

SensorData® Easy

Quickstart guide and manual



SOEMER

Ideen & Messtechnik.

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Safety instructions and technical support

Please read these **operating instructions** before using the device for the first time. Any person responsible for installing, commissioning, operating or maintaining the device must have read at least the relevant parts of the operating instructions.

The operating instructions are part of the product. Please keep them in such a way that they are accessible to all users at all times. If you pass the device on to third parties, always pass it on together with the documents relevant to the device.

Safe operation of the **SensorData Easy** can only be guaranteed if you follow the instructions in the manual. If the weighing indicator is used in a safety-relevant location and there is a risk of personal injury or other damage to the system in the event of failure, additional precautions should be taken to prevent this. If you have any questions regarding the application, please contact one of our technicians.

Technical support

Of course, we are also happy to help you personally with any other technical questions: You can reach our service technicians Monday to Friday from 8:00 a.m. to 4:30 p.m. at the following extension:



+49 2721 9262 64

Operating instructions

- ✓ The device should ideally be mounted in a housing or switch cabinet.
- ✓ Protect the device from direct contact with water and other liquids.
- ✓ Choose an installation that protects the device from the weather.
- ✓ Please check the specifications for protection class IP65, which must be observed for front installation.
- ✓ Please note the technical data and specifications on the following page.

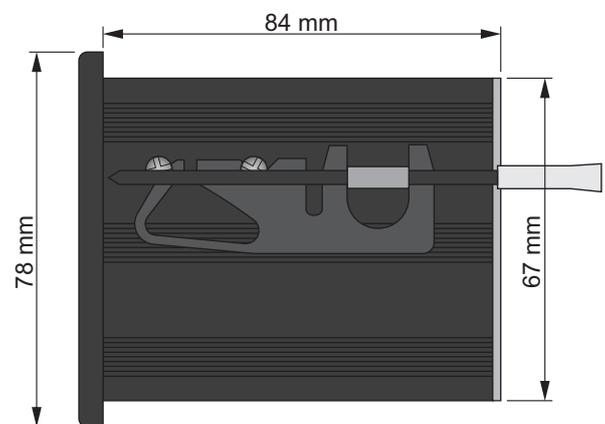
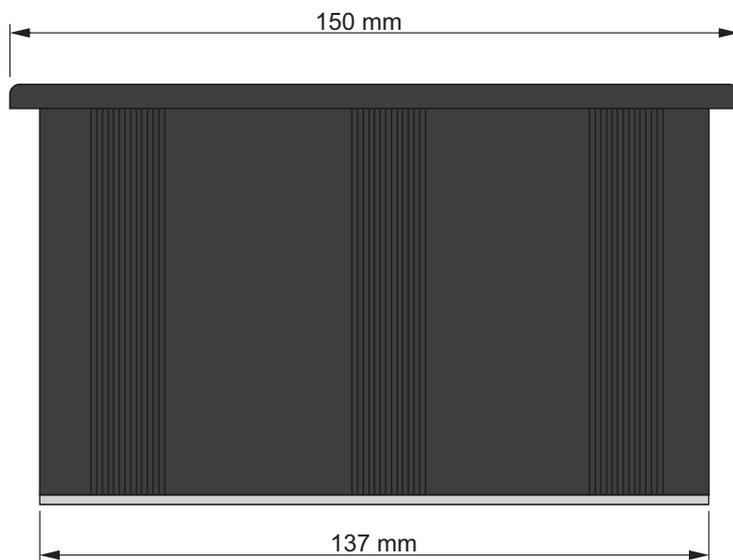
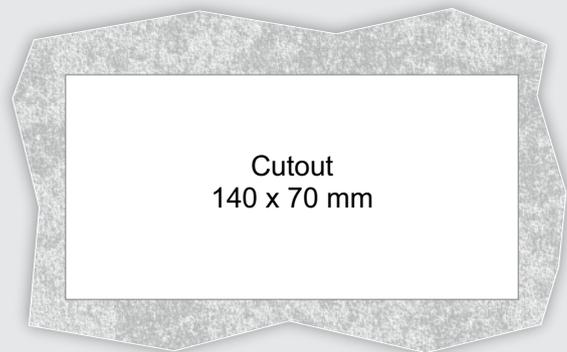
Maintenance

- ✓ The *SensorData Easy* is maintenance-free.

Cleaning

- ✓ Disconnect the power supply before cleaning.
- ✓ Clean the housing with a slightly moistened cloth.
- ✓ Do not use solvents to clean the front label.
- ✓ When cleaning, make sure that no liquid enters the unit or the connections.

Housing views and cut-out for control cabinet installation



Specifications

Linearity	: < +/-0,005 %
Bridge Supply Voltage	: 5 VDC, 6 wire technique, max. up to 8 DMS Load cells with 350 Ohm or up to 16 DMS Load cells with 1.100 Ohm
Input Signal Range	: max. 3,5 mV/V, Common-Mode Rejection 50/60 Hz > 200 dB
Signal Filter	: from 0 ... 100 Hz adjustable
Display	: 2,8" TFT LCD Display 320 x 240 Pixel, Contrast 350:1, Brightness 200 cd/m ²
ADC Resolution	: 24-Bit-A/D-Converter with 1.600 measurements per second
Digital Logic Inputs	: 3 optically isolated inputs, external keyboard control, 18 ... 36 VDC logic level
Digital Logic Outputs	: 4 optically isolated semiconductor relays, max. Load 36 VDC / AC (0.5 A)
Serial Interface (Option)	: RS-232 and RS-422 4-wire technology, optically isolated, 1200 to 115,200 baud, bus capable and addressable from 0 ... 255
Other Interfaces	: Ethernet/IP (Standard), Profibus (Optional)
Temperature Effect	: <12 ppm/°C to zero and <10 ppm/°C to sensitivity
Temperature Range	: -10 °C bis +40 °C, Storage temperature range -20 °C bis +60 °C
Analog Output, passiv (Option)	: 0/4 ... 20/24 mA, 16-Bit-D/A-Converter resolution, as gross, net or tare assignment
Housing	: Aluminum continuous casting, painted black
Dimensions	: 150 x 78 x 87 mm, Weight: about 800 g, Protection IP65 (front mounting)
Cut Out	: 140 x 70 mm, Installation depth: 82 mm (without plugs)
Power supply	: 18 - 36 VDC/AC; Optionally available: plug power supply. 100 - 240 VAC 50/60 Hz

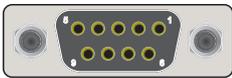
D-SensorData-Easy-061118

3.1 Connection diagram: Serial interface RS232 / RS422

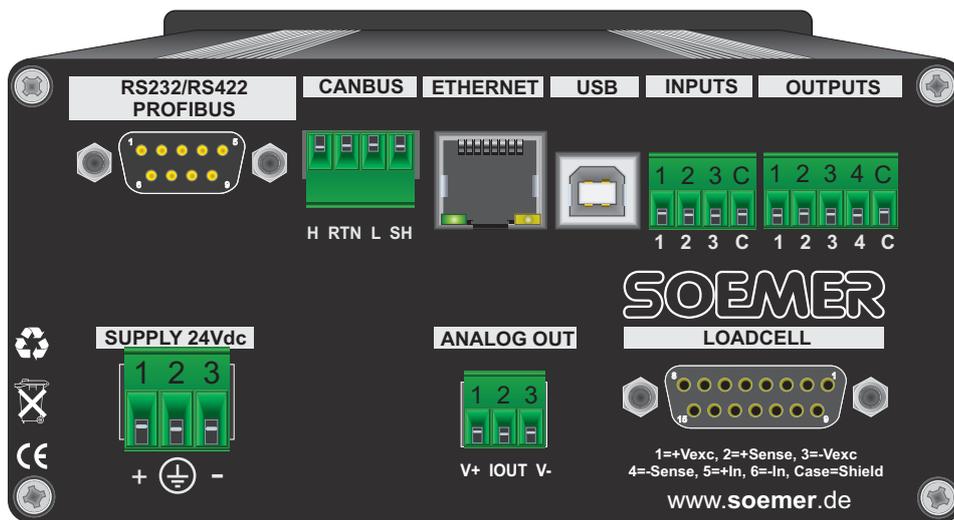
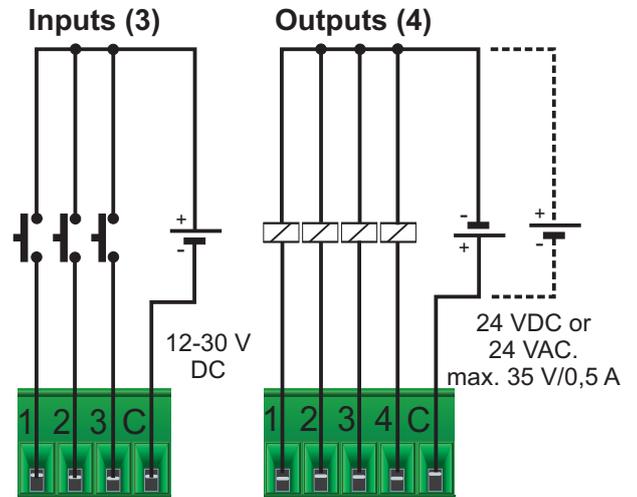
Serial interface RS-232/RS-422

RS-232 Interface (COM2)			PC or SPS		
PIN EASY	Function	Symbol	PIN PC/SPS	Function	Symbol
2 ←	Receive data	Rx	3 →	Transmit data	Tx
3 →	Transmit data	Tx	2 ←	Receive data	Rx
5	Ground	GND	5	Ground	GND

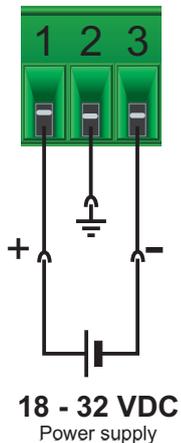
RS-422 Interface (COM1)			Master		
PIN EASY	Function	Symbol	PIN PC/SPS	Function	Symbol
1 ←	Receive data	-Rx	6 →	Transmit data	-Tx
4 ←	Receive data	+Rx	9 →	Transmit data	+Tx
6 →	Transmit data	-Tx	1 ←	Receive data	-Rx
9 →	Transmit data	+Tx	4 ←	Receive data	+Rx



SUB-D-9 Connector
 Cable: female
 EASY-Port: male
 RS-232 Port: COM 2
 RS-422 Port: COM 1

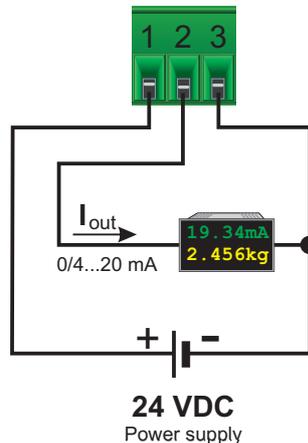


Power supply



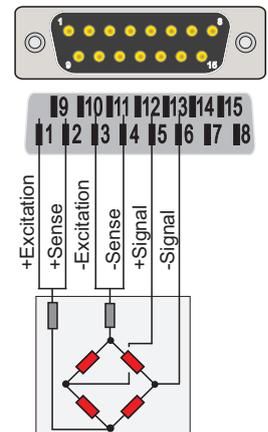
Analog-Output 0/4-20 mA

Optional not standard!



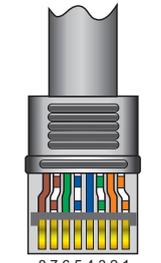
DMS-Sensor-Connector

6-Wired



3.2 Connection diagram: Ethernet (RJ-45) and USB

RJ-45 Ethernet

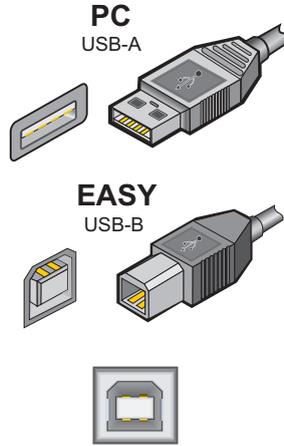


Implemented protocols
 TCP/IP
 Ethernet IP
 ASCII over Ethernet

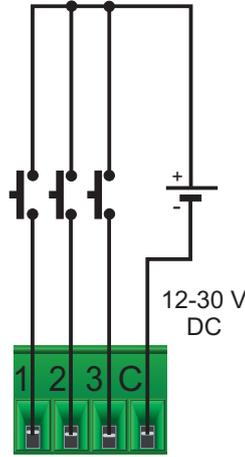
Connection plan

PIN 1 +Tx ==>
 PIN 2 -Tx ==>
 PIN 3 +Rx <==
 PIN 4 n/c
 PIN 5 n/c
 PIN 6 -Rx <==
 PIN 7 n/c
 PIN 8 n/c

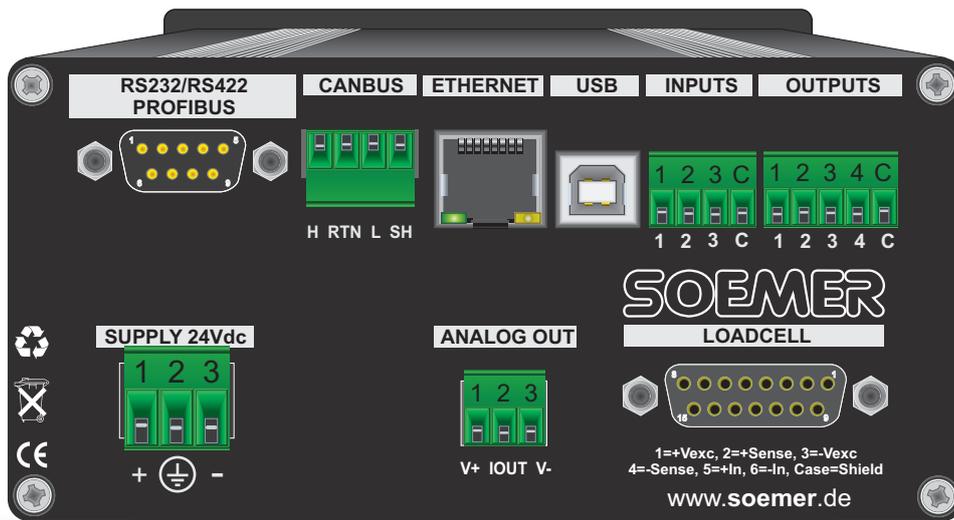
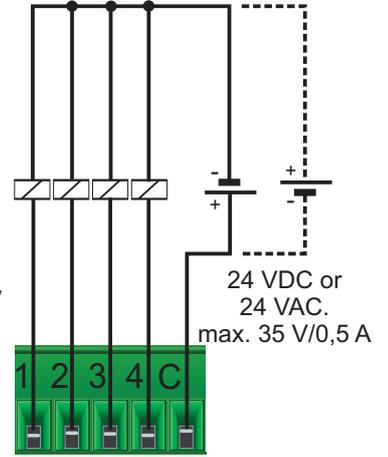
USB Connector



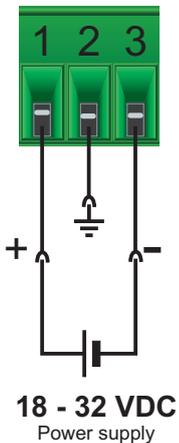
Inputs (3)



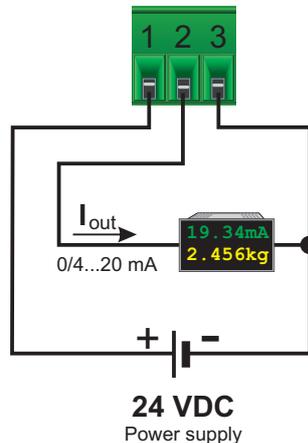
Outputs (4)



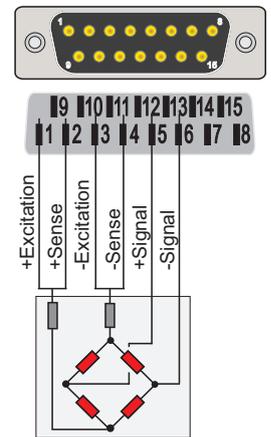
Power supply



Analog-Output 0/4-20 mA
 Optional not standard!

