Practice.

user manual

smartPKM

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Systems. Controls. Sensors.

user manual

Subject to changes

Subject to changes in the interests of technical advancement.

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Table of contents

1 Change index

Change	Date	Index
First edition	07. aug. 23	00

2 General

This user manual contains the following subjects:

- Electrical specifications
- Installation
- Commissioning
- Configuration/parameterization

Since the documentation has a modular structure, this user manual is deemed a supplement to other sources of documentation such as product data sheets, dimensional drawings, brochures and assembly instructions.

The user manual may form part of the scope of delivery depending on customer specifications or it may be requested separately.

*These operating instructions are kept up-to-date. However, since **TRsystems GmbH/UNIDOR** products are subject to continuous further development, it is possible that short-term deviations between the device version and the operating instructions might occur due to technical changes. Please note that we do not assume liability for damage which might arise as a result.*

2.1 Scope of application

This user manual solely applies to the following product:

smartPKM

Order number: 1921 1000 0000

The products are marked by attached nameplates and form part of a system.

Therefore, the following documentation applies:

- The system-specific operating instructions of the operator
- This user manual
- Further documents supplied together with system

3 Additional safety notes

3.1 Definition of icons and notes

means that minor physical injury or property damage may occur if appropriate precautions are not taken.

refers to important information and/or characteristics of and application advice for the product used.

3.2 Supplement notes to the intended use

The system is designed to be used in **Ethernet** networks with a maximum speed of 100 Mbs for full-duplex operation specified in IEC 61158 as CPF2/2 (Communication Profile)

The technical directives on establishing the Ethernet network must be complied with in order to ensure safe operation.

The intended use also includes:

observing all notes contained in this user manual,

*observing the assembly instructions, in particular the chapter **"Fundamental safety notes"** must be read and understood before beginning to work*

3.3 Organizational measures

This user manual must always be available at the place of use of the system.

Before beginning work, the personnel assigned to perform activities on the system must have read and understood
– the assembly instructions, in particular the chapter "Fundamental safety notes",
– and this user manual, in particular the chapter "Additional safety notes"
.

This particularly applies to temporary personnel.

4 Technical data

design	smartPKM
display	10.4" LCD display 1024x768 pixel, 24 bit
operating system	1 finger touch, resistive
operating system	WIN 10IoT® Ent. 2019
power supply	24V DC (Us/Up) via 4 pin M8 (IN/OUT)
current consumption	>= 900mA at 24V (Us)
temperature range	0... 40°C
humidity	10...90 % non condensing
CPU	Intel® AtomTM SoC E3845, Quad Core 1.91 GHz. 2M cache
mainboard	3.5" SBC singlecomputer
RAM	4 GB DDR3L
maindrive	16 GB eMMC (on board)
capacity CFast	8 GB CFast card (optional)
chipset	System OnChip (SOC)
interfaces	1 x LAN RJ45 Ethernet (Intel® i210)
	1 x LAN RJ45 EtheCAT® (Intel® i210)
	1 x USB 2.0
	1 x USB 3.0
	1 x VGA, displayport (DP)
cooling system	passive cooling system
front color	silver
case	aluminum anodized
case mounting	incl. mounting adapter, VESA compatible
protection class	IP30
dimensions	240 x 215 x 66mm (WxHxD)
mounting	table or variable wall mounting
Weight	2.15 kg

5 functionality

the smartPKM is a digital tonnage monitoring device with 2 channels and min/max monitoring. The device has a touch operation screen with graphical event display (channel and total force display) as well as the display of the current machine angle (virtual encoder) and display of the current stroke rate. Integrated user administration; tool memory for 1,000 tools (alphanumeric); data backup on USB flash drive; 1 cam input (trigger signal); 1 clutch input; 1 stop output.

The piezo sensors are used to measure strains or compressions of the machine. The piezo sensors convert the strain (compression) proportional to the tonnage into an electrical voltage. The maximum force occurring within a cycle is stored and displayed, and compared with the specified set value. If the set values are exceeded, the machine is switched off.
Min/max monitoring also active in jog mode (when no trigger signal is detected).

