INSTRUCTION MANUAL

SD1

The Display / Indicator

SPS

Contents

1. Technical Data

Mechanical characteristics

Case	Aluminium, rubber shock protection
Front plane	Acryl glass (scratch proof)
Dimensions / Weight	(W x H x D) 60 x 59.5 x 21.7 mm / 95 g

Electrical characteristics

Power supply	Battery (CR2032)
Battery lifetime	approx. 8000 h (SD1 with probe)
Measuring rate	adjustable, 2 … 20 values / sec

LCD display

Display type	Liquid crystal display, reflective
Numeric display	7 digits (10.5 mm)
Analogue display	53 segments

LEDs / Acoustical output

Tolerance display	3 LEDs : 1x red, 1x green, 1x yellow
Buzzer	Piezo

Connections

ISi interface	Bus connection for sensors, hand / foot switch, tolerance adapter, …
Triple-I interface	Connection for IBR radio modules or cable with USB / RS232 interface

Measuring systems

The measurands : measuring range, resolution, precision, … are defined by the connected measuring probe or sensor. Example : Measuring probe IMS-5S → Range 5mm, Resolution 0.01µm

Environmental conditions

Operation / Storage temp.	+41 … +113 °F / -4 … +158°F
Protection class	IP65 (CEI / IEC 529)

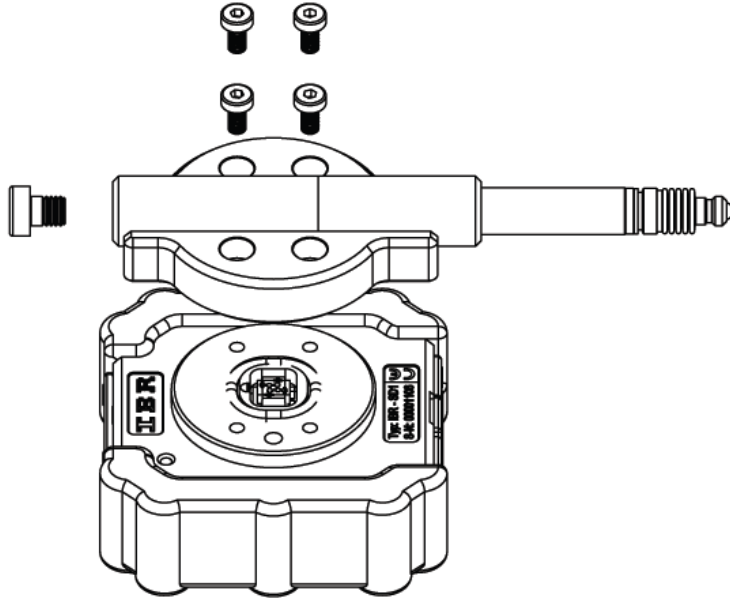EMC according to EN50081-2 and EN50082-2

2.   Dimensions

3.   Connecting probes

Variant A
➔ Usage as dial gauge

Variant B
➔ Connection of up to 2 probes and an additional hand / foot switch
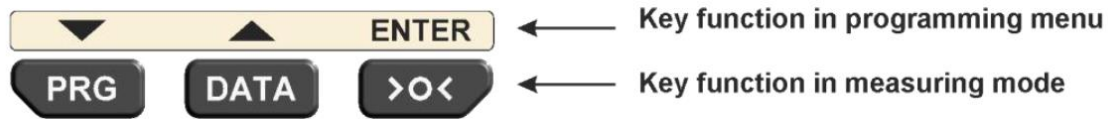

pneumatic

ISi - Bus

4. Display

1.   Calibration request
2.   Tolerance LEDs
3.   Column display
4.   Data transmission
5.   Dynamic measuring mode
6.   Numeric display
7.   Unit
8.   Battery display
9.   Factor defined
10.   Function „Hold"
11.   Programming menu
12.   Passcode set
13.   Measuring probe 1 / 2

A detailed description can be found in chapter 6 "Measuring Mode".

