

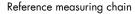
# Portable High-Precision Calibrator and Testing Device

Strain gage simulator / Sensor test / Precision voltage source

# **MODEL TRANS CAL 7281**









Extensive accessories









#### Sensor types:

- Strain gage sensors
- Standard signal ±5 V or ±10 V
- Potentiometric sensors

#### **Highlights**

- Precision measuring chain
- Portable data-logger for up to 30.000 measured values
- Ultra-low non-linearity of less than 0.001 % F.S.
- Up to 16 measuring programs can be configured and saved
- Easy sensor configuration by burster TEDS
- Wheatstone full bridge simulator
- Sensor test
- High-precision voltage source 0 to 10 V DC
- DAkkS/factory calibration certificate available for the device or the entire measuring chain (optional)

#### **Applications**

- High-precision system calibrations of presses and assembly lines
- Service and maintenance
- Checking and readjusting presses, production systems and testing machines

#### **Product description**

The TRANS CAL 7281 can be fitted with standard or rechargeable batteries for portable use or can run from an external power supply for stationary use for a longer period of time. In conjunction with a sensor, the device can be used flexibly as a reference measuring chain, e.g. for force, torque and pressure measurement, and is particularly suitable for service technicians for calibrating and, if necessary, adjusting different systems.

The choice of sensors includes strain gage, normalized signal  $\pm 5 \text{ V/} \pm 10 \text{ V}$  and potentiometric sensors. The graphical LCD display shows the current measured value. The bar display below shows the level of the measuring range. In addition, information about the percentage of the electrical input voltage range used is also shown. It also supports display functions such as data-logger, tared value in percent and upper/lower limit for the comparator with simultaneous indicator (> = <) of the evaluation result.

With the extended sensor test and strain gage simulator functions and the precision voltage source, you have the most important tools for regularly checking your complete system and quickly localizing faults and calibrating instrumentation amplifiers.

DAkkS calibration certificates/factory calibration certificates are optionally available. The TRANS CAL configuration and data-collection software provides useful display and reporting functions.

