



# Inhaltsverzeichnis

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1. Scope of delivery	3
Adapter cables	3
2. General description of function	3
3. Security advice	4
Exclusion of warranty	4
Status of battery charge	4
Cable manipulations during operation	4
4. Starting up the Sensor Communicator (SC)	5
4.1 Power supply	5
4.2 Wiring and pressure connection	5
4.4 Switch-on the SC	6
4.5 Cursor functions	6
5. Working with the Sensor Communicator (SC)	7
5.1 Sensors with analog signal output	7
5.2 Sensors with digital signal output	7
6. Maintenance	8
6.1 Batteries	8
6.2 Software updates	9
7. Theory of pressure measurement	10
7.1 Relative pressure measurement	10
7.2 Absolute pressure measurement	10
7.3 Accuracy	11
7.4 Zero point, Span, Final value	12
8. Technical data, explanations	13

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

## 1. Scope of delivery

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- 1pc Sensor Communicator including rechargeable batteries
- 1pc USB connecting cable (Sensor Communicator (SC) to PC)
- 2pcs Reduction adapter for test plugs, red and black

### Adapter cables

Different dedicated adapter cables are available to connect pressure sensors.

## 2. General description of function

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The SC is a handheld device to adjust different parameters of selected Trafag devices. It can be used for zero- or span adjustment or initialization of a CANopen pressure transmitter. The SC can communicate with analog (e.g. 4...20mA, 0...10VDC, ...) or digital (e.g. CANopen) versions.

**A recalibration should be performed by qualified personnel only**

## 3. Security advice

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### 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 accuracy. After a recalibration by the customer the warranty related to accuracy is automatically lost.

### Status of battery charge

We strongly recommend to charge the batteries before using the SC in a field application (see chapter ‚Maintenance‘). In case of low battery or loss of supply the data will not be saved. Therefore a constant electrical supply must be assured.

### Cable manipulations during operation

Please do not manipulate the cables during the operation mode, e.g. plug in and out of the cables. This can destroy the sensor!

# 4. Starting up the Sensor Communicator (SC)

## 4.1 Power supply

### Sensor Communicator SC

#### Battery supply

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

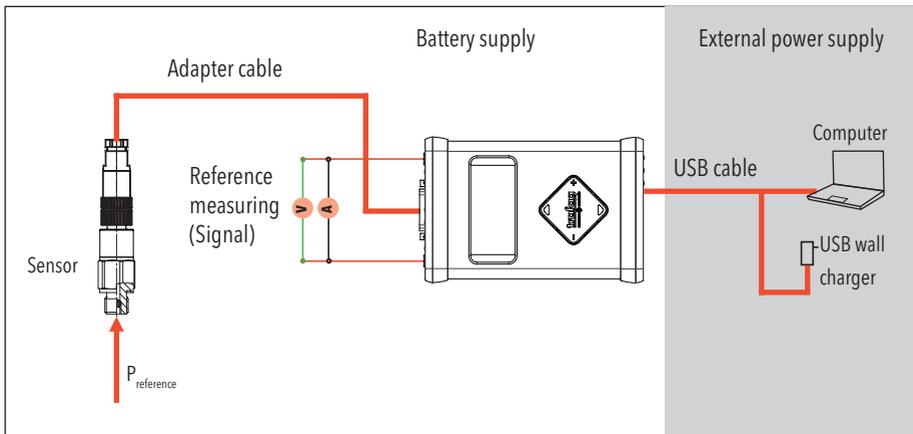
#### Mains supply

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

## 4.2 Wiring and pressure connection

Please connect to following scheme.

**Please use the compatible and original adapter cable from Trafag!**



## Connecting of a reference pressure

All adjustments of a pressure sensor are depending on the applied reference pressure. It has an influence of the measuring accuracy of the pressure transmitter during its operation.

If the pressure port of the transmitter is open to ambient air, the pressure corresponds to atmospheric pressure.