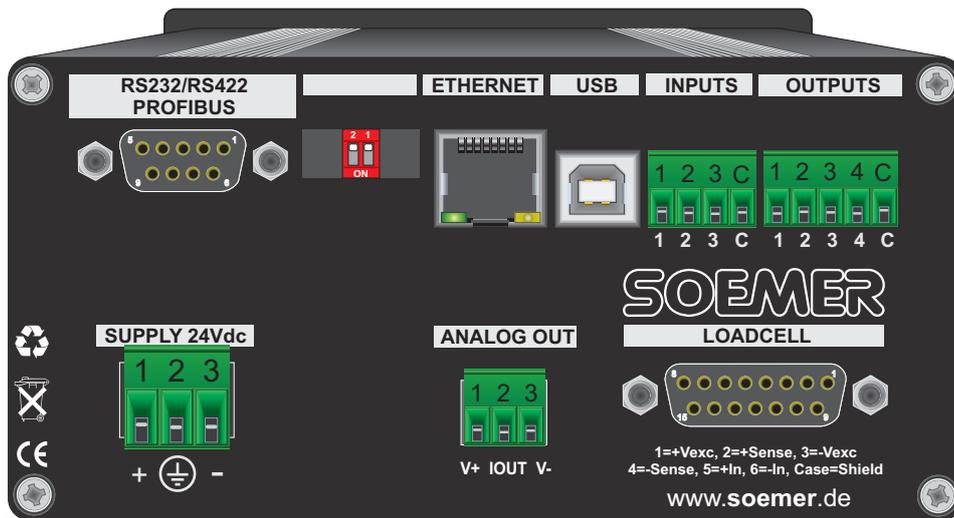
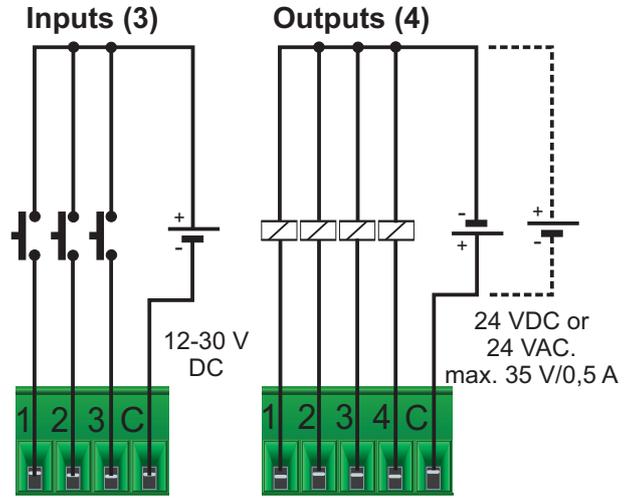
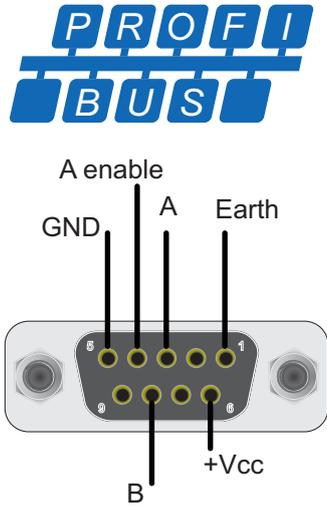


DMS-Sensor-Connector
 6-Wired

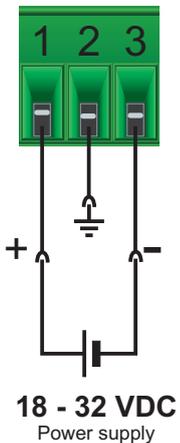


3.3 Connection diagram: Profibus

Profibus Port connection

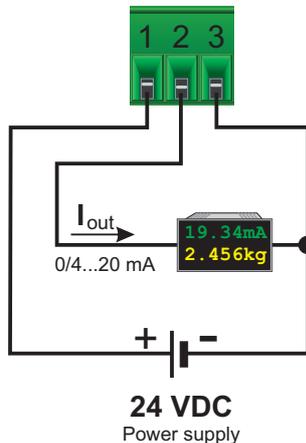


Power supply



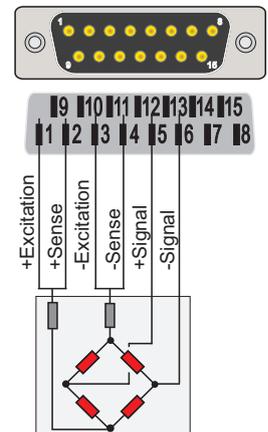
Analogue-Output 0/4-20 mA

Optional not standard!

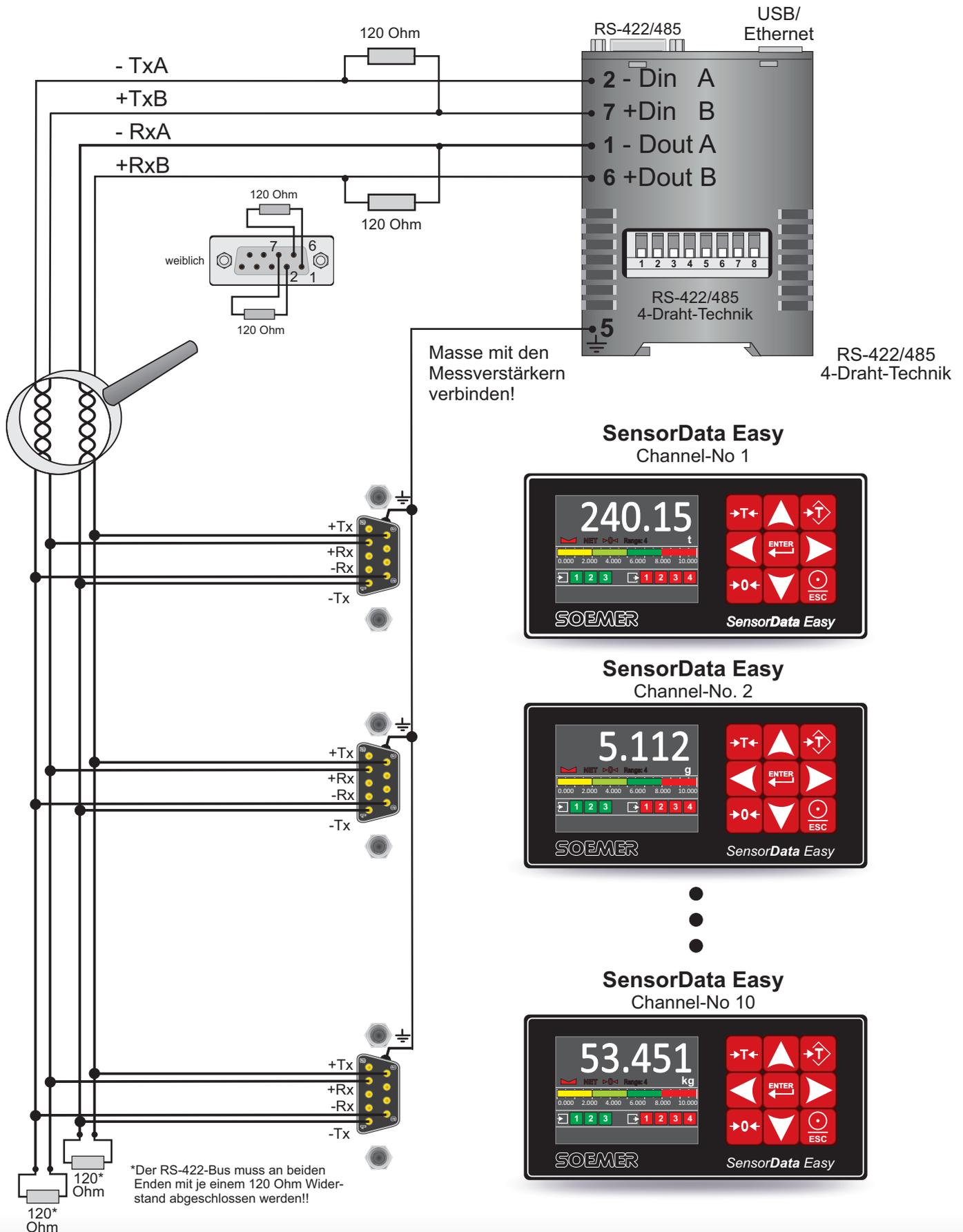


DMS-Sensor-Connector

6-Wired

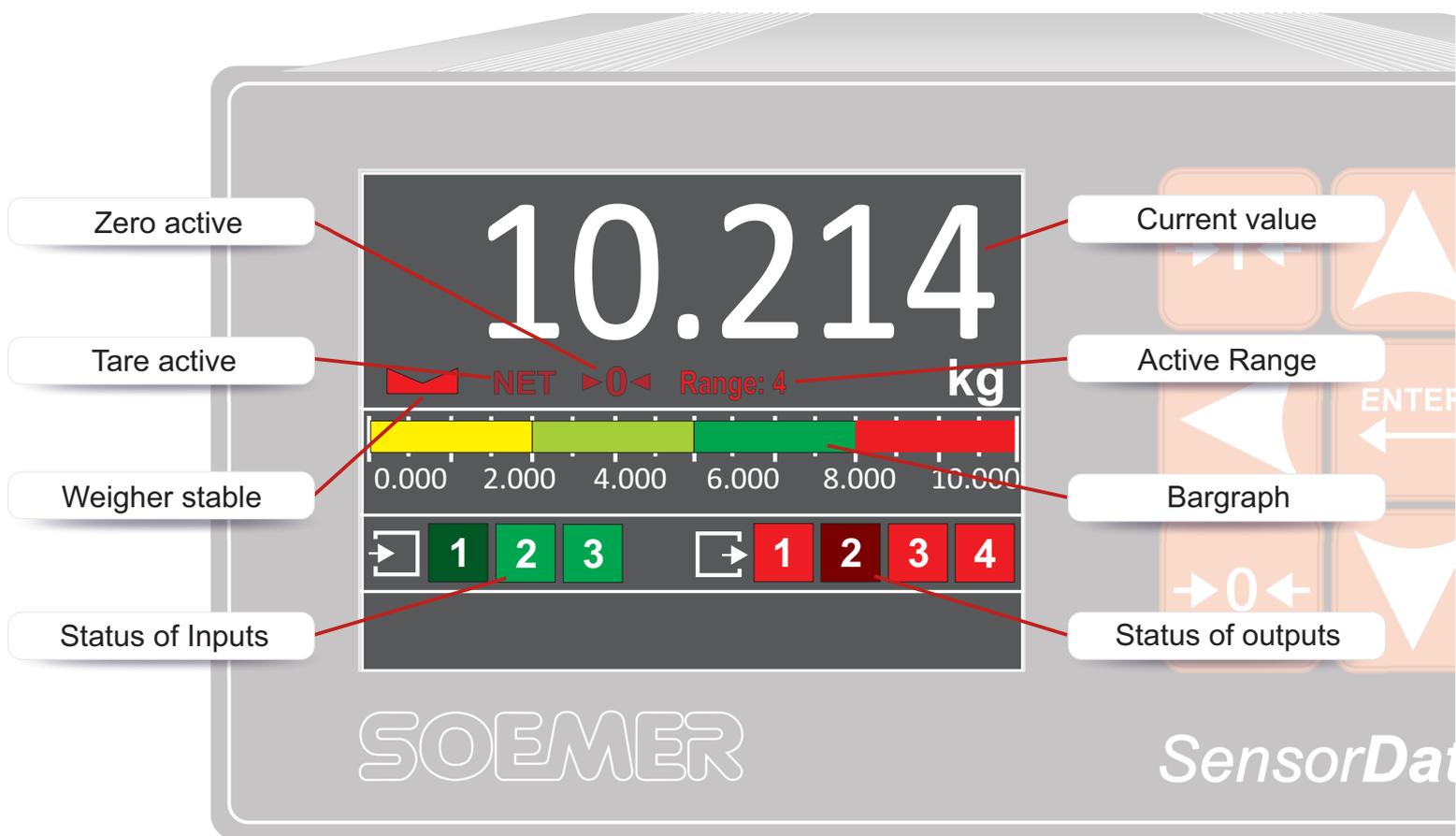


3.4 RS-422-Bus to USB or Ethernet



4.1 Screen Display

The **SensorData Easy** measuring device has a colored 5" display that was developed for the universal use of strain gauge sensors. The main display is 20 mm high and can still be clearly read from a distance of 10 m. The main display is also available in a variety of colours. The individually adjustable bar graph display allows the fast reading of sensitive measured values in large as well as very small ranges, which can be specially selected for the respective application. Status displays of the digital inputs and outputs or of the balance itself complete the overall picture of the screen display.

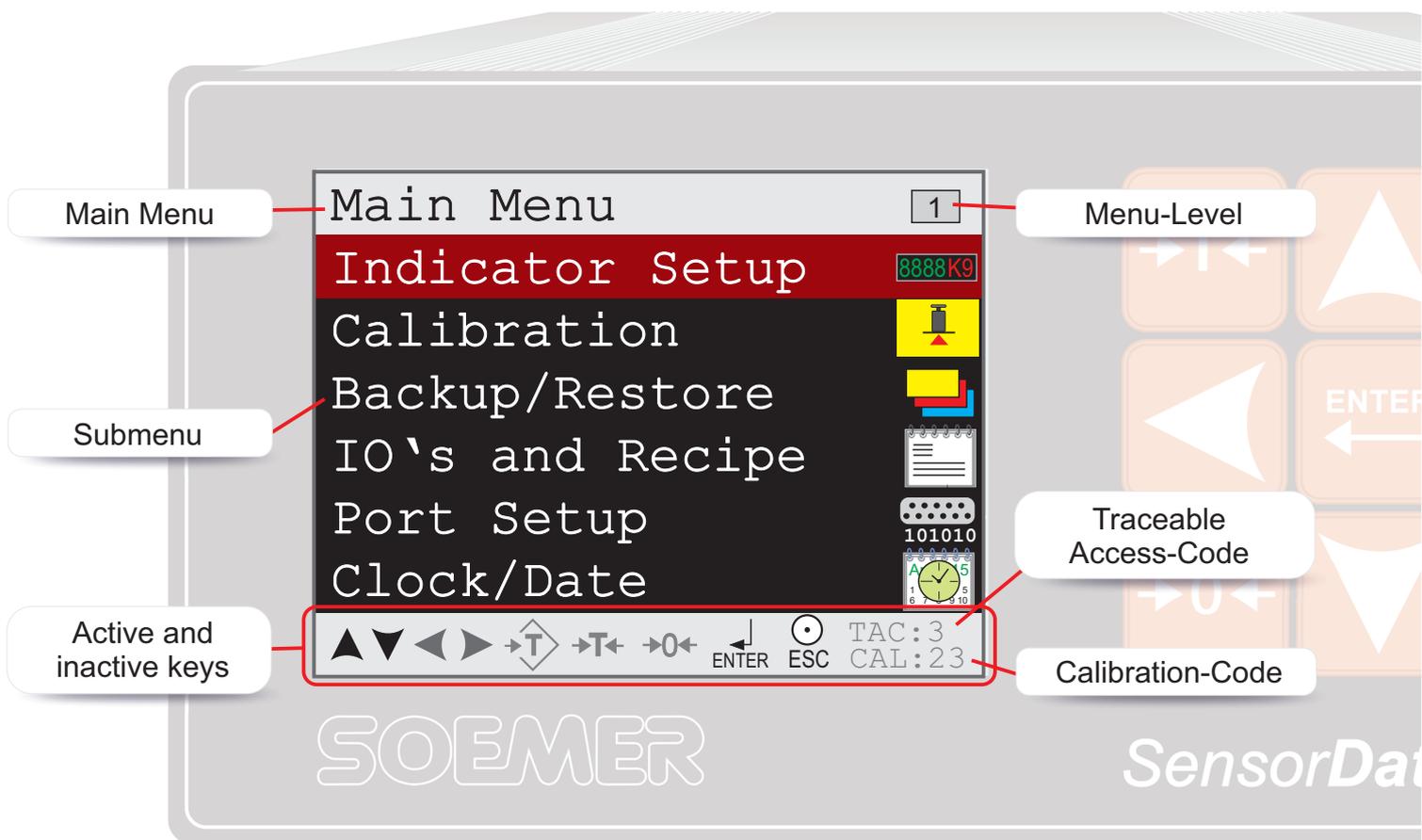


4.2 Menu Display

All system settings of the **SensorData Easy** are made via a simple and intuitive menu structure.

All active operating elements are marked in **bold**. Elements highlighted in light grey are inactive in the currently displayed menu and have no function in this menu.

Tip:
You can reach the main menu by holding down the "Enter" key for **2 seconds**.



4.3 Keyboard and special functions



A high-quality foil keyboard with backed microswitches protects the **SensorData Easy** reliably against environmental influences and at the same time offers the necessary EMC protection for the sensitive input signals in the μV range.

A total of nine individual keys form the ergonomic navigation centre of the measuring device. In addition to the familiar standard functions, the individual keys can also be assigned individual special functions.



Tare. Press the key to tare the display. Press the key again to reset the function. The NET display shows the status.



Up key. With this key you can move up in the menu structure or increase numbers. This key can activate individually adjustable special functions.



Set fixed tare. A fixed tare value can be activated here. Press again to reset the function.



Down key. This allows you to move down in the menu structure or decrease numbers. This key can activate individually adjustable special functions.



Zeroing. With this you can set the display in a preselected measuring range to zero. Reset by pressing the zero key >2 s.



Left key. With this key, you can move to the left in the menu structure. This key can activate individually adjustable special functions.



Escape/Print. Within the setting menus, this key has the escape function. In the basic menu, you can print either the current value <2 s or the sum >2 s.



Right button. With this key, you can move to the right in the menu structure. This key can activate individually adjustable special functions.

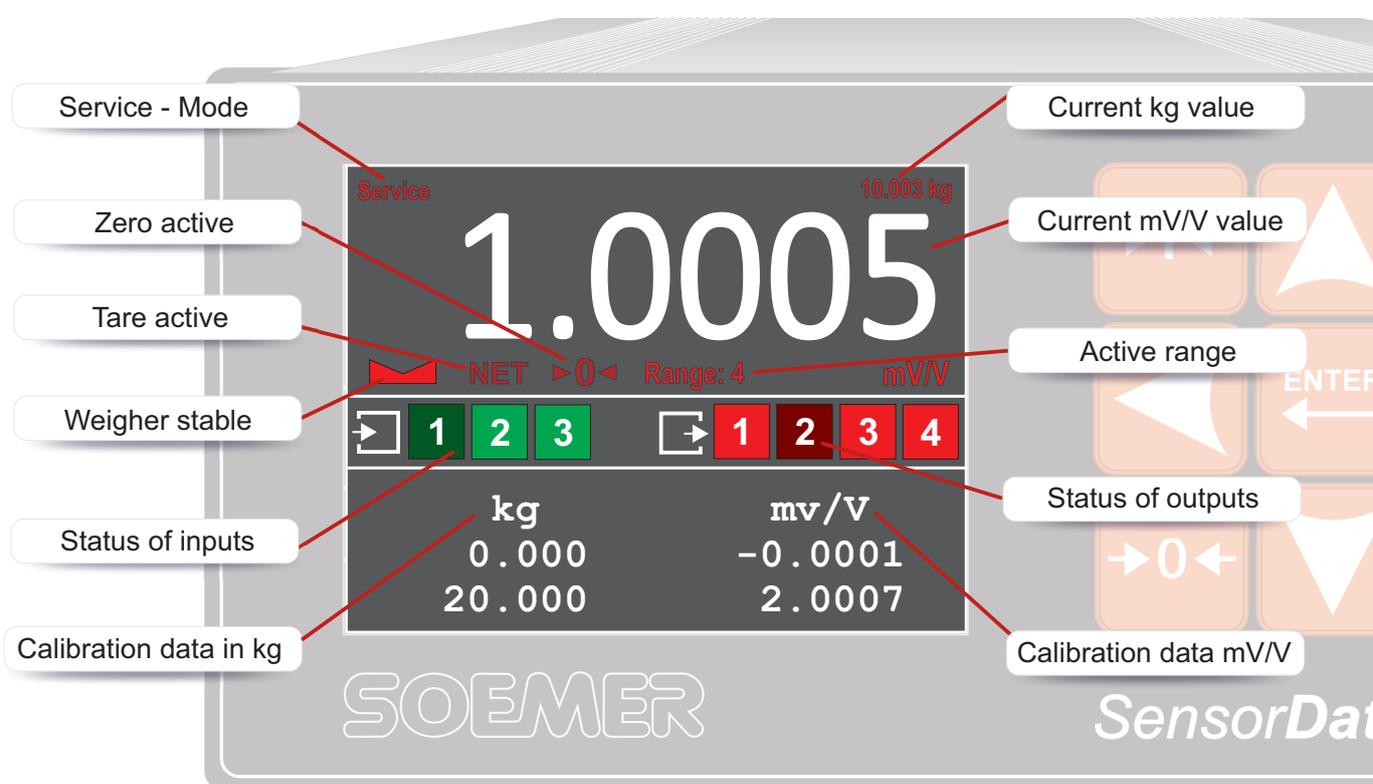


Enter. Pressing the Enter button for more than 2 seconds will take you to the main menu of the measuring device.

