

SC SENSOR COMMUNICATOR

MANUAL (ENGLISCH)



Inhaltsverzeichnis

1	Scope of delivery	3
2	General description of function	3
3	Security advice	4
4	Starting up the Sensor Communicator	5
4.1	Installation of USB driver software for PC	5
4.2	Power supply	6
4.3	Wiring/Pressure connection	6
4.4	Switch-on the SC	7
4.5	Cursor functions	7
5	Working with the Sensor Communicator	8
5.1	Sensors with analogue signal output	8
5.2	Sensors with digital Signal output	9
6	Maintenance	10
6.1	Batteries	10
6.2	Software updates	10
6.3	Customized software adaptations	10
7	Theory of pressure measurement	11
7.1	Relative pressure measurement	11
7.2	Absolute pressure measurement	11
7.3	Accuracy, Zero point, Span, Final value,	12, 13
8	Technical data, Explanations	14, 15

Before using the Sensor Communicator (SC) for the first time please read this manual

1. Scope of delivery:

1 pce Sensor Communicator including rechargeable batteries

1 pce USB connecting cable (Sensor Communicator (SC) to PC)

1 pce Measuring bridge cable

Option: to the sensor compatible original adapter cable (Communicator to pressure Sensor)

2. General description of function

The SC is a handheld device for adjustment of different parameters of selected Trafag devices. You can for example adjust zero point or span or initialize a CANopen pressure transmitter. The SC can communicate with analogue (e.g. 4...20mA, 0...10VDC, ...) or digital (e.g. CANopen) versions.

Please calibrate a sensor only with qualified personnel.



3. Security advice:

Exclusion of warranty

With using the SC for calibrating a sensor the factory settings of the sensor will be changed and can have a direct influence to the guaranteed measuring accuracies. After a customer sensor adjustment is done the warranty concerning accuracy will be cancelled. Trafag is also not responsible for consequential damages of a customer calibrated sensor.

Status of battery charge

The status of battery charge is just for information and can change very fast (depending on operating mode). We strongly recommend to charge the batteries before using the SC in a field application (see also under section ‚Maintenance‘)

Break of supply

Should be break down the electrical supply while using the SC the connected sensor can in the worst case not save the data. Take care for a constant electrical supply.

Cable manipulations during operation

Please don't handle at the cables while the operation mode e.g. plug-in and out of the cables. It can destroy the sensor!

4. Starting up the Sensor Communicator (SC)

4.1 Installation of USB driver software for PC:

Before using the SC with USB-cable and computer please install the recommended software:

Download: www.trafag.com , Button ,Download' , section ,Tools').

- 1) download the zip-file to your computer
- 2) open the accordingly installation guide (pdf-file)
- 3) install the in the zip-file containing driver as instructions of the installation guide

...follow next pages...



4.2 Power supply:

Sensor Communicator SC

from batteries:

With integrated rechargeable batteries. They will discharging depending on operating mode. We strongly recommend to charge the batteries before using the SC in a field application (see also under ‚Maintenance‘)

from power supply system:

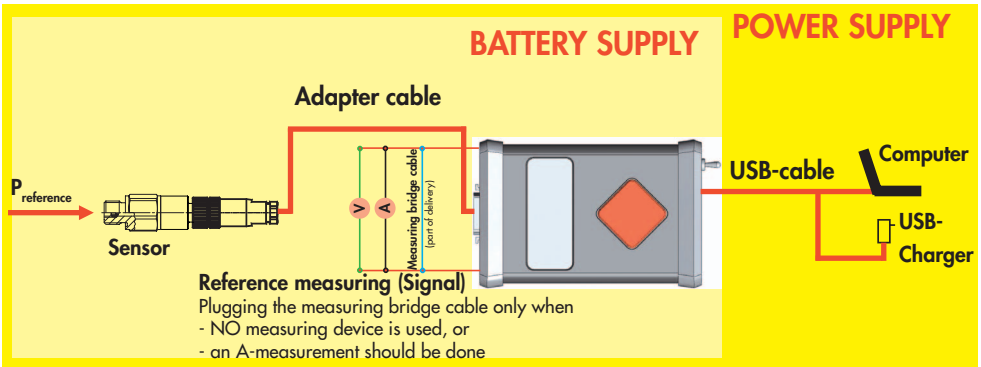
With a USB-power supply unit (charger) or USB-cable (SC to computer).

