Digital Force Gauge

FS





PROFESSIONAL MEASURING

Original Version

Operating Instructions for Digital Force Gauge

Version 2.0
2026_06
en
FS-BA-en-2606

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SAUTER

Operating Instructions for Digital Force Gauge

Version 2.0 2026_06

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1 Available Models

Model	Internal measuring cell	Measuring range of internal measuring cell [Max] N	Resolution of internal measuring cell N	Number of measurement channels	Max. possible resolution per channel d
FS 2	-	-	-	2	10,000
FS 2-20	•	20	0.004	2	10,000
FS 2-50	•	50	0.01	2	10,000
FS 2-100	•	100	0.02	2	10,000
FS 2-200	•	200	0.04	2	10,000
FS 2-500	•	500	0.1	2	10,000
FS 4	-	-	-	4	10,000
FS 4-20	•	20	0.004	4	10,000
FS 4-50	•	50	0.01	4	10,000
FS 4-100	•	100	0.02	4	10,000
FS 4-200	•	200	0.04	4	10,000
FS 4-500	•	500	0.1	4	10,000

1.1 Maximum measurement range



Never exceed the maximum measuring range of the device! The maximum measuring range of your device with an internal measuring cell is indicated on the type plate on the back of the device! The maximum measuring range of external sensors is indicated on the type plate on the sensors!
Overloads are indicated by a warning tone when the audible signals are activated. Overload values are stored. Overloaded devices and sensors are excluded from the warranty, return, and exchange policies.

1.2 Notes

Please remember to end the current measurement by pressing the STOP button.

Please do not connect or disconnect an external load cell while a measurement is in progress. This can lead to data loss. As a result, the FS force gauge will no longer function properly with the external load cell.

Please do not change any settings, such as the unit in the calibration menu, as this will require the device to be returned for recalibration.

2 Declaration of Conformity

The current EC/EU Declaration of Conformity can be found online at:
https://www.kern-sohn.com/shop/de/DOWNLOADS/

3 Basic Information (General)

3.1 General Information on Warnings

This operating manual uses warning notices to alert you to potential personal injury or property damage in specific situations.

Signal word	Description
DANGER	Failure to follow this warning will result in serious injury, permanent disability (e.g., loss of a limb), or death to the user or third parties
WARNING	Failure to follow this warning may result in serious injury, permanent disability (e.g., loss of a limb), or death of the user or third parties
CAUTION	Failure to follow this warning may result in minor injuries or temporary impairment of the user or third parties (e.g., minor cuts)
NOTICE	Failure to follow this warning may result in property damage

Symbols in warning notices :

Symbol	Meaning
Warning signs	Warning signs alert you to hazards that may result in personal injury. The symbol indicates the type of hazard.
	Indicates general hazards or a hazardous area
	Warning of electrical voltage
	Warning regarding electrostatic-sensitive components

Symbol	Meaning
Mandatory sign	Mandatory signs prescribe measures you must take to prevent personal injury or property damage. The symbol indicates the necessary actions or items to prevent damage.
	Indicates a required action

3.2 Intended use

The SAUTER FS device is intended for measuring forces and torques in industrial environments.
After use, place the device and its accessories in the device box and store it properly. The device should be stored in a dry and cool environment.
If you have any questions, please contact SAUTER or visit our website at www.sauter.eu.

3.3 Improper use

The measuring device is not intended for medical use.
Do not use the device in potentially explosive areas or for measurements in liquids or on live parts. This device is not waterproof and cannot be used in environments with high humidity or water mist. Prevent liquids, powders, or solid foreign objects such as water and dust from entering the measuring aperture and the housing.
Unauthorized structural modifications, additions, or alterations to the device are prohibited. Unauthorized modifications may impair the accuracy of the device or even cause irreversible damage to it.

3.4 Warranty

The warranty is void if

- Failure to follow our instructions in the operating manual
- Use outside the described applications
- Modification or opening of the device
- Mechanical damage and damage caused by media, liquids, natural wear and tear
- Improper setup or electrical installation
- Improper assembly or electrical installation

4 Basic warnings and safety instructions

4.1 Follow the instructions in the operating manual



Carefully read the operating instructions before commissioning/using the device, even if you already have experience with SAUTER devices. Always keep the instructions in the immediate vicinity of the device.

4.2 Staff training

The device may only be used by persons who have read and understood the operating instructions, particularly the Safety chapter.

4.3 Safety

⚠ WARNING	
	**Read all safety warnings and instructions.** Failure to follow the safety instructions and guidelines may result in electric shock, fire, and/or serious injury. **Keep all safety instructions and guidelines for future reference.** ● Make sure that people or objects are never located under the load, as they could be injured or damaged! ● Do not modify the design of the measuring device. This can lead to incorrect measurement results, safety defects, and destruction of the measuring device ● Do not operate the device in or place it in potentially explosive rooms or areas. ● Do not operate the device in a corrosive atmosphere. ● Do not submerge the device in water. Do not allow liquids to enter the interior of the device. ● The device must only be used in a dry environment and under no circumstances in rain or at a relative humidity exceeding the operating conditions. ● Protect the device from prolonged direct sunlight. ● Do not expose the device to strong vibrations. ● Do not remove any safety signs, stickers, or labels from the device. Keep all safety signs, stickers, and labels in a legible condition. ● Do not open the device

⚠ WARNING	
	**Risk of injury from electric shock!** Cleaning the electrical system with wet cloths poses a risk of injury from electric shock. ● Turn off the power supply using the main switch. ● Unplug the power cord. ● Do not use wet cleaning cloths. ● Always use only dry or damp cloths.