# **Technical data**

Analog / (a)gliel convenion   Measurement roses		
Analog / (a)gliel convenion   Measurement roses		
	Non-linearity	< ±0.001 % F.S.
Emperature coefficient	Analog/digital conver- sion	24-bit
The properties of the prope		0.1 to 1200/s (DC); 0.1 to 2/s (AC or clocked DC voltage/2 kHz) (reduced accuracy from 50/s)
Comparison   C		±0.001 %/K
Units Compatible sensors  Freely selectable  Compatible sensors  Freely selectable  Compatible serving age  Veasurement error  4 0.02 % F.S.  Acting resistance [full and possible sensor excitation options apput voltage ranges DC]  2.5 V, 5 V [at 120 Ω, only 2.5 V]  2.5 Vms/5 Vmms [from 350 Ω]  Sensor excitation options  AC   2.5 Vms/5 Vmms [from 350 Ω]  Sensor excitation options  AC   2.5 Vms/5 Vmms [from 350 Ω]  Sensor excitation options  AC   3.5 Vms/5 Vmms [from 350 Ω]  Max. 30 mA   3.5 Vms/6 Vmms [from 350 Ω]  Sensor excitation options  Read from sensor EEPROM  Potentiametric sensors  Veasurement error  5 0.05 % F.S.  Connection options  3- or 5-conductor technology  Excitation options  3- or 5-conductor technology  Excitation oursen  4.5 V DC   3.0 m A   3.0		< 0.2 µV/K
Compatible sensors  Pull-bridge strain gage  Weassurement error  \$ 0.02 % F.S.  2.0 02 % F.S.  2.0 02 10 10 10 μΩ  120 Ω to 10 10 μΩ  Connection options  \$ 4- or 6-conductor technology  \$ 15 mV; ±30 mV \$ 250 mV  Concludes (DC)  \$ 2.5 V, 5 V (or 120 Ω, only 2.5 V)  \$ 2.5 V, 5 V (or 120 Ω, only 2.5 V)  \$ 2.5 V, 5 V (or 120 Ω, only 2.5 V)  \$ 2.5 V / say 1.0 m / y ±30 mV  \$ 2.5 V / say 1.0 m / y ±30 mV  \$ 2.5 V / say 2.0 m / y ±30 mV  \$ 2.5 V / say 3.0 m / y ±30 mV  \$ 2.5 V / say 3.0 m / y ±30 mV  \$ 2.5 V / say 3.0 m / y ±30 mV  \$ 2.5 V / say 5.0 m / y ±30 mV  \$ 2.5 V / say 3.0 m / y ±30 mV  \$ 2.5 V / say 5.0 m / y ±30 mV  \$ 2.5 V / say 5.0 m / y ±30 mV  \$ 2.5 V / say 6.0 m / y ±30 mV  \$ 2.5 V / say 5.0 m / y ±30 mV  \$ 2.5 V / say 6.0 m / y ±30 mV  \$ 2.5 V /	Cut-off frequency	10 kHz (-3 dB)
Veasurement error   < 0.02 % F.S.	Units	Freely selectable
Measurement error	Compatible sensors	
Bridge resistance (full 120 Ω to 10 kΩ  Connection options 4- or 6-conductor technology input voltage ranges (CC) ±15 mV; ±30 mV; ±250 mV  Sensor excitation voltage (PC) 2.5 V, 5 V (et 120 Ω, only 2.5 V)  apply voltage ranges (AC) 2.5 Vms/5 Vms (from 350 Ω)  Sensor excitation voltage (PC) Read from sensor EEPROM  AMAX. 30 mA  Read from sensor EEPROM  Read from sensor EEPROM  Potentiometric sensors  Read from sensor EEPROM  Read from sensor E	Full-bridge strain gage	
Connection options   4- or 6 conductor technology	Measurement error	≤ 0.02 % F.S.
\$\frac{15 \text{ mV; \pm 30 mV; \pm 2250 mV}{2.5 \text{ V, 5 V (ct 120 Ω, only 2.5 V)}{2.5 \text{ mV; \pm 30 mV}{2.5 V}{2.5 V (ct 120 Ω, only 2.5 V)}{2.5 \text{ months of the college (AC)}{2.5 \text{ V, ms } 5 \text{ Vrms } (from 350 Ω)}{2.5  Vr		120 $\Omega$ to 10 k $\Omega$
Sensor excitation collage (DC) collage (DC) at 15 mV; ±30 mV  ±15 mV; ±30 mV  £15 mV; ±30 mV  £2.5 Vrms/5 Vrms (from 350 Ω)  £3 vrms/5 Vrms (from 350 Ω)  £4 smoor excitation  Max. 30 mA  Letertonic Adaptate (TEDS) Adaptate (TEDS) Adaptate (TEDS) Adaptate (TEDS) Adaptate (TEDS)  ### Potentilometric sensors  ### Potentilometric senso	Connection options	4- or 6-conductor technology