Pressure Transmitter:

The sensor can be connected with external power supply (e.g. by running process of a plant or by separate power supply) or with direct supplying from the SC.

4.3 Wiring/Pressure connection

Please connect to following scheme. **Please use for the sensor the compatible and original adapter cable from Trafag!**



Connecting of a reference pressure:

All adjustments of a pressure sensor are depending from the connected reference pressure. It will have an influence of the measuring accuracy of the pressure transmitter during its operation.

If no pressure connected and the pressure port of the pressure transmitter is not connected to anywhere (e.g. on a closed pressure system) than is existing atmospheric pressure (about 0.96bar, depending of geographic location).

4.4 Switch-on the SC:

Please be sure that all preparations are done correctly as at the sections before are described:

- Power supply (provided USB-cable, from battery or from power supply system)
- Wiring (to the sensor with compatible and original adapter cable from Trafag)
- Reference measuring of signal (I- or U-out, otherwise the bridge cable is to plugging)
- If desired, connection of reference pressure $P_{\text{reference}}$

Switch-on:

- 1) Then switch on the SC at the main switch (ON/OFF)
- 2) Please wait about 2 seconds
- 3) At first-time use please enter date and time
- 4) Autodetect mode: the SC is reading the specifications of the sensor
- 5) Follow the explanations of the menu flowchart at separately attached sheet

4.5 Cursor functions:

With pressing at the edges of the red cursor  you have following functions:



5. Working with the Sensor Communicator (SC):

5.1 Sensors with analogue signal output (e.g. 4...20mA, 0...10VDC, ...)

Read-out of the sensor data

(Model, signal output, type plate, date of manufacturing...)

Follow the explanations of the menu flowchart at separately attached sheet (left sheet side)

Adjustment of zero point and span

Please note that the ambient temperature will influence the adjustments. Particularly when difference between the ambient temperature of calibration process and the ambient temperature of operation is big. The factory settings are normally made at an ambient temperature of about 25°C.

Follow the explanations of the menu flowchart at separate attached sheet (left sheet side)

Reset to mode ‚Factory Set‘

You reset the adjusted data to factory calibrating.

Follow the explanations of the menu flowchart at separate attached sheet (left sheet side)



5.2 Sensors with digital signal output (e.g. CANopen, ...)

Read-out of the sensor data

(Model, protocol, type plate, date of manufacturing...)

Follow the explanations of the menu flowchart at separately attached sheet (right sheet side)

Adjustment of Node-Id

Follow the explanations of the menu flowchart at separately attached sheet (right sheet side)

Adjustment of zero point and span

Please note that the ambient temperature will influence the adjustments. Particularly when difference between the ambient temperature of calibration process and the ambient temperature of operation is big. The factory settings are normally made at an ambient temperature of about 25°C.

Follow the explanations of the menu flowchart at separately attached sheet (right sheet side)

Reset to mode 'Factory Set'

You reset the adjusted data to factory calibrating.