4.4 Service-Display

The **SensorData Easy** meter has an **intelligent service menu** that displays **all important settings** as well as the **current valid calibration**. A service technician gets **perfect information for error analysis** with the help of the large mV/V main display, the calculated weight value in kg and the displayed current 2-point calibration.

Of course, we are also happy to help you personally: You can reach our service technicians Monday to Friday from 8:00 a.m. to 4:30 p.m. at the following extension:



```

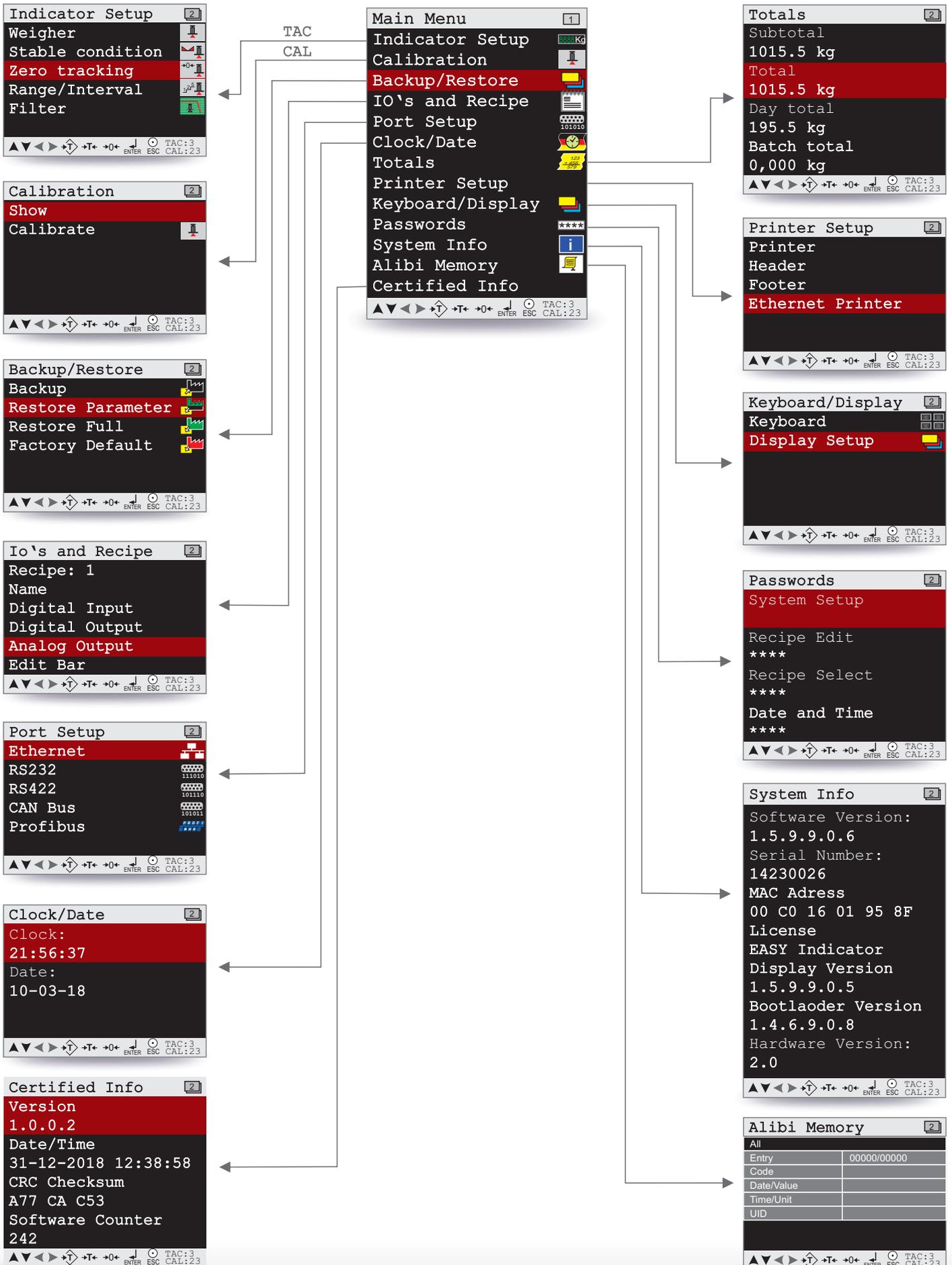
Service
Datum: IP 192.168.111.033
Kunde: MASK 000.000.000.000
Option: GATEWAY 000.000.000.000
Bemerk: PRINTER IP 003.000.000.000

RS232 Kein 9600N81
RS422 ASCII 9600N81
CAN Kein
PROFIBUS Kein

Software Version: 1.5.9.9.0.6
Seriennummer: 14260165
    
```

Two additional screen pages display additional information and important communication settings of the meter. In the case of a service call, the software version and any built-in hardware options are particularly important for a telephone error analysis by one of our service technicians.

To exit the SERVICE menu, please press any key several times until you are back in the main menu.



Practical example: Setting a 100,00 kg scale

Every measuring task in weighing technology is very individual and often even unique. For this reason, the connected electronics must be highly flexible, accurate, readable, certified, networked and compatible. Many of these requirements are already met by the basic version of the **Sensordata Easy** measuring instrument, but it can also be extended and supplemented with a wide range of additional options.

In order to achieve optimum results for the individual application, a precise analysis of the measuring task is required. The desired objectives, such as display resolution, accuracy, limit values, etc., are then defined in this analysis and the important setting parameters for the measuring instrument are determined.

Platform load cell 1040 - 100 kg

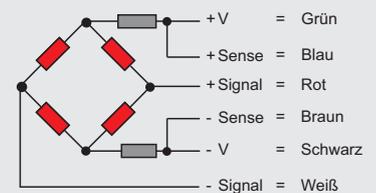
A practical example is the best way to explain the possibilities of the **SensorData Easy** or to illustrate the individual functions of the measuring instrument. We have selected a standard 100 kg platform scale for this purpose, which is to be used as a filling scale for foodstuffs with a resolution of 10 g. The scale is designed for use in the food industry. The load cell used has the following specification:



Measuring range
Rated output
Accuracy
Safe overload
Temperature range
Protection class
Material

0 - 100,00 kg
2,0184 mV/V
0,011 %
150,00 kg
-40 °C bis +70 °C
IP67
Aluminium

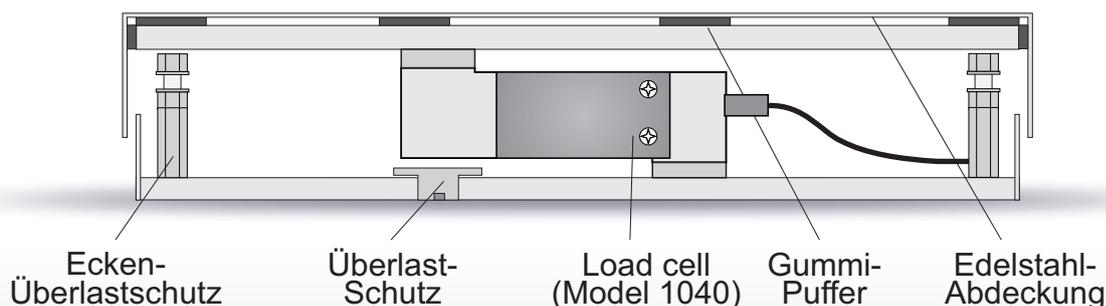
Electrical connections
6-Wire-cable



Installing and connecting the load cell

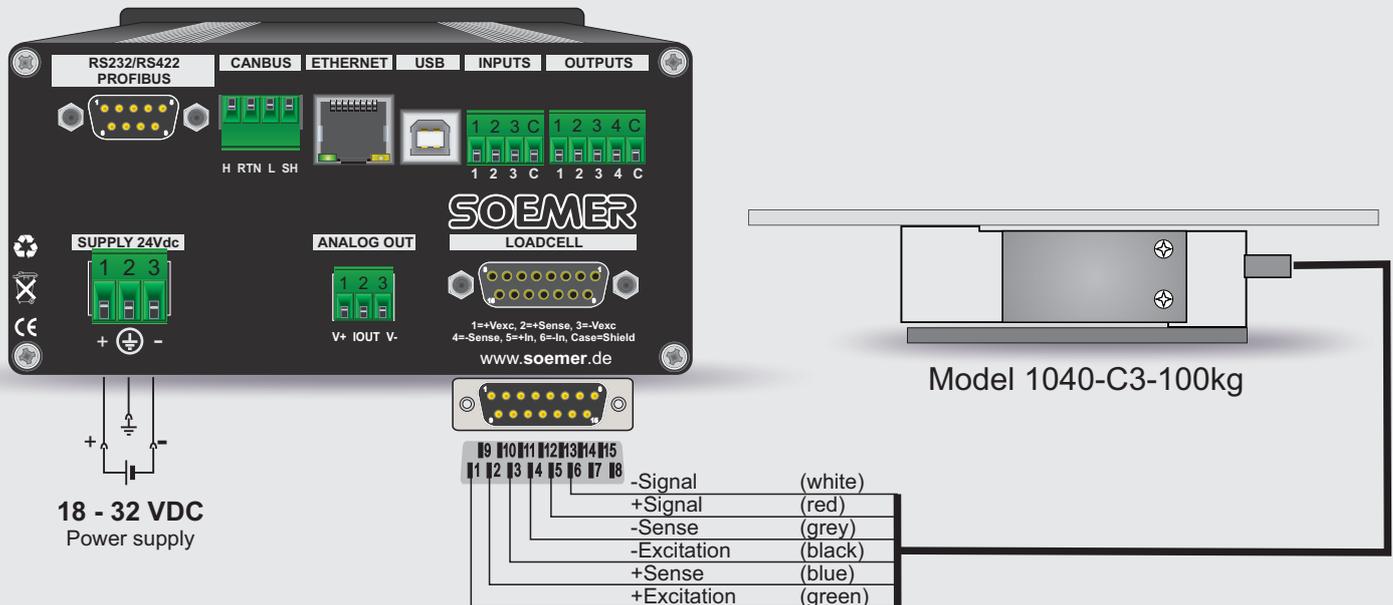
The load cell is carefully integrated into the mechanical structure and the correct mechanical function is checked. It is very important that the load cell is installed free of tension and movement and that any kind of force shunts are avoided. Mechanical stops should ensure that the load cell is not overloaded. In addition, small rubber bearings (which are installed under the weighing platform) can provide reliable protection against dynamic peak loads. The platform scale is now fully assembled and can be connected to the measuring instrument via the 6-wire connection cable as shown on the next page.

After you have set the most important parameters and calibrated the balance, it is immediately ready for operation.



Practical example: Setting a 100,00 kg scale

Wiring diagram load cell 1040-100kg



Adjustment and calibration

For a better understanding, we have answered all questions for an exemplary 100,00 kg scale and entered the optimum parameters for it. Since 100,00 kg can also correspond to 100,00 %, our example is also very easily adaptable to any other scale. **This is why we use this practical example as a "red thread" throughout the entire manual in order to be able to explain the interrelationships more easily.**

Questions and answers about the settings of the 100,00 kg scale

What is the desired measuring range?

0 100,00 kg

What is the desired resolution?

0,01 kg

Should a decimal point be used? If yes, where?

Yes - 2 decimal places: 000,00 kg

Where does the overload range begin and should the display warn against it?

At 110,00 kg and yes, the display should warn of overloads.

Should the scale carry out a zero point tracking independently in the zero point range?

Yes - Balance stability range +/-0.05 kg; overrun in 0,01 kg increments every second.

Are accurate weights available for practical calibration?

Yes - 5 precise weights of 20 kg are available (i.e. 100 kg in total).

Is there a certificate for the 100 kg load cell with information on sensitivity at rated load?

Yes - 2.0184 mV/V at 100.00 kg

On the next page we have listed all the parameters defined here in tabular form and briefly described their meaning. In addition, you will find a detailed list of the menu structure in the table in order to enter these parameters into the *SensorData Easy*.

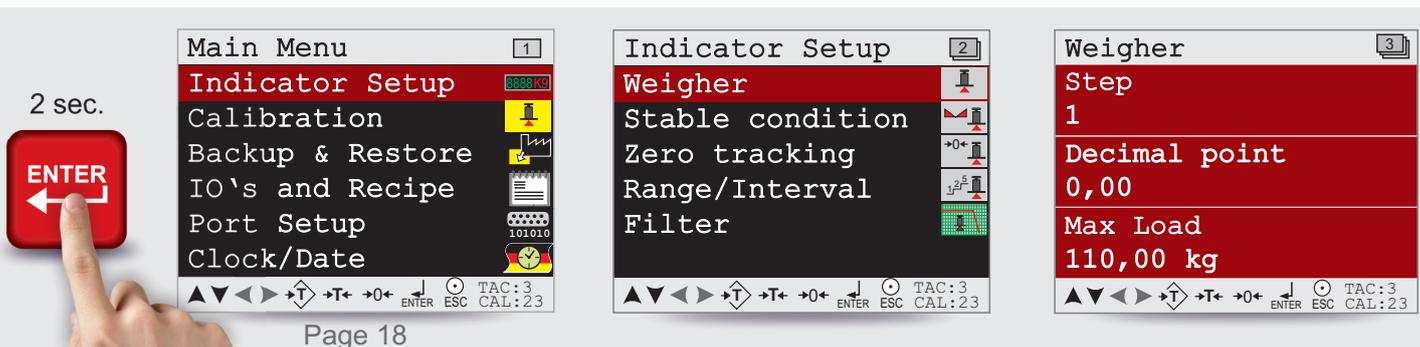
Practical example: Setting a 100,00 kg scale

Parameter table Practical example 100,00 kg scale

Description	Parameter	Menu item in EASY	Value table
Resolution display	0,01 kg	Main menu/Indicator setup/Weigher/Step	0,01 kg
Decimal point display	0,00 kg	Main menu/Indicator setup/Weigher/Decimal point	0,00 kg
Maximum display	110,00 kg	Main menu/Indicator setup/Weigher/Max load	110,00 kg
Zero tracking range	0,05 kg	Main menu/Indicator setup/Zero tracking/Bereich	0,05 kg
Zero tracking correction step	0,01 kg	Main menu/Indicator setup/Zero tracking/Schrittweite	0,01 kg
Correction time/partial step	1,00 s	Main menu/Indicator setup/Zero tracking/Time	1,00 s
Zero calibration (1)	0,00 kg	Main menu/Calibration/Calibrate/Zero	0,0125 mV/V
Gain calibration (2)	100,00 kg	Main menu/Calibration/Calibrate/Gain	2,0184 mV/V

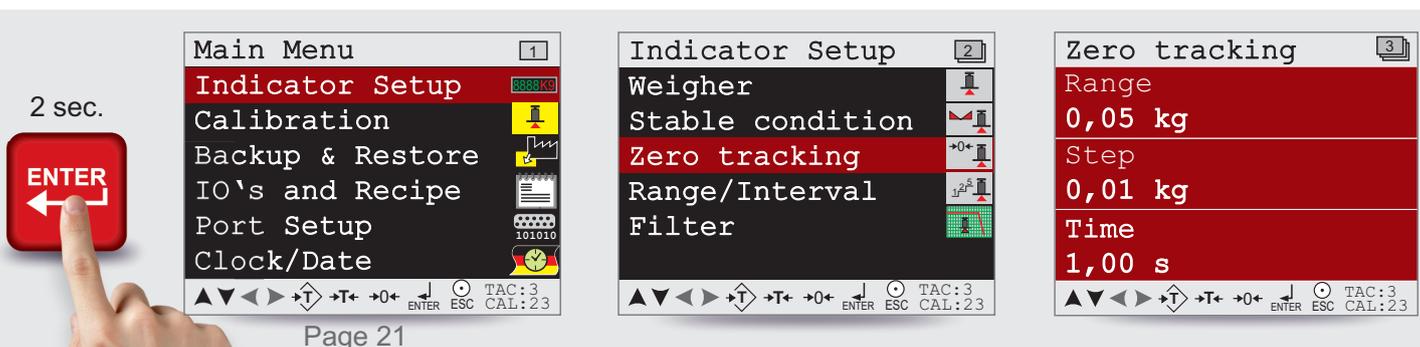
We have designed the menu structure to be as simple and self-explanatory as possible. This enables an experienced technician, after selecting the desired parameters, to completely set up and commission the measuring device according to the table above. In addition, we have compiled a **Quick Start Guide** for this practical example below. At each step you will find a page number where you can view the detailed description in the manual.

First we set the resolution, the decimal point and the maximum load according to the short table.



In the submenu **"Zero Tracking"** we now activate an automatic zero correction, also called "Zero Tracking". First you define the range in which the zero point is to be checked and automatically corrected according to the further conditions. +/-0,05 kg have been defined.

Under the menu item **"Step size"** the display step is indicated with which the measuring instrument approaches the zero point again and this with a speed of one step size per second. If a zero offset of 0,04 kg is then detected (e.g. after the balance has become dirty), the zero point correction starts with the stored conditions. After one second the display is set to 0,03 kg, then 0,02 kg, 0,01 kg and finally - after 4 seconds - to exactly 0,00 kg.