2.5 V, 5 V (at 120 L), only 2.3 V   and 120		±15 mV; ±30 mV; ±250 mV
AC   Sensor excitation   2.5 Vrms/5 Vrms (from 350 Ω)		2.5 V, 5 V (at 120 Ω, only 2.5 V)
Sensor excitation   Max. 30 mA		±15 mV; ±30 mV
Read from sensor EEPROM		2.5 Vrms/5 Vrms (from 350 $\Omega$ )
Read from sensor EEPROM  Read from sensor EEPROM  Reasurement error  S 0.05 % F.S.  Firsck resistance  Connection options  3- or 5-conductor technology  Excitation voltage Excitation current  Reasurement range  From sensors and devices with voltage output  Measurement range  From sensors and devices with voltage output  Measurement error  Excitation voltage  12 V DC ± 5 %  Excitation current  100 mA  110 mB  1		Max. 30 mA
Measurement error $≤ 0.05 \% F.S.$ First rack resistance $≤ 0.00 \Omega to 10 k\Omega$ 3- or 5-conductor technology  5 V DC  5xcitation voltage  5 V DC  5xcitation current  4 30 mA  Measurement range  1 2 V DC ±5.%  6xcitation voltage  1 2 V DC ±5.%  6xcitation voltage  1 2 V DC ±5.%  6xcitation voltage  1 2 V DC ±5.%  6xcitation current  4 100 mA  1 100 mB  1		Read from sensor EEPROM
Frack resistance $500 \Omega \text{ to } 10 \text{ k}\Omega$ Connection options $3 \cdot \text{or } 5 \cdot \text{conductor } \text{technology}$ Excitation voltage $5 \text{ V DC}$ Excitation current $< 30 \text{ mA}$ Measurement range $+5 \text{ V}$ Fransmitters or sensors and devices with voltage output  Measurement error $\leq 0.02 \text{ % F.S.}$ Excitation voltage $12 \text{ V DC} \pm 5 \text{ %}$ Excitation voltage $12 \text{ V DC} \pm 5 \text{ %}$ Excitation current $< 100 \text{ mA}$ Input voltage range $< 100 \text{ mA}$ Strain gage simulator operating mode (model 7281-V0011 only) $\Rightarrow$ Note: Not suitable for amplifiers with carrier frequency method weasurement error $< 0.01 \text{ % F.S.}$ Excitation voltage $< \pm 10 \text{ V (DC)}$ Measurement of excitation voltage $< \pm 10 \text{ V (DC)}$ Measurement of excitation voltage $< \pm 10 \text{ V (DC)}$ Measurement of $< 0 \text{ to } 10 \text{ V DC}$ Excitation voltage $< \pm 10 \text{ V (DC)}$ Measurement of $< 0 \text{ to } 10 \text{ V DC}$ Excitation voltage $< \pm 10 \text{ V (DC)}$ Measurement of $< 0 \text{ to } 10 \text{ V DC}$ Excitation voltage $< 0 \text{ to } 10 \text{ V DC}$ Excitation voltage $< 0 \text{ to } 10 \text{ V DC}$ Excitation voltage $< 0 \text{ to } 10 \text{ V DC}$ Excitation voltage $< 0 \text{ to } 10 \text{ V DC}$ Excitation voltage $< 0 \text{ to } 10 \text{ V DC}$ Measurement error $< 0 \text{ to } 25 \text{ MeS}$ , $< 0 \text{ voltage}$ , $< 0 $	Potentiometric sensors	
Connection options   3- or 5-conductor technology	Measurement error	≤ 0.05 % F.S.
Excitation voltage  Excitation current  Academy Streams trange  Fransmitters or sensors and devices with voltage output  Measurement error  Excitation voltage  Excitation voltage  Excitation voltage  Excitation voltage  Excitation voltage  Excitation current  Academy Streams terror  Excitation gage simulator operating mode (model 7281-V0011 only) → Note: Not suitable for amplifiers with carrier frequency method the suitable for amplifiers with carrier frequency method to the suitable for amplifiers with carrier frequency method to the suitable for amplifiers with carrier frequency method to the suitable for amplifiers with carrier frequency method to the suitable for amplifiers with carrier frequency method to the suitable for amplifiers with carrier frequency method to the suitable for amplifiers with carrier freq	Track resistance	