Follow the explanations of the menu flowchart at separately attached sheet (right sheet side)



6. Maintenance

6.1 Batteries:

Battery charging:

Direct with USB-charger (not part of this delivery) or per computer with enclosed USB-cable (details see ,technical data'). Time of charging: about 2.5h

Battery replacement:

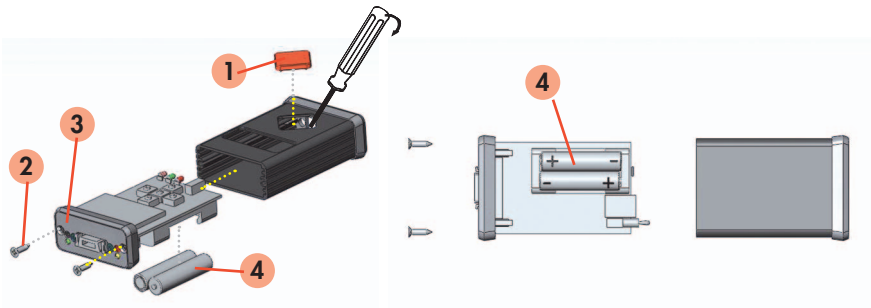
The batteries have to be replaced after about 1000 charging cycles. Exchange the batteries as follows (battery type see under ,technical data'):

Open:

- 1) Remove the cursor through light lifting with a screw driver
- 2) Unscrew the 2 cross-head screws at the top cap
- 3) Pull the cap careful outwards until the whole circuit board module is outside of the housing
- 4) Replace the 2 batteries with new ones. Please regard to the right polarisation.

Close:

Go ahead in reverse direction as described under section ,open'. Please attend during insertion of the circuit board module to display and other devices: they may not be damaged.



6.2 Software updates:

If updates are existing you can download it direct from www.trafag.com, section ,Download'. Upload with the USB interface from the PC to the SC.

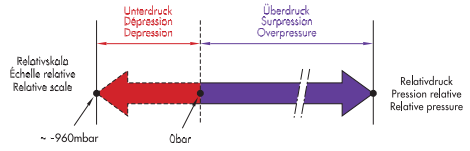
6.3 Customized software adaptations:

Trafag offers the possibility to adapt the SC software at your special needs. Please contact your local Trafag sales service.

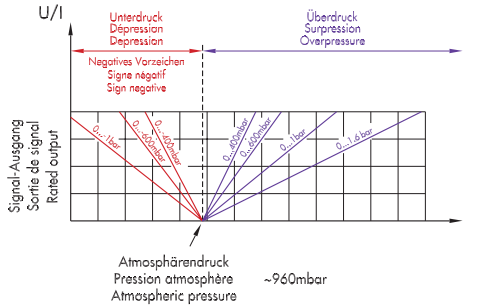
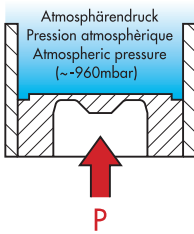
7. Theory of pressure measurement

7.1 Relative pressure measurement

The measuring result is always the deviation to the current atmospheric pressure.
 e.g. 4 mA = 960 mbar (=atmospheric pressure);
 Zero point (Z): 0 bar

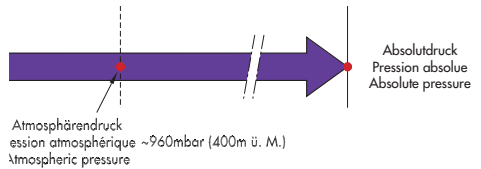


Relative pressure measurement

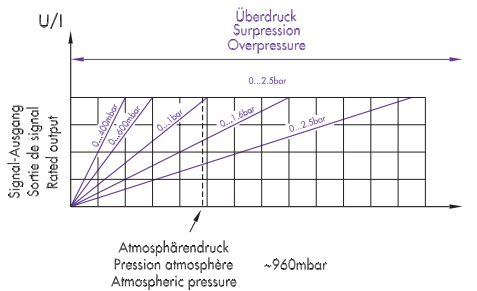
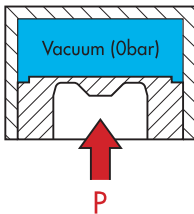


7.2 Absolute pressure measurement

The measuring result is always the deviation to the absolute zero (vacuum). The signal size is not affected by the atmospheric pressure.
 e.g. 4 mA = 0 bar (=Vacuum);
 Zero point (Z): 0 bar



Absolute pressure measurement



7.3 Accuracy

TYP.

typical, 70... 80% of all instruments fulfil this typical measured value

FS (FULL SCALE)

Whole defined measuring range.