5. Programming menu

Open the programming menu by pressing the PRG button.

The following settings are available :

Note : The access to the settings via the programming menu can be restricted by using
the Windows configuration software SD1_Win.exe (➜ see chapter 9).
Because of this, there may not be all of the following menu options available.

Overview :

- Unit — Selection of unit
- rESoL. — Selection of resolution
- dir. — Selection of measuring direction
- PrESEt — Zeroadjustment / Preset
- 2-CAL. — 2 Master calibration
- dt.-CAL. — Temperature forced calibration (in steps of 0.5 °C)
- tF.-CAL. — Timer forced calibration (in steps of 30 min)
- FActor / ProbES (*) — Measuring input A and B
- SEt.OP. — Selection of a Measuring mode
- GrAdinG — Selection of a Grading mode
- SEt.Pnt. (*) — Input of the nominal value with relative tolerances
- SEt.toL. (*) — Input of absolute tolerances
- toL.LED — Tolerance LEDs
- CoL.diS. — Analogue display
- hoLd — Freezing of the display on a static measurement
- but.PRG. — Assign a second function to the PRG button
- but.dAtA. — Assign a second function to the DATA button
- but.CAL. — Assign a second function to the >O< button
- FootS. — Assign a function to a hand / foot switch
- P.C.ProG. — Passcode for the programming menu (4 digits)
- P.C.CAL. — Passcode for the calibration (4 digits)
- Auto.oFF — Setting the Auto Power Off time
- SA.rAtE — Setting the measurement rate
- BEEP — Button tone
- ProG.End — Leave the programming menu

Note : The selection of the active menus (marked with (*)) is only possible with the
Windows configuration software SD1_Win.exe (➜ see chapter 9), not with the
programming menu of the SD1.

Basic function / Selection of the unit

Basic function / Selection of the resolution

Basic function / Selection of the measuring direction
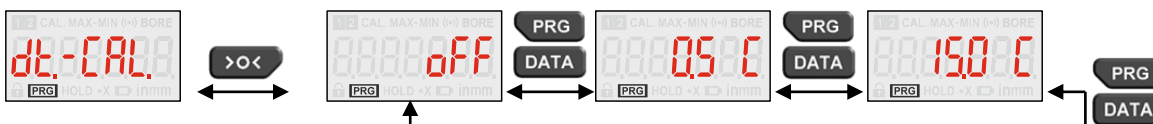

Calibration / Zeroadjustment & Preset

Note :
All digits have to be set one by one with the buttons
PRG and DATA . The change to the next digit is done
by pressing the button >O< . If the button >O< is
pressed > 2 sec., the complete number is confirmed
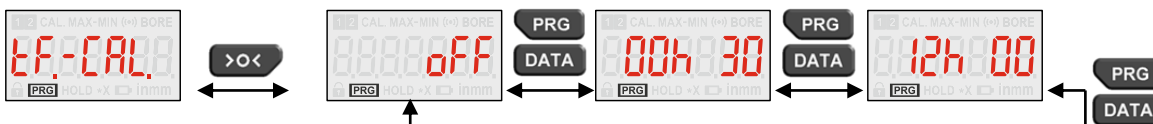regardless of which digit is active at the moment.

Calibration / 2 Master calibration

Calibration / Temperature forced calibration

Calibration / Timer forced calibration

First display variant, if only one probe was selected in the basic settings:

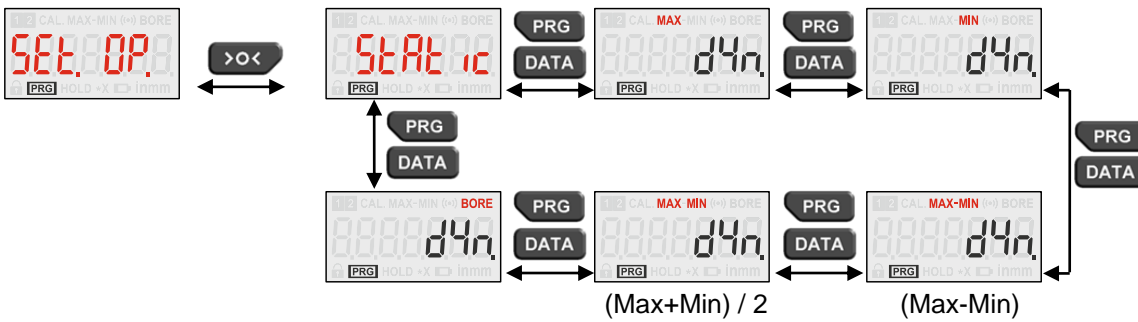Second display variant, if both probes were selected in the basic settings :