user manual
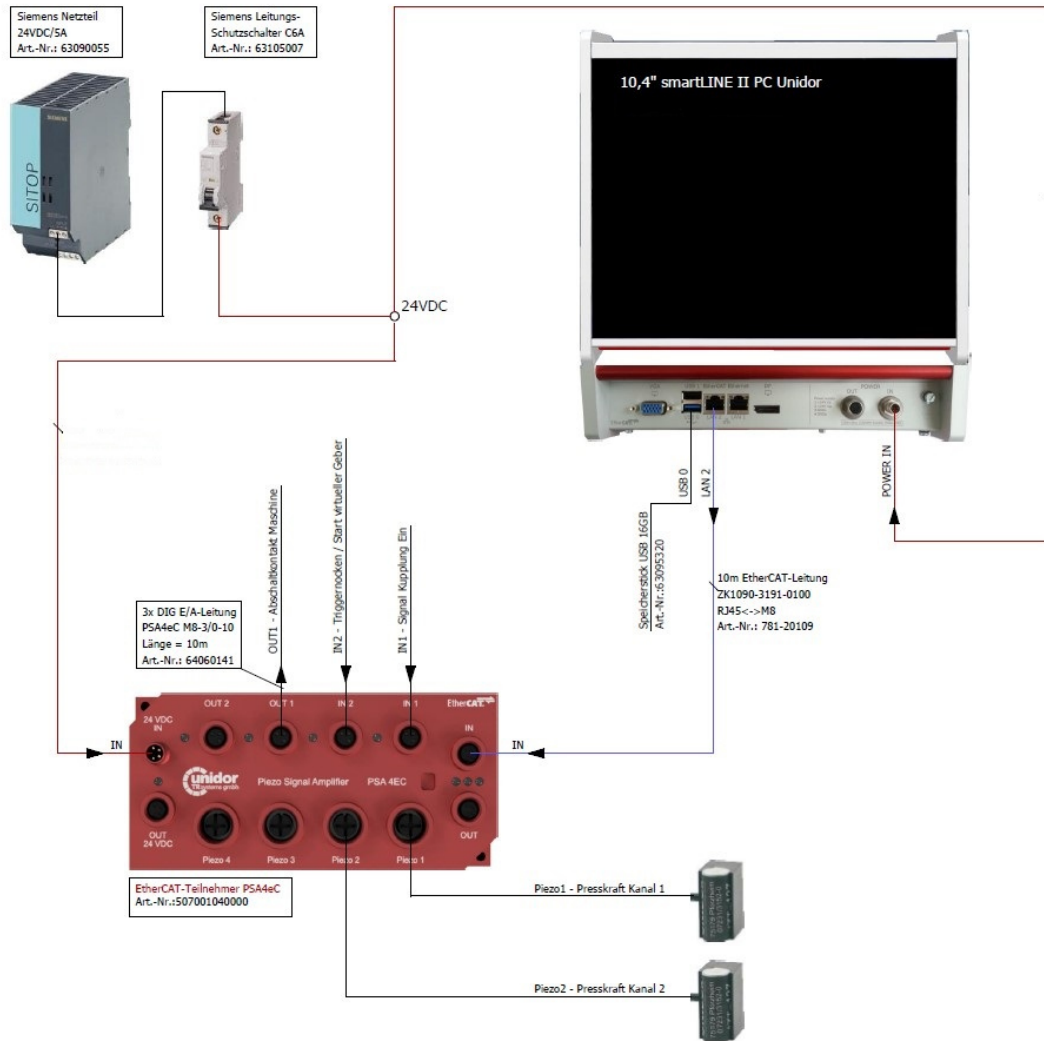
6 Signals and connection diagram

figure 2.0

Inputs of the smartPKM/PSAeC4
power supply and EtherCat connection via M8 sockets

Outputs of the smartPKM/PSAeC4
power supply via M8 sockets; EtherCat connection cable RJ45/M8;
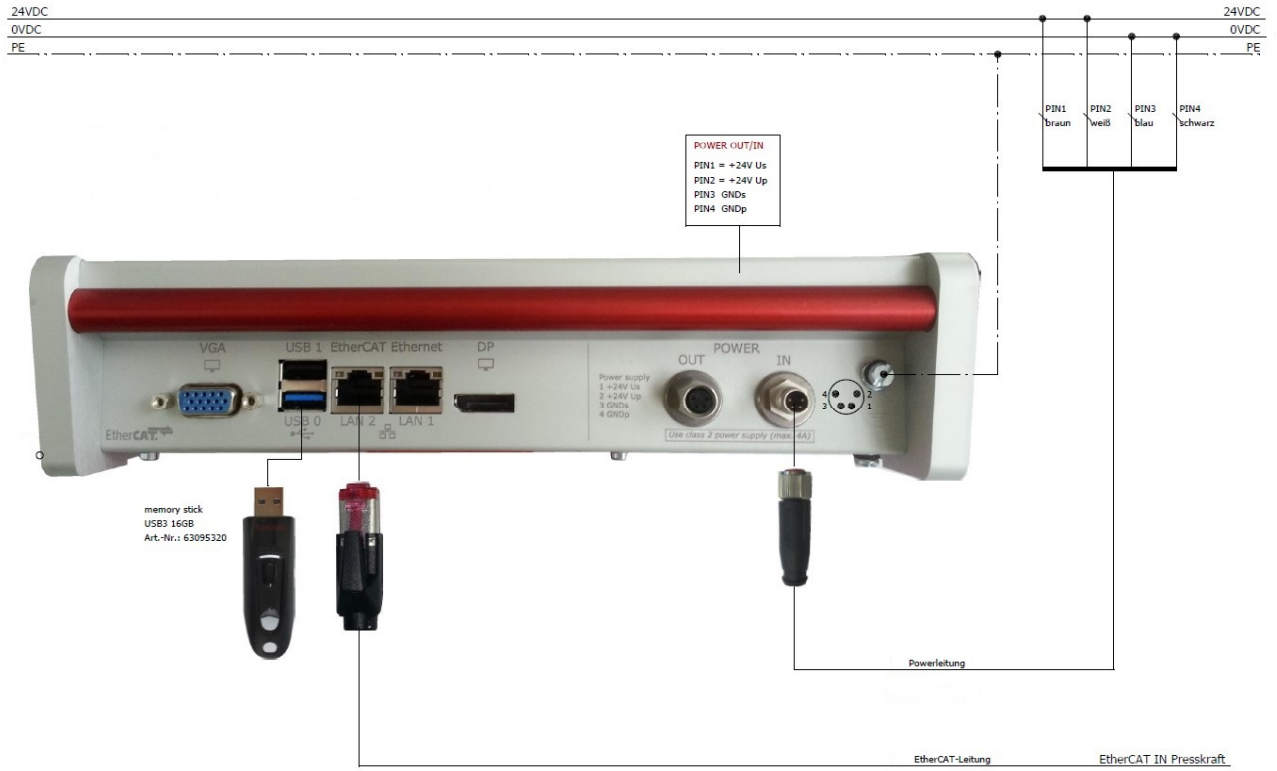machine signals via M8 sockets of the PSAeC4

Practice.

user manual

7 device view connections

POWER OUT/IN

PIN1 = +24V Us
PIN2 = +24V Up
PIN3 GNDs
PIN4 GNDp

PIN1 braun
PIN2 weiß
PIN3 blau
PIN4 schwarz

24VDC
0VDC
PE

Power supply
1 +24V Us
2 +24V Up
3 GNDs
4 GNDp

Use class 2 power supply (max. 4A)

memory stick
USB3 16GB
Art.-Nr.: 63095320

Powerleitung

EtherCAT-Leitung   EtherCAT IN Presskraft

figure 3.0

Systems. Controls. Sensors.