⚠ WARNING	
	**Choking hazard!** Do not leave the packaging material lying around carelessly. It could become a dangerous toy for children. ● This device is not a toy and should not be left within reach of children. ● This device may pose a hazard if used improperly or for purposes other than those intended by untrained persons! Pay attention to personnel qualifications !

⚠ WARNING	
	**Electrostatic-sensitive device!** ● The device can be destroyed by electrostatic discharges. Connectors for RF signals are particularly at risk. ● Please follow the handling instructions for electrostatic-sensitive components.

⚠ WARNING	
 	Improper use of rechargeable or non-rechargeable batteries can cause them to catch fire, explode, emit toxic fumes, or leak corrosive liquids. Therefore, the following applies to all rechargeable and non-rechargeable batteries: ● Protect from fire and heat. ● Never expose to high pressure or microwaves. ● Do not allow them to come into contact with liquids or chemicals. ● Never allow the electrical contacts of rechargeable and non-rechargeable batteries to come into contact with metal objects or short-circuit. ● Never modify rechargeable batteries, batteries, or chargers. ● Batteries must never be recharged. ● Never use or charge a defective, damaged, or deformed battery. ● Do not use power adapters that do not meet the technical specifications. Otherwise, the battery's service life may be shortened, or an electric shock may occur, which could damage the device or cause a fire.

	● If the device is not used for an extended period, disconnect the external power supply to prevent the device from overheating and causing a fire. ● If you do not use the device for an extended period, you should charge it every two weeks; otherwise, the internal battery may be slightly damaged, making it impossible to use the device again

CAUTION

● Keep a sufficient distance from heat sources.
● Do not use the device in environments with high humidity or water mist.

NOTE

● To prevent damage to the device, do not expose it to extreme temperatures, extreme humidity, or moisture.
● Do not use harsh cleaners, abrasives, or solvents to clean the device.

⚠ WARNING	
	**Read all safety warnings and instructions.** Failure to follow the safety instructions and guidelines may result in electric shock, fire, and/or serious injury. **Keep all safety instructions and guidelines for future reference.** ● Ensure that no people or objects are ever located under the load, as they could be injured or damaged! ● The test system must not be structurally modified. This can lead to incorrect measurement results, safety defects, and destruction of the system ● Do not operate the system in or install it in potentially explosive rooms or areas. ● Do not operate the system in a corrosive atmosphere. ● Do not submerge the system in water. Do not allow liquids to enter the interior of the device. ● The system must only be used in a dry environment and under no circumstances in rain or at a relative humidity exceeding the operating conditions. ● Protect the system from prolonged direct sunlight. ● Do not subject the system to strong vibrations. ● Do not remove any safety signs, stickers, or labels from the device. Keep all safety signs, stickers, and labels in a legible condition ● Do not open the device

⚠ WARNING	
	**Choking hazard!** Do not leave the packaging material lying around. It could become a dangerous toy for children. ● This device is not a toy and should not be left in the hands of children. ● This device may pose a hazard if used improperly or for purposes other than those intended by untrained persons! Ensure that personnel are properly qualified !

⚠ WARNING	
	**Risk of injury from electric shock!** ● There is a risk of short circuits caused by liquids entering the housing! ● Do not submerge the device or its accessories in water. Ensure that no water or other liquids enter the housing. ● Work on electrical components must only be performed by an authorized specialist company!
⚠ WARNING	
	Electrostatic-sensitive device! ● The device can be destroyed by electrostatic discharges. Connectors for RF signals are particularly at risk.

	● Please follow the handling instructions for electrostatic-sensitive components.

⚠ WARNING	
 	Improper use of rechargeable or non-rechargeable batteries can cause them to catch fire, explode, emit toxic fumes, or leak corrosive liquids. Therefore, the following applies to all rechargeable and non-rechargeable batteries: ● Protect from fire and heat. ● Never expose to high pressure or microwaves. ● Do not allow them to come into contact with liquids or chemicals. ● Never allow the electrical contacts of rechargeable and non-rechargeable batteries to come into contact with metal objects or short-circuit. ● Never modify rechargeable batteries, batteries, or chargers. ● Batteries must never be recharged. ● Never use or charge a defective, damaged, or deformed battery. ● Do not use power adapters that do not meet the technical specifications. Otherwise, the battery's service life may be shortened, or an electric shock may occur, which could damage the device or cause a fire. ● If the device is not used for an extended period, disconnect the external power supply to prevent the device from overheating and causing a fire. ● If you do not use the device for an extended period, you should charge it every two weeks; otherwise, the internal battery may be slightly damaged, making it impossible to use the device again

CAUTION

Risk of injury!

There is a risk of injury when working on or with the test system.

● Comply with applicable and binding national regulations regarding accident prevention.
● Follow the recognized technical rules for safe and proper work practices.
● Comply with the regulations regarding safety and health protection when providing and using work equipment.
● Observe company regulations, such as supervision and reporting requirements.
● Read the operating instructions thoroughly.
● Read the operating instructions and data sheets for external components in their entirety.
● Observe all safety instructions in the operating manual.
● Observe all safety signs affixed to the test system.
● Always wear appropriate safety equipment.
● Keep a sufficient distance from heat sources.

NOTE

● To prevent damage to the test system, do not expose it to extreme temperatures, extreme humidity, or moisture.
● Do not use harsh cleaners, abrasives, or solvents to clean the test system.

● Only one operator may work on the test system at a time.
During operation, the operator’s workstation is located in front of the test system.