Practical example: Setting a 100,00 kg scale

1. Main Menu
Indicator Setup
Calibration
Backup & Restore
IO's and Recipe
Port Setup
Clock/Date

2. Calibration
Show
Calibrate

3. Calibrate

Load	mV/V
0,00kg	0,0000
100,00kg	2,0184
0,82kg	0,0165

4. Zero Point
Calibration Value
0,00 kg
Zero Point-Offset
0,0000 mV/V
Active Signal
0,0165 mV/V

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Calibrate zero

The zero point can be calibrated in two ways like the gain. Either by numerically entering the mV/V signal from the balance in the unloaded state, or by accepting the measured zero signal, i.e. the "current signal", from an unloaded balance. **If technically possible, we recommend that you completely unload the balance and then assign the current zero signal in mV/V to the zero point of the balance.** Immediately after this assignment, the signal should be displayed in the "Zero offset" and the "current signal" must be entered identically in the table. This entry makes it easy to see why it makes no difference whether you simply type in the known zero point value 0,00 kg (zero point offset) 0,00 kg or simply accept the zero point signal (current signal) when the scale is unloaded.

Later correction of the zero point, possibly due to mechanical changes in the balance structure, is possible at any time without any problems (without affecting the gain). Simply assign the new zero signal to the scale zero point - and you're done!

Zero Point
C
Calibrate
Z
0,0000 mV/V
Active Signal
0,0165 mV/V

Zero Point
Calibration Value
0,00 kg
Zero Point-Offset
0,0165 mV/V
Active Signal
0,0165 mV/V

1. Main Menu
Indicator Setup
Calibration
Backup & Restore
IO's and Recipe
Port Setup
Clock/Date

2. Calibration
Show
Calibrate

3. Calibrate

Load	mV/V
0,00kg	0,0000
100,00kg	2,0184
0,82kg	0,0165

4. Gain
Calibration Value
100,00 kg
Gain
2,0000 mV/V
Active Signal
2,0184 mV/V

Page 30

Calibration gain

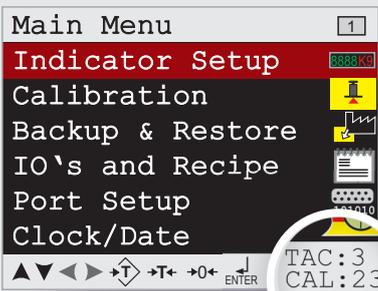
Calibrating the gain is as easy as zero calibration. There are also two ways to define the slope of the linear function $y = mx + b$. The calibration of the gain is as simple as the zero point calibration. Either you enter the signal in mV/V at nominal load in numerical terms (as shown in the load cell certificate) or you load the scale precisely with a known weight, enter this weight value as the "calibration value" and accept the displayed "current signal" as the reference value - and that's it!

You can use any known weight that you have previously checked on a precise scale (e.g. the precise weight of a person who then stands on the scale to be calibrated). It does not have to be a smooth calibration value, but for accuracy reasons it should be greater than or equal to 60% of the maximum weighing range. For a 100 kg scale, this means ≥ 60 kg.

Gain
C
Calibrate
G
2,0000 mV/V
Active Signal
2,0184 mV/V

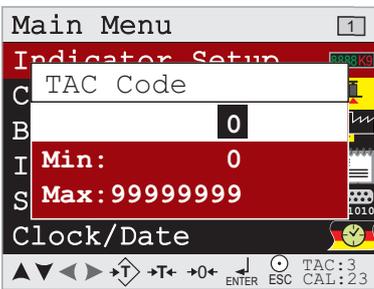
Gain
Calibration Value
100,00 kg
Gain
2,0184 mV/V
Active Signal
2,0184 mV/V

7.1 Weigher settings



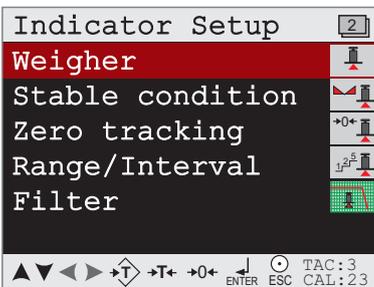
For an optimal setting of the digital display for your individual application you have all possibilities in the submenu **"Indicator settings"**. To do this, select this item in the main menu and adjust the display exactly to your needs.

Tip:
You can reach the main menu by holding down the **"Enter"** key for **2 seconds**.

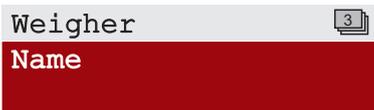


All settings and possible changes in this menu are protected by the TAC code (Traceable Access Code). Any change in this area will automatically result in an increase in the TAC code number. This number is displayed in the bottom line of each menu and must now be entered here in order to make the desired settings.
The TAC code in this example is: TAC = 3

After the entry you will automatically be taken to the next menu.



For the basic settings, e.g. to define a name for the application, to select the physical unit and to determine the steps of the digital display, please select the menu item **"Weigher"**.



You can assign a **unique name** to your application, which is then permanently displayed on the front of the meter. This means that the assignment of the device is displayed unambiguously in a process or operation.



The physical unit can be defined in this menu item. You can select the desired **unit**, e.g. **kg**, from a variety of options.

7.1 Weigher settings (continuation)

Weigher 

Step
1

Decimal Point
0,00

Operation Mode
Industry

Max Load
100,09 kg

Sample Rate
1.600 samples/s

▲▼◀▶↕ →T+ →0+ ENTER ESC TAC:3 CAL:23

The smallest possible digit jump of a digital display is also called **step**. Typically, the digit jump is set to "1". However, it can also be useful to select a larger step size, e.g. for better readability with a high resolution, in order to be able to display a more stable result by rounding up or rounding off the last digit of the display. Therefore you have the choice to set a step size of 1, 2, 5, 10, 20, 50 & 100. The choice of the step size has a corresponding influence on the measurement result, as can easily be seen in the following example.

Example step size for a measured value of 2005 kg .	
Step	Weight (kg)
1	2005
2	2006
5	2005
10	2010

In order to display the desired physical unit correctly on the digital display, the **decimal point** in this menu must be set accordingly. For a desired display with, for example, **2 decimal places**, the selection would be as shown on the left.

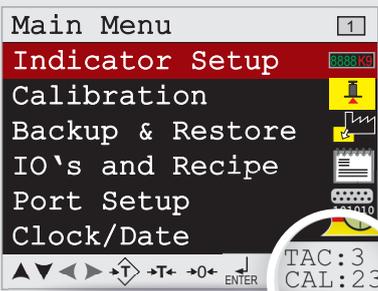
Please select the **operating mode "Industry"** here. This means that the measuring instrument is completely freely adjustable and is not subject to any international or regional calibration laws which only permit limited resolutions, step sizes, stability criteria and sub-range measurements. This instrument is also available as a special version with custody transfer approval. Please ask us if you are interested.

To indicate an overload situation to the operator of a weighing or dosing system, you can define a **maximum load** in this menu at which the display only shows double lines "=====" to indicate that a limit value situation exists. With a custody transfer scale, these are "9" increments over the measuring range. Here 100,09 kg for a scale with 100,00 kg measuring range.

The integrated A/D converter can sample the input signal at up to 1.600 measurements per second. So every 0,6 ms (integration time) a digital measured value is formed. This is particularly important for very fast reactions in case of limit value overruns, peak value recordings, checkweighers, as well as for filling and dosing tasks.

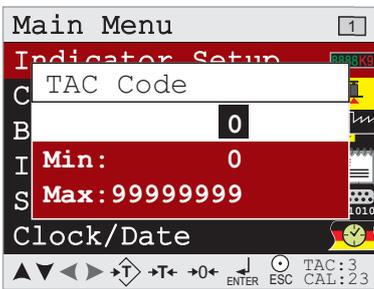
For very slow applications with highest accuracy requirements it might make sense to extend the integration time considerably to achieve a stable and quiet display by averaging. The following sampling frequencies are available: **10, 20, 25, 50, 100, 200, 400, 800 and 1.600 measurements per second**.

7.2 Stable condition



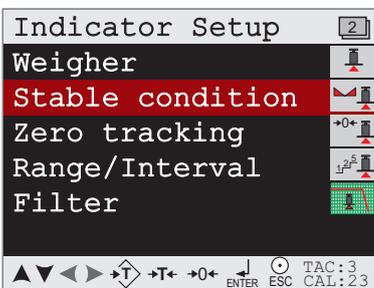
For an optimal setting of the digital display for your individual application you have all possibilities in the submenu **"Indicator settings"**. To do this, select this item in the main menu and adjust the display exactly to your needs.

Tip:
You can reach the main menu by holding down the **"Enter"** key for **2 seconds**.



All settings and possible changes in this menu are protected by the TAC code (Traceable Access Code). Any change in this area will automatically result in an increase in the TAC code number. This number is displayed in the bottom line of every menu and must now be entered here in order to be able to make the desired settings. The TAC code in this example is: **TAC = 3**

After the entry you will automatically be taken to the next menu.



In normal operation mode, the symbol  on the screen display indicates whether the measurement signal is currently stable and calm or not. This is important both for the correct acceptance/reading of results and for taring the display if necessary (e.g. for intermediate doses). In this menu item you can define which conditions the measuring signal must fulfil in order to display a "stable state"

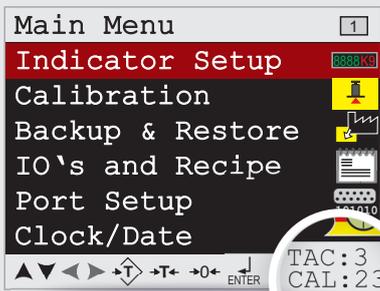


Here you can set a reasonable **fluctuation width** of the digital display for your application. The measured value can only **be tared** within the range you have specified. If the display fluctuates more than set here, neither the keyboard nor an input can be used for taring.



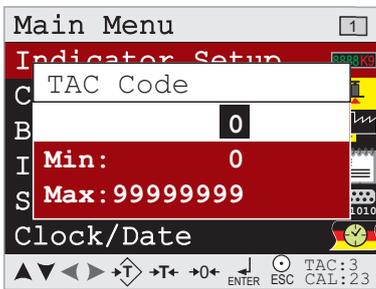
Here you define the **time in which** the measuring signal must be stable within the set **fluctuation range**. Typically, the time window of 1,00 s has proven to be the most common value here.

7.3 Zero tracking



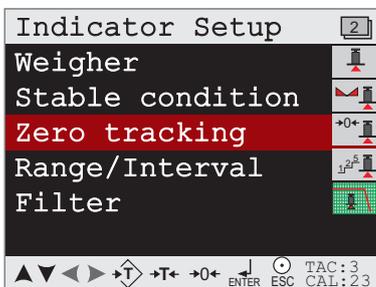
For an optimal setting of the digital display for your individual application you have all possibilities in the submenu **"Indicator settings"**. To do this, select this item in the main menu and adjust the display exactly to your needs.

Tip:
 You can reach the main menu by holding down the **"Enter"** key for **2 seconds**.

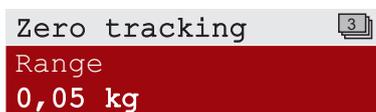


All settings and possible changes in this menu are protected by the TAC code (Traceable Access Code). Any change in this area will automatically result in an increase in the TAC code number. This number is displayed in the bottom line of each menu and must now be entered here in order to make the desired settings. The TAC code in this example is: **TAC = 3**

After the entry you will automatically be taken to the next menu.



Large fluctuations in temperature, dirt deposits and high humidity can cause a calibrated balance to display slight zero offsets after a long period of operation. To correct this automatically, select the menu item **"Zero tracking"**. Here you can define the correction range, the correction step size and the time window by resetting the measuring instrument by one step towards the zero point.



Here you can set the maximum possible **zero offset** that may be possible due to deposits, moisture and other environmental conditions. The value is read in as +/- range and compensated.

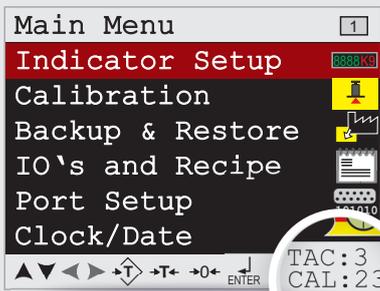


If the measuring instrument detects a zero offset which lies within the **permitted zero tracking range**, the display is automatically moved towards the zero point with a **step** set here.



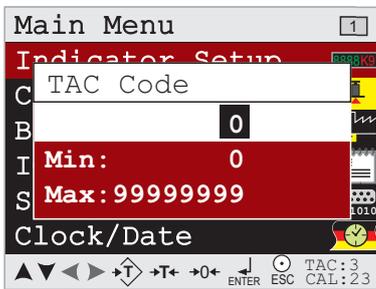
To ensure that the automatic zero correction is carried out smoothly and without unrest in the display, you can set the **period of time** in which the measuring instrument may correct a **step size** in the **direction of zero point**.

7.4 Range / Interval



For an optimal setting of the digital display for your individual application you have all possibilities in the submenu **"Indicator settings"**. To do this, select this item in the main menu and adjust the display exactly to your needs.

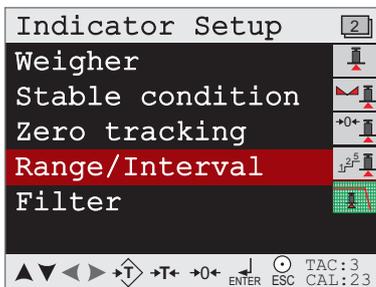
Tip:
You can reach the main menu by holding down the **"Enter"** key for **2 seconds**.



All settings and possible changes in this menu are protected by the TAC code (Traceable Access Code). Any change in this area will automatically result in an increase in the TAC code number. This number is displayed in the bottom line of each menu and must now be entered here in order to make the desired settings.

The TAC code in this example is : **TAC = 3**

After the entry you will automatically be taken to the next menu.



In absolute special cases, e.g. custody transfer applications, you can select and set a multi-range scale in this menu item in order to divide the entire weighing range into sub-ranges with different resolutions/accuracies. Please ask us if you have such an application. We will be pleased to help you to configure your device optimally for this purpose.



Here the first measuring range 0 ... 30.00 of the **multi-range scale** which is to be displayed with the highest accuracy and a resolution in "1" steps. The second range is then 30.01 to 60.00 with step width "2" and then 60.01 to 150.00 with step width "5".



Here you define how many subareas are to be displayed with which resolution. Here you can select resolutions or step sizes of **1, 2, 5, 10, 20, 50, 100 and 200**.

7.4 Range / Interval (continuation)

Sample setting of a multi-range scale

Increment = 1, range = 3,000 and maximum increment = 5

In our example, a subrange of 3,000 parts was selected and a maximum resolution of "5" as step size. This results in a 3-range scale with a resolution of 3000 d each.

Shown Area	Step
0 - 30,00	1
30,00 - 60,00	2
60,00 - 150,00	5

Operation Mode
Multi Range

▲▼◀▶↕→T←→0← ENTER ESC TAC:3 CAL:23

Depending on the quality of the load cells used, it is possible to build a **multi-range scale** or a higher-quality **multi-interval scale**.

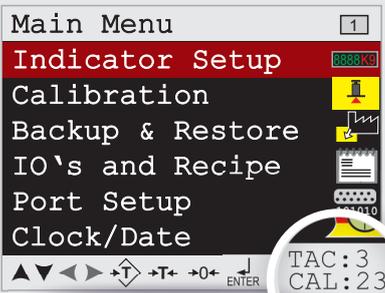
Both types of scales make use of special load cell specifications in order to be able to use them in partial ranges with the highest resolution/precision.

Depending on the load cell used - which is specially tested for these special scales - a multi-range scale differs from a multi-interval scale in the return flow (weight reduction) from the highest possible weighing range.

When returning from the highest weighing range (60 kg to 150 kg with 0.05 kg increments), the **multi-range scale** then remains at the coarse resolution/step size of "5" until the balance is **completely unloaded** and a stable zero point is displayed.

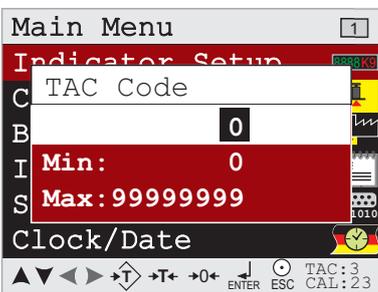
The **multi-interval scale**, on the other hand, **switches** the resolution/step size **dynamically** at the range interfaces as **symmetrically** as during ramp-up (increase in weight) and during return (decrease in weight).

7.5 Filter



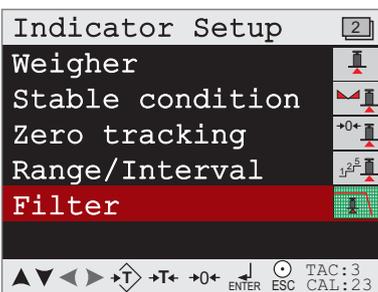
For an optimal setting of the digital display for your individual application you have all possibilities in the submenu **"Indicator settings"**. To do this, select this item in the main menu and adjust the display exactly to your needs.

Tip:
You can reach the main menu by holding down the **"Enter"** key for **2 seconds**.



All settings and possible changes in this menu are protected by the TAC code (Traceable Access Code). Any change in this area will automatically result in an increase in the TAC code number. This number is displayed in the bottom line of each menu and must now be entered here in order to make the desired settings. The TAC code in this example is: **TAC = 3**

After the entry you will automatically be taken to the next menu.



In order to meet the accuracy requirements and display readability of an individual application, different **signal filter ranges** have been implemented in **SensorData Easy**. These can be read out by selecting the sub-menu "Filter" and adjusted if necessary.



The analog input range up to the A/D converter has a 2-stage, active and adjustable **low-pass filter**. This filter is upstream of all other filters and is therefore also called the **"total filter"**.

The **digital filter** is an intelligent **software filter**, which only becomes active after the A/D converter and has no influence on the analog signal range.