8 connection piezo sensors

the supplied piezo sensors are mounted (as shown below) in the tension or compression area of the press. To protect the encoders, please also mount the sensor protective covers before mounting and calibration. The connecting cables to the unit must not be disconnected and extended with plugs or clamps. (charge loss)

max. 56mm pressure

sensors/ piezo quartz

tensile force

connection

thread R 1/8", NPT, boring ⌀ 8,7
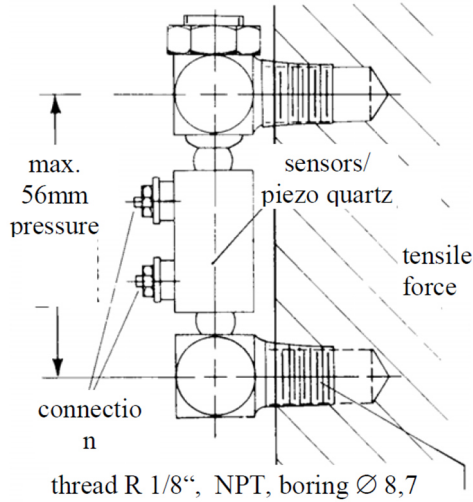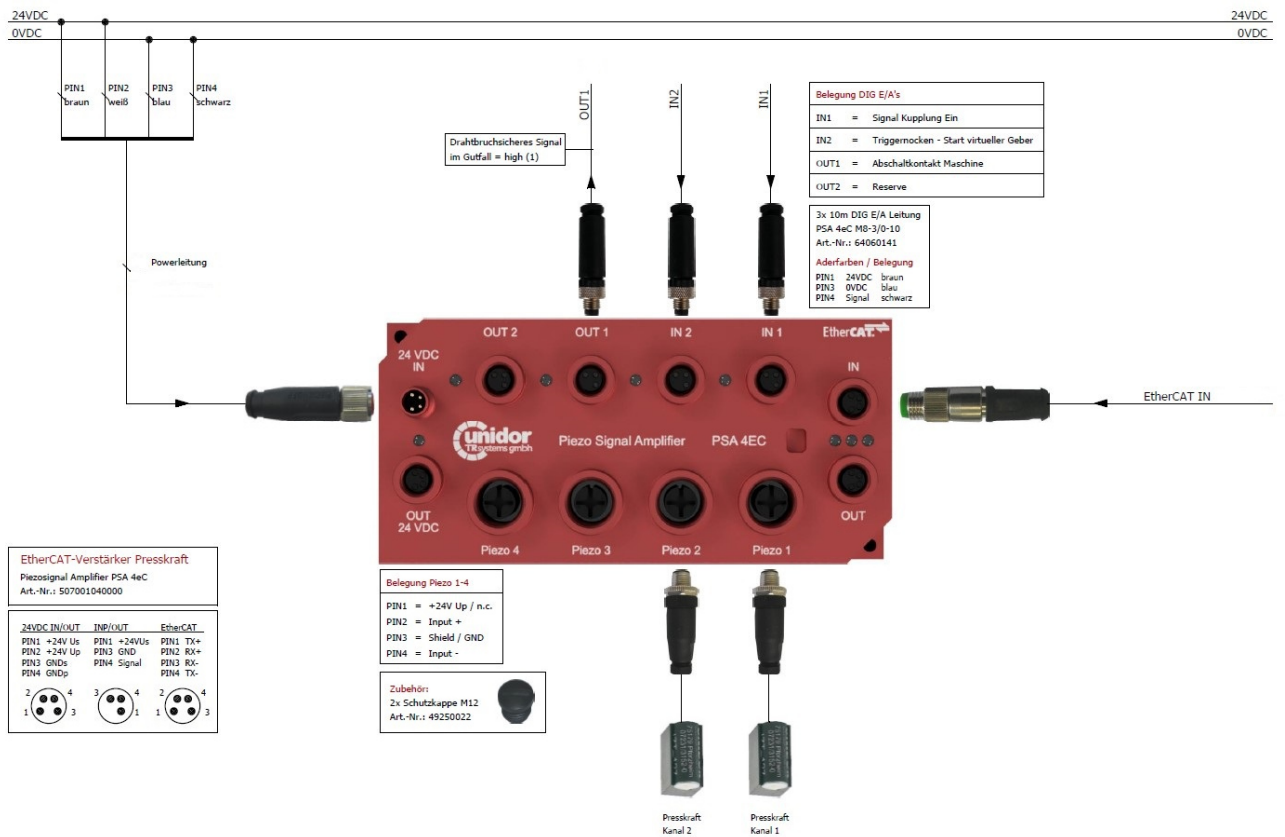
figure 4.0