5 Transport and Storage

5.1 Note

Improper storage or transport of the device may result in damage. Follow the instructions for transporting and storing the device.

5.2 Transport

When transporting the device, use the carrying case included in the package to protect it from external damage.

5.3 Storage

When the device is not in use, observe the following storage conditions:

- dry and at a temperature between protected from frost and heat
- in the carrying case, protected from dust
- the storage temperature complies with the technical specifications

5.4 Packaging/Return Shipping

Returns are only possible within the limits of the general terms and conditions Keep all parts of the original packaging for any necessary return shipping.

- Only the original packaging may be used for return shipping
- Before shipping, disconnect all connected cables and remove any loose or movable parts
- Reattach any transport safety devices that were provided
- Secure all parts against slipping and damage

6 Unpacking and Setup

6.1 Unpacking



In the event of a return, please follow the instructions in the chapter “Packaging/Return Shipping”

Upon receipt of the device, check immediately to ensure that no transport damage has occurred and that the outer packaging, the housing, other parts, or even the device itself have not been damaged. If any damage is visible, please notify SAUTER GmbH immediately.

6.2 Initial Setup

To ensure the proper functioning of the measuring device, it must be fully charged in the charging station using the supplied power adapter before use .

7 Overview of the device

7.1 Scope of Delivery





- FS Force Gauge
- Systainer® carrying case
- Touch pen
- USB-C cable
- EU power adapter
- User manual

2 Connections

2.1 USB-C Port

The USB-C port on the right side of the device supplies power to your device and serves as an interface for data transfer to a PC. The interface description is provided in Chapter10: Interface.



2.2 SD Card

The built-in SD card can be removed from the outside by pressing the SD card lightly into the device. A spring mechanism pushes the SD card out for easier removal. The pin included in the scope of delivery can also be used for this purpose.

2.3 Connection sockets for external sensors

Depending on the model, 2 or 4 strain gauge sensors can be connected to your force measurement device simultaneously for simultaneous measurement. There are always 5 sockets on your device. Measurement channels 3 and 4, as well as the interface socket (on the left, unlabeled), are only optionally assigned!



You will receive the connectors when ordering sensors from SAUTER, as described in the chapter “8.2 .”

2.3.1 Compatibility and Required Accessories

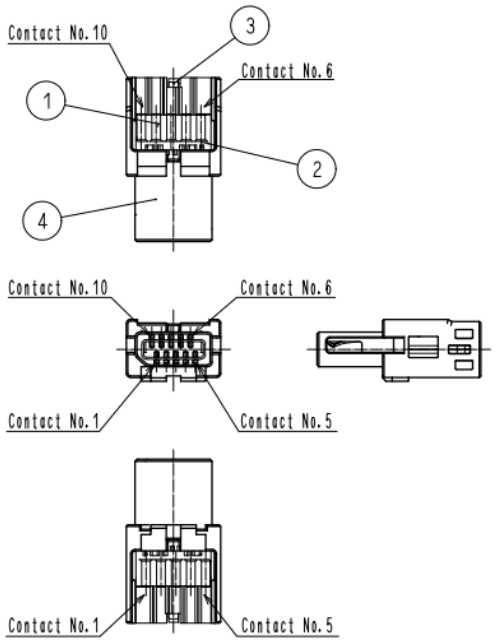
It is recommended that you purchase the sensors directly from SAUTER. There you will receive compatible sensors along with the necessary services. The services listed in Chapter8.2include calibration of the measurement chain, the connector, and the required data storage chip.

2.3.2 Plug-and-play for external sensors

External sensors can be disconnected and replaced with other calibrated sensors. Due to the tolerances of the respective input channels, the sensors must be calibrated with the device in use. To do this, the device must be sent to the KERN laboratory when sensors are reordered.

Whenever possible, always connect the sensor to the channel on which it was adjusted and calibrated. You can find this information on the enclosed calibration certificate.

2.3.3 Pin Assignment for Connector



Pin	Connection
1	N.C.
2	Memory chip IO
3	Memory chip GND
4	N.C.
5	N.C.
6	Supply +
7	Input +
8	Input -
9	Power +
10	N.C.

2.4 Expansion from 2 to 4 measurement channels

Every device is factory-equipped with sockets for 4 measurement channels, even if you purchased a 2-channel version.

2.5 Connection socket for optional data interface

The socket is present on the device! Interface currently not available.

3 Technical Specifications

3.1 Battery

- Rechargeable lithium-ion battery
- Nominal voltage 3.7V
- Capacity 2400mAh or 8.88Wh

Safety data sheets are available in the manufacturer’s online store or upon request! Do not use devices with defective batteries! Do not ship defective batteries or devices with defective batteries!

3.2 Display and measurement technology

- 3.5" touchscreen
- Standard version with 2 or 4 measurement channels for external force sensors (can be upgraded from 2 to 4)
- An internal measurement cell is possible (is deactivated if an external measuring cell is plugged into slot 1)
- Suitable for 4-wire and 6-wire sensors with strain gauges up to 3 mV/V
- Bridge supply voltage 6V
- High resolution: up to 10,000 points per measurement channel
- Internal measurement frequency: 1000 Hz per measurement channel
- Measurement accuracy:
    - with internal measuring cell: 0.1% of [Max]
    - with external measuring cell: depends on the measuring cells used
- Overall dimensions W×D×H 71×31×180 mm
- Overload protection: 150% of [Max] with internal load cell
- Thread on load cell: M6 (external)
- Internal battery operation, standard, operating time up to 8 h, charging time approx. 8 h
- External power adapter, for connection to the USB-C port, standard
- Net weight approx. 0.4 kg
- Protection class IP40