## 4.4 Switch-on the SC

**Make sure that all preparations, described in the chapters before, are done correctly:**

### Procedure

- 1) Switch on the SC by pressing [down] key
- 2) Device is starting up
- 3) At first start up enter date and time
- 4) Press [down] button
- 5) Autodetect mode: the SC is reading the specifications of the sensor
- 6) Follow the explanations of the menu flowchart on page 15

## 4.5 Cursor functions

By pressing on the edges of the red cursor  you have following functions:



## 5. Working with the Sensor Communicator (SC)

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### 5.1 Sensors with analog signal output

(e.g. 4...20mA, 0...10VDC, ...)

#### Read-out of sensor data

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

Follow the explanations of the menu flowchart on page 15

#### Adjustment of zero point and span

Please note that the ambient temperature will influence the adjustments. This is important for large deviations of the actual temperature from 25°C (factory calibration temperature)

Follow the explanations of the menu flowchart on page 15

#### Reset to ‚Factory Set‘

Reset of the adjusted data to factory calibration

Follow the explanations of the menu flowchart on page 15

### 5.2 Sensors with digital signal output

(e.g. CANopen, ...)

#### Read-out of sensor data

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

Follow the explanations of the menu flowchart on page 15

#### Adjustment of Node-Id

Follow the explanations of the menu flowchart on page 15

#### Adjustment of zero point and span

Please note that the ambient temperature will influence the adjustments. This is important for large deviations of the actual temperature from 25°C (factory calibration temperature)

Follow the explanations of the menu flowchart on page 15

#### Reset to ‚Factory Set‘

Reset of the adjusted data to factory calibration

Follow the explanations of the menu flowchart on page 15

# 6. Maintenance

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## 6.1 Batteries

### Battery charging

Directly with USB-charger (not part of this delivery) or per computer with enclosed USB-cable (details see 'Technical data'), charging time 5h.

### Battery replacement

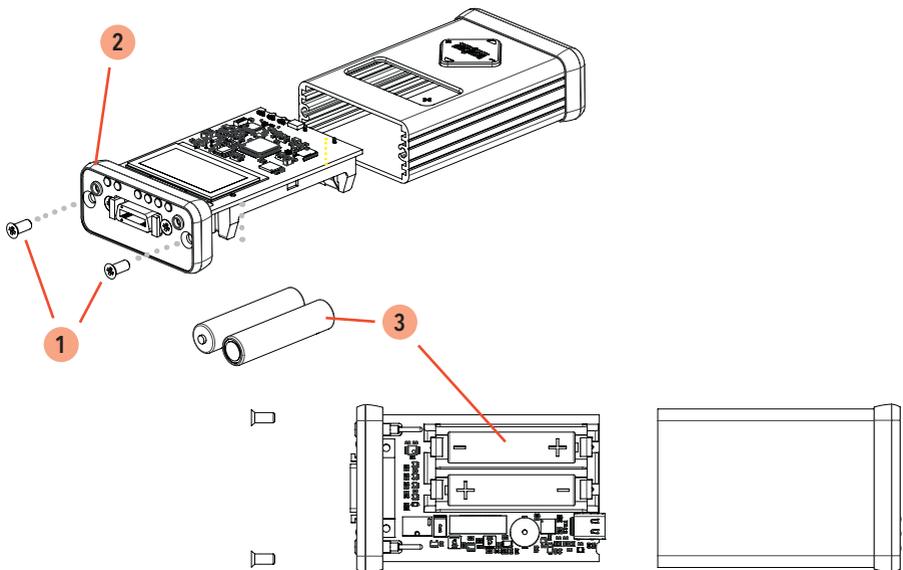
The batteries have to be replaced after about 1000 charging cycles. Exchange the batteries as follows (battery type see 'technical data'): **USE ONLY RECHARCHABLE BATTERIES!**

#### Open:

- 1) Unscrew the 2 cross recessed screws at the top cap
- 2) Pull the cap carefully outwards until the circuit board module is outside of the housing
- 3) Replace the 2 batteries in correct polarity

#### Close:

Proceed in reverse direction as described under chapter 'open'. Insert the module carefully to avoid damage.