figure 5.0

PiezoSignalAmplifier PSAeC4
Steckplatz Piezo 1-4

Sensor Presskraft
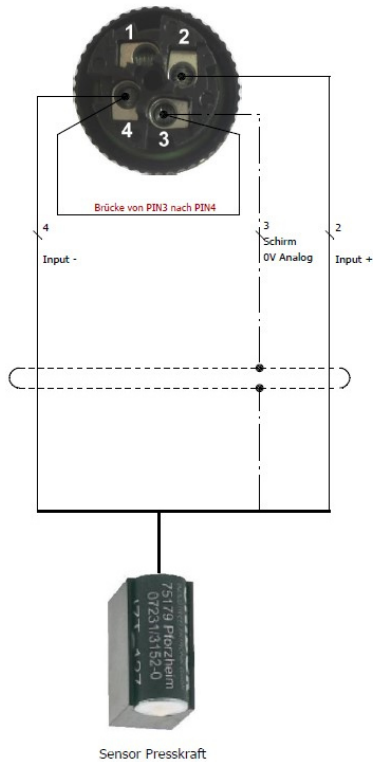
Kabel für Pleuelmontage - Farbe Sensorleitung weiß			
Anschlussart / Funktion	Farbe	Signale	Stecker 4pol. Art.-Nr.: 62000627
Anschlussbelegung bei Zugbelastung	weiß schwarz Schirm	Input + Input – Schirm	PIN 2 PIN 4 PIN 3 Brücke von PIN3 nach 4
Anschlussbelegung bei Druckbelastung	schwarz weiß Schirm	Input + Input – Schirm	PIN 2 PIN 4 PIN 3 Brücke von PIN3 nach 4

Kabel für Ständermontage - Farbe Sensorleitung schwarz			
Anschlussart / Funktion	Farbe	Signale	Stecker 4pol. Art.-Nr.: 62000627
Anschlussbelegung bei Zugbelastung	rot schwarz Schirm	Input + Input – Schirm	PIN 2 PIN 4 PIN 3 Brücke von PIN3 nach 4
Anschlussbelegung bei Druckbelastung	schwarz rot Schirm	Input + Input – Schirm	PIN 2 PIN 4 PIN 3 Brücke von PIN3 nach 4

figure 6.0

9 installation and setup

wiring of the system
connection of power supply; EtherCat connection and machine signals (fig. 2.0)

connection of the sensors
mounting the force transducers on the machine stand and connecting them to the measuring amplifier (fig. 4.0; 5.0 and 6.0)

switching on the system
start screen (fig. 7.0) Log in as administrator in the user administration (password: please request, daily updated!)

calibrate system
select "Force left" or "Force right" on start screen (fig. 7.0)
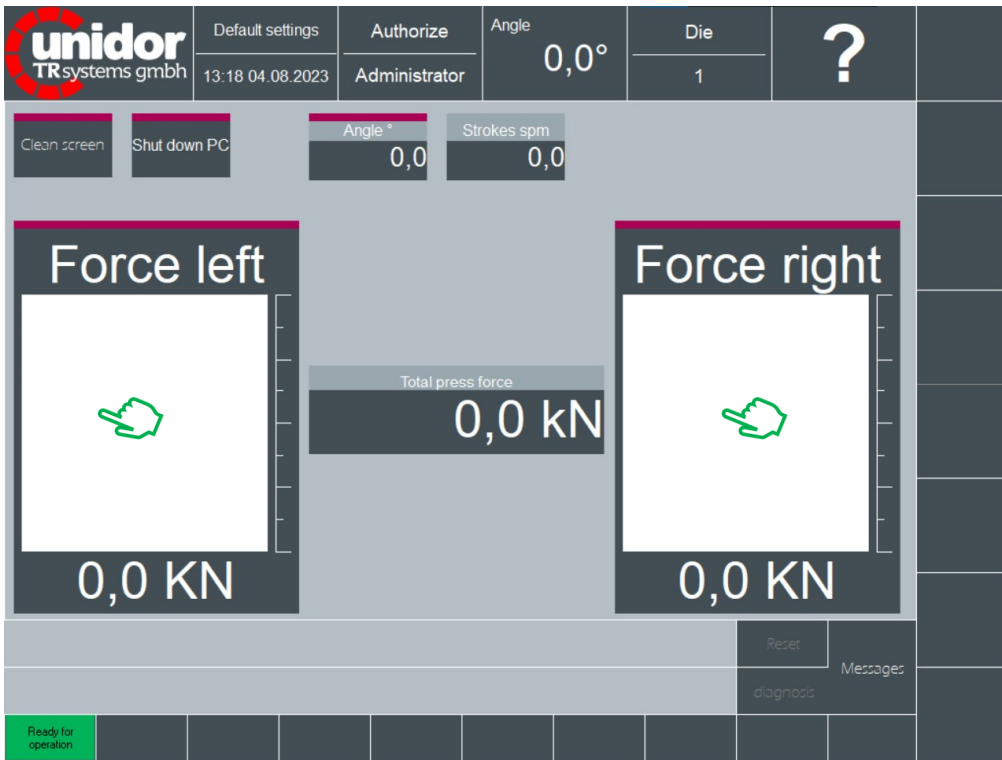
figure 7.0