3.3 Temperature

3.3.1 Storage temperature

-10°C to 40°C

Recommended storage temperature for lithium-ion battery: +10°C to 20°C

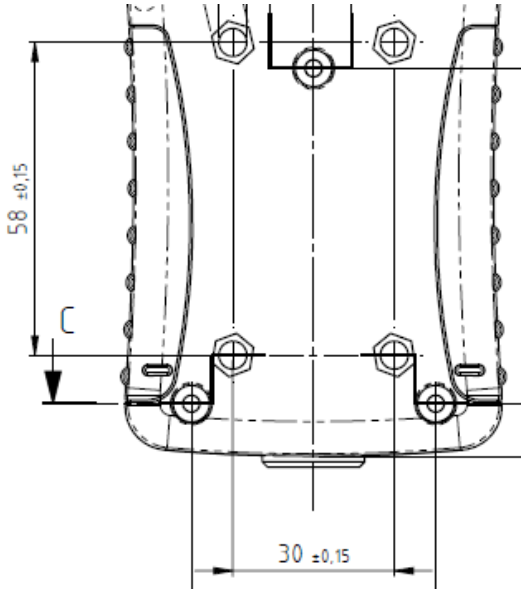
3.3.2 Operating temperature

10°C to 40°C

The measuring system is temperature-compensated within this range.

3.4 Mounting options

The device can be mounted on test benches, fixtures, and handles (AFK 02 is available as an option) using M3 screws through the four threaded holes on the back:





4 Preparing for measurement

4.1 Turn on

Press and hold the ON/OFF button for approx. 2 seconds

4.2 Activate the display when power-saving options are enabled

If you have activated the display's power-saving mode as described in the section "6.1.3 ," it is possible that your device is turned on but the display is off. To activate the display, briefly press the START/STOP button or touch the display. If the display does not activate, restart the device as described in the section "4.1 ."

4.3 Measuring with the internal sensor

For devices equipped with an internal sensor (excluding FS 2 and FS 4), the internal sensor is displayed as Channel 0 (CH0) when you click the “Measurement” function. If an external sensor is connected, CH0 is automatically deactivated and the external channels are displayed instead.

4.4 Measuring with external sensors

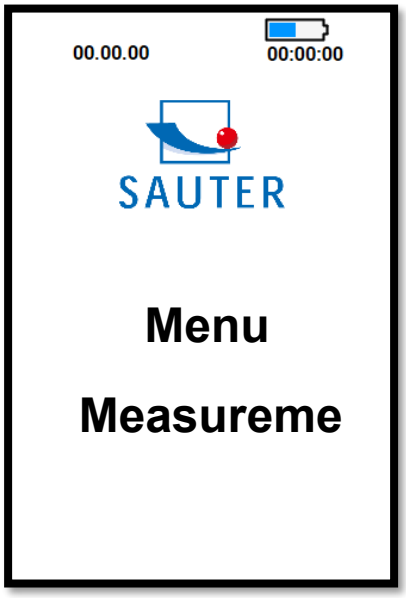
The external measurement channels are displayed as CH1 and CH2 on the FS 2-x and CH1 through CH4 on the FS 4-x. Measurements can be taken simultaneously on the external channels CH1 through CH4, and the data can be saved.

4.5 Connecting and disconnecting external sensors

To connect or disconnect the external sensors, the meter must be turned off or must be in the main menu. The start screen appears; you are in the main menu.

5 Measurement

5.1 Start screen



5.2 Start measurement

Click on "Measurement" on the touchscreen

5.3 Initialize measurement channels

Press the START/STOP button to display the measured values from the connected sensors

5.4 Tare measurement channels

5.4.1 Channel individually

To set a single channel to zero, click with the touch pen on “→ 0← ” to the right of the displayed channel.

5.4.2 Zero all channels

Press and hold the "→ 0← " button for at least 3 seconds to set all connected sensors to 0.

5.5 Save measurement data

The various measurement functions available and how the measured values are saved are described in the section "6.2.3

Function ".