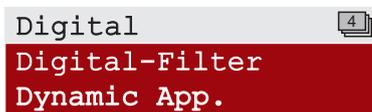
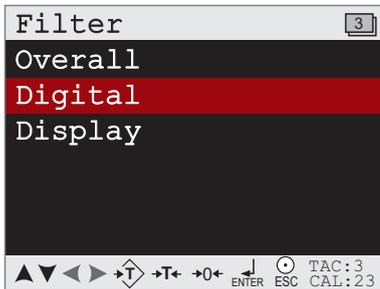
The **display filter** only serves to improve **readability** and has no influence on the internal signal.



In this menu you can choose how much the **overall filter** should attenuate the analog input of the measuring device. You can choose between **0 dB** (no filter) and **-50 dB** (maximum filter) in 8 gradations: **0, -6, -12, -18, -30, -36, -42 and -50 dB**.

The overall filter has an influence on all other filter options.

7.5 Filter (continuation)



The **digital filter** is connected downstream of the analog total filter and corresponds to an intelligent 2nd order software filter.

Here you have the choice between **None**, **Dynamic Application** and **Static Application**.

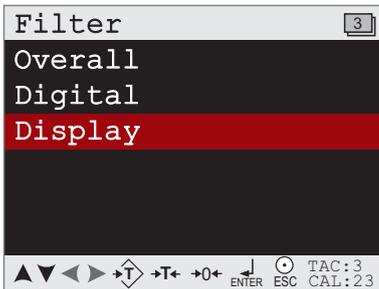
Filling and dosing tasks as well as belt and checkweighers are **dynamic applications**. For these applications, a fast response time and maximum measuring speed are essential.

In **static applications**, it is typically not speed that is important, but maximum precision and repeatability.

Here you can define the **cut-off frequency** from which the measuring instrument should begin to attenuate/filter the signal. The following gradations are available: **1,0 Hz**, **1,4 Hz**, **2,5 Hz**, **5,0 Hz** and **10 Hz**. For dynamic balances, you typically select the tenth part of the mechanical natural frequency of the balance here.

Select an existing **interference frequency** here. Typically the mains frequency of 50 Hz (60 Hz) is present everywhere. Any other interference can be entered here between **1 Hz and 200 Hz**.

7.5 Filter (continuation)



Sometimes it can be useful to analyze the measurement signal unfiltered (highly dynamic) in order to also record possible peak values. Even limit values (limits) and short-term disturbances can be recorded ultra-fast in order to be able to react, for example, to safety-relevant specifications as far as possible in the ms range. In order to still achieve a stable and **correct display**, it is possible to filter the **display** separately without influencing the internal process. You have the following options for this in the menu item **"Display"**:

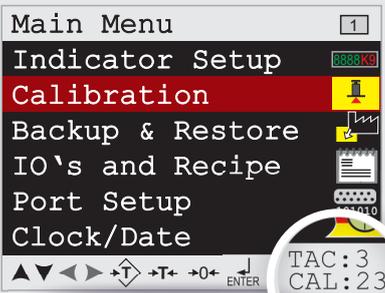
So that the **display filter** only activates when the signal has calmed down or fluctuates within a certain band width, you can specify the permissible fluctuation range within one second here. This allows dynamic fast changes to be displayed without delay. However, as soon as the signal does not fluctuate more than ± 0.5 g per second, the filter is activated and the result is displayed quietly as an average.

How strong the **filter** of the **digital display** should have an effect can be freely selected in this menu. You can choose between **0 dB** (no filter) and **-50 dB** (maximum filter) in 8 gradations: **0, -6, -12, -18, -30, -36, -42 und -50 dB**.

Depending on the application, it may be useful to set the **update** or **refresh rate** of the digital display to slow (very slow with averaging) or dynamic (very fast and possibly restless). You can choose between **1, 2, 3, 5, 10 and 25 measurements per second**.

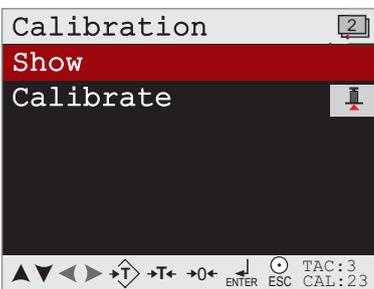
Very high resolutions or environmental disturbances, such as vibrations, wind, decaying vibrations, strong electrical disturbances, etc., can result in an unstable, unsteady display on the display. This is particularly undesirable in the zero state (without load or force). In order to still display a stable zero point, this menu item is used to set the **range** from which the display **permanently shows zero**, although the scale in the background still fluctuates between -3 g and $+3$ g, for example.

8.1 Display the existing calibration and weighing signal of the measuring instrument



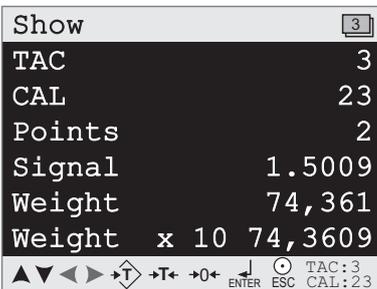
The most important settings are made in the **"Calibration"** menu and already configured values can be displayed and checked.

Tip:
 You can reach the main menu by holding down the **"Enter"** key for 2 seconds.

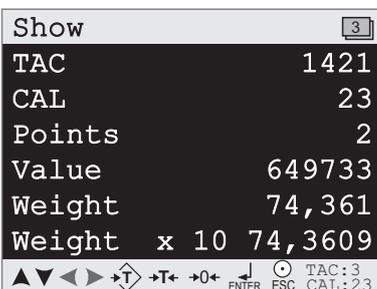


Note: This menu item can only be reached after entering the CAL code. The current code is shown at the bottom right of the display. Every smallest change in this menu increases the CAL code by "1". This documents every intervention.

To display and read out an existing calibration, first select the **"Display" menu** item and confirm your selection with the "Enter" key.

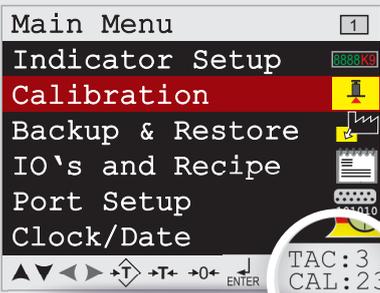


In this menu item you have all relevant and current data "live" on the screen. The **TAC code** indicates how often important and protected parameters have been changed in the meantime. The **CAL code** indicates how often the instrument has already been calibrated. Under **"Points"** you can see that this device has been calibrated with the help of 2 points, as is typically the case. Below this the current "live" **measuring signal is displayed in mV/V** and under **"Weight"** the corresponding weight. As a special feature we also show the **weight with 10 times higher resolution** for information.



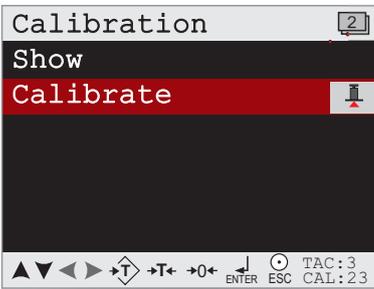
Tip: Instead of the **current signal (in mV)**, you can also display the current **internal A/D converter** value of the measuring instrument. By pressing the arrow keys **"to the left"** and **"to the right"** you can switch back and forth between the signal from the balance in mV/V and the digital resolution of the measuring instrument, the A/D converter value. The internal resolution in the measuring instrument is approx. +/-1.000.000 d. The A/D converter has a much higher resolution, but since typical resolutions of more than +/-100.000 d do not make sense in weighing technology, the excess resolution is used for stabilization, averaging and steadying.

8.2 Calibration of the zero point



The most important settings are made in the "Calibration" menu and already configured values can be displayed and checked.

Tip:
You can reach the main menu by holding down the "Enter" key for 2 seconds.



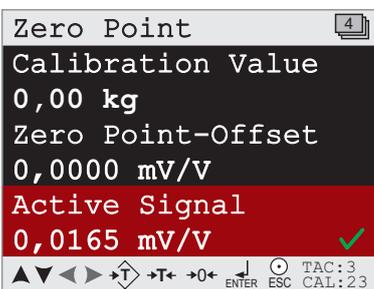
Note: This menu item can only be reached after entering the "CAL" code. The current code is shown at the bottom right of the display. Every smallest change in this menu increases the CAL code by "1". This documents every intervention.

To display and read out an existing calibration, select the "Calibrate" menu item here and confirm your selection with the "Enter" key.



Calibration of the zero point:

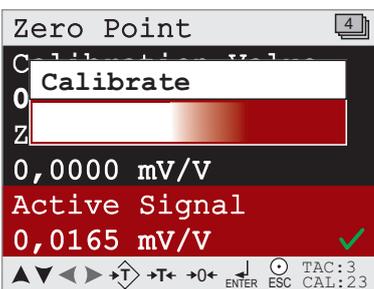
This menu displays the currently valid 2-point calibration in tabular form. In addition, the last line shows the current signal of the balance in mV/V and the corresponding physical load. When recalibrating or correcting an existing zero point, select the first point by pressing the "Enter" key.



1

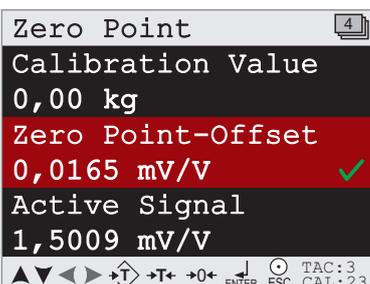
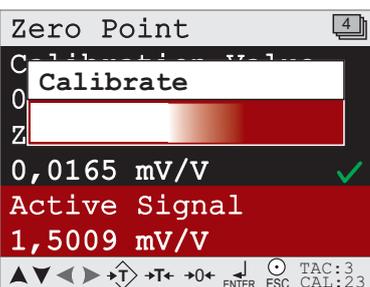
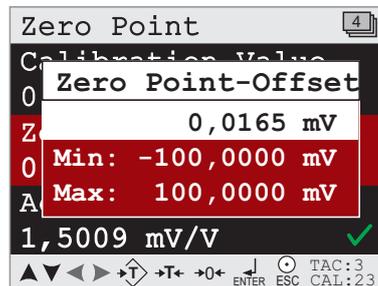
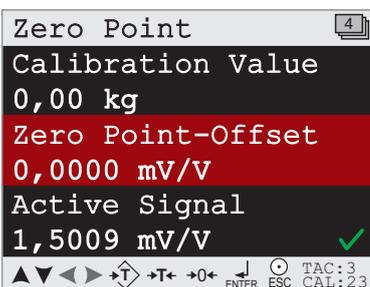
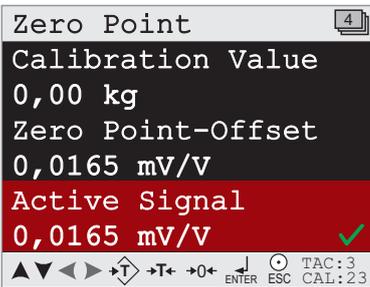
"Practical" calibration of the current zero point:

In any case, we recommend the practical calibration of the zero point with the balance unloaded. To do this, the balance is completely unloaded and the zero state is restored. The current signal can now be used to read off the signal from the balance, which is typically very close to zero. Only the empty or tare weight of the weighing platform (or of an empty silo or conveyor belt) is still visible in the current signal as a small offset.



By pressing the Enter key, the current zero point signal highlighted in red is accepted and assigned to the zero point display. It takes about **2-3 seconds** for the meter to calculate and store the correct zero point by averaging at least **5,000 measurements**. The green check mark on the bottom line indicates to a later observer or service technician how the instrument was originally calibrated at zero.

8.2 Zero calibration (continuation)



Shortly after the meter has finished assigning the "current signal" and zero point display, the "zero point" menu reappears. Here you now have an overview of the zero point parameters at a glance. The "Zero point offset" here is 0,0165 mV/V (like the current signal of the unloaded balance). The green checkmark in the last menu item indicates to the viewer that the zero point of the balance has been calibrated by accepting the "current signal" with the balance unloaded.

2

"Theoretical" calibration:

If you know the signal value of the balance in the unloaded state, or if you can derive it from the data in the load cell certificate and the tare weight, you can also **theoretically calibrate** the zero point by simply entering the measurement signal in mV/V under zero load. This calibration always makes sense if the balance cannot be completely unloaded.

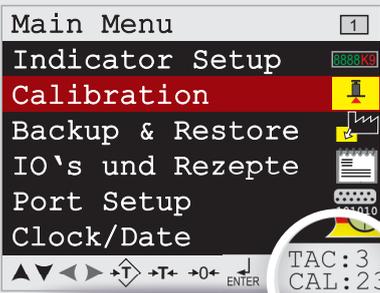
In our example we have calculated a zero signal of 0.0165 mV/V.

After selecting the "Zero offset" menu item, enter the known or calculated zero offset value in mV/V here and confirm your entry by pressing the "Enter" key.

Now the SensorData Easy automatically assigns the zero point signal of 0,0165 mV/V at which the balance is to display exactly zero: 0,00 kg.

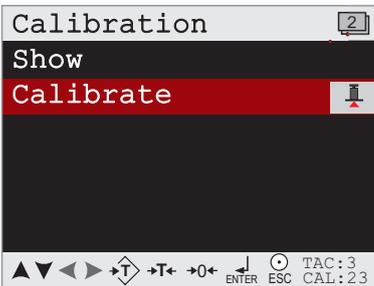
As soon as the assignment has been completed in the meter, the "Zero point" menu appears again. Now the entered zero point signal is displayed and the green check mark indicates that the zero point calibration was carried out theoretically, i.e. by entering the zero point signal. If it is later possible to completely unload the balance, you can correct the calibration at any time and set it to zero by taking over the real "current zero point signal".

8.3 Calibrate gain



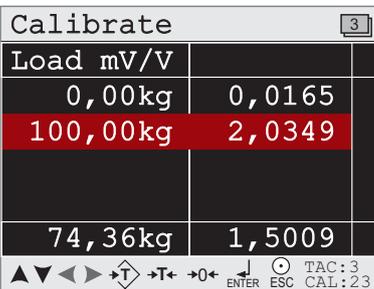
The most important settings are made in the "Calibration" menu and already configured values can be displayed and checked.

Tip:
You can reach the main menu by holding down the "Enter" key for 2 seconds.



Note: This menu item can only be reached after entering the "CAL" code. The current code is shown at the bottom right of the display. Every smallest change in this menu increases the CAL code by "1". This documents every intervention.

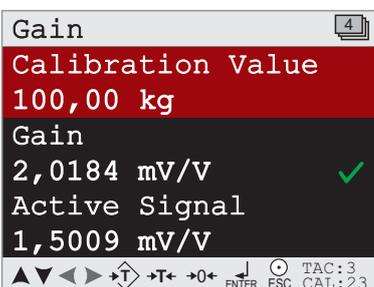
To display and read out an existing calibration, select the "Calibrate" menu item here and confirm your selection with the "Enter" key.



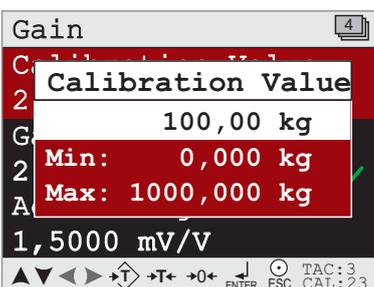
Calibration of the gain using the example of a 100 kg scale:

Similar to the calibration of the zero point, the **gain of the scale** can also be set in two ways.

"Theoretically" via the signal specified in the load cell certificate at nominal load, or "practically" by loading the balance with precise weights. For a highly accurate calibration, however, you should always prefer the **practical calibration**.



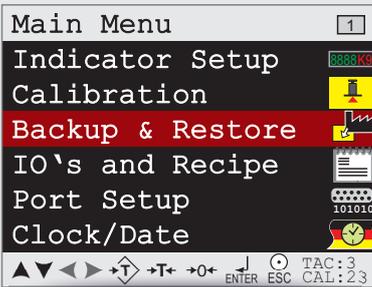
In this "Gain" menu you can set the calibration value, define the gain by simply entering the signal value from the balance when loaded with the "Calibration value", or assign the "Current signal" to the "Calibration value" by loading the balance with the "Calibration weight value". First we define the calibration value and call up the first menu item "Calibration value".



Here we now enter the desired final value of the balance and save it as the reference value.

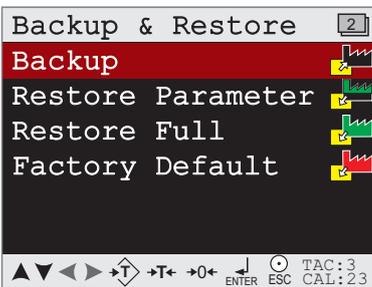
In our example, we have used the maximum weight value (also called the nominal value) of the load cell. However, you can also use any weight value if, for example, you do not have a 100 kg weight available. For a precise calibration, however, you should - if possible - calibrate with a load of $\geq 60\%$ of the nominal load.

9.1 Saving Settings (Customer Default Setting)



Select the **"Backup & Restore"** submenu from the main menu to back up your existing settings or restore previously saved configurations.

Tip:
 You can reach the main menu by holding down the **"Enter"** key for **2 seconds**.

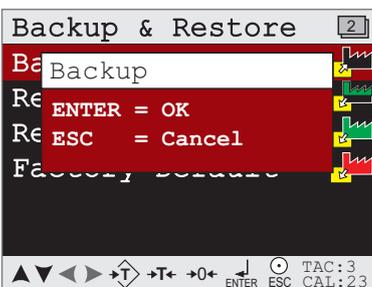


In the submenu "Backup & Restore" you have the possibility to save all set parameters (incl. the calibration data). We also call these customer-specific settings "Customer Default Settings".

The "Restore" function can then be used to restore all original data at any time - e.g. if the device is completely out of order. To save a working original version for security reasons, select in this submenu **"Backup"**.



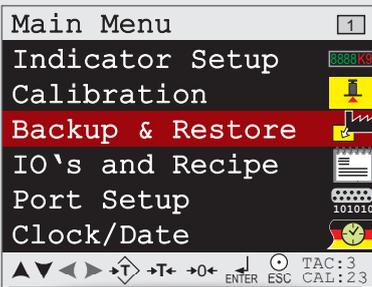
The backup function is **password** protected, so that only specialists have the possibility to save or change a working new version. To access this protected area, the general password **"25630"** must be entered and confirmed by selecting "OK" and pressing the "Enter" key.