Submenu for the selection of a probe

Submenu for the activation / deactivation of the probe with input of a factor
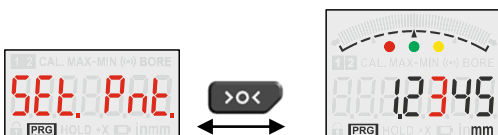

Measuring modes

(Max+Min) / 2   (Max-Min)

Grading mode / Number of grades [Off...30]

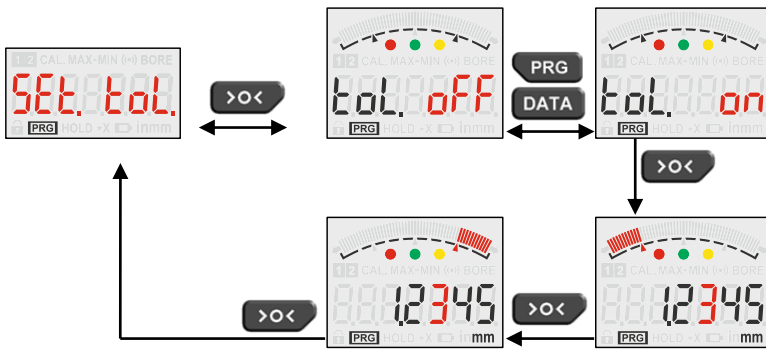Grading mode / Display of grade on numeric display on / off


Tolerance limits / Nominal value

Note :
All digits have to be set one by one with the buttons PRG and DATA. The change to the next digit is done by pressing the button >0<. If the button >0< is pressed > 2 sec., the complete number is confirmed regardless of which digit is active at the moment.

Tolerance limits / Tolerances

Note :
All digits have to be set one by one with the buttons PRG and DATA. The change to the next digit is done by pressing the button >0<. If the button >0< is pressed > 2 sec., the complete number is confirmed regardless of which digit is active at the moment.

Tolerance LEDs / Exceeding upper tolerance limit and lower tolerance limit
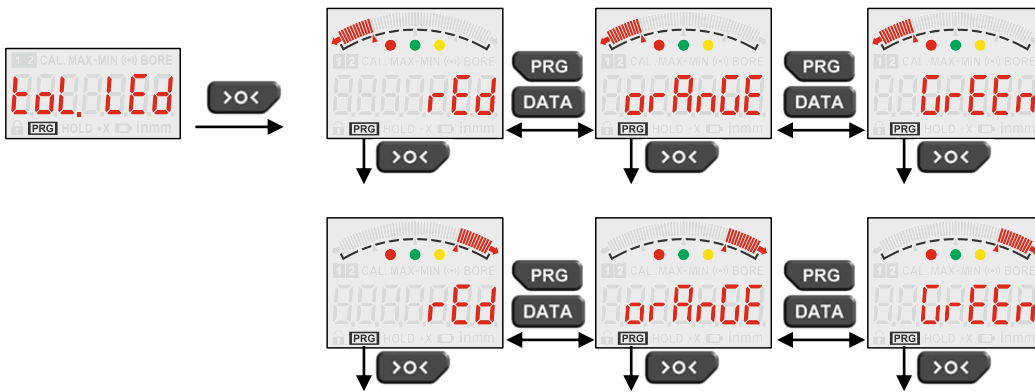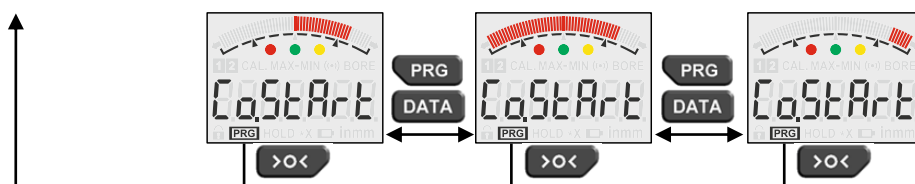