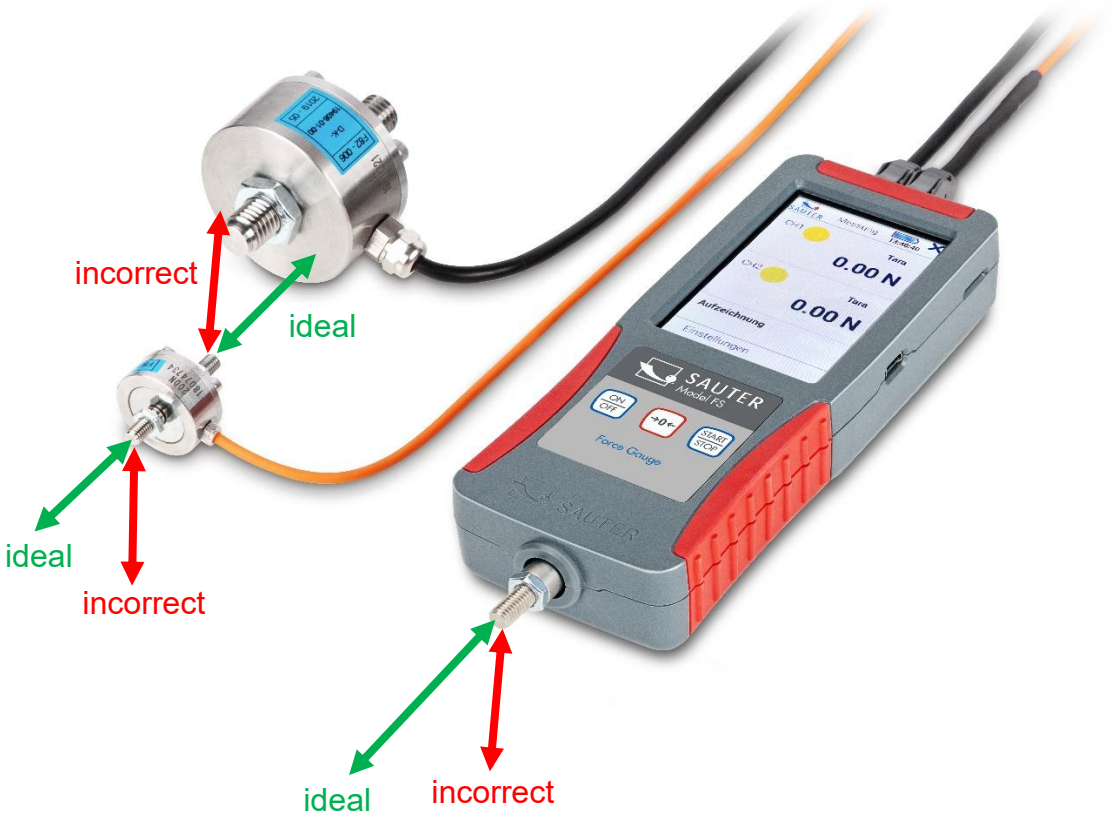
5.6 Force Application

Devices with an internal sensor can measure forces in the tensile direction (positive reading) and in the compressive direction (negative reading). External sensors may vary. You can use sensors for tensile and compressive forces, or tensile force sensors or compressive force sensors. For more information on external sensors, see the chapter8.2 External load cells .

The forces on the FS measuring device must always be applied in the axial direction of the load-application bolt. Avoid transverse forces. These cause measurement errors and can damage the sensor.

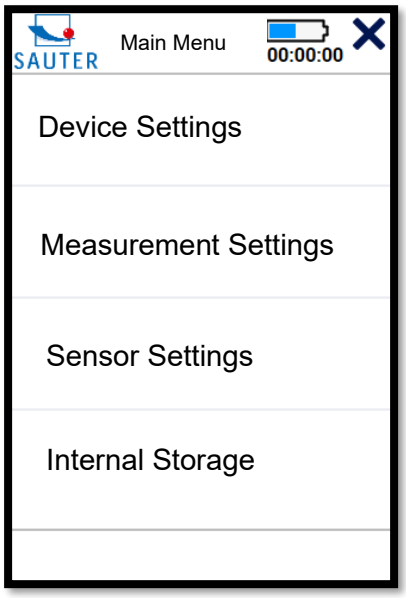
Ideal force application

Incorrect force application



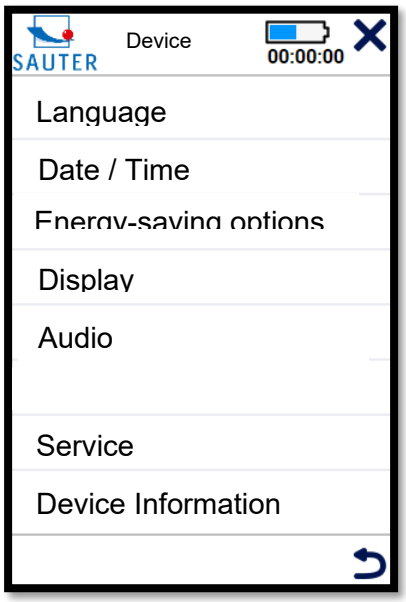
6 Main Menu Settings

If your device is in the start menu, you can adjust settings by clicking on "Menu." This will take you to the main menu with the following subpages:



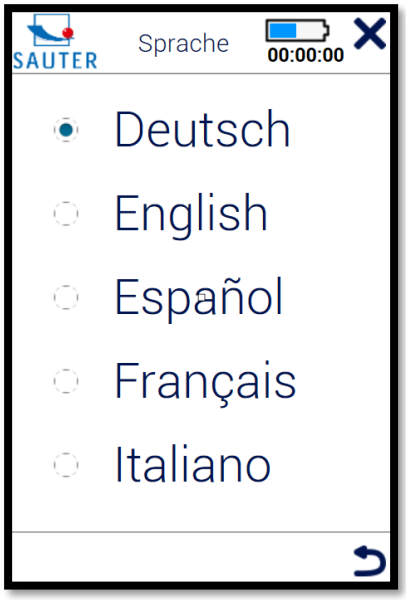
Clicking on ✕ or ⮌ will take you to the previous page. Pressing the ON/OFF button will take you back to the home screen.

6.1 Device Settings Menu



6.1.1 Select Language

Select your desired language:
→ Menu Device Settings→ Language



6.1.2 Set time and date

Menu→ Device Settings→ Date/Time
Click “Change” with the touch pen and use the arrows to set the current time and date. Save the entered values by clicking “OK”

6.1.3 Set power-saving options

Menu→ Device Settings→ Energy-Saving Options
Set here when the device or display should turn off to save energy! Turning off the display is only recommended for long-term measurements! As a rule, use the settings "Never turn off device" and "Never turn off display."

To reactivate the display, briefly press the START/STOP button or touch the display.

6.1.4 Display Brightness

Menu→ Device Settings→ Display
Set the desired display brightness here by moving the slider on the display.