TEB (=TOTAL ERROR BAND)

Total error of all influences of temperature, NLH, calibration accuracy without time influence (long-term stability).

ACCURACY

Accuracy at ambient temperature with consideration of NLH, zero signal and final value deviation.

or: TFB without temperature influence at ambient temperature.

NLH (=NON-LINEARITY AND HYSTERESIS):

Largest deviation from the ideal reference line.

BSL (=BEST STRAIGHT LINE)

Best straight line (= reference line), does not run through the zero point of the diagram.

TEMPERATURE COEFFICIENT (TC)

Change of measured value of zero point and span during change of temperature.

NON-LINEARITY

The maximum divergence of the actual characteristic curve from the reference line.

PRESSURE HYSTERESIS

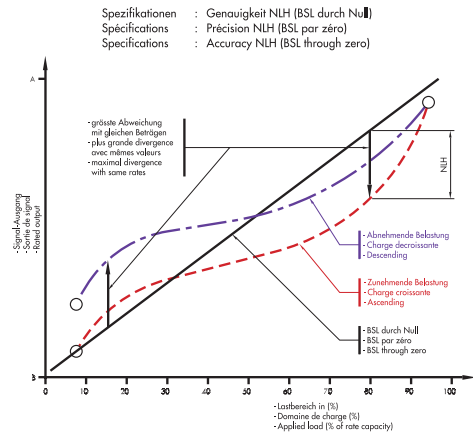
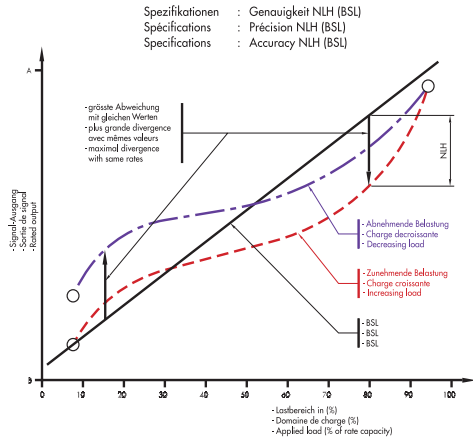
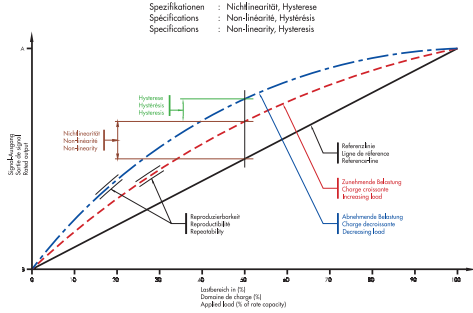
The variation in the measuring characteristic of a given pressure when approached from a rising and falling direction.

REPEATABILITY

The capability under operating conditions to reproduce the same output signal under repetitive applications of an ideal input.

LONG TERM STABILITY

Change of accuracy under time influence (aging).



Zero point, Span, Final value

ZERO POINT (Z)

Z=zero

Signal output without applied pressure (P_{min})

e.g. 4 mA at 0 bar (P_{min})

FINAL VALUE (FV)

FV= Final Value

Signal output of the highest pressure value within the nominal

pressure range (P_{max})

e.g. 20 mA at 100 bar (P_{max})

SPAN (S)

Final value (FV)-Zero point(Z)=Span (S)

e.g. Span (S)=(FV)20mA-(Z)4mA=16mA

Calculating example:

Range:

0...100 bar

Sensor:

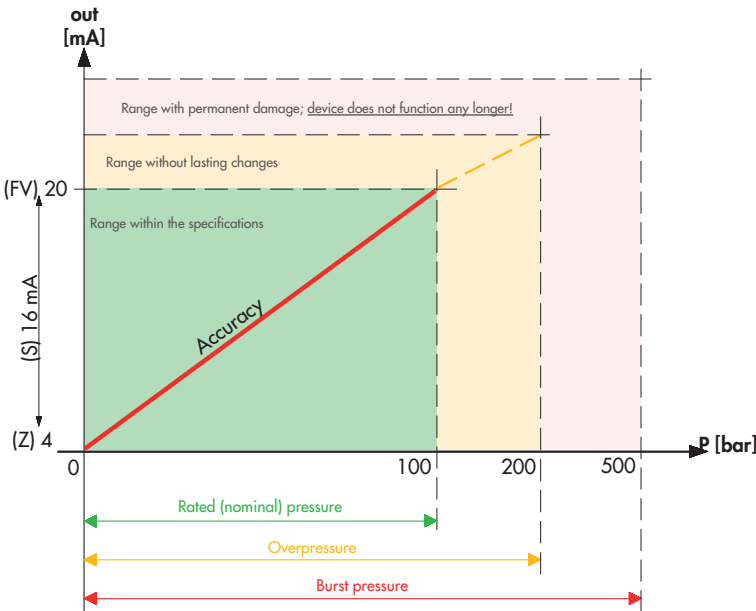
Thin film on steel

Out:

4...20mA

Accuracy:

0.3% FS, NLH (BSL through 0)



8. Technical data, explanations

Supply:	5VDC, $\leq 0.5A$ (supply from USB-interface)
Batteries	
Type:	2 pcs, AAA, NiMH, 1000mAh, 1.2V
Operation time	
with external power supply of the sensor:	about 20h
without external power supply of the sensor:	about 2h (fully battery operation)
Charging time:	about 2.5h
Showing battery charge state:	Battery symbol on display
Sleep Mode:	after 5Min, advance warning with beeper
Wake up:	press on any edge of the cursor
Beeper:	acoustical feedback after entry over cursor
Operating temperature:	0...70°C
Storage temperature:	-20...80°C
Protection:	IP 30
Dimensions:	LxWxH 85x55x25 (mm)
Software:	Flash-Update possible, with USB-interface (see chapter ‚Maintenance‘)
Accessories:	
Sensor adapter cable:	Pls use to the pressure sensor compatible original adapter cable from Trafag
USB-Charger:	
Buying at a local PC-Shop with accordingly connector for your local power supply.	
DC-Output of USB: 5VDC, $\geq 0.5A$	

Logger connection

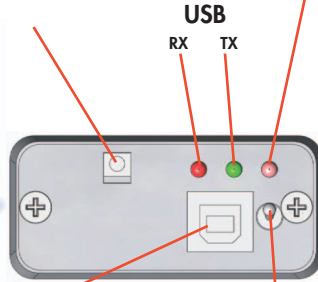
2.4VDC

Not part of delivery. For additional battery supply



Battery charge state

flashing: Batteries are loading
bright/not bright: Charging O.K.



USB
RX TX

ON/OFF Switch



USB-Cable

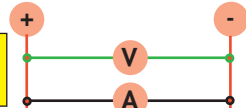
Sensor Communicator - PC

Part of delivery. For power supply and/or PC-communication

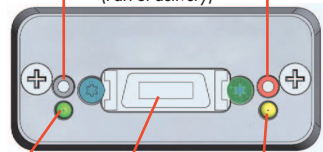


Connection of an external measuring device

Plugging the measuring bridge cable only when
- NO measuring device is used, or
- an A-measurement should be done



Measuring bridge cable
(Part of delivery)