Tolerance LEDs / Display time
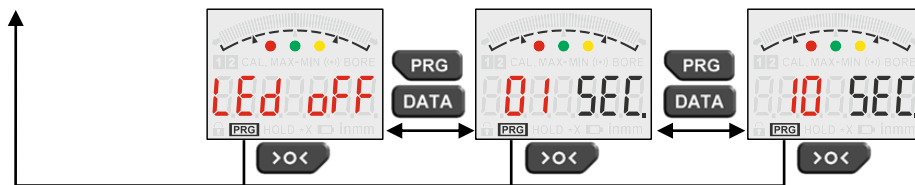
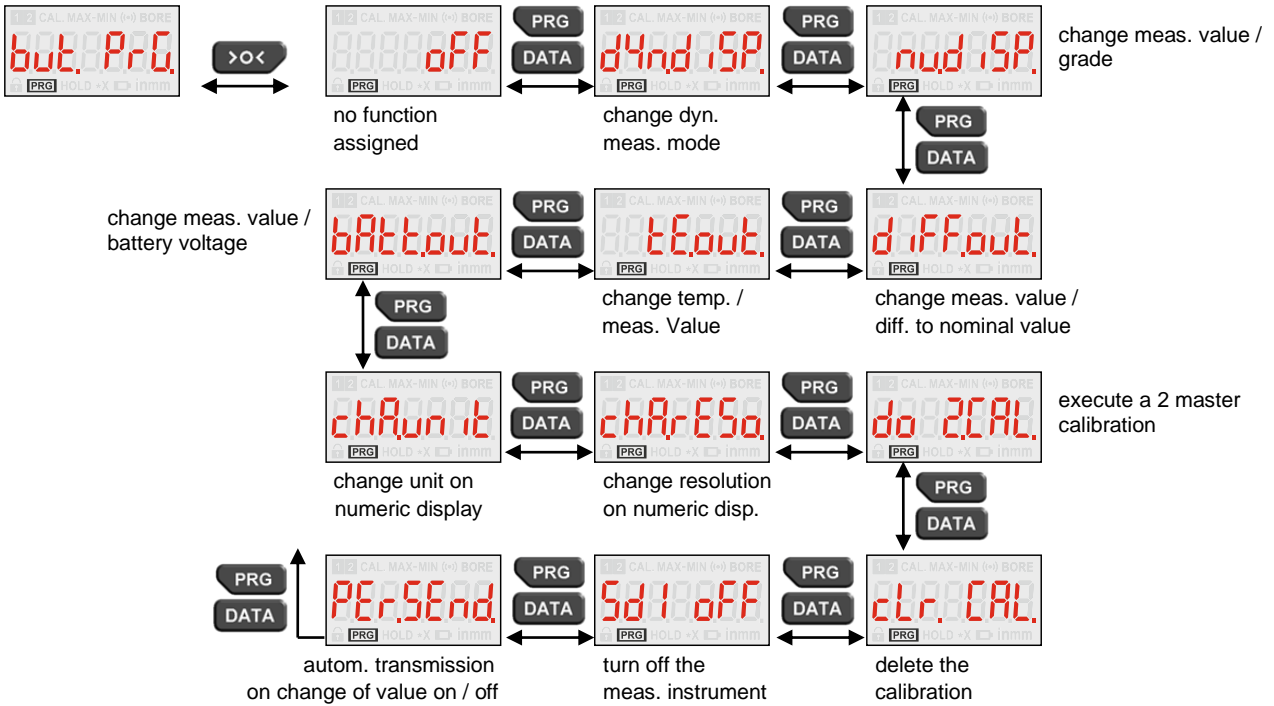