## 6.2 Software updates

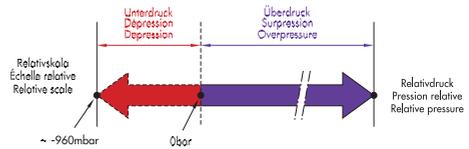
Updates can be downloaded from [www.trafag.com](http://www.trafag.com)

Upload the new software version by means of the USB interface. Connect the Sensor Communicator with the USB cable with the PC.

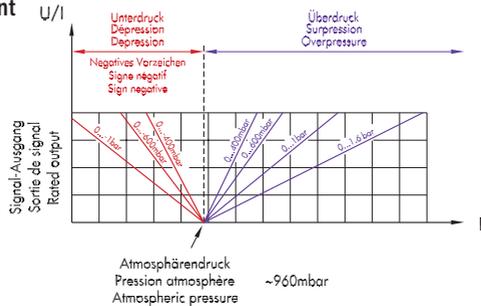
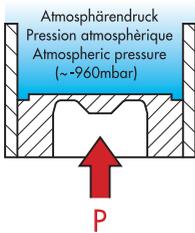
# 7. Theory of pressure measurement

## 7.1 Relative pressure measurement

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

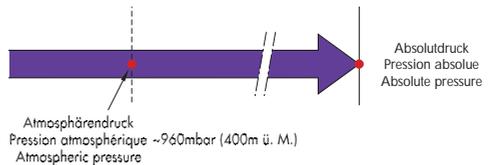


### Relative pressure measurement

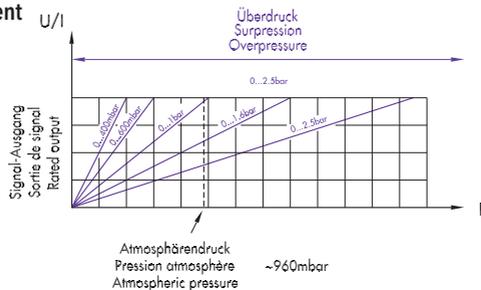
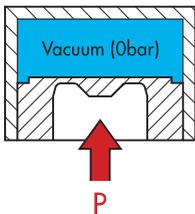


## 7.2 Absolute pressure measurement

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 fulfill this value

## FS (Full scale)

Complete 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

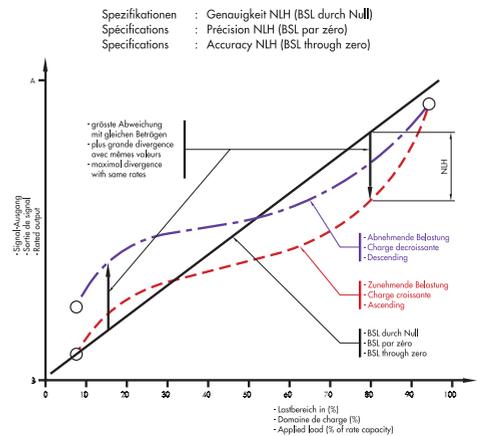
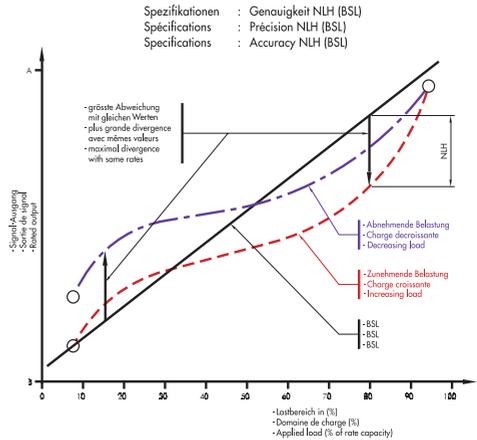
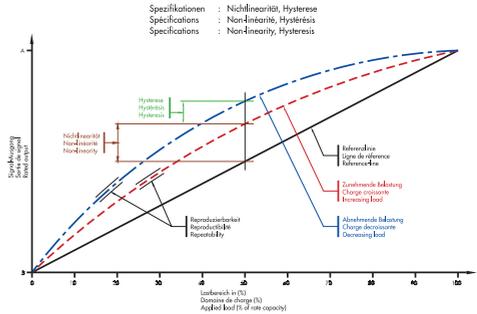
The variation in the measuring characteristic of a given pressure when approached by a rising or falling pressure