Second content   Sec	Connection options	3- or 5-conductor technology
Measurement range ±5 V  Transmitters or sensors and devices with voltage output  Measurement error ≤ 0.02 % F.S. Excitation voltage 12 V DC ±5 % Excitation voltage 120 0 mA Input voltage range 110 V  Measurement error ≤ 0.01 % F.S.  Excitation voltage range 110 V  Measurement error ≤ 0.01 % F.S.  Excitation voltage 100 to 10 V DC  Measurement of excitation voltage 100 to 10 V DC  Rated outputs (infinitely adjustable simulation voltage 100 to ±3 mV/V to 0 to ±50 mV/V  Resolution 16-bit 100 mA  Tridge resistance 100 may like in the sensor 100 may like in the senso	Excitation voltage	5 V DC
Transmitters or sensors and devices with voltage output  Measurement error $\leq 0.02 \% \text{ F.S.}$ Excitation voltage $12 \text{ V DC} \pm 5 \%$ Excitation current $\leq 100 \text{ mA}$ Input voltage range $\pm 10 \text{ V}$ Strain gage simulator operating mode (model 7281-V0011 only) $\Rightarrow$ Note: Not suitable for amplifiers with carrier frequency method $= 100 \text{ V DC}$ Measurement error $\leq 0.01 \% \text{ F.S.}$ Excitation voltage $\leq \pm 10 \text{ V (DC)}$ Measurement of excitation voltage $= 100 \text{ V DC}$ Rated outputs (infinitely adjustable simulation voltage) $= 100 \text{ V DC}$ Resolution	Excitation current	< 30 mA
Measurement error $≤ 0.02 \% F.S.$ Excitation voltage $12 \text{ V DC} \pm 5 \%$ Excitation current $< 100 \text{ mA}$ Input voltage range $± 10 \text{ V}$ Strain gage simulator operating mode (model 7281-V0011 only) $\Rightarrow$ Note: Not suitable for amplifiers with carrier frequency method $< 0.01 \% F.S.$ Excitation voltage $≤ ± 10 \text{ V DC}$ Measurement of excitation voltage $≤ ± 10 \text{ V DC}$ Rated outputs (infinitely adjustable simulation voltage $≤ ± 10 \text{ V DC}$ Resolution $≤ ± 10 \text{ V DC}$ R		
Excitation voltage $12 \text{ V DC} \pm 5 \%$ Excitation current $< 100 \text{ mA}$ Input voltage range $\pm 10 \text{ V}$ Strain gage simulator operating mode (model 7281-V0011 only) $\Rightarrow$ Note: Not suitable for amplifiers with carrier frequency method Measurement error $\leq 0.01 \% \text{ F.S.}$ Excitation voltage $\leq \pm 10 \text{ V (DC)}$ Measurement of excitation voltage $\leq \pm 10 \text{ V (DC)}$ Acted outputs (infinitely adjustable simulation values) $\leq \pm 10 \text{ V (DC)}$ Resolution $\leq \pm 10 \text{ V (DC)}$ Remperature coefficient $\leq \pm 10 \text{ V (DC)}$ Sensor test operating mode (model 7281-V0011 only)  Remperature coefficient $\pm 0.002 \% \text{ K}$ Calibration offset  Weasurement error $\leq \pm 0.25 \% \text{ F.S.}$ Shunt resistors $\leq \pm 0.25 \% \text{ F.S.}$ Input and output resistance of the sensor  Measurement error $\leq \pm 0.25 \% \text{ F.S.}$	Transmitters or sensors an	d devices with voltage output
