

OPERATION MANUAL

TRANS CAL Model 7280

© 2012 burster
präzisionsmesstechnik gmbh & co kg
All rights reserved

Software version V3.01

Valid from: 18.06.2012

Manufacturer:

burster präzisionsmesstechnik gmbh & co kg	
Talstraße 1 - 5	P.O.Box 1432
76593 Gernsbach	76587 Gernsbach
Germany	Germany

Tel.:	(049) 07224 / 6450
Fax.:	(049) 07224 / 64588
E-Mail:	info@burster.com
	www.burster.com

Note:

All information in the present documentation was prepared and compiled with great care and reproduced subject to effective control measures. No warranty is provided for freedom from errors. We reserve the right to make technical changes. The present information as well as the corresponding technical data can change without notice. Reproduction of any part of this documentation or its processing or revision using electronic systems is prohibited without the manufacturer's prior written approval.

Components, devices and measured value sensors made by burster praezisionsmesstechnik (hereinafter referred to as „product“) are the results of targeted development and meticulous research. As of the date of delivery, burster provides a warranty for the proper condition and functioning of these products covering material and production defects for the period specified in the warranty document accompanying the product. However, burster excludes guarantee or warranty obligations as well as any liability beyond that for consequential damages caused by improper use of the product, in particular the implied warranty of success in the market as well as the suitability of the product for a particular purpose. Furthermore, burster assumes no liability for direct, indirect or incidental damages as well as consequential or other damages arising from the provision and use of the present documentation.

Präzisionsmessgeräte, Sensoren und Messsysteme
für elektrische, thermische und mechanische Größen



EG-Konformitätserklärung

EC- Declaration of Conformity according to EN ISO/IEC 17050-1:2004

Name des Herstellers: burster präzisionsmesstechnik gmbh & co kg
Manufacturer's Name:

Adresse des Herstellers: Talstr. 1-5
Manufacturer's Address: 76593 Gernsbach, Germany

erklärt unter alleiniger Verantwortung, dass das gelieferte Produkt
declares under sole responsibility that the product as originally delivered

Produktname: Prüfgerät für Kraft, Drehmoment, Weg und Druck TRANS CAL
Product Name: Test instrument for force, torque, length and pressure TRANS CAL

Modellnummer(n) (Typ): 7280
Models Number / Type:

Produktoptionen: Diese Erklärung beinhaltet obengenannte Produkte mit allen Optionen
Options: This declaration covers all options of the above product(s)

mit den folgenden europäischen Richtlinien übereinstimmt und entsprechend das CE-Zeichen trägt:
complies with the requirements of the following applicable European Directives, and carries the CE marking accordingly:

2006/95/EC <i>Low Voltage</i>	Elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen <i>Electrical Equipment designed for use within certain voltage limits</i>
2004/108/EC <i>EMC</i>	Elektromagnetische Verträglichkeit <i>Electromagnetic Compatibility</i>

Obengenannte Produkte entsprechen folgenden harmonisierten Normen:
Above named products conform with the following product standards:

Sicherheit: <i>Safety requirements:</i>	IEC 61010-1:2001 / EN 61010-1:2001	Messkategorie 1 CAT 1	Schutzklasse III; * <i>Safety class 3</i>
		* Netzteil Ladestation 7280-Z001 <i>Docking station</i>	Schutzklasse 2 <i>Safety class 2</i>

EMV Störaussendung: IEC/CISPR 11:2003 + A1:2004 + A2:2006 / EN 55011:2007 + A2:2007
EMC Generic emission:

EMV Störfestigkeit: IEC 61326-1:2005 / EN 61326-1:2006
EMC Generic immunity: Industrie Bereich
Industrial environment

Ergänzende Informationen: / Additional Information:

Das Produkt wurde in einer typischen Konfiguration getestet. Um optimale Störfestigkeit zu erreichen ist das Gerät über geschirmte Leitungen anzuschließen. Verwenden Sie nur den angegebenen Batterietyp.

The product was tested in a typical configuration. In order to reach optimal electromagnetic immunity the device has to be conducted with shielded line. Do not mix with different types of battery. Always use specified battery.