force angle (fig. 8.0) select "Parameters" to display the partial forces and the total force as a curve:
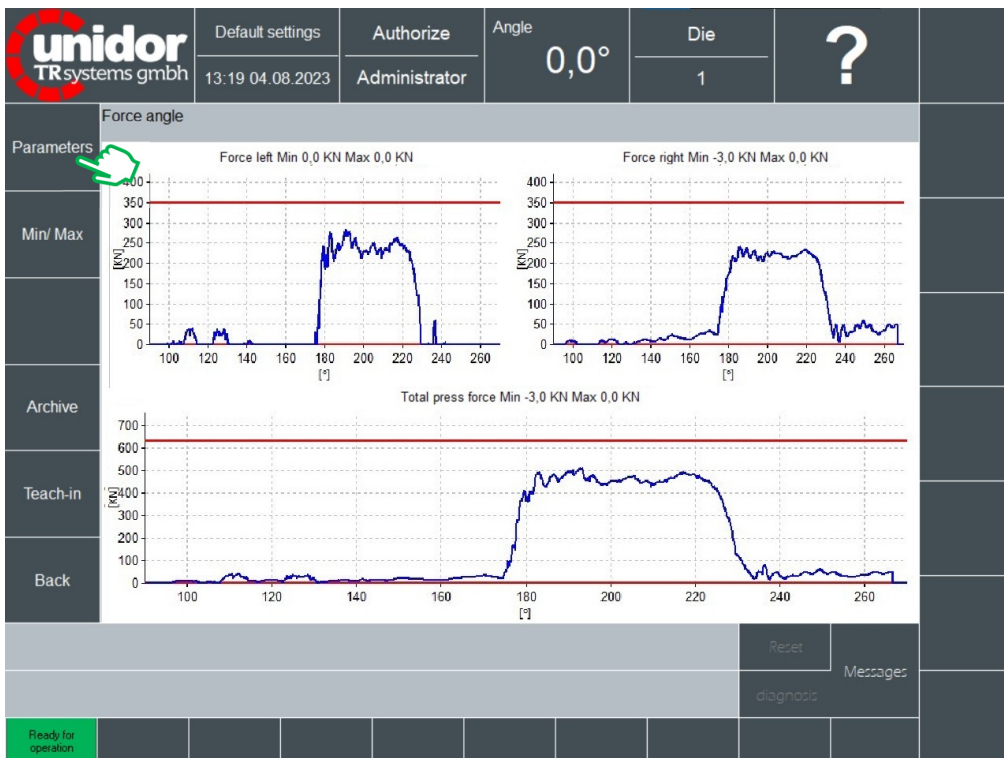
figure 8.0

force angle parameters display and settings bypass and error memory (fig. 9.0) select "Inputs":
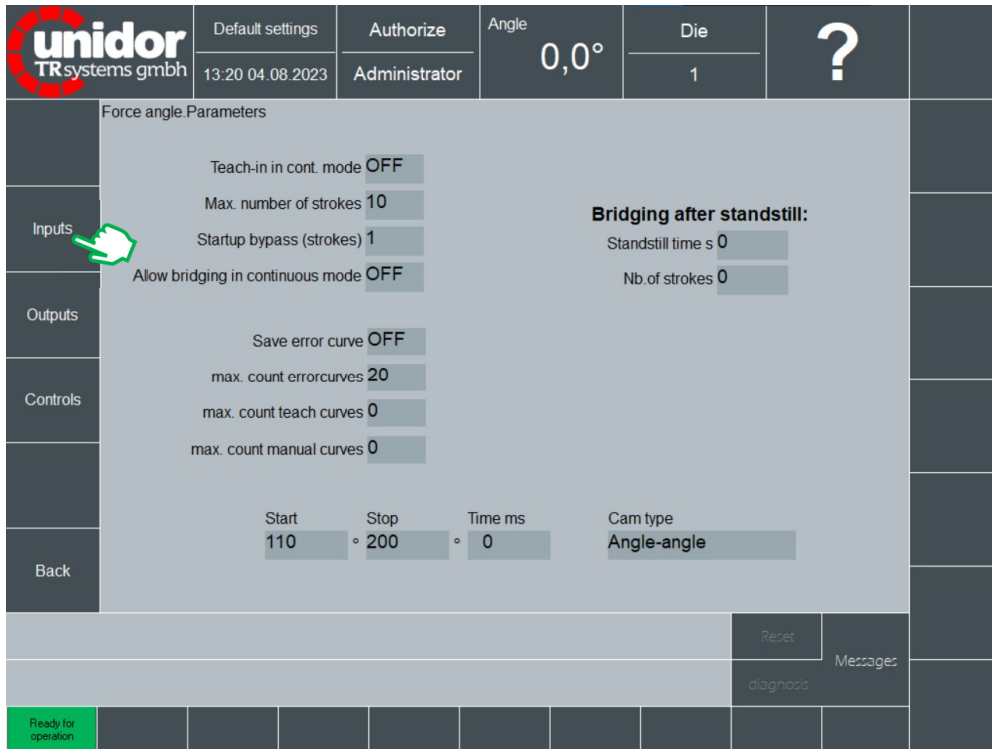