$ \begin{array}{c} \text{Excitation current} & < 100 \text{ mA} \\ \text{Input voltage range} & \pm 10 \text{ V} \\ \text{Strain gage simulator operating mode (model 7281-V0011 only)} \Rightarrow \text{Note: Not suitable for amplifiers with carrier frequency method weasurement error} & \leq 0.01 \% \text{ F.S.} \\ \text{Excitation voltage} & \leq \pm 10 \text{ V (DC)} \\ \text{Measurement of excitation voltage} & 0 \text{ to } 10 \text{ V DC} \\ \text{Read outputs (infinitely adjustable simulation voltage} & 0 \text{ to } \pm 3 \text{ mV/V to } 0 \text{ to } \pm 50 \text{ mV/V} \\ \text{Resolution} & 16 \text{ bit} \\ \text{Bridge resistance} & 350 \Omega \\ \text{Temperature coefficient} & \pm 0.002 \% \text{/K} \\ \text{Sensor test operating mode (model 7281-V0011 only)} \\ \text{Temperature coefficient} & \pm 0.005 \% \text{/K} \\ \text{Calibration offset} \\ \text{Measurement error} & \leq 0.25 \% \text{ F.S.} \\ \text{Shunt resistors} & 59 \text{ k}\Omega; 80 \text{ k}\Omega; 100 \text{ k}\Omega; 300 \text{ k}\Omega; 300 \text{ k}\Omega \\ \text{Input and output resistance} & \leq 0.25 \% \text{ F.S.} \\ \text{Measurement error} & \leq 0.25 \% \text{ F.S.} \\ \text{Measurement error} & \leq 0.25 \% \text{ F.S.} \\ \text{Resourement error} & \leq 0.25 \% \text{ F.S.}$	Measurement error	≤ 0.02 % F.S.
nput voltage range $±10 \text{ V}$ Strain gage simulator operating mode (model 7281-V0011 only) → Note: Not suitable for amplifiers with carrier frequency method where the properties of the series o	Excitation voltage	12 V DC ±5 %
Strain gage simulator operating mode (model 7281-V0011 only) $\Rightarrow$ Note: Not suitable for amplifiers with carrier frequency method Measurement error $\leq 0.01 \% \text{ F.S.}$ Excitation voltage $\leq \pm 10 \text{ V (DC)}$ Weasurement of excitation voltage $\leq \pm 10 \text{ V (DC)}$ Rated outputs (infinitely adjustable simulation values) $\leq \pm 10 \text{ V (DC)}$ Resolution $\approx \pm 10 \text{ V (DC)}$ Resolution	Excitation current	
Measurement error $\leq 0.01 \% \text{ F.S.}$ Excitation voltage $\leq \pm 10 \text{ V (DC)}$ Measurement of excitation voltage $\leq 0.01 \% \text{ F.S.}$ Rated outputs (infinitely adjustable simulation values) $\approx 0.0000000000000000000000000000000000$		
$ \leq \pm 10 \text{ V (DC)} $ Weasurement of excitation voltage $ \leq \pm 10 \text{ V (DC)} $ Weasurement of excitation voltage $ \qquad \qquad 0 \text{ to } 10 \text{ V DC} $ Rated outputs (infinitely adjustable simulation values) $ \qquad \qquad 0 \text{ to } \pm 3 \text{ mV/V to } 0 \text{ to } \pm 50 \text{ mV/V} $ Resolution $ \qquad \qquad 16 \text{-bit} $ Ratinger resistance $ \qquad \qquad 350 \Omega $ Remperature coefficient $ \qquad \qquad \pm 0.002 \text{ W/K} $ Remperature coefficient $ \qquad \qquad \pm 0.005 \text{ W/K} $ Resolution offset $ \qquad \qquad \qquad \pm 0.005 \text{ W/K} $ Resolution offset $ \qquad \qquad \qquad \leq 0.25 \text{ W F.S.} $ Resolution offset $ \qquad \qquad \leq 0.25 \text{ W F.S.} $ Resolution offset $ \qquad \qquad \leq 0.25 \text{ W F.S.} $ Resolution offset $ \qquad \qquad \leq 0.25 \text{ W F.S.} $ Resolution offset $ \qquad \qquad \leq 0.25 \text{ W F.S.} $ Resolution offset $ \qquad \qquad \leq 0.25 \text{ W F.S.} $ Resolution offset $ \qquad \qquad \leq 0.25 \text{ W F.S.} $ Resolution offset $ \qquad \qquad \leq 0.25 \text{ W F.S.} $ Resolution offset $ \qquad \qquad \leq 0.25 \text{ W F.S.} $	Strain gage simulator oper	
Weasurement of excitation voltage  Rated outputs (infinitely adjustable simulation values)  Resolution  Resolutio		