Diese Konformitätserklärung betrifft alle nach Ausstellungsdatum ausgelieferten Produkte:
This DoC applies to above-listed products placed on the EU market after:

Gernsbach 09.07.2008 i. V. Alfred Großmann
Datum / date Quality Manager

Dieses Dokument ist entsprechend EN ISO/IEC 17050-1:2004 Abs. 6.1g ohne Unterschrift gültig / According EN ISO/IEC 17050 this document is valid without a signature.

burster präzisionsmesstechnik gmbh & co kg · Talstr. 1-5 · D-76593 Gernsbach (Postfach 1432 D-76587 Gernsbach) Tel. 07224/645-0 · Fax 645-88
www.burster.de · www.burster.com · info@burster.de

Sitz der Gesellschaft: HRA 530170 Mannheim · Komplementär: burster präzisionsmesstechnik Verwaltungs-GmbH · Sitz der Gesellschaft: Gernsbach · HRB 530130 Mannheim
Geschäftsführer: Matthias Burster · Prokurist: Edgar Miglier · UST-Identnr.: DE 144 005 098 · Steuernr.: 39454/10503
Dresdner Bank AG Rastatt Kto. 06 307 073 00 BLZ 662 800 53 · Volksbank Baden-Baden Rastatt eG Kto. 302 082 00 BLZ 662 900 00



Operating Instruction
Checking Device for Force, Torque, Displacement
and Pressure
Model 7280 (from V3.01)



from serial number: 20218

Identification

Residual risks which can occur during the operation with the 7280 are pointed out with following symbols in this instruction:



Warning:

A note which indicates a possible risk of serious or life-threatening injuries. The accident prevention regulations of the government safety organizations must be considered.



Caution:

A note that indicates a possible risk of damage to the product, process, the human or the environment



Note:

Additional information



Important / Tip:

Reference to more detailed technical information

Health and safety protection

To ensure that our products are safe and they pose no health hazard, the following points must be considered:

1. All relevant sections of this manual must be read carefully before beginning with the operation.
2. All warning labels on packages and containers must be observed.
3. Installations, operation, maintenance and repair work must be carried out by suitably trained personnel in accordance with the given instructions. If any of these instructions are not met, the user of the product bears the full responsibility for all consequences occurring from this failure to comply.
4. Before opening the device, it must be separated from any supply.

Qualified personnel

Qualified personnel are persons who are familiar with the installation, operation and maintenance of the 7280 measuring amplifier and also have the required qualifications. The 7280 amplifier is to be used by qualified personnel according to the technical data in connection with the special safety rules and regulations and use. In addition, the operation required for each individual application, legal and safety regulations. The 7280 measuring amplifier shall only be used by qualified personnel according to the specifications and the following indicated safety regulations and rules. During the operation, the legal and safety regulations, required for each individual application, must be considered in addition. This also applies when using accessories.

Modification

The 7280 amplifier may not be changed constructional or safety-related without our explicit permission. **burster präzisionsmesstechnik gmbh & co kg** will not take responsibility for any resulting damages. Repairs and modifications of the printed boards are prohibited.

Contents

	Page
1. General.....	9
1.1 Application	9
1.2 Description	9
2. Preparations for use	11
2.1 Unpacking the device	11
2.2 Using the device for the first time	11
2.3 Mains operation	12
2.4 Safe and correct use.....	12
3. Controls and terminals	13
3.1 General.....	13
3.2 Program overview	13
3.3 Description of the key	14
3.4 Digital input	15
3.5 Pin assignment.....	16
4. Manual operation	17
4.1 Menu description	17
4.2 Measuring with 7280.....	19
4.2.1 Negative zero output.....	19
4.2.2 Stored adjustment values	19
4.3 Sensor parameters.....	20
4.4 ADJUST - adjustment menu	20
4.5 Adjustment procedure.....	21
4.6 Operating and function principle of the data logger in 7280 amplifier.....	23
4.7 Adjustments in the LOGG mode.....	24
5. Remote.....	25
5.1 Serial interface	25
5.2 Read-out of current sensor parameters.....	26
5.3 Read-out complete status	26
5.4 Read-out complete status	27
5.5 Format of the serial interface output.....	29
5.6 Adjustments in the SCI mode	29
5.7 Transfer rate / specification RS232 (V.24) / USB.....	29
5.8 Link connection to USB	30
5.9 Measuring rate 1000/s and LOGG Mode 1 ms.....	30
6. Technical data	31
7. Programmer example	33
8. Automatic OFF at battery / mains operation.....	37