figure 9.0

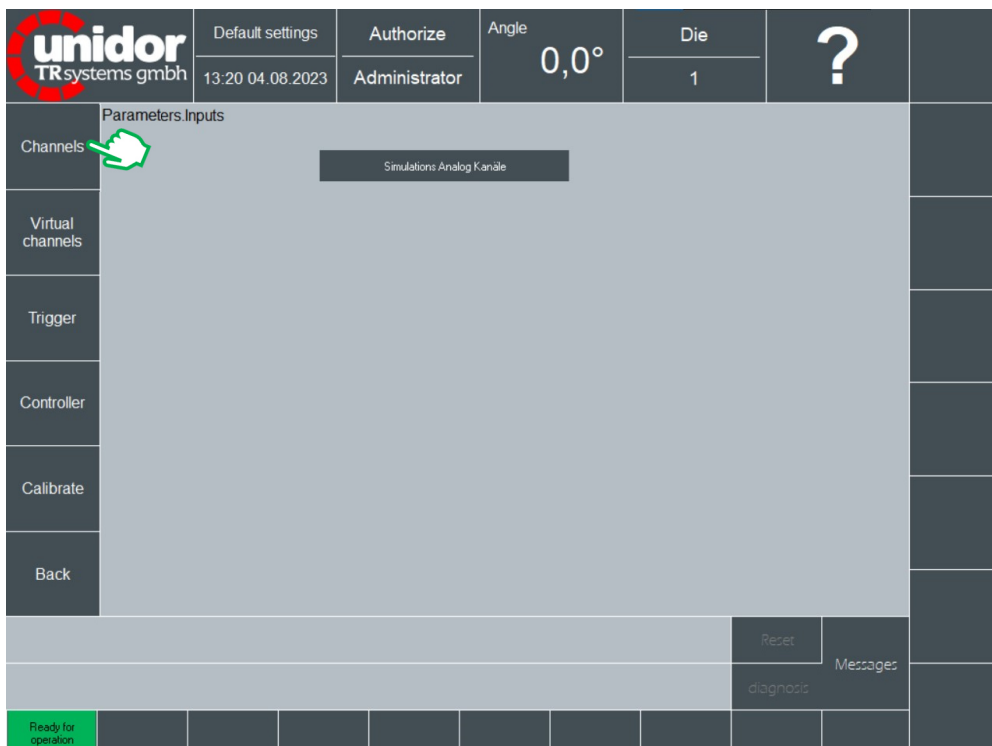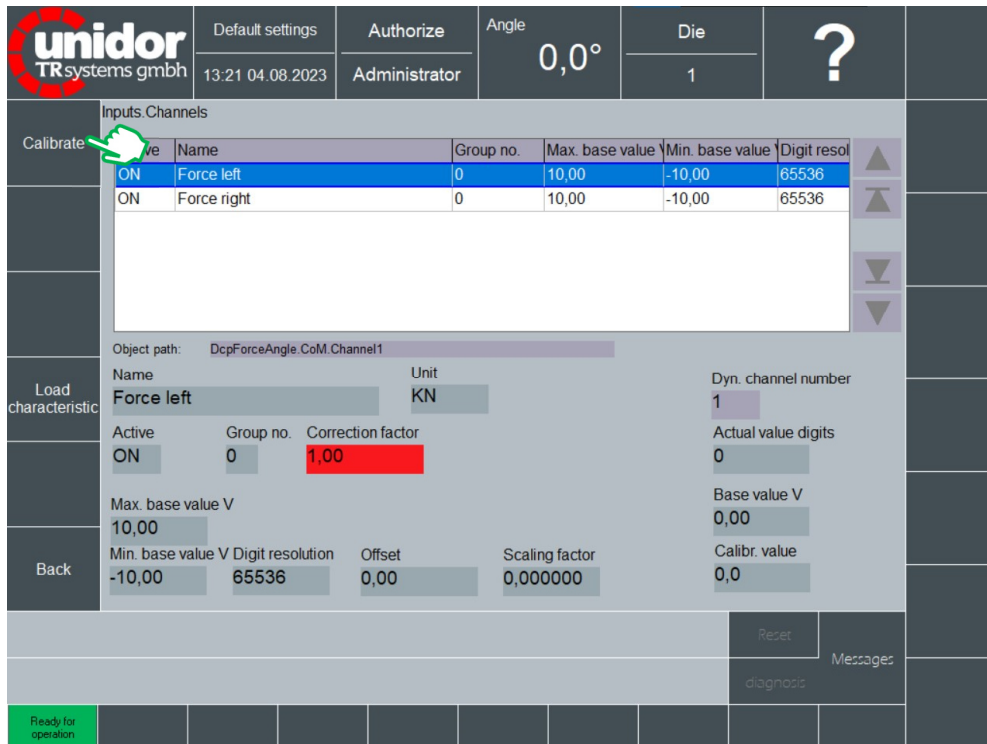parameters inputs (fig. 10.0) select "Channels":

figure10.0

inputs channels (fig. 11.0) select "Calibrate":
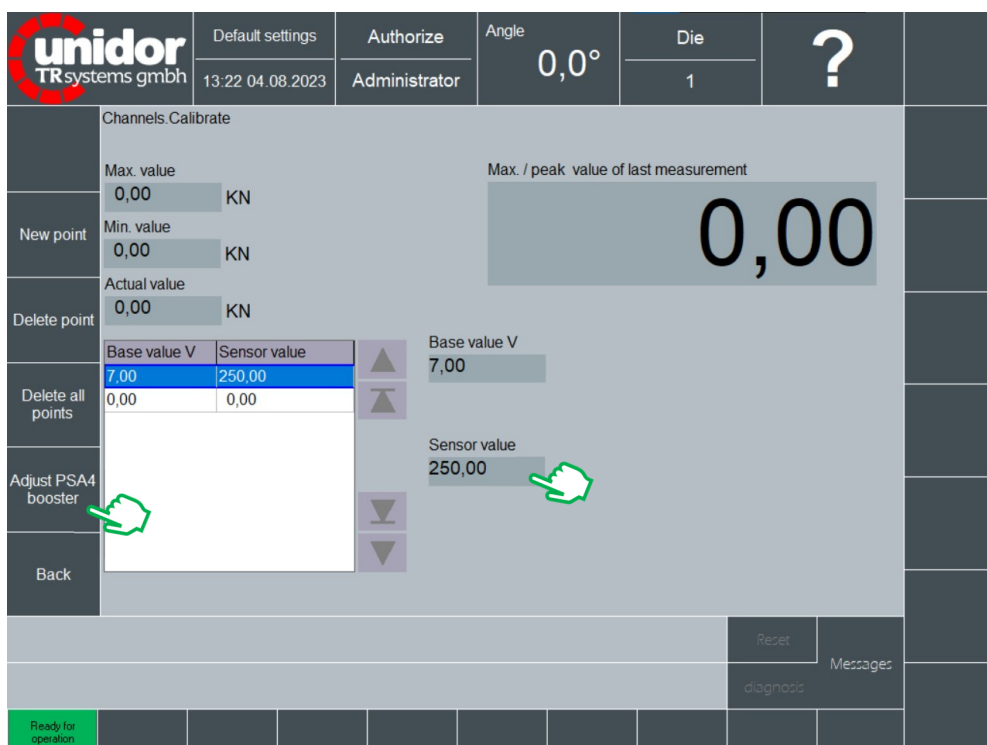
figure 11.0