Resolution voltage Rated outputs (infinitely adjustable simulation values)  Resolution  Resolution  Resolution  Remperature coefficient  Remperature coefficient  Remperature coefficient  Remperature coefficient  Remperature coefficient  Resolution  Remperature coefficient  Resolution offset  Resolution  Shuth resistors  Shuth resistors  Shuth resistors  Shuth resistance of the sensor  Resolution  Shuth resistance of the sensor  Shuth resistance of the sensor  Shuth resistance of the sensor	0	≤ ±10 V (DC)
To to $\pm 3$ mV/V to 0 to $\pm 50$ mV/V and $\pm 5$	excitation voltage	0 to 10 V DC
Resolution $16\text{-bit}$ Stridge resistance $350\ \Omega$ Temperature coefficient $\pm 0.002\ \%/K$ Sensor test operating mode (model 7281-V0011 only)  Temperature coefficient $\pm 0.005\ \%/K$ Calibration offset  Weasurement error $\leq 0.25\ \%\ F.S.$ Shunt resistors $59\ k\Omega;\ 80\ k\Omega;\ 100\ k\Omega;\ 150\ k\Omega;\ 300\ k\Omega$ Input and output resistance of the sensor  Weasurement error $\leq 0.25\ \%\ F.S.$	adjustable simulation	0 to $\pm 3$ mV/V to 0 to $\pm 50$ mV/V
Bridge resistance $350 \Omega$ Temperature coefficient $\pm 0.002 \text{ %/K}$ Sensor test operating mode (model 7281-V0011 only)  Temperature coefficient $\pm 0.005 \text{ %/K}$ Calibration offset  Weasurement error $\leq 0.25 \text{ % F.S.}$ Shunt resistors $59 \text{ k}\Omega$ ; $80 \text{ k}\Omega$ ; $100 \text{ k}\Omega$ ; $300 \text{ k}\Omega$ Input and output resistance of the sensor  Measurement error $\leq 0.25 \text{ % F.S.}$		16-bit
Temperature coefficient $\pm 0.002 \%/K$ Sensor test operating mode (model 7281-V0011 only)  Temperature coefficient $\pm 0.005 \%/K$ Calibration offset  Weasurement error $\leq 0.25 \%$ F.S.  Shunt resistors $59 \mathrm{k\Omega}; 80 \mathrm{k\Omega}; 100 \mathrm{k\Omega}; 150 \mathrm{k\Omega}; 300 \mathrm{k\Omega}$ Input and output resistance of the sensor  Measurement error $\leq 0.25 \%$ F.S.	Bridge resistance	
Sensor test operating mode (model 7281-V0011 only)  Emperature coefficient $\pm 0.005 \text{ %/K}$ Calibration offset $\leq 0.25 \text{ % F.S.}$ Shunt resistors $59 \text{ k}\Omega$ ; $80 \text{ k}\Omega$ ; $100 \text{ k}\Omega$ ; $150 \text{ k}\Omega$ ; $300 \text{ k}\Omega$ Input and output resistance of the sensor $\leq 0.25 \text{ % F.S.}$		±0.002 %/K
Temperature coefficient $\pm 0.005  \%/K$ Calibration offset $\leq 0.25  \%  F.S.$ Shunt resistors $59  k\Omega;  80  k\Omega;  100  k\Omega;  150  k\Omega;  300  k\Omega$ Input and output resistance of the sensor $\leq 0.25  \%  F.S.$		
Calibration offset  Measurement error $\leq 0.25 \% \text{ F.S.}$ Shunt resistors $59 \text{ k}\Omega$ ; $80 \text{ k}\Omega$ ; $100 \text{ k}\Omega$ ; $150 \text{ k}\Omega$ ; $300 \text{ k}\Omega$ Input and output resistance of the sensor  Measurement error $\leq 0.25 \% \text{ F.S.}$		
Shunt resistors $59 \text{ k}\Omega; 80 \text{ k}\Omega; 100 \text{ k}\Omega; 150 \text{ k}\Omega; 300 \text{ k}\Omega$ Input and output resistance of the sensor $\leq 0.25 \% \text{ F.S.}$		
Input and output resistance of the sensor $\leq 0.25 \%$ F.S.	Measurement error	≤ 0.25 % F.S.
Measurement error ≤ 0.25 % F.S.	Shunt resistors	59 kΩ; 80 kΩ; 100 kΩ; 150 kΩ; 300 kΩ
Measurement error ≤ 0.25 % F.S.	Input and output resistanc	e of the sensor
Measurement range 120 $\Omega$ to 10 $k\Omega$		
	Measurement range	120 Ω to 10 kΩ