Column display / Selection of the column display mode

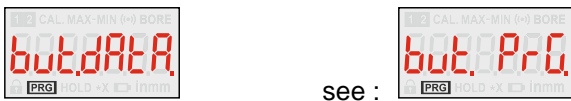Column display / Column starting point

Display control / Freezing the display on a static measurement

| hoLd | ⟷ >0< ⟷ | hoLdoFF | PRG / DATA ⟷ | hoLd on |

Favourite buttons / PRG button pressed > 2 seconds in measuring mode

| but. PrG. | ⟷ >0< ⟷ | oFF | PRG / DATA ⟷ | dYnd iSP. | PRG / DATA ⟷ | nud iSP. | change meas. value / grade |
| | | no function assigned | | change dyn. meas. mode | | | |

PRG / DATA ↕

| change meas. value / battery voltage | bAtt.out. | PRG / DATA ⟷ | tE.out. | PRG / DATA ⟷ | d iFF.out. | change meas. value / diff. to nominal value |
| | | | change temp. / meas. Value | | | |

PRG / DATA ↕

| chАun it | PRG / DATA ⟷ | chArESo. | PRG / DATA ⟷ | do 2.CAL. | execute a 2 master calibration |
| change unit on numeric display | | change resolution on numeric disp. | | | |

PRG / DATA ↕

| PRG / DATA ↑ | PEr.SEnd | PRG / DATA ⟷ | Sd1 oFF | PRG / DATA ⟷ | cLr. CAL. |
| | autom. transmission on change of value on / off | | turn off the meas. instrument | | delete the calibration |

Favourite buttons / DATA button pressed > 2 seconds in measuring mode

| but.dAtA | see : | but. PrG. |

Favourite buttons / >0< button pressed > 2 seconds in measuring mode

| but. CAL. | see : | but. PrG. |

Hand / foot switch : Selection of the function

| FootS | ⟷ >0< ⟷ | oFF | PRG / DATA ⟷ | SEnd | send meas. value |

PRG / DATA ↕

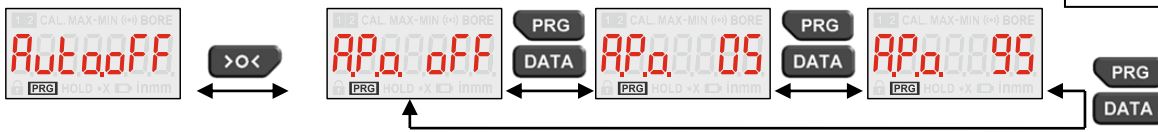| execute a calibration | CAL ibr. | PRG / DATA ⟷ | toL.out. | output of the tolerance position of the meas. value with the LEDs |
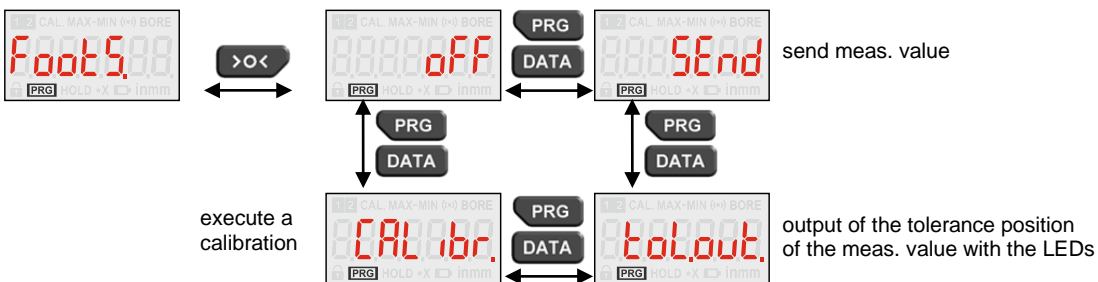
Passcodes / Passcode for Programming menu
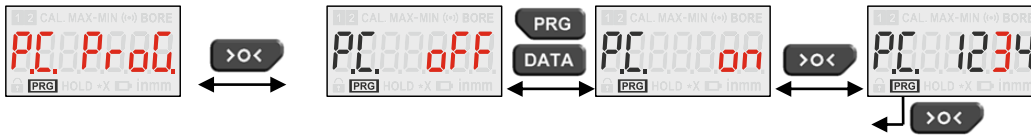
Passcodes / Passcode for calibration
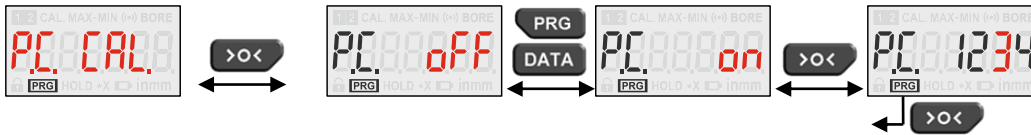
Special parameter / Auto Power Off time