In the now selected menu, you can store the currently valid parameters and calibration values in an EEPROM by pressing the **"Enter"** key or exit the menu again by pressing the **"ESC"** key without changing the previously stored values.

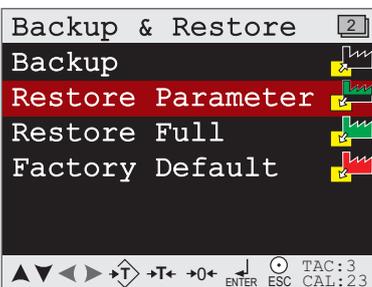
Important: The "old" backup is saved when a new one is saved. "Backups" irretrievably overwritten.

9.2 Restore setting parameters (without calibration)



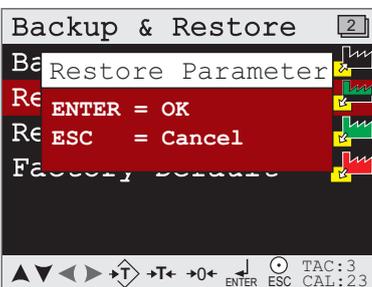
Select the **"Backup & Restore"** submenu from the main menu to back up your existing settings or restore previously saved configurations.

Tip:
You can reach the main menu by holding down the **"Enter"** key for **2 seconds**.



In the submenu "Backup & Restore" you have the possibility to restore an already saved and working setup. Thereby, one has the choice to reactivate only the original setting parameters or to reload the whole setup including the calibration.

In our example we only want to reactivate the setting parameters **without changing the calibration**. Please select the menu **"Restore Parameters"**.

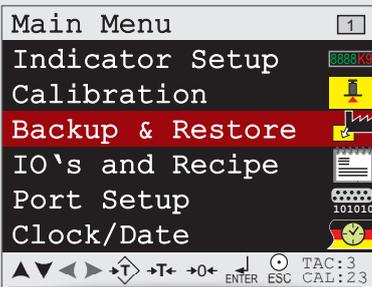


In the menu that opens, you must confirm the restore process again. To start the restore process (without calibration data), press the **"Enter"** key. You can cancel the process here by pressing the **"ESC"** key.

Important: This procedure cannot be undone and all existing unsaved settings (with the exception of the calibration data) are lost.

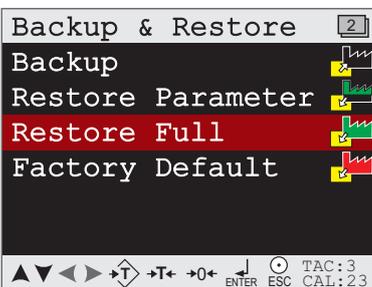
After pressing the "Enter" key, the meter restarts automatically so that the internal processor can read in all parameters and calibration data again.

9.3 Restore complete setup (incl. calibration)



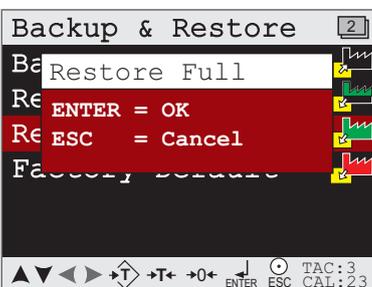
Select the **"Backup & Restore"** submenu from the main menu to back up your existing settings or restore previously saved configurations.

Tip:
You can reach the main menu by holding down the **"Enter"** key for **2 seconds**.



In the submenu "Backup & Restore" you have the possibility to restore an already saved and working setup. Thereby, one has the choice to reactivate only the original setting parameters or to reload the whole setup including the calibration.

In our example we now want to reactivate the **complete setup (including the calibration data)**, select the menu **"Restore All"** and confirm this by pressing the "Enter" key.

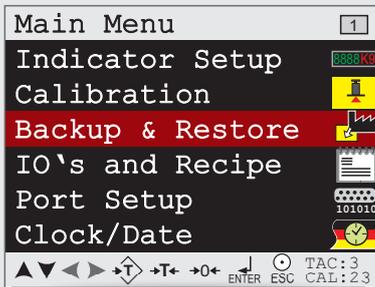


In the menu that opens, you must confirm the restore process again. To start the complete restoration of the meter, press the **"Enter" key**. You can cancel the process here by pressing the "ESC" key.

Important: This operation cannot be undone and all existing unsaved settings will be lost.

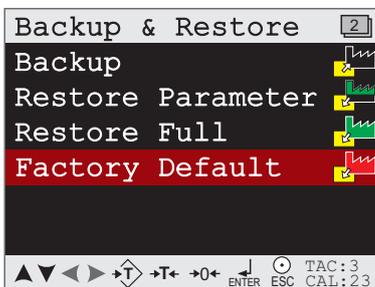
After pressing the "Enter" key, the meter restarts automatically so that the internal processor can read in all parameters and calibration data again.

9.4 Restoring calibration data and parameter values



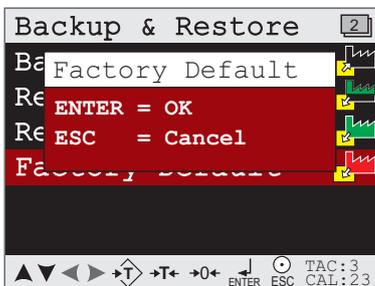
Select the **"Backup & Restore"** submenu from the main menu to back up your existing settings or restore previously saved configurations.

Tip:
You can reach the main menu by holding down the **"Enter"** key for **2 seconds**.



In the submenu "Backup & Restore" it is also possible to reset the instrument to the original **factory settings**. In practice, this is the best way to quickly reactivate a fully adjusted and incorrectly calibrated instrument if no backup of an already functioning setting has yet been performed.

Important note: After the complete setting and successful calibration of your instrument, it is essential that you back up all setting and calibration parameters.



In the menu that opens, you must confirm the reset to factory settings again. To restore the factory settings, press the **"Enter"** key. You can cancel the process here by pressing the "ESC" key.

Important: This operation cannot be undone and all existing unsaved settings will be lost.

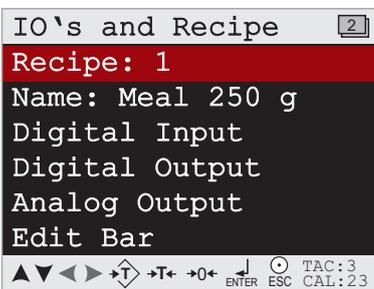
After pressing the "Enter" key, the meter restarts automatically so that the internal processor can read in all parameters and calibration data again. The SensorData Easy now again has a measuring range of 0 to 10,000 kg with a sensitivity of 0 to 2,0000 mV/V. The sensor is now ready for operation.

10.1 Select and name recipes



The SensorData Easy has **20 individually adjustable recipes** as standard. Each individual recipe can be given a name and **the inputs and outputs, the analog output and the bargraph display** can be set exactly as desired. When a recipe is selected later, all important parameters are already set.

Tip:
 You can reach the main menu by holding down the "Enter" key for 2 seconds.

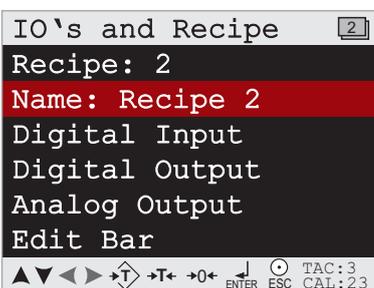


1

The last recipe selected appears on the screen with 1 the possibility of viewing and, if necessary, changing the **settings** of the digital inputs and outputs, the analog output and the bar graph display. If you want to **select another recipe** to activate or adjust it, select the first menu item.



First one of the **possible 20 recipes** is selected for the first selection or for **correction/modification** of an already existing recipe. Please note that this selected recipe is valid immediately after **leaving the "IO's and Recipes"** menu and all individual settings contained in it are activated. In our example we now create a new recipe "2".



2

Then select the second menu item to give the new recipe a name, which will later be displayed on the main screen for checking purposes. A short intermediate menu then takes you to the input mask for the new recipe name.



Please proceed as follows:

1. First delete the old name using the **→0←** key.
2. Use the **↕** key to select the desired screen.
3. Select the new recipe name (max. 15 characters).
4. At the end, **be sure to select "OK" and save with "Enter"**.

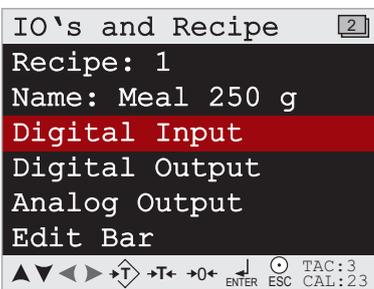


10.2 Configuring Digital Inputs

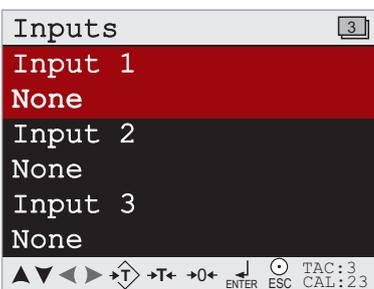


The **3 digital inputs** can take over different tasks. The assignment of the individual inputs is defined in the **"IO's and Recipes"** menu. Since the inputs are set depending on the recipe, the desired recipe must first be selected.

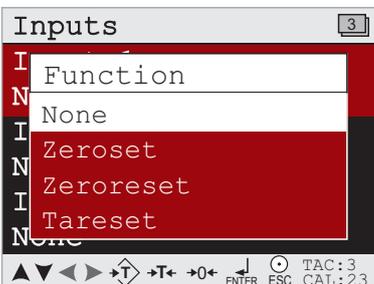
Tip:
 You can reach the main menu by holding down the **"Enter"** key for **2 seconds**.



After selecting the **"IO's and Recipes"** menu, the currently selected and current recipe appears on the screen. If you now select the submenu **"Digital inputs"**, the 3 existing inputs with the selected input functions are displayed.



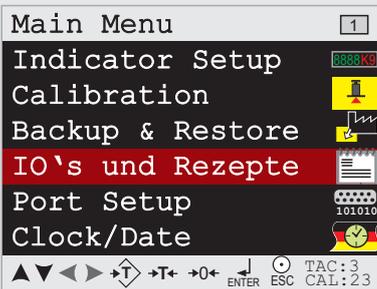
In order to assign other functions to the digital inputs (e.g. controlled by pushbuttons, light barriers, proximity switches or a PLC), it is now possible, for example, to select input 1 and assign a selected function to it. The same applies to inputs 2 and 3.



For the sake of simplicity, we have compiled the following selection options in tabular form:

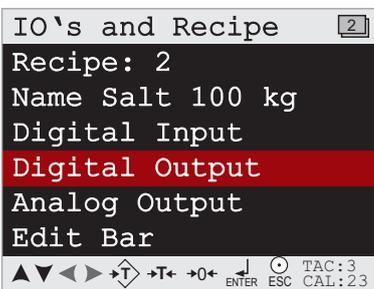
Function	Importance
None	No Function
Zeraset	Aktiviere Nullstellung
Zero reset	Rücksetzen Nulleinstellung
Tare	Aktiviere Tara Funktion
Tare reset	Rücksetzen Tara-Wert
Tare toggle	Wechsel zwischen Brutto und Netto und umgekehrt
Preset tare on	Tarieren mit vorab eingestelltem Gewichtswert

10.3 Configuring Digital Outputs

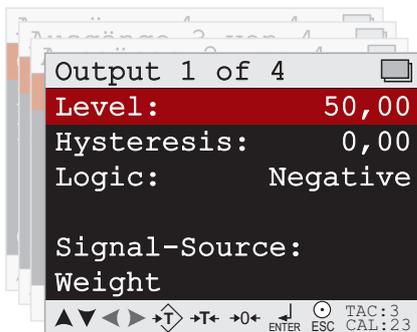


The **4 digital outputs** can independently check different limit values/limits and forward the results via the optically isolated outputs, e.g. to external relays, lights or a PLC. All settings are made in this menu item. First you must select the desired recipe (as with the inputs).

Tip:
 You can reach the main menu by holding down the "Enter" key for **2 seconds**.



First select the menu item "**Digital outputs**" in order to be able to set the 4 digital outputs in **recipe "2"** according to your wishes.



When setting a digital output for the first time, you should first set the limit at which a logical decision is to be made by the measuring instrument. In our example this could be an overflow control of a container to prevent the container from overflowing.

Level: 50,00

To do this, first define the limit value (1) at which the encoder is to output a logical reaction at output (1).

Logic: Positive

An exceeding of a limit value can be signalled by an ascending signal (positive logic) or a descending signal (negative logic). An explanatory diagram for better understanding can be found on page 41.

10.3 Configuring Digital Outputs (continuation)

Signal: Weight

This submenu is used to define which signal source is to be checked for compliance with limit values. Typically, the useful signal/weight is selected here, which is also displayed on the screen. Other selectable signal sources are listed below in tabular form:

Function	Description
Weight	Filtered net value of the balance for Multi Range/Interval
Fast Gross	Unfiltered gross value
Fast Net	Unfiltered net value
Display Gross	Gross value with display Filter
Display Net	Net value with display Filter
Tare	Tare Value
Peak	Peak value after last reset
Valley	Minimum value after last reset
Weight x 10	Filtered net value with 10-fold resolution Multi Range/Interval
Hold	Weight value in buffer memory
Fast Gross x 10 (unfiltered)	Unfiltered gross value with 10-fold resolution
Fast Net x 10 (unfiltered)	Unfiltered net value with 10-fold resolution
Display Gross x 10	Gross value with display filter and 10-fold resolution
Display Net x 10	Net value with display filter and 10-fold resolution
Tare x 10	Tare value with 10-fold resolution
Peak x 10	Peak value after last reset 10-fold resolution, resettable
Hold x 10	Weight value in buffer memory with 10-fold resolution
Valley x10	Minimum value after last reset 10-fold resolution, resettable
Signal	A/D converter signal unprocessed

A stable result is essential for a clear and unambiguous detection of limit values. A signal which fluctuates around the limit value leads to a constant switching on and off of an action. This can easily destroy an electrical device, such as a connected pump, a high power contactor or alarm systems.

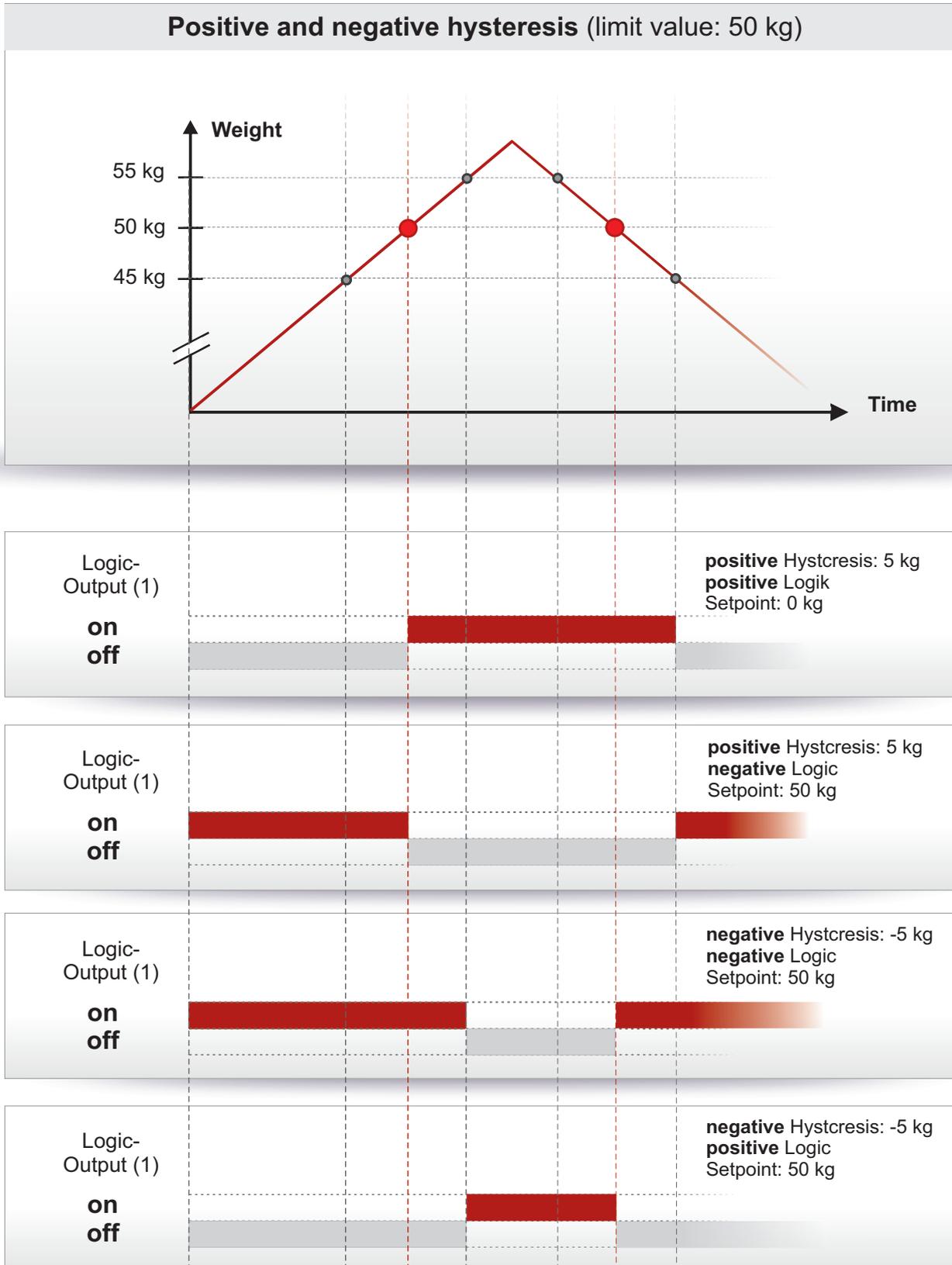
Positive hysteresis: With a limit value of 50 kg and a positive hysteresis of 5 kg, the entsprechende Ausgang bei 50 kg and remains switched on until the value falls below 45 kg.