channels calibrate (fig. 12.0) select "adjust PSA4 booster":
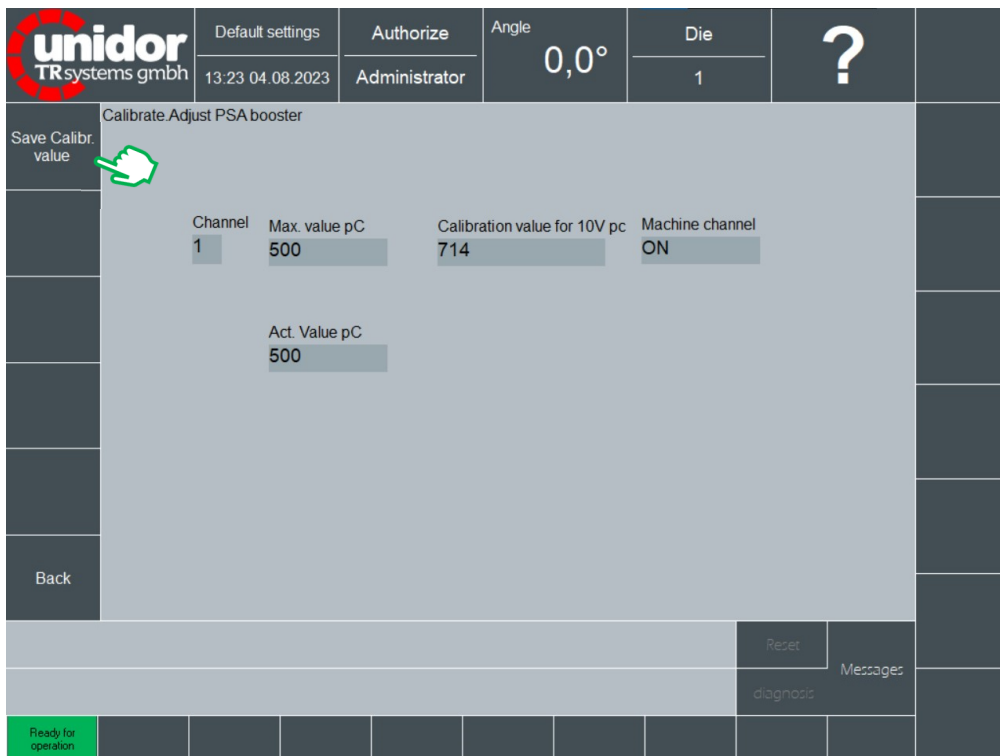
figure 12.0

calibrate adjust PSA booster (fig. 13.0) select "save calibre. value":

figure 13.0

back to channels calibrate (figure 12.0) and set the maximum channel tonnage of the machine in the table at 7.0V.
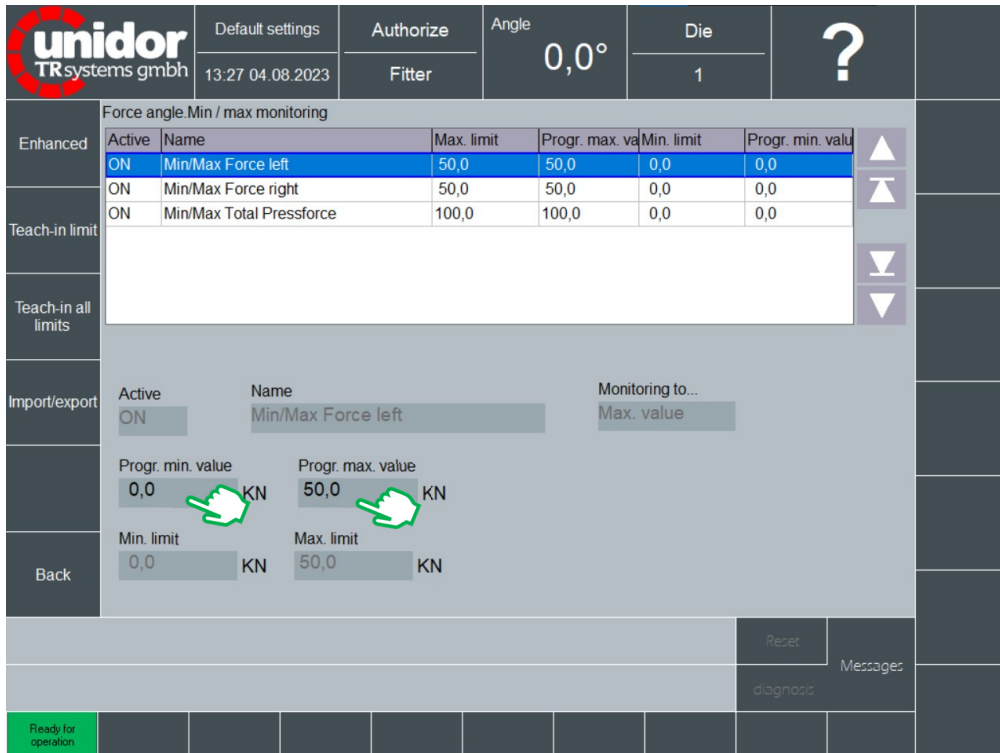
Caution, incorrect specification of the maximum channel tonnage can lead to overloads and damage to the machine. This is the responsibility of the calibrating expert.