Insulation resistance	
Accuracy	±5 % of reading
Measurement range	20 MΩ to 1 GΩ
Resolution	1 MΩ
Temperature coefficient	±0.1 %/K
Precision voltage source ope	erating mode (model 7281-V0011 only)
Measurement error	≤ 0.02 % F.S.
Infinitely adjustable simulation values	0 to +10 V
Resolution	1 mV
Temperature coefficient	± 0.005 %/K
General device data	
Supply voltage (external)	10 to 28 V DC
Rated temperature range	0 to +40 °C
Storage temperature range	-20 to +60 °C
Display	LCD with white LED backlighting
Housing material	Aluminum (light gray/black)
Housing dimensions (L x W x H)	220 x 100 x 52 mm
Degree of protection	IP40
Weight	Approx. 850 g
Connections	
Reference measure- ment, strain gage simulator, sensor test	SUB-D 9-pin, socket
Strain gage simulator	SUB-D 9-pin, pins
PC interface	USB 2.0, type B connector, backwards compatible, opto-isolated
Baud rate	115200 Bd
Supply voltage	4 x Mignon or 10 to 28 V DC, integrated battery charging circuit

## **Electrical connection**

#### D-SUB 9-pin socket (measurement, sensor test and voltage source)



Pin	Meaning
1	+ excitation, strain gage, potentiometer; voltage source output
2	+ sensor line, strain gage, potentiometer
3	+ transmitter excitation (+12 V DC)
4	- sensor line, strain gage, potentiometer
5	- excitation, strain gage, potentiometer; voltage source output
6	+ strain gage signal input, standard signal, potentiometer
7	burster TEDS
8	- transmitter excitation
9	– strain gage signal input, standard signal, potentiometer

# D-SUB 9-pin connector (device test and strain gage simulator)



Pin	Meaning
1	+ excitation, strain gage, potentiometer
2	+ sensor line
3	n.c.
4	– sensor line
5	- excitation, strain gage, potentiometer
6	+ signal output
7	n.c.
8	n.c.
9	– signal output



### **Application**

#### Basic version 7281-V0010

#### High-precision calibration/reference measuring chain:

The multipurpose TRANS CAL 7281 digital indicator can be used wherever there is a need to perform high-precision, in-situ measurement and calibration of sensing components used in equipment such as presses, torque tools and pressure-regulating systems.

With a DAkkS or factory calibration certificate for the entire measuring chain, the data-logger is ideal for use as a mobile or stationary reference. This enables you to evaluate your system quickly, regularly and cost effectively at any time and to document the measurement results in a traceable way using the software.



#### Plus version 7281-V0011 (additional functions)

#### Strain gage sensor test:

If a reference measurement of the sensors in the system is not possible, functional testing can be carried out. The sensor test checks the zero point, the input/output resistance as well as the insulation resistance of the sensor. A shunt calibration with an unloaded transducer (targeted unbalancing of the strain gage full bridge) provides you with the calibration step characteristic value specified on the test certificate and therefore the information of a still-intact characteristic curve slope.



#### Strain gage simulator up to ±50 mV/V

(manual or NEW via USB interface):

The strain gage simulator allows you to simulate a sensor by specifying the exact characteristic value (mV/V) in order to test the downstream electronics and readjust them if necessary. In addition, the excitation voltage is measured and displayed so the supply voltage can also be effectively evaluated. Precise strain gage simulation values can be output cyclically via interface operation, enabling fully automated testing or calibration of the downstream electronics.



#### **Precision voltage source**

(manual or NEW can be operated via USB interface):

PLC analog inputs, instrumentation amplifiers and external display devices often need to be adjusted. The voltage source can be used to generate precise specified values so the electronics can be tested and adjusted.