Negative hysteresis: With a limit value of 50 kg and a negative hysteresis of -5 kg, the corresponding output switches on at 55 kg and remains switched on until the value falls below 50 kg.

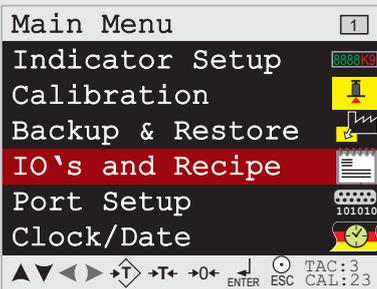
Hysteresis: 5,00

Hysteresis: - 5,00

10.4 Chart: Positive and negative hysteresis

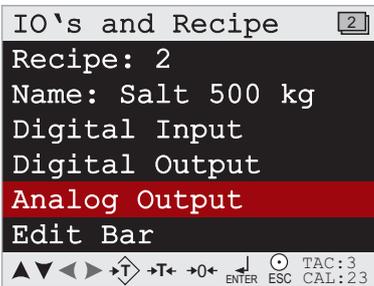


10.5 Configuring the analog output



In order to be able to adapt the **analog output** to different, individual applications, we have integrated the settings into the recipe area. This allows you to define **different configurations for the analog output in up to 20 recipes**.

Tip:
 You can reach the main menu by holding down the "Enter" key for 2 seconds.



First select the **recipe** in which you want to reset the analog output, or modify an existing setup. Then you can select which encoder signal is to be linked to the analog output. For the sake of simplicity, we have summarized the options in the following table. Typically, the analog output is linked to the weight display.



Function	Description
Weight	Filtered net value of the balance for Multi Range/Interval
Fast Gross	Unfiltered gross value
Fast Net	Unfiltered net value
Display Gross	Gross value with display Filter
Display Net	Net value with display Filter
Tare	Tare Value
Peak	Peak value after last reset
Valley	Minimum value after last reset
Weight x 10	Filtered net value with 10-fold resolution Multi Range/Interval
Hold	Weight value in buffer memory
Fast Gross x 10 (unfiltered)	Unfiltered gross value with 10-fold resolution
Fast Net x 10 (unfiltered)	Unfiltered net value with 10-fold resolution
Display Gross x 10	Gross value with display filter and 10-fold resolution
Display Net x 10	Net value with display filter and 10-fold resolution
Tare x 10	Tare value with 10-fold resolution
Peak x 10	Peak value after last reset 10-fold resolution, resettable
Hold x 10	Weight value in buffer memory with 10-fold resolution
Valley x10	Minimum value after last reset 10-fold resolution, resettable
Signal	A/D converter signal unprocessed

10.5 Configuring the analog output (continuation)

Minimum at
0,00 kg

Maximum at
100,00 kg

Mode
4-20 mA

▲▼◀▶↔+T+ →0+ ENTER ESC TAC:3
CAL:2.3

In this menu the assignment of the smallest weight to the smallest output signal is selected (in our example 4 mA at 0.00 kg). Typically, the zero point of the balance is selected here. It is possible to set the analog output to any value in order to fine-tune the control in a desired range, to open/close dosing flaps, or to set conveyor belt speeds.

The same applies to the assignment of the maximum value. Here you define at which weight/signal the analog output delivers its maximum current value. In this example it is 20 mA with a weight of 100,0 kg.

The **SensorData Easy** is a controllable constant current source. The measuring range can cover different output ranges as shown in the table below.

Please select the desired output range and save the value via the "Enter" key.

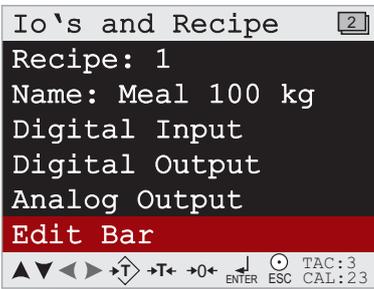
Option	Description
Raw data	Raw value from 0 to 6.500 parts
0 - 20 mA	0 to 20 mA are converted as a percentage from 0 to 100 %
4 - 20 mA	4 to 20 mA are converted as a percentage from 0 to 100 %
0 - 24 mA	0 to 24 mA are converted as a percentage from 0 to 100 %
4 - 24 mA	4 to 24 mA are converted as a percentage from 0 to 100 %

10.6 Bar graph setting



In the "IO's and recipes" menu, you can individually set the **bar graph display** for each of the 20 possible recipes and thus ideally adapt it to the requirements of the set limit values.

Tip:
 You can reach the main menu by holding down the "Enter" key for 2 seconds.

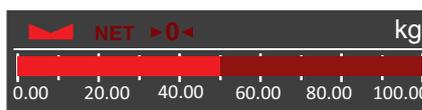


First, please select the recipe in which you want to reset or modify the bar graph display.

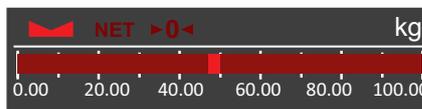
Then select the "Bar graph display" submenu and confirm your selection with the "Enter" key.



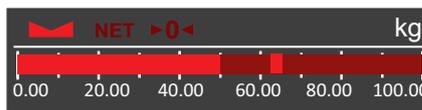
In the first menu item of the "Bar graph display" you can decide in which form the bar graph should display the assigned signal. The default style is "Bar". The bar graph can easily be **changed to other styles**:



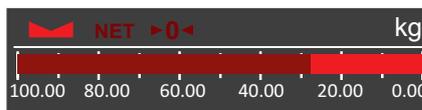
Bar style: **Bar**



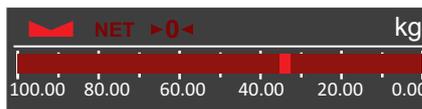
Bar style: **Dot**



Bar style: **Bar course**



Bar style: **Bar negated**



Bar style: **Point negated**

10.6 Setting the bar graph display (continuation)

Start Point
0,00 kg

Lower Margin
20,00 kg

Upper Margine
90,00 kg

End Point
100,00 kg

Step
10,00 kg

▲▼◀▶↕ +T+ +0+ ENTER ESC TAC:3 CAL:23

Enter the **start point** where the bar graph display is to start. Typically this is the zero point. However, any value can be set. For example, you can also use the bar graph display as a magnifying glass to view a weight value in high resolution in a very small measuring range window.

The **lower limit** up to which the bar graph is coloured yellow is entered here. This area could, for example, draw the operator's attention to the fact that any stock quantity is no longer sufficient for a new complete shift.

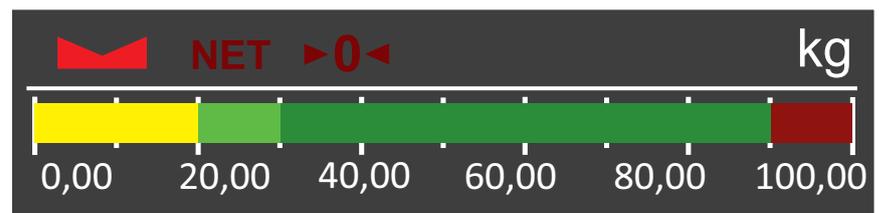
From the lower limit to the **upper limit**, the bar graph is colored green to indicate, for example, a permissible measuring range or a permissible filling weight.

From the upper limit to the **end point**, the bar graph is colored red and indicates an unauthorized alarm range.

The **scale of the bar graph** is freely selectable, but should be selected so that not more than 10 scale lines (i.e. nominal range divided by 10) are displayed, otherwise the scale becomes too small and illegible.

Example Setting for a 100 kg scale with 30 kg load

Option	Value
Start Point	00,00 kg
Lower Margin	20,00 kg
Upper Margin	90,00 kg
End Point	100,00 kg
Step	10,00 kg

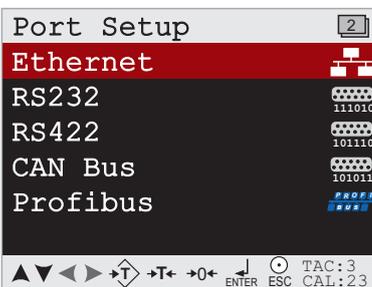


11.1 Ethernet settings



Select "Interfaces" from the main menu to edit the settings of the various communication options:

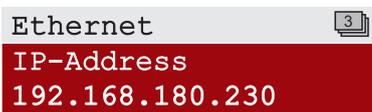
Ethernet, RS232, RS422, CAN Bus and Profibus.



In the submenu "**Interfaces**" the different serial connections to the outside world (PC/PLC) can be addressed and set. Select the appropriate interface to access the settings menu.

First select the most frequently used **Ethernet interface**.

Note: Only those interfaces can be automatically selected which are installed in your current device version.



The desired **Ethernet address** can now be entered here. For integration into a company network, ask your system administrator for help.



Here you can set the correct **subnet mask address**, also called network mask.



If provided in your network, you can enter the **TCP/IP address** of the **gateway** here in order to connect the measuring instrument to the Internet.



The optimum Ethernet transmission speed is **automatically** checked and set by the meter. The value can also be set manually to **10 Mbps** or **100 Mbps**.

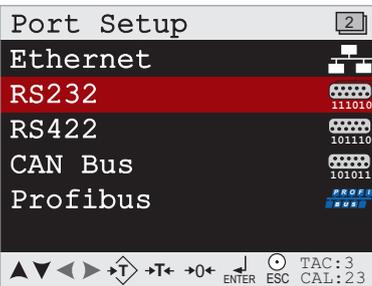


Up to 8 encoders of the SensorData Easy series can be networked via the internal bus link. Each individual device can then also act as a master for a further 5 SUB devices.



The sub-addresses for the master devices are defined here. You can choose between **None** and **1-5**.

11.2 RS232 Settings



Select "**Interfaces**" from the main menu to edit the settings of the various communication options:

Ethernet, RS232, RS422, CAN Bus and Profibus.

In the submenu "**Interfaces**" the different serial connections to the outside world (PC/PLC) can be addressed and set. Select the appropriate interface to access the settings menu.

To set the **RS-232 interface** according to your requirements, please select this menu item.

Note: Only those interfaces can be automatically selected which are installed in your current device version.

Please select the desired communication protocol here. You can choose between **None, Printer, ASCII and NPV Slave**. The ASCII protocol is selected by default.

Each device can be individually set between **0 ... 255** can be addressed. By default, the address (0) is entered, since the RS-232 interface is typically not used in bus systems.

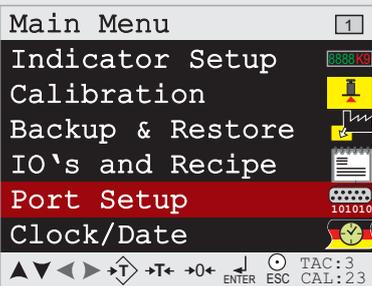
Stop bits are used to synchronize serial interfaces. The transmitting and receiving devices must have the same number of stop bits. Typ. **1 stop bit** is used.

The parity bit (also called check bit) is used to control the serial data transmission. You can choose between **None, Odd, Even, Mark and Space**. Type Setting: **None**

The transmission speed of the serial data protocol can be set between **1.200, 2.400, 4.800, 9.600, 19.200, 38.400, 57.600, and 115.200 Baud** can be selected.

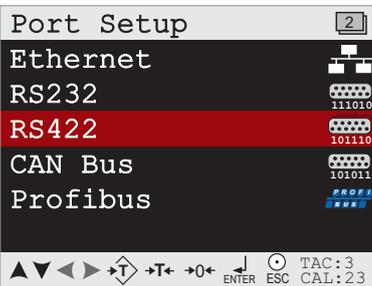
If several devices are connected and the **NPV slave** protocol is used, up to 40 devices can be controlled and queried via one master. The sub-addresses from **1 - 5** or "**None**" are entered here.

11.3 RS422 Settings



Select **"Interfaces"** from the main menu to edit the settings of the various communication options:

Ethernet, RS232, RS422, CAN Bus and Profibus.



In the submenu **"Interfaces"** the different serial connections to the outside world (PC/PLC) can be addressed and set. Select the appropriate interface to access the settings menu.

To set the **RS-422 interface** according to your requirements, please select this menu item.

Note: Only those interfaces can be automatically selected which are installed in your current device version.



Please select the desired communication protocol here. You can choose between **None, Printer, ASCII and NPV Slave**. The ASCII protocol is selected by default.



Each device can be individually set between **0 ... 255** can be addressed. The address (0) is entered by default. The RS-422 interface is typically used in bus systems.



Stop bits are used to synchronize serial interfaces. Transmitter and receiver must have the same number of stop bits. Typ. **1 stop bit** is used.



The parity bit (also called test bit) is used to control serial data transmission. You can choose between **None, Odd, Even, Mark and Space**. Type Setting: **None**

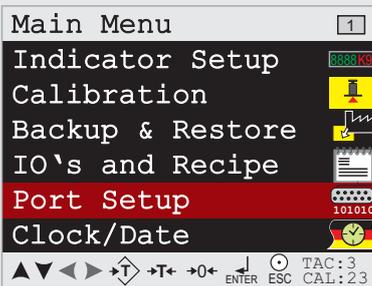


The transmission speed of the serial data protocol can be set between **1.200, 2.400, 4.800, 9.600, 19.200, 38.400, 57.600, and 115.200** Baud can be selected.



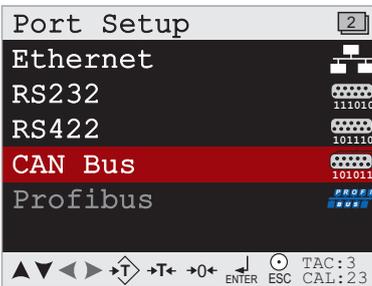
If several devices are connected and the **NPV slave** protocol is used, up to 40 devices can be controlled and queried via one master. The sub-addresses from **1 - 5** or **"None"** are entered here.

11.4 CAN Settings



Select "**Interfaces**" from the main menu to edit the settings of the various communication options:

Ethernet, RS232, RS422, CAN Bus and Profibus.



In the submenu "**Interfaces**" the different serial connections to the outside world (PC/PLC) can be addressed and set.

As an option, the SensorData Easy can be equipped with a **CAN bus interface**. All necessary settings are then made via this menu item.

Note: Only those interfaces can be automatically selected which are installed in your current device version.



Here you can select between **None** or **Buslink** communication protocol. The CAN bus interface serves as carrier for an internal communication of several Easy type measuring instruments, but cannot function as standard CAN bus communication.



Up to 8 encoders of this model can be networked via the internal bus link. Each individual device can then also act as a master for further 5 SUB devices.



The sub-addresses for the master devices are defined here. You can choose between **None** and **1-5**. This allows a total of up to 40 measuring devices to be connected to each other.



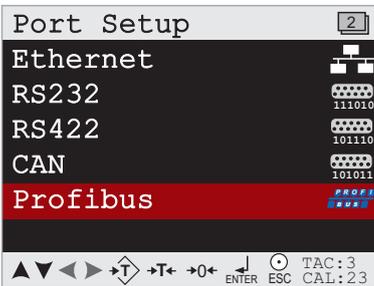
Select the optimum communication speed for your application here. The following baud rates are possible: **100, 125, 250 and 500 K-Baud**.

11.5 Profibus settings



Select "**Interfaces**" from the main menu to edit the settings of the various communication options:

Ethernet, RS232, RS422, CAN Bus and Profibus.



In the submenu "**Interfaces**" the different serial connections to the outside world (PC/PLC) can be addressed and set. Select the **Profibus** to access the corresponding settings menu.

Note: Only those interfaces can be automatically selected which are installed in your current device version.



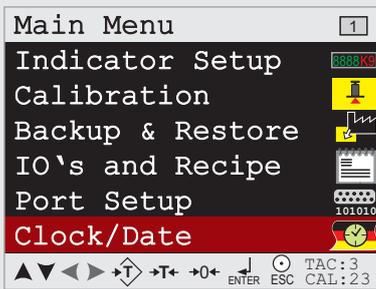
A fixed channel number must be assigned to each **Profibus** device before commissioning in order to be able to use the devices in a master system.

/to be able to address the slave relationship unambiguously. Channel numbers from **0 - 15** are optionally available.



Here it is defined whether the exchange of data is to be communicated as **integer** values (integers without decimal point), or whether **floating point** values (i.e. numbers with variable decimal points) are to be used.

Setting the time and date of the device



Select "**Time/Date**" from the main menu to set the time and date of the meter.



The time is saved in the following format:

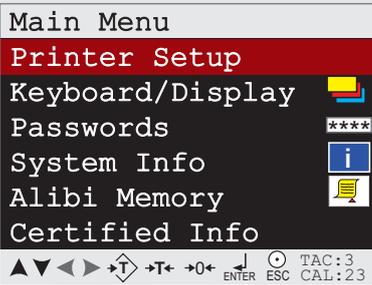
Hours : minutes : seconds



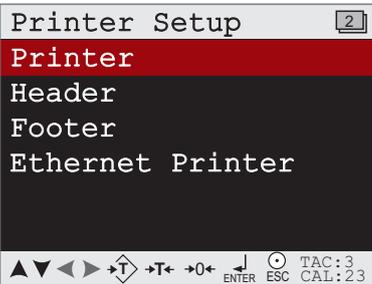
The date is saved in the following format:

Day - Month - Year

13.1 General Printer Settings



Select "**Printer Setup**" from the main menu to view and edit all settings of the printer port of the meter. In this submenu, you can define the layout of the printout and commission a network printer.



Then select the "**Printer**" menu item to edit the general printer settings. In the following, you can define and configure the desired layout of the printout.



Virtually any printer with a serial interface or with a standard Ethernet connection can be connected to the SensorData Easy. Depending on the printer type, the printout can either be made as a **ticket** (similar to a receipt) or as a **protocol printout** in one line.