## Repeatability

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

## Long term stability

Change of accuracy under time influence (ageing)



# 7.4 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) 20 mA-(Z) 4 mA = 16mA

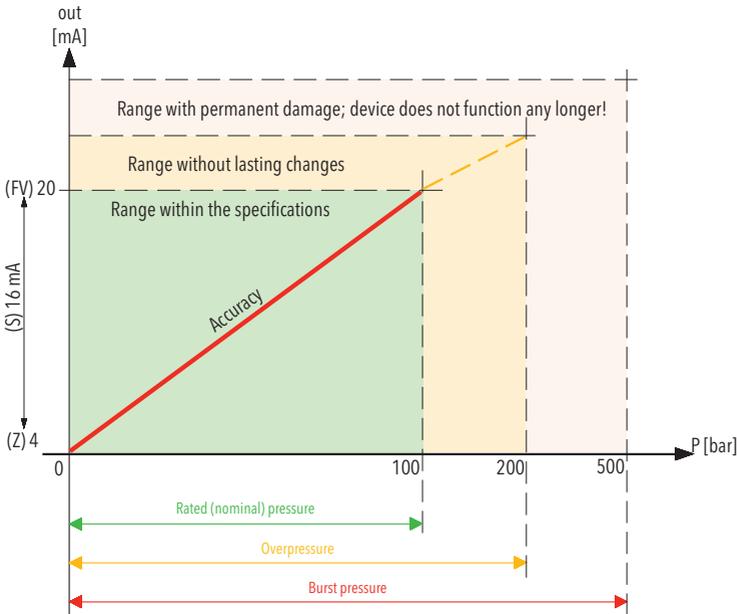
## Calculating example

Range: 0...100 bar

Sensor: Thin film on steel

Out: 4...20mA

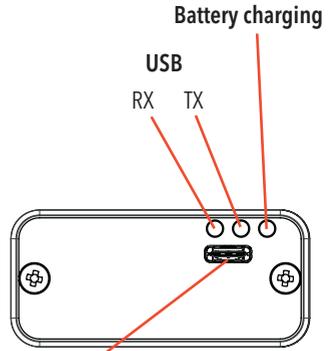
Accuracy: 0.3% FS, NLH (BSL through 0)



## 8. Technical data, explanations

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<b>Supply</b>	5VDC, $\geq 0.5A$ (supply from USB-interface)
<b>Batteries</b>	
Type	Rechargeable batteries ONLY 2 pcs, AAA, NiMH, 2000mAh, 1.2V
Operation time	ca. 5h
<b>Charging time</b>	ca. 5h
<b>Battery charging</b>	Battery symbol on display
<b>Sleep Mode</b>	after 5 Min., pre-warning with beeper
<b>Wake up</b>	press any edge of the cursor
<b>Beeper</b>	acoustical feedback after entry via cursor
<b>Ambient temperature</b>	0 ... +70°C
<b>Storage temperature</b>	-20 ... +80°C
<b>Protection</b>	IP34
<b>Dimensions</b>	LxWxH 85x55x25 (mm)
<b>Software</b>	Flash-Update possible, with USB-interface (see chapter ‚Maintenance‘)
<b>Accessories</b>	
Sensor adapter cable	Use compatible original adapter cable from Trafag
USB-Charger	Available at your local PC-Dealer, suitable for supply needed in your country. DC-Output of USB: 5VDC, $\geq 0.5A$

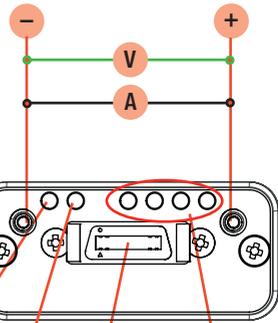


**USB (type C)**

- Sensor Communicator - PC connection
- Battery charging
- External power supply



**Connection of an external measuring device**



- Sensor supply active
- Adapter control
- Sensor adapter-cable connection
- Data transfer indication