Special parameter / Measuring rate

Special parameter / Button tone

Leave the Programming menu

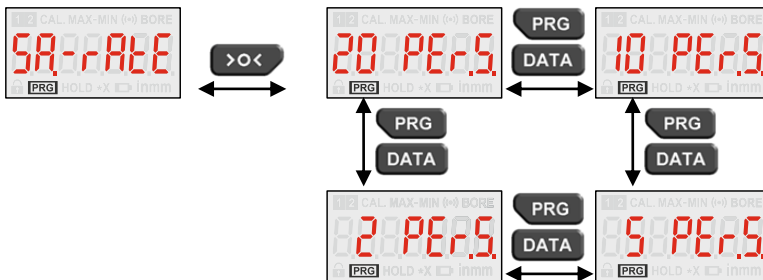 → Measuring mode

Note :
All digits have to be set one by one with the buttons **PRG** and **DATA** . The change to the next digit is done by pressing the button **>O<** . If the button **>O<** is pressed > 2 sec., the complete number is confirmed regardless of which digit is active at the moment.

6. Measuring mode

Key functions in :	Measuring mode
PRG	Call programming menu
> 2 sec.	*Freely programmable favorit key*
DATA	Data transfer Start / Stop dynamic measurement
> 2 sec.	*Freely programmable favorit key*
>O<	Zero adjustment
> 2 sec.	*Freely programmable favorit key*

Note : During a static measurement the measuring value is transmitted by pressing the DATA button.
During a dynamic measurement the measuring values transmitted when the dynamic measurement is **ended** with the DATA button.
When **PRG** and **DATA** are pressed together for more than 2 seconds, all settings are returned to Default.
The default passcode is **9837** on calling the programming menu.

Description of the display elements

1.	Calibration request	→	blinks at temp. / time contolled calibration (a data transmission is not possible)
2.	Tolerance LEDs	→	light when the DATA button is pressed
3.	Column display		
4.	Data transmission	→	Standard mode : blinks shortly when DATA button is pressed Permanent mode : is lighted permanently
5.	Dynamic measuring mode	→	blinks while a dynamic measurement is running
6.	Numeric display		
7.	Unit		
8.	Battery display	→	Segment off = Battery okay on = Battery low blinking = Battery critical
9.	Factor defined		
10.	Function „Hold"		
11.	Programming menu		
12.	Passcode set		
13.	Measuring probe 1 / 2		

7. Instructions for battery replacement

Battery type : CR2032

8. PC connection

(H) **3i-USB**   **[F420 010]**   Triple -I connection cable for USB interface

(H) **3i-232**   **[F420 020]**   Triple -I connection cable for RS232 interface

9.   Windows configuration software SD1_Win.exe

The software *SD1_Win.exe* allows the programming of SD1 dial gauges by using a PC :
-   Online programming of SD1 dial gauges
-   Definition of configurations (= test schemes)
-   Saving of configurations from SD1 dial gauges to a file
-   Loading of configurations from a file into SD1 dial gauges
-   Menu for performing firmware updates.