6.1.5 Turning Sounds On and Off

Menu→ Device Settings→ Turn Sounds On and Off

6.1.6 Service

Menu→ Device Settings→ Service

6.1.6.1 Display Raw Data

Switch here to display the raw measurement values during calibration as an AD value or as voltage in mV.

6.1.6.2 Reset device

Do not use this function! Contact the service department!

6.1.7 Device Info

→ menu Device settings→ Device info
Here you will find information about

- Device name or model
- Installed firmware revision
- Device serial number

6.2 Measurement menu Settings

6.2.1 Measurement frequency

6.2.1.1 Set

By clicking on "Change," you can change the frequency at which the measured values are saved in "Track" mode or transmitted via the interface! The following frequencies are available: 1000, 500, 100, 50, 10, 5, and 1 Hz

6.2.1.2 Which frequency is required?

Select the lowest possible frequency that still meets your needs! A high frequency for data storage or transmission results in a large amount of data, which takes a long time to transfer.

6.2.1.2.1 For long-term measurements

such as a fatigue test, select a very low frequency, max. 50 Hz.

6.2.1.2.2 For short-term measurements

such as maximum load measurement up to failure, which takes only a few seconds, select a higher frequency.

6.2.2 Readability

By clicking on "Change," you can increase the resolution by the displayed factor. The maximum resolution is n=10,000

The smallest adjustable resolution for a sensor is calculated as follows:

$$d_{min}: kleinste\ Ablesbarkeit\ in\ N$$
$$MAX: Kennwert\ in\ N$$
$$n: maximale\ Auflösung$$
$$d: eingestellte\ Ablesbarkeit\ in\ N$$
$$STEP: Ablesbarkeitsfaktor$$

$$d_{min} = \frac{MAX}{n}$$
$$d = d_{min} * STEP = \frac{MAX}{n} * STEP$$

Example FS 2-100:

$$MAX = 100\ N$$
$$d_{min} = \frac{100N}{10.000} = 0{,}01N$$
$$STEP = 2$$
$$d = \frac{MAX}{n} * STEP = \frac{100N}{10.000} * 2 = 0{,}02N$$

Set the resolution factor as high as possible and as low as necessary! Very low resolution often leads to unstable display values with the measurement technology used and the high sampling frequencies. Readability factor 1 should ideally only be set if the measured data is subsequently processed using additional PC software, for example to filter, smooth, etc., the stored values.

If values are only read or saved manually, it is recommended to set the readability factor to ≥ 5.

6.2.3 Function

6.2.3.1 Track

Measurement values are displayed continuously and saved at the set sampling rate as needed.
To save the measured values:

1. press the Start/Stop button
2. The measured values are now saved, and the generated filename in which the data is saved appears on the display below the "Recording in progress" message
3. Pressing the Start/Stop button briefly pauses the saving of the measurement series; "Recording Paused" appears on the display
4. Pressing the button briefly again resumes saving. "Recording in progress" is displayed
5. Press and hold the Start/Stop button for more than 3 seconds to stop saving to the displayed file. The message “Recording Stopped” will appear
6. To save a new measurement series to a new file, proceed as described in step 1.

6.2.3.2 Peak

To detect a peak value, select the Peak setting. When the measured value is displayed, start the detection by briefly pressing the START/STOP button.

Please note that a peak can only be detected above the threshold value of +/- 5% of the nominal measured value. For example, 100N measurement range: Peak detection from +5N or -5N.

The message “Peak running” appears on the display. Perform your measurement. If a peak value is reached and then drops again, the measurement ends. You can now view the file name of the created measurement on the display and enter it into your measurement log.

6.2.3.3 Manual without statistics

Use this mode to manually save the measurement values currently displayed after initialization at the touch of a button.

1. Press the START/STOP button. The display shows “Manual running.” This value is not yet saved.
2. Each subsequent short press of the START/STOP button saves the currently displayed measurement values. The number of saved values is shown in the lower right corner. To the left of this is the file name under which the data is saved.
3. Press and hold the START/STOP button until “Manual ended” appears on the display to end the measurement series. No further data points can be saved in this file.
4. Pressing the START/STOP button again restarts the mode from the beginning and creates a new file.

6.2.3.4 Manual with Statistics

The manual saving of measurement values is the same as described in the chapter "6.2.3.3 ."
In addition, the min, max, and average values of the saved measurement values are displayed here.

6.2.4 Channel Limits

This setting controls the displayed traffic light when working in the Measurement window. Change the values by clicking on them with the touch pen.
If the function is not needed, enter the negative characteristic value of the sensor as MIN and the positive characteristic value as MAX. The traffic light remains permanently yellow.

6.2.4.1 Yellow

Displayed measurement value is below the entered MIN value

6.2.4.2 Green

Displayed value is between the entered MIN and MAX values

6.2.4.3 Red

Displayed measurement value is above the entered MAX value

6.3 Sensor Settings

Select the channel on which you wish to make settings. Only external channels to which a sensor is connected are displayed. For external sensors, use only the connectors with memory chips installed by SAUTER.
Force gauges and optional external sensors, as described in the chapter "8.2 ," are shipped pre-calibrated. Only make adjustments on this page if your device no longer displays the correct (and verified) measurement values and you have experience calibrating force gauges. For calibrated force gauges, a new calibration must be performed after an adjustment.

6.3.1 Calibration

To recalibrate a device, you need a calibration weight. Ideally, this should match the rated load of the sensor being calibrated.

6.3.1.1 Measurement Range and Unit

Do not change these values. A new adjustment will be necessary, and possibly also a recalibration!

6.3.1.2 Resolution

The displayed value is the smallest adjustable resolution. As described in the chapter "6.2.2 ," set the resolution required for your application before performing the measurement.