Contents

	Seite
9. MISC	37
9.1 Transportation	37
9.2 Initiation and setup.....	37
9.3 Normal operation	38
9.4 Maintenance and cleaning	38
9.5 Disposal	39

1. General

1.1 Application

The portable digital indicator model 7280 is a universal checking device for instrumentation examination mechanical components like press, equipment of torque and so on. The employment takes place in the ranges quality assurance, start-up and process monitoring. By high measuring rates very fast reactions to the measuring signals are possible. A min./max. memory makes further areas of application possible for the equipment. A universally configurable data logger can store measured values up to 15288. By the possibility 10 parameter sets to deposit, are possible different calibration data such as sensor designation and physical units. Measured values or logging values can be spent over RS232-/USB interface at a PC or a printer. So that the measurement chain is traceable, a proprietary calibration certificate can be provided. The traceability of the calibration exists over the used reference normal.

1.2 Description

The model 7280 is mobile by battery or accu, can be operated however also with an external power pack. A high measuring accuracy paired with fast measuring rate, 16 bit A/D converter and a microprocessor are ensured by the employment by highly precise amplifiers.

The pocket model 7280 support sensors on strain gage basis and active sensors to 10 V / 20 mA. Indicated on the 14 mm high LED main display will the current measured value, on a second display directly under it can for example the peak value be read off. With the function tare can be away-tared an existing basis load. For a force measuring chain we recommend to attach the tension and compression load cell model 8524 to the digital indicator. Depending upon can be selected between measuring range of 500 N and 200 kN (divides into 9 stages). The reference measuring chain is completely configures and calibrated.



2. Preparation for use

2.1 Unpacking the device

The device weights approx. 0.5 kg and due to this it is packed shockproof. Unpack it accurately and check the completeness of the delivery.

This normally includes: 1 TRANS CAL model 7280
 1 copy of this manual

Verify accurately, that there is no damage on the device.

If here is a suspicion, contact the manufacturer within 72 hours.

Retain the packaging for examination by a representative of the manufacturer and/or the deliverer.

Only ship the TRANS CAL in original packaging or in a container providing the same degree of protection.

2.2 Using the device for the first time

Warning: The device must never be switched on if it shows signs of damage during shipping.

2.3 Mains operation

Mains operation:

A plug-in power supply with controlled 6 V DC must be employed with min 1.5 A. For discharged batteries the charging current will be approx. 290 mA. In this way, the accumulators are also loaded simultaneously, also in the case of switched-off 7280.

During continuous operation on the net, it is recommended to remove the accumulators. For fast loading to 100 % of the accumulators, an external loader (e.g. Ansmann 4 - 6) is recommended.



Prior to mains operation (disposable-) batteries must be removed from the device, as they would be destroyed by the charging process and thus lead to equipment damage !

Accumulator operation:

Use 4 x NiMH Mignon-Accumulators of min. 1600 mAh and 1.2 V correctly poled.

Accumulator charge time:

The accumulator charge time at accumulator-capacity of 2.7 Ah is approx. 9 - 10 h. At discharged accumulators, the constant charging rate is approx. 290 mA. Charged accumulators are recognized by the Minus-Delta-Peak-Procedure (overload protection).

Battery operation:

Use 4 x Mignon/AA batteries with 1.5 V

Never use a power supply plug when batteries are inserted !

Voltage supply:

If the admissible battery voltage falls below, the display starts to blink.

Safe and correct use

Caution:



- Protect the device from moisture dew, rain, snow...
- Protect the device from direct solar irradiation
- Protect the device from dust and pollution
- Protect the device from high and/or excessive ambient temperature
- Protect the device from excessive vibration

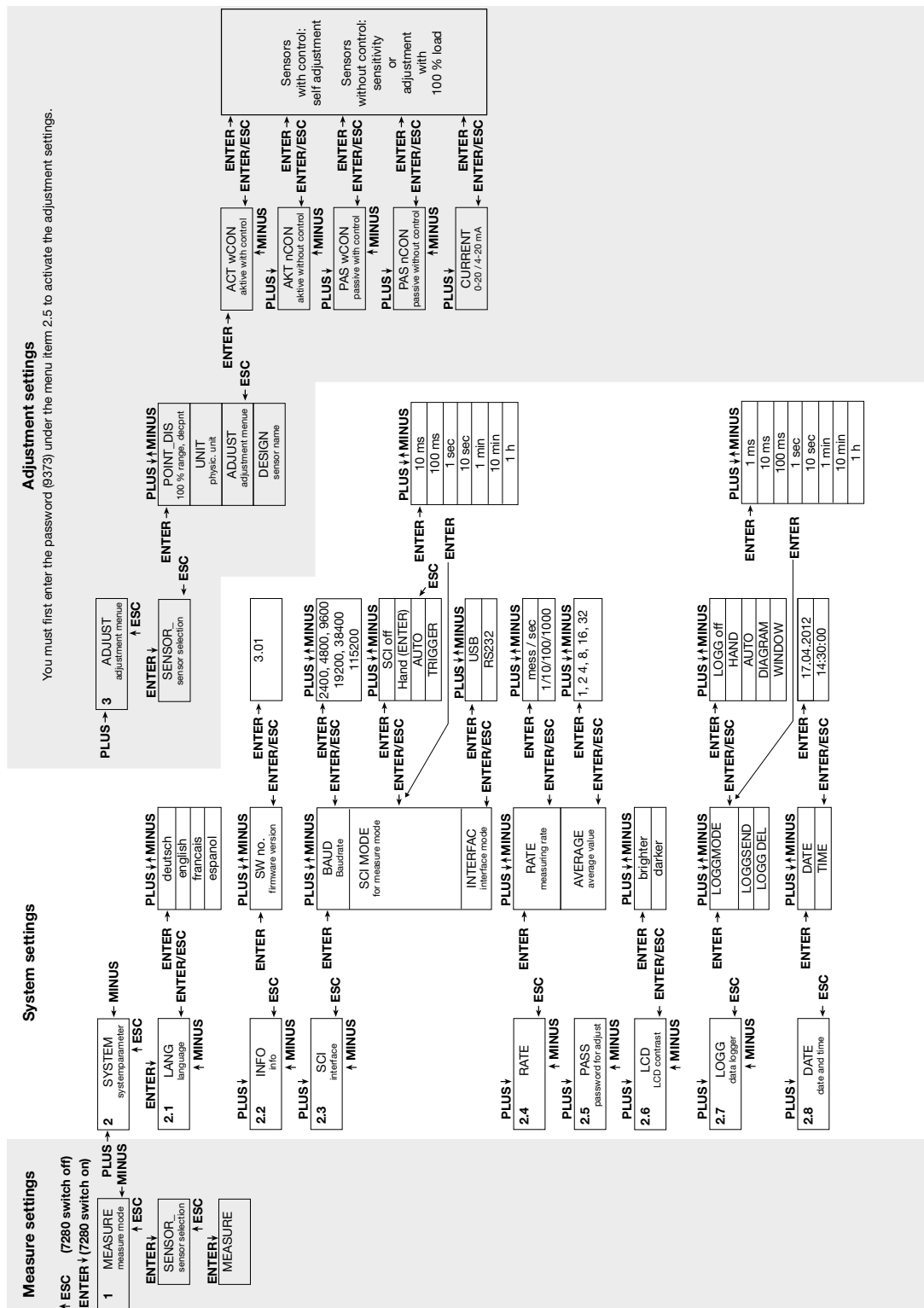
3. Controls and Terminals

3.1 General

The device can be operated via the keyboard or via the RS232-/USB interface. The following describes operation of the keyboard in a brief overview.

3.2 Operating overview

Brief overview for the operation



3.3 Description of the keys

Example:

In 7280 switch on

- The 7280 is switched on, when ENTER button is pressed.

Time and data

- control or correct time and date in SYSTEM menu

Edit language

- Change in menu to 2 SYSTEM – 2.1 LANG. When **ENTER** button is pressed, 7280 is in selection mode. With the buttons **PLUS** and **MINUS** the language can be selected. With **ENTER** the selected language will be saved. With **ESC** the selected language will be discarded.

Edit time

- Change in menu to 2 SYSTEM – 2.8 DATE. When **ENTER** button is pressed TIME will appear on LCD. Press **ENTER** and you can edit the time. With **PLUS** and **MINUS** button the hours can be adjusted. After **ENTER** the minutes can be adjusted with **PLUS** and **MINUS** button. With **ENTER** the selected time will be saved. With **ESC** the selected time will be discarded.

Chance into the measure mode

- From menu 1 MEASUR by pressing **ENTER** the list of all sensors is called up. By the keys **PLUS** and/or. **MINUS** a sensor parameter set is being chosen, then. By pressing **ENTER** the 7280 is being adjusted to this sensor parameter set. By pressing **ESC** it is possible to switch back to menu 1 MEASUR from any mode.

Change measuring rate by measuring mode

- The measuring can be exited by pressing key **ESC**. After pressing key **ESC** again, the 7280 will return to menu 1 MEASUR. From there the menu 2 SYSTEM – 2.4 Rate can be called up. Select entry RATE by key **PLUS** and/or **MINUS**. By pressing key **ENTER** the set measuring rate is being displayed, first. By key **PLUS** and/or **MINUS** a new measuring rate can be set now. By **ENTER** the new measuring rate will be taken over, by **ESC** the new measuring rate will be discarded.

Switch off 7280

- 7280 is switched off, when **ESC** button is pressed >3 seconds.

Key assignment:

Key	Programming mode
▲	Scroll up
▼	Scroll down
ENTER	Confirmation, one step forward in the menu
ESC	Reject, one step back in the menu

3.4 Digital input

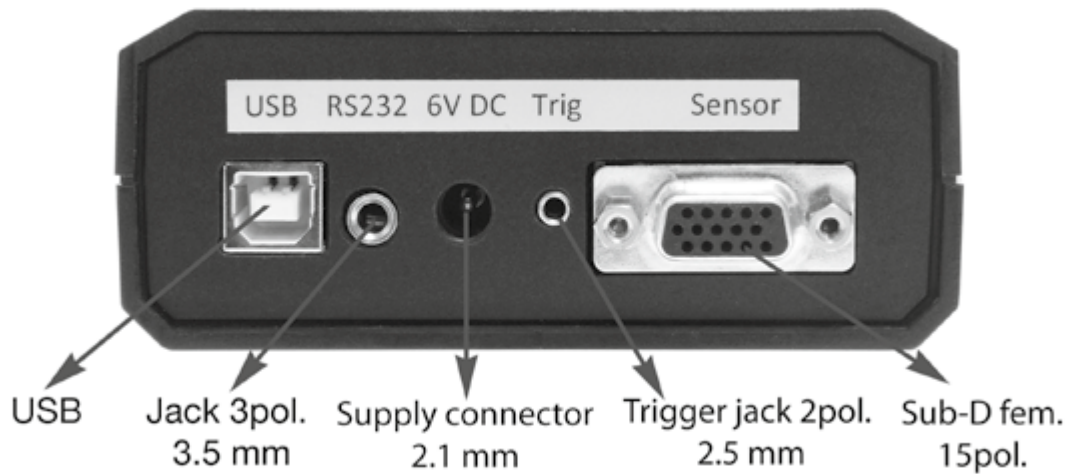
The device has a voltaic isolated control input: **Trigger**. This input can be controlled by e.g. a PLC, a remote switch, a foot switch etc. As 100 % control signal, following voltage levels must be applied at the phone jack for the respective logic state:

Logic state	Low level	High level
Voltage level	0 V ... 2 V	3.5 V ... 27 V
State	inactive	active