Note : The SD1 has to be activated and must not be in the programming menu.
Else, no connection can be established.
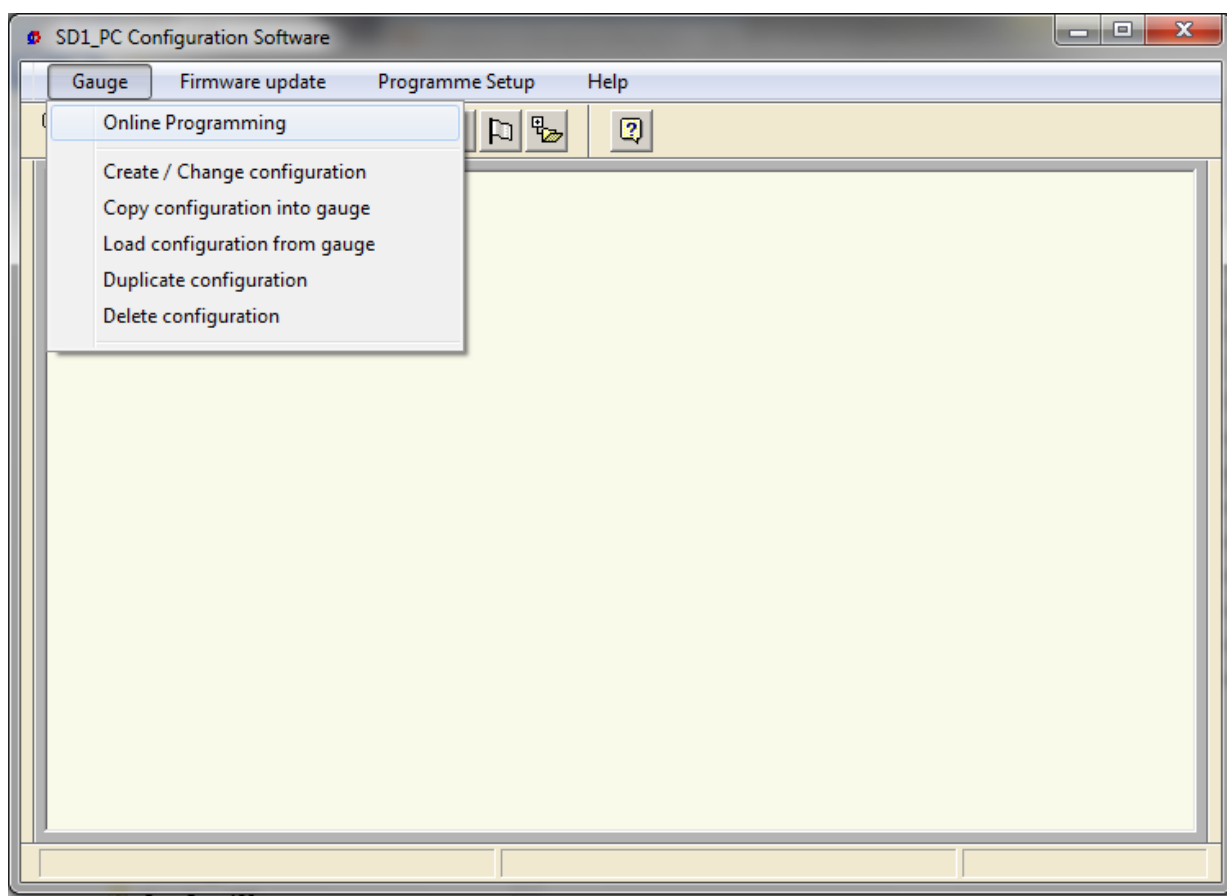
By the red-marked selection boxes the programming menus inside the SD1 can be switched on / off.
By the blue-marked edit boxes the settings in SD1 can be programmed.
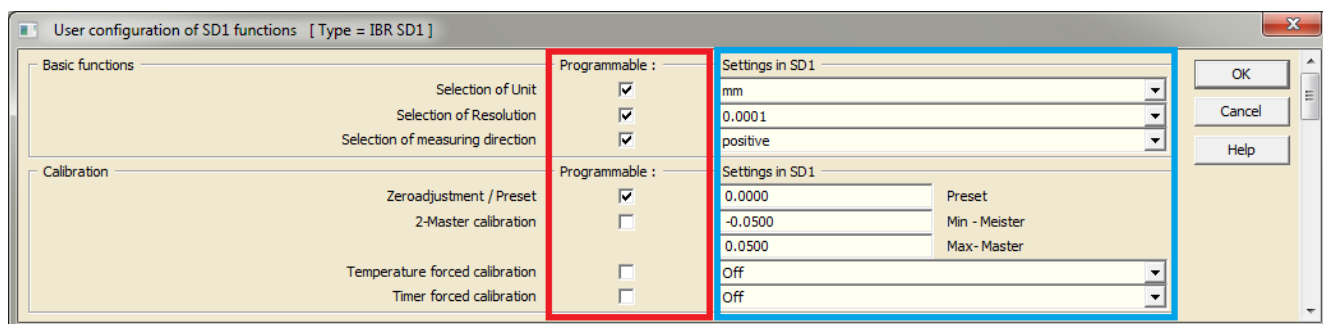
10. Safety instructions