6.3.1.3 Two-point calibration

Click on "Adjustment" and then on "Two-point adjustment."

6.3.1.3.1 Enter the calibration weight values

Enter your calibration points in the upper section of the display under "Value?". For example:

- Positive adjustment point: 500 N
- Negative calibration point: 0 N

It is recommended to calibrate using a weight that is as close as possible to the nominal value. For example, a weight of 400 N to 500 N for a force gauge with a maximum measuring range of 500 N. Calibration weights that are too small will result in a high measurement error!

6.3.1.3.2 Load and unload before calibration

Load and unload the device at least 3 times with the rated load.

6.3.1.3.3 Read in calibration points

Now read in the calibration points set in6.3.1.3.1 . Once you have attached the respective calibration weight, click on “Positive Calibration Point” and “Negative Calibration Point” in the lower part of the display. After successful recording, the raw values will be displayed to the right with a checkmark next to them.

6.3.1.3.4 Save calibration

Save the calibration by clicking Save. If the calibration has been successfully saved, a checkmark icon will appear to the right of it.

6.3.1.3.5 Checking the calibration

Use your calibration weights to verify the settings you have made. To do this, follow the procedure described in the chapter "5 ."

6.3.2 Calibration data

On this page, you will find information if a measuring device with an internal cell (CH0) or a device with an external measuring cell (CH1 to CH4) was calibrated at the KERN laboratory.

The specified measurement channel indicates which channel (CH1 to CH4) an external sensor was connected to during adjustment and calibration. It is recommended to always use external sensors on the same channel and on the same measuring device on which they were adjusted and calibrated to keep measurement errors to a minimum.

The calibration date indicates the date of the last calibration. Under "Certificate," you will find the calibration number, which allows you to assign the corresponding certificate.

6.3.3 Overload Values

On this page, you can see the three highest overload values, provided that overloads exceeding the rated load occurred. Avoid overloads! These lead to measurement inaccuracies, can damage the sensor, and void the warranty on your device!

6.4 Internal memory

6.4.1 File name format

f_ddMMyy_hhmmss

f: stored measurement function
- M = Manual measurement function
- T = Track measurement function
- P = Peak measurement function

The rest of the filename consists of the date and time when the file was created

6.4.2 Send file

If you connect the measuring device to a PC via an interface, you can send the selected files to the PC. The optionally available SAUTER AFI 2.0 plugin for MS Excel is recommended for this purpose.

6.4.3 Delete file

Select the files you no longer need to delete them. Do not store data on the device. Transfer it to another storage medium as soon as possible and clear the entire data memory of the FS!

6.4.4 Reading files

It is not possible to read files using a PC. The PC must be set to receive mode at the interface in order to receive the files sent by the FS.

7 Turn off the device

Press and hold the ON/OFF button until the device turns off.

8 Accessories

When attaching accessories to your sensor, please note that the weight of the accessories must be taken into account as dead weight!

8.1 Standard accessories for force transducers with internal load cell

- AC 43 Standard metal attachments
- AE 01 Standard Clamp, clamping range from 0 to 7 mm, 0 to 500 N
- AE 02 Wide-jaw clamp, clamping range from 0 to 6 mm, 0 to 500 N
- AE 03 Strap clamp, clamping range from 0 to 2.5 mm, 0 to 500 N
- AE 04 Strap clamp, range from 0 to 6 mm, 0 to 500 N
- AE 05 Cable and thread clamp, 0 to 500 N
- AE 06 Cable pull-through clamp, clamping range 1.5 to 6 mm, 0 to 500 N
- AE 07 Wedge clamp, clamping range 0 to 6 mm, 0 to 500 N
- AE 2K Screw-type clamp, clamping range 0 to 15 mm, 0 to 2000 N
- AE 500 Screw-type clamp, clamping range 0 to 10 mm, 0 to 500 N
- AFK 02 Handle for force measurement devices

Additional accessories can be found in the webshop at www.sauter.eu

8.2 External load cells





External sensors are available in the webshop at www.sauter.eu. For each sensor, you need the service corresponding to the rated load from the following table, including connector and memory chip:

FS 402	Connector for FS incl. PARAMETER MEMORY mounted on load cell and two-point calibrated with weight up to 0.5 kN
FS 403	Connector for FS incl. PARAMETER MEMORY mounted on load cell and two-point calibrated with weight up to 2 kN
FS 404	Connector for FS incl. PARAMETER MEMORY mounted on load cell and two-point calibrated with load up to 5 kN
FS 405	Connector for FS incl. PARAMETER MEMORY mounted on load cell and two-point calibrated with load up to 20 kN
FS 406	Connector for FS incl. PARAMETER MEMORY mounted on load cell and two-point calibrated with load up to 50 kN
FS 407	Connector for FS incl. PARAMETER MEMORY mounted on load cell and two-point calibrated with load up to 120 kN
FS 408	Connector for FS incl. PARAMETER MEMORY mounted on load cell and two-point calibrated with load up to 250 kN

8.2.1 Adjustment and Calibration



To adjust and calibrate the entire measurement chain, a measuring instrument and sensor are required at the Kern laboratory! Your QM representative can provide you with information on the timeframe within which recalibration is necessary. We recommend obtaining a DAkks calibration certificate for every new device and sensor.

8.2.2 Additional sensors

If you purchase additional sensors for your device at a later date, you must send the device to the KERN laboratory, as the entire measurement chain is required for adjustment and calibration.
Check which other sensors in your inventory currently require recalibration or will do so in the foreseeable future, and send them all together to the KERN laboratory to minimize shipping costs and downtime. Please observe the nationally and internationally applicable transport regulations for devices with built-in lithium-ion batteries.