# Menu Flow Chart

## For Sensor Communicator

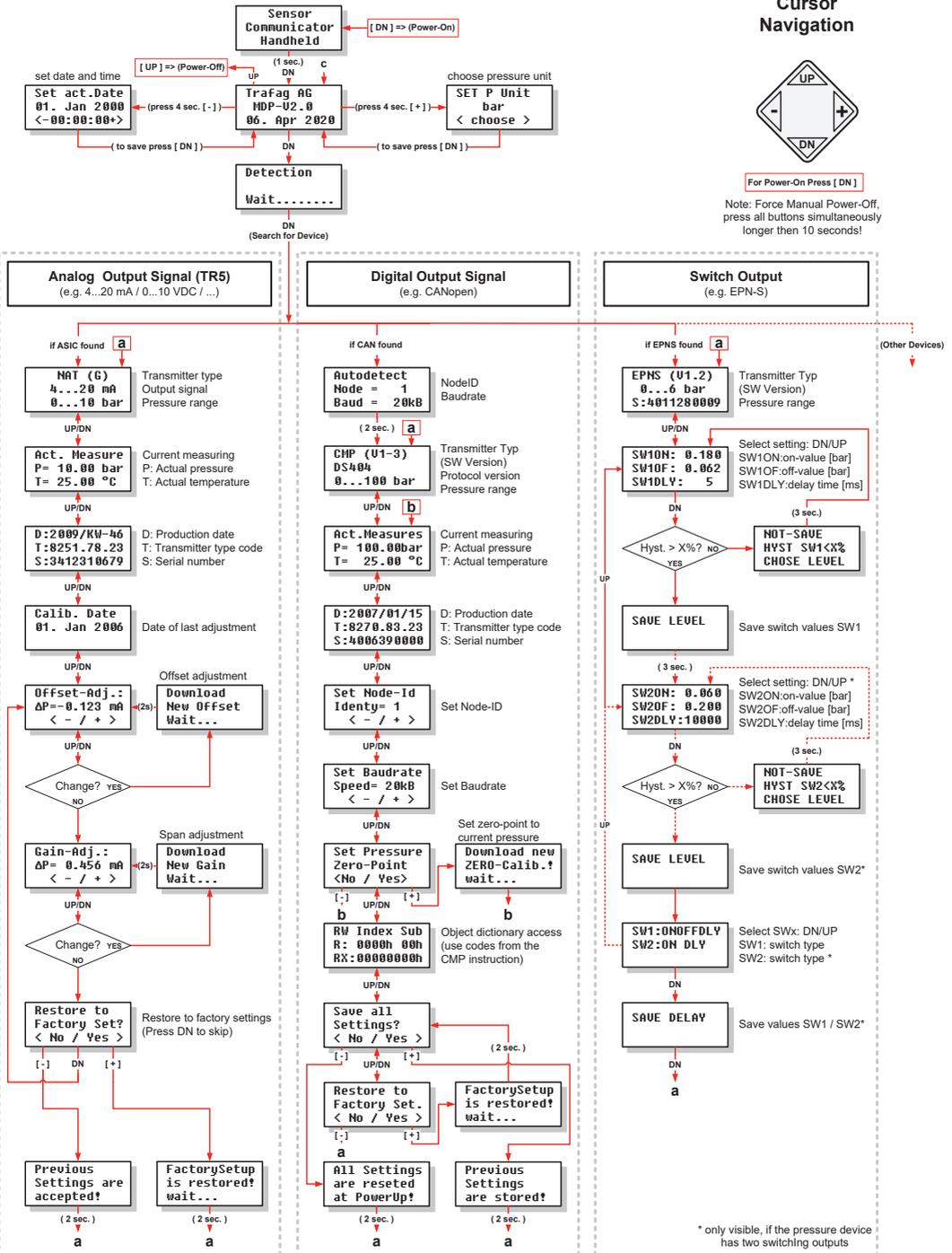
### Version 2.0

## Cursor Navigation



For Power-On Press [DN]

Note: Force Manual Power-Off, press all buttons simultaneously longer than 10 seconds!



\* only visible, if the pressure device has two switching outputs