Ticket - Printer

Firma Meyer & Müller GmbH	

15-12-2018	14:51
Nr:	28
N	2.114 kg
T	0,000 kg

B/G	2.114 kg

Protocol-Printout

22	15-12-2018	16:10	2.114 kg
23	15-12-2018	16:12	2.115 kg
24	15-12-2018	16:30	2.222 kg
25	15-12-2018	16:31	1.998 kg
26	15-12-2018	16:32	2.012 kg
27	15-12-2018	16:34	2.555 kg
27			

13.1 General Printer Settings (continuation)

Columns
40

Check the specification of the connected printer and set the maximum column width of your printer here. The number of columns can be entered **between 0 and 80**.

Rows
24

Hier wird festgelegt wie viele Druckreihen auf eine Page passen und/oder gewünscht werden. Auch hier kann eine Zahl **zwischen 0 und 80** eingegeben werden.

Margin
2

The same applies to the width of the print margin. Again, the width is configured with a number **between 0 and 80**.

Printer Newline
CR+LF

Here you specify which additional command is to be used to close a print line at the end. Depending on the printer type, a "line feed" is automatically selected at the end of the line, or a line feed is selected together with carriage return/line lead. Check the printer manual and choose between **CR, LF, CR+LF and CR+00**.

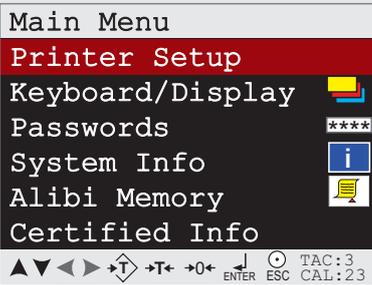
Option	Bedeutung	(Schreibmaschine)
CR	Carriage Return	(Wagenrücklauf)
LF	Line Feed	(Zeilenvorschub)
CR+LF	Carriage Return + Line Feed	(Wagenrücklauf + Zeilenvorschub)
CR+00	Carriage Return + 00 Zeilen	(Wagenrücklauf + 00 Vorschub)

Port
RS232

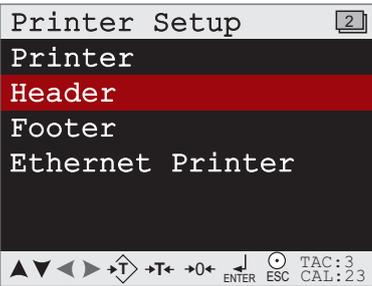
Finally, specify the port used for the printer. Communication is possible via **RS232, RS422 or IP address**.

▲▼◀▶↕ →T+ →0+ ↵ ENTER ⌘ ESC TAC:3 CAL:2.3

13.2 Configuring the header of the printout



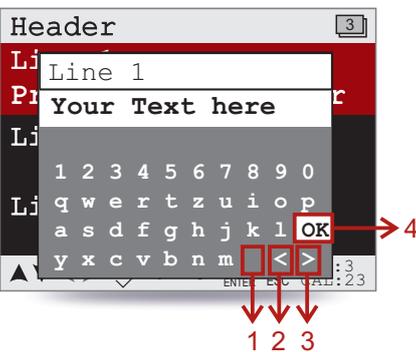
Select **"Printer Setup"** from the main menu to view and edit all settings of the printer port of the meter. In this submenu, you can define the layout of the printout and commission a network printer.



Then select the menu item **"Header"** to define the top lines of the printout. You can enter a total of up to 4 header lines, which then appear at the top of each printout.



Select **lines 1 to 4** one after the other and enter your desired text in the input menu that appears. You have **32 characters** per line.

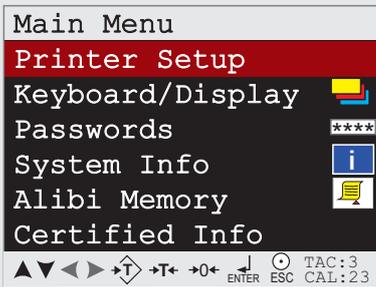


To enter text, use the arrow keys to select the letters one after the other and confirm your selection with the **"Enter"** key. The characters can be deleted step by step using the **"Zero"** key. After completion, you can confirm the entire header line by selecting the word **"OK"** (see No. 4 in the graphic on the left).

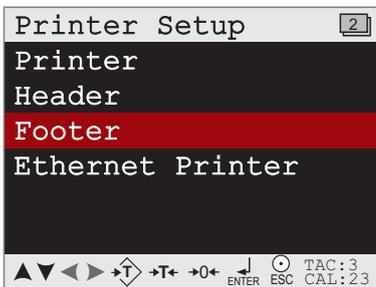
1	Insert blank line
2	Navigate one character to the left
3	Navigate one character to the right
4	"OK" for confirming and saving the entire header line.

Tip: To switch the keyboard input from lower case to upper case letters (and special characters if necessary), press the **"Tare preselection key"**.

13.3 Configuring the footer of the printout



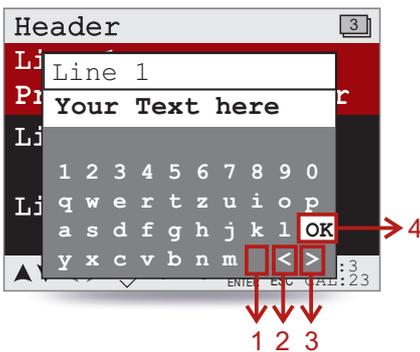
Select **"Printer Setup"** from the main menu to view and edit all settings of the printer port of the meter. In this submenu, you can define the layout of the printout and commission a network printer.



Then select the menu item **"Footer"** to define the top lines of the printout. You can enter a total of up to 4 header lines, which then appear at the top of each printout.



Select **lines 1 to 4** one after the other and enter your desired text in the input menu that appears. You have **32 characters** per line.

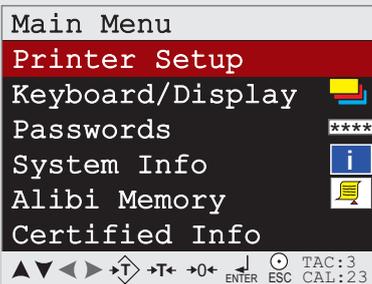


To enter text, use the arrow keys to select the letters one after the other and confirm your selection with the **"Enter"** key. The characters can be deleted step by step using the **"Zero"** key. After completion, you can confirm the entire footer line by selecting the word **"OK"** (see No. 4 in the graphic on the left).

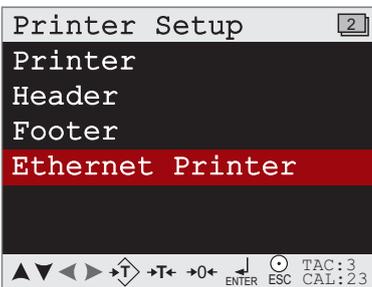
1	Insert blank line
2	Navigate one character to the left
3	Navigate one character to the right
4	"OK" for confirming and saving the entire header line.

Tip: To switch the keyboard input from lower case to upper case letters (and special characters if necessary), press the **"Tare preselection key"**.

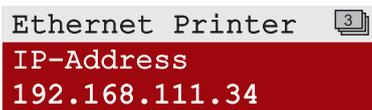
13.4 Putting the network printer into operation



Select "**Printer Setup**" from the main menu to view and edit all settings of the printer port of the meter. In this submenu, you can define the layout of the printout and put a network printer into operation.



Finally, select the menu item "**Ethernet Printer**" to configure the communication setting of the printer interface.

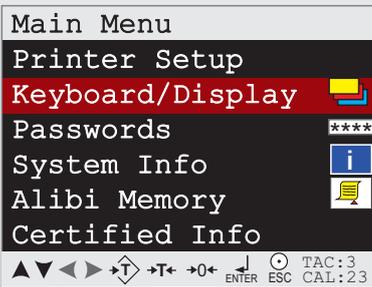


In the following menu you can use the arrow keys to enter the **IP address** of the network printer and confirm with "Enter".

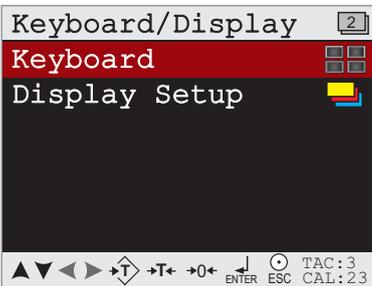
Tip:

Use "left" and "right" to change the position of the cursor. With "up" and "down" you change the numerical value.

14.1 Keyboard settings



If you select the submenu **"Keyboard/Display"** in the main menu, you can assign special functions to the **function keys** as well as design the **display** individually according to your wishes.



Within the screen setup, select **"Keyboard"**. Additional functions for the special keys can be set in this menu.



The **4 arrow keys** and the **Enter key** are typically used for calibration and parameter setting. They have no function in normal operation mode. You can change this by assigning individual functions to these keys (as shown in the table below):

Function	Description
None	No further function
Set zero	Set Zero
Zero reset	Reset Zero
Set Tare	Set Tare
Tare reset	Reset Tare
Tare	Switch between gross and net and vice versa
Tare preselection	Taring with pre-set weight
Print	Print ticket
Print subtotal	Print ticket including subtotal
Print sum	Print ticket including sum
Print daly total	Print ticket including daly total
Print batch sum	Print ticket including batch sum

14.1 Keyboard setting (continuation)

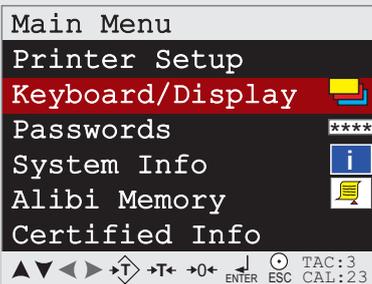
Furthermore there are the following (intelligent) functions, which can be used as key assignment:

Function	Description
Sum	Sum current weight
Subtotal reset	Set subtotal to zero
Sum reset	Set the sum of the weights to zero
Day sum reset	Set the sum of the daily weights to zero
Batch sum reset	Set the batch sum to zero
Peak reset	Set the peak to the current value
Minimum value reset	Set the minimum value to the current value
Holding / Save	Currently the value is saved and displayed.
Keylock	Lock the keyboard
Recipe selection	IO's and recipe menu

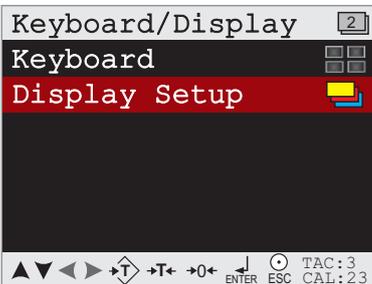


To prevent unauthorized persons or the operating personnel from triggering incorrect or unintended functions on the measuring instrument, you can also **activate or lock the keys with fixed functions** (such as the zero, tare and ESC keys).

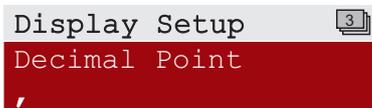
14.2 Display setup



If you select the submenu **"Keyboard/Display"** in the main menu, you can assign **special functions** to the function keys as well as design the **display** individually according to your wishes.



For some basic settings of the screen display, please select the menu item **"Display Setup"**. Here you can set the display of the decimal point, activate or deactivate the confirmation tone for key activation, select the language, configure the menu timer and define the assignment of the digital main display.



Depending on the location/country, the decimal point is used as a dot or comma. In this menu item you can select and save one of the two display options **"Point"** or **"Comma"**.



The meter can confirm the activation of a key with an acknowledgement tone to indicate to the operator that a key has been pressed. In exceptional cases, these acknowledgement tones may interfere with users or customers when making frequent changes. It is therefore possible to switch the **acknowledgement tone on or off** here.



4 menu languages are stored in the **SensorData Easy** measuring instrument. In this submenu you can choose between **German, English, French and Dutch**.



Set the time after which the display automatically switches back from the menu to the start display. You can select a time between **0 and 240 seconds**.

Note: If a value of less than **10 seconds** is entered, the automatic exit from the start display menu is deactivated.

Management of the system password and access rights



In the main menu, select **"Passwords"** to define the main password of the measuring instrument and to protect access to system-critical settings (e.g. recipe management) with your own passwords so that only desired persons have access to certain configurations.

Tip:
 You can reach the main menu by holding down the **"Enter"** key for 2 seconds.



After selecting the submenu **"Passwords"** you will be asked to enter the system password. **This password is not set in the delivery state and after resetting the factory settings.** Please leave the password input field empty and select **"OK"** using the arrow keys. Confirm your selection with the **"Enter"** key.

If you have already set the password yourself, you can enter your personal password here instead.

To enter text, use the arrow keys to select the letters one by one and confirm your selection with the **"Enter"** button. The gradual deletion of the characters is possible with the **"Zero key"** possible. After entering the complete password, select **"OK"** in the dialog window.

Tip: To switch the keyboard input from lower case to upper case letters (and special characters if necessary), press the  **"Tare preselection key"**.



In the passwords submenu you can now set the system password of the device. This password serves as the **main password** of the SensorData Easy and protects system-critical setting menus from access by unauthorized persons. To set the password, select **"System Setup"**.

You can then assign your desired password in the dialog box that opens. To save, select **"OK"** from the menu with the arrow keys and confirm your entry with the **"Enter"** key.

Important: The new password only becomes effective after the meter has been restarted.

By assigning this password, the **following submenus** can now only be viewed after entering a password:

IO's and Recipes	Time / Date
Interfaces	Screen setup
Passwords	

Management of system password and access rights (continuation)



In addition to the system password, you can assign individual passwords for certain SensorData Easy settings using the same procedure so that, for example, only certain employees can **edit recipes**, **select recipes** or change the **time settings** of the measuring instrument.

Please note the following information when assigning passwords:

- ✓ If a system password is assigned, the 3 passwords shown on the left are as follows when delivered:

Edit recipe	3456
Select recipe	2345
Date and time	1234

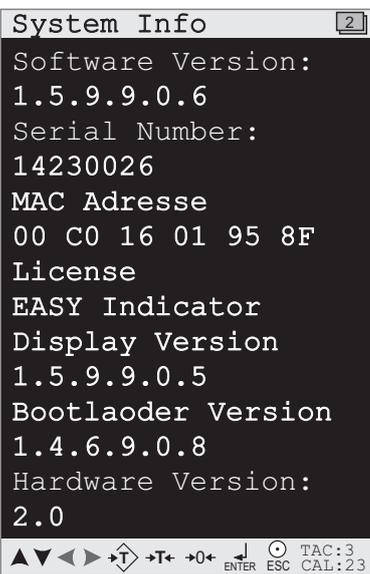
- ✓ These 3 function passwords are only effective if you have assigned a system password (see p. 61).
- ✓ If the system password is subsequently removed, these passwords are also no longer active.
- ✓ Once the password has been successfully entered, the protected submenus can be accessed for a few minutes without having to be re-entered. The password lock is then automatically reactivated (or after a restart of the device).

Read out internal system information of the measuring instrument



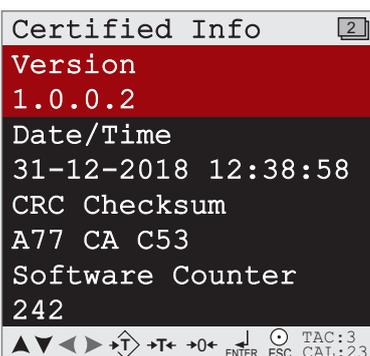
Via the lowest 3 menu items of the main menu you can read out all relevant internal **system information** of the measuring instrument as well as display the parameters and protocol values important for custody transfer applications

Tip:
 You can reach the main menu by holding down the "Enter" key for 2 seconds.

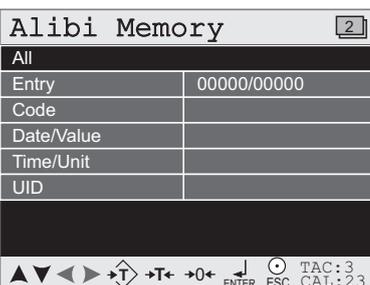


In the "System information" menu, you will find all device-specific information compactly summarised on one page, which can be very helpful especially in the **event of service**.

In addition to the serial number and hardware version, you will also find the installed **software version** of your device.



In the menu "Certified Info" as well as in the menu "Alibi memory" you can read out all protocol and history values relevant for custody transfer applications, which are prescribed according to the currently valid guidelines of the custody transfer office and which are necessary for the acceptance of your application.



17.1 Specifications of the different model options

	Standard	RS232/422	CANBUS	Pofibus
Power supply	18-32 VDC; 7,5 W max.			
Load cell power supply	5 VDC	5 VDC	5 VDC	5 VDC
Sensitivity	0,4 μ V/d	0,4 μ V/d	0,4 μ V/d	0,4 μ V/d
Sensitivity range Unipolar	-0,2 mV/V to +3 mV/V			
Sensitivity range Bipolar	-3 mV/V to +3 mV/V			
Measuring range Unipolar	1 mV to +15 mV			
Measuring range Bipolar	-15 mV to +15 mV			
A/D Conversion speed	1.600/s	1.600/s	1.600/s	1.600/s
Max. load cell impedance	1.100 Ω	1.100 Ω	1.100 Ω	1.100 Ω
Min. load cell impedance	43,75 Ω	43,75 Ω	43,75 Ω	43,75 Ω
Max. no. of load cells	350 Ω 8	8	8	8
	1.000 Ω 16	16	16	16
Max. number of d	10.000	10.000	10.000	10.000
Display resolution	100.000	100.000	100.000	100.000
Display steps	1,2,5,10,20,50,100,200	1,2,5,10,20,50,100,200	1,2,5,10,20,50,100,200	1,2,5,10,20,50,100,200
Display size	2,8"; 320 x 240 pixels			
Inputs, 24 V	3	3	3	3
Outputs, 24 V	4	4	4	4
Analog output	Optional	Optional	Optional	Optional
Communication	RS232	No	Yes	No
	RS422/485	No	Yes	No
	Ethernet	Yes	Yes	Yes
	USB	Yes	Yes	Yes
	CAN BUS	No	No	Yes
	Profibus	No	No	No
Operating temperature	-10 °C to +40 °C			
Storage temperature	-20 °C to +70 °C			
Relative Humidity	40-90 % not condensed.			
Mono filling	Available	Available	Available	Available
Protection class	IP45	IP45	IP45	IP45
Protection class (build in)	IP65	IP65	IP65	IP65