 17025 and recognized by the Approval Authority responsible for carrying out the tests:	
7.	Remarks:	*N/A.*

NSAI, 1 Swiftsquare, Northwood, Santry, Dublin 9, Ireland. Telephone: (+353+1) 807 3800, Facsimile: 01-807 3844

SCHAEFFLER

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