#### **Accessories**

Order code	
7281-Z001	Power pack, 100 – 240 V AC, 50/60 Hz, 12 V DC, 1.5 A included with device
7281-Z002	Battery set of 4 x Mignon AA included with device
7200-CASE	Aluminum case for TRANS CAL 7281 and accessories
	PC software for TRANS CAL 7281 – Basic version:
7281-P101	Measurement display, editing device parameters, making settings via the configuration interface, generating reports from data-logger values, data export, processing metadata
	PC software for TRANS CAL 7281 – Plus version:
7281-P100	Measurement display, editing device parameters, making settings via the configuration interface, generating reports from data-logger values and sensor test data, data export, processing metadata, remote control of the strain gage simulator and the precision voltage source
9900-K349	USB connection cable
9900-V209 (+ 99004: standard connector mounting)	9-pin SUB-D connector (standard sensor connection)
9900-V229 (+ 99011: standard plug mounting with TEDS programming)	9-pin SUB-D connector (sensor connection with TEDS option)
99609-000E-0150010	Connection cable for strain gage simulation/device test Length 1 m, 6 wire, 9-pin socket of model 9900-V609 at one end, loose solder ends at other
99209-540A-0110010	Adapter cable for sensors with 12-pin round plug 9941 Length 1 m/12-pin coupling socket model 9940 to 9-pin SUB-D connector of model 9900-V209

## Calibration of the measuring chain

Calibration	
72ABG	Calibration of the 7281 display unit with standard sensors (inc. ABG calib. report)
72ABG-2 (for TEDS)	Calibration of the 7281 display unit with TEDS sensors (inc. ABG calib. report)

#### Calibration certificate with accreditation symbol

Calibration certificate with accreditation symbol for the TRANS CAL 7281. Calibration is based on the accreditation of calibration laboratory D-K-15141-01-00 for the scope of parameters listed in the annex of the accreditation certificate. Traceability to national standards and wide international recognition is therefore assured (DAkkS is a signatory to the EA, ILAC and IAF Multilateral Recognition Arrangements).



#### **Device calibration**

Standard factory calibration certificate for the device (WKS)	
72WKS-7281-00	ISO/factory calibration for TRANS CAL model 7281-V0010 (11 measured values in total)
72WKS-7281-01	ISO/factory calibration for TRANS CAL model 7281-V0011 (20 measured values in total)
Calibration certificate with accreditation symbol for the device (DKD)	
72DKD-7281-00	Calibration certificate with accreditation symbol (DAkkS) for TRANS CAL model 7281-V0010 (36 measured values in total)
72DKD-7281-01	Calibration certificate with accreditation symbol (DAkkS) for model 7281-V0011 (61 measured values in total)

# **Calibration of measuring chains**

Standard factory calibration certificate for a reference measuring chain (WKS)	
Optionally available	Our standard factory calibration certificate generally contains measurement points that are recorded in five stages starting from zero (distributed as evenly as possible over the measuring range) until the sensor's rated value is reached. The physical input variable is changed with increasing and decreasing signals without changing the installation position of the sensor. Calibration is carried out in conjunction with a transducer (sensor) for physical variables and follows the procedure specified on the sensor data sheet.
Special factory calibration certificate for measuring chains (WKS)	
On request	We are happy to calibrate sensors and measuring chains to the customer's specifications.
Calibration certificate with accreditation symbol for a reference measuring chain (DKD)	
Optionally available	Our ISO 17025 accredited calibration laboratory (DAkkS) offers accredited calibration certificates in accordance with its scope of services. The calibration procedures used can also be found on the data sheet for the transducer (sensor) used. Calibration is carried out in conjunction with a transducer (sensor) for physical variables.

## **Example order**

Item number	
8527-6010-N0T0S000	Reference compression load cell with TEDS connector 9900-V229
7281-V0011	Plus version (reference tester/strain gage simulator/sensor test/precision voltage source)
72ABG-2	Calibration of the measuring chain

#### Order code

Item number	
7281-V0010	Basic version (reference tester)
7281-V0011	Plus version (reference tester/strain gage simulator/sensor test/precision voltage source)