8.3 Carrying Case for Accessories

The accessory transport case with the item number FS TKZ is available for the transport and storage of external sensors, accessories, and tools. The transport case for the force measuring device included in the scope of delivery can be connected to several other cases using the “T-LOCK” closure.



8.4 Reading stored measurement values with the EXCEL plugin

With the optionally available EXCEL plugin SAUTER AFI 2.0, stored measurement data can be transferred to a PC. (EXCEL software not included!)

9 Power supply

9.1 Charging the Battery

The device comes equipped with a battery from the factory. Charge the battery using the included USB-C cable and a power source with the following specifications:

- Voltage: 5V DC
- Current: 1A

When a power source and USB cable are properly connected, the plug icon appears on the display to the right of the battery charge level when the device is turned on.

9.2 Power Adapter

In some countries, a different AC adapter may be required to connect to the local power grid. The adapter or AC power supply used must not exceed the output values at the USB port:

- Voltage: 5V DC
- Current: 1A



Do not use a defective or damaged AC adapter! There is a risk of death due to high voltage!

9.3 Power supply via PC

The device can also be powered via a USB-C cable from a PC to simultaneously transfer data via the USB interface.

10 Interface

10.1 Interface description

10.1.1 USB

This is a virtual USB interface. The device is not recognized as a storage medium!
Baud rate: 115200 Data bits: 8 Stop bits: 1 Parity: none

10.2 Interface protocol

The KCP (KERN Communication Protocol) interface protocol can be downloaded from the website www.kern-sohn.com.
Important ASCII interface commands:

- SI Immediately sends the current display without waiting for stable conditions.
- SIR Send the current reading immediately and repeat
- U Query the display unit
- ZI immediately zero
- @ Cancel / Unsubscribe

8 Battery operation / Power supply

⚠ WARNING



Fire and explosion hazard due to improper charging or a defective battery



Fire or explosion can cause serious injury

- ⇨ Be sure to follow the instructions regarding batteries in the Safety chapter.
- ⇨ Observe national and international transport regulations for devices with a built-in lithium-ion battery.
- ⇨ Do not replace defective batteries yourself! Contact SAUTER or an authorized dealer directly.

This device is equipped with a built-in rechargeable lithium-ion battery. Please use the original battery and do not substitute other batteries to avoid damage to the device or other malfunctions.

- Nominal voltage 3.7 V
- Capacity 3200 mAh

The battery should be fully charged before first use. Use the included power adapter for this purpose.

9 Maintenance, Care, and Disposal



Disconnect the device from the power supply before performing any maintenance, cleaning, or repair work.

9.1 Cleaning

Clean the device with a damp, soft, lint-free cloth. Make sure that no moisture penetrates the housing. Do not use sprays, solvents, alcohol-based cleaners, or abrasive cleaners; use only plain water to dampen the cloth.

9.2 maintenance and Repair

Do not make any modifications to the device or install any replacement parts. Contact the manufacturer for repairs or device inspections.

9.3 Disposal



Old devices and accessories do not belong in household waste.

The operator must dispose of the packaging and the device in accordance with applicable national or regional laws at the user's location.

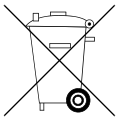
The device consists of various components and materials, such as:

- Electronic components (circuit boards, electrical wires)
- Plastic (housing)
- Metal

Improper disposal of the device can have harmful effects on people and the environment.

Proper and environmentally sound disposal can prevent harmful effects and allow for the recovery of raw materials.

Disposal of rechargeable and non-rechargeable batteries:



Rechargeable and non-rechargeable batteries do not belong in household waste.

The operator must dispose of rechargeable and non-rechargeable batteries in accordance with applicable national or regional laws at the user's location.

10 Battery Act

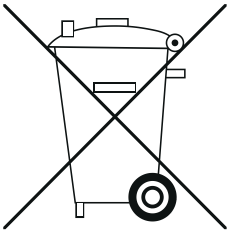
Note in accordance with the Battery Act (BattG):

INFORMATION

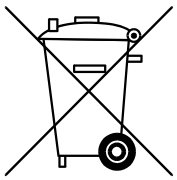
- The following information applies to Germany.

In connection with the sale of batteries and rechargeable batteries, we as a retailer are obligated under the Battery Act to inform end consumers of the following:

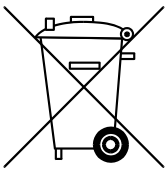
- End consumers are legally obligated to return used batteries and rechargeable batteries.
- Batteries and rechargeable batteries can be returned free of charge to municipal collection points or retailers after use. The batteries/rechargeable batteries must have reached the end of their normal service life; otherwise, precautions must be taken to prevent short circuits.
- The return option is limited to batteries and rechargeable batteries of the type we currently carry or have carried in our product range, as well as to the quantity that end consumers typically dispose of.
- A crossed-out trash can symbol means that you must not dispose of the batteries or rechargeable batteries in household waste under any circumstances. Old batteries or rechargeable batteries may contain hazardous substances that can harm people and the environment if not disposed of properly.



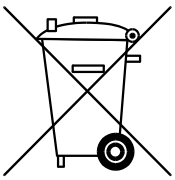
- Batteries containing hazardous substances are marked with a symbol consisting of a crossed-out trash can and the chemical symbol (Cd = cadmium, Hg = mercury, or Pb = lead) of the heavy metal responsible for the classification as containing hazardous substances.



Cd



Hg



Pb