Sensor-adapter-cable connection

Sensor supply active

Function only with sensor supply from Sensor Communicator

Data transfer

Flashing during transfer



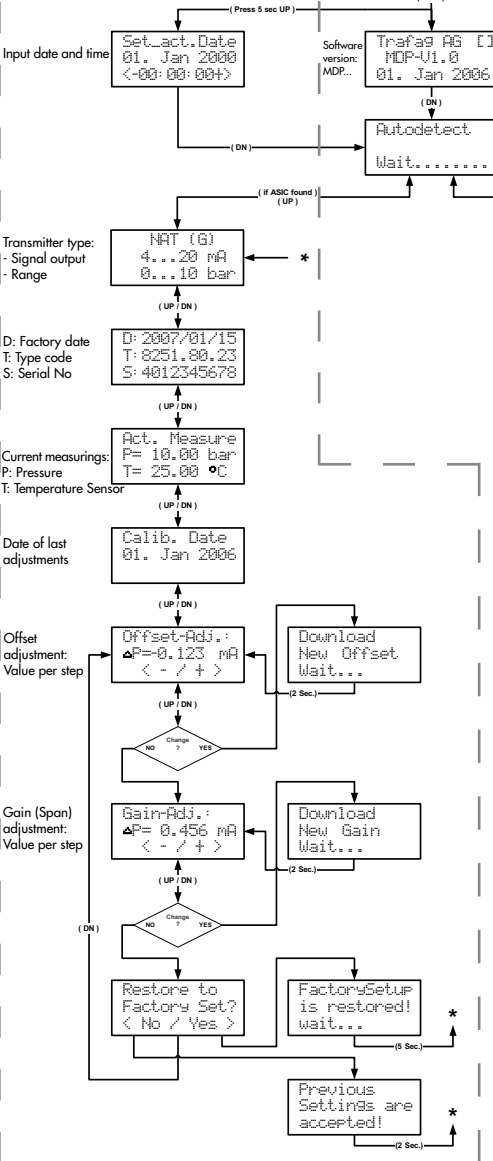
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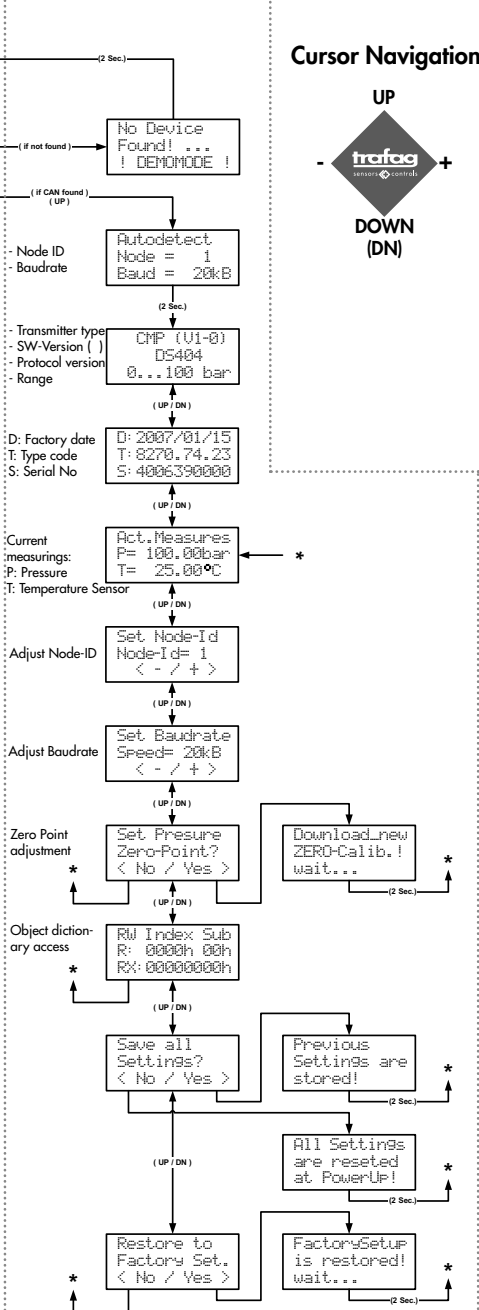
ANALOGUE SIGNAL OUTPUT

(e.g. 4...20mA/0...10mA/...)



DIGITAL SIGNAL OUTPUT

(e.g. CANopen)



Cursor Navigation



Menu Flow Chart
for: Sensor Communicator SC