The equipment manufacturer accepts no liability in this respect!

set tolerances
(log in as a setter in the user administration, password: "111110")

force angle min/max monitoring set progr. min/max value per channel (picture 14.0):

figure 14.0

Practice.

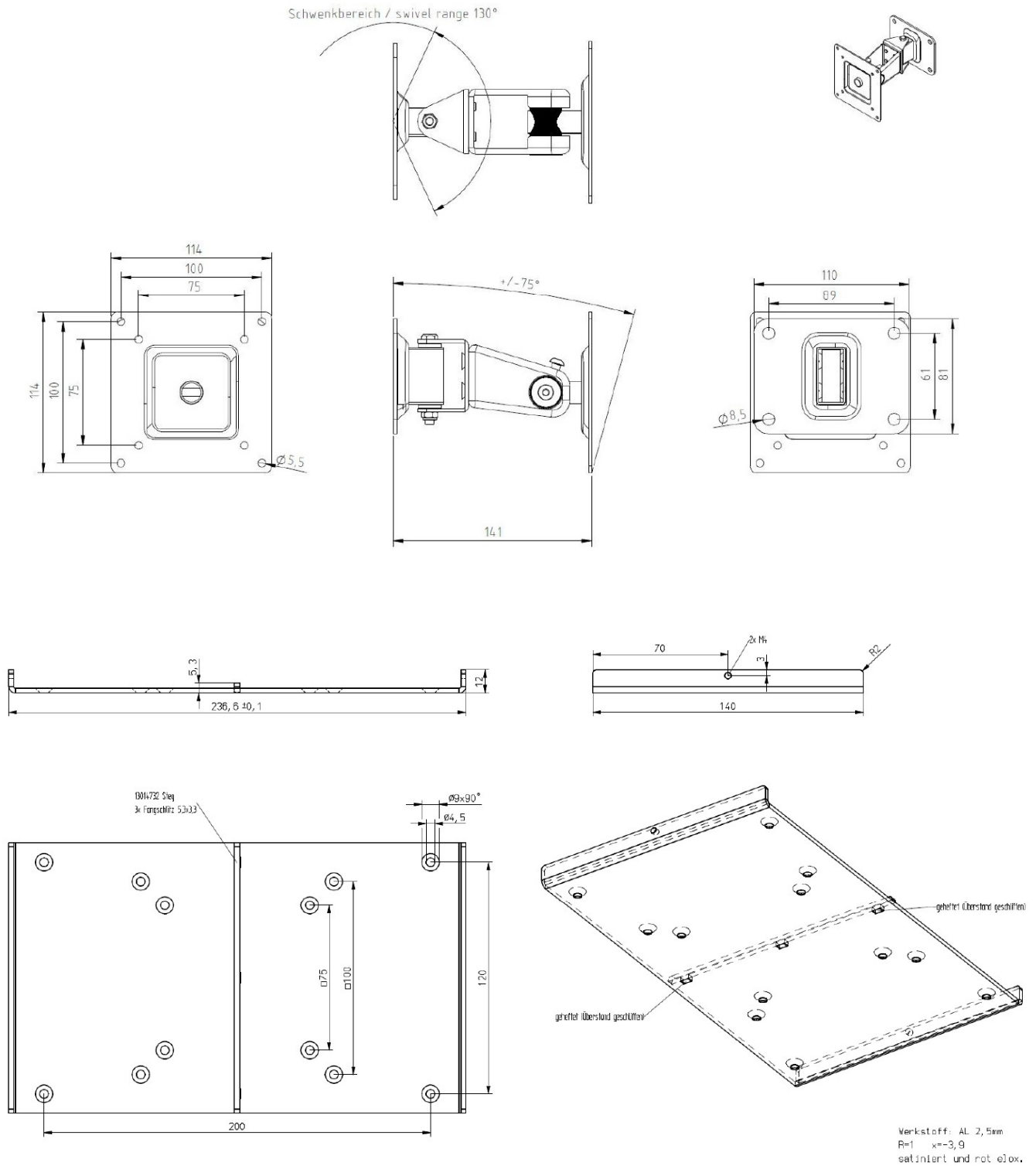**user manual**

Systems. Controls. Sensors.

10 dimensions

Montage der PSA-Verstärker

Beachten Sie bei der Montage der Piezo-Signal-Amplifier-Verstärkern PSA4eC an der Maschine, das diese keiner Schockbelastung >25G ausgesetzt werden dürfen.

10 dimensions

11 EC Declaration of Conformity

Manufacturer:	TRsystems GmbH, System department Unidor
Factory:	Unidor, Freiburger Straße 3, D-75179 Pforzheim

hereby confirm for the

Product:	smartPKM
Device type:	Press Force Measuring Device
Model name:	smartPKM

compliance with the EC Directive 89/392/EEC and the following standards:

- ✓ EN 60204.1, Electrical Equipment for Industrial Machines
- ✓ Electromagnetic Compatibility 89/336/EEC IEC 801 Parts 1, 2, 4
- ✓ EN 55011 Radio Interference Voltage
- ✓ EN 55022 Noise Radiation
- ✓ VDE 0100, VDE 0113, EN 60204

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RoHS-konform gemäß 2011/65/EU