The instrument has been designed and manufactured according to the state of the art and approved technical safety regulations. It is nevertheless mandatory to observe the following instructions in order to prevent personal injuries or accidental death of staff members and other persons.

1. All operators must read the present instructions and this manual very carefully **prior to starting operation**.

2. The instrument may be used only **in proper operational** condition. Malfunctions or errors that may potentially impair the operational safety must be eliminated immediately.

3. The instrument is to be used only for its intended purpose and according to the Instruction Manual. The Instruction Manual is to be kept near the place of operation and ready for use.

4. Prior to connecting the instrument to the power outlet, make sure that the voltage indicated on the label corresponds to the voltage of the local mains. If this is not the case, the device should under no circumstances be connected to the power outlet!

5. The instrument must be connected to the power supply through a properly grounded safety socket. Extension cables, if required, must comply with VDE safety standards.

6. Any modification to or change in procedures concerning the instrument is permitted only with prior written approval. Unauthorized opening of the instrument or tampering with the device shall void the guarantee and exempt the manufacturer from any liability. Before opening the instrument, make sure to effectively cut the power supply, e.g. by disconnecting the power cable.

7. Disconnect the instrument from the mains prior to cleaning.
   Never let any liquids penetrate the inside of the instrument.
   Do not use cleaners that dissolve plastic.

8. Replace faulty fuses only with fuses of **identical** amperage and current characteristics following the instructions given in this manual.

9. Corporate guidelines and safety regulations enforced by the industrial trade associations for the prevention of industrial accidents must be strictly observed. Make sure to consult the safety officer at your company.

10. Do not operate the instrument in an environment containing explosive gases, because an electric spark can cause an explosion.

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11. Declaration of conformity

Thank you very much for your confidence in purchasing this product. We herewith certify that it was manufactured and inspected in our works.

We declare under our sole responsibility that this product is in conformity with technical data as specified in this instruction manual.

Furthermore, we certify that the measuring equipment used to check this product refers to national master standards. The traceability of measuring values is guaranteed by our Quality Assurance System.

12. Guarantee

The quality of this instrument is guaranteed for a period of 12 months from the date of delivery. This guarantee covers all material and manufacturing defects.
Our liability is limited to product repair services or, should we deem it necessary, replacing or crediting the goods.
This guarantee does not include the batteries or damage due to:
- ◆ *Disregard of operating instructions*
- ◆ *Incorrect handling*
- ◆ *Tampering by unauthorised staff*
- ◆ *Attempts by any unauthorised person to repair the instrument.*

We are not to be held liable for any subsequent damage caused by, directly or indirectly, the instrument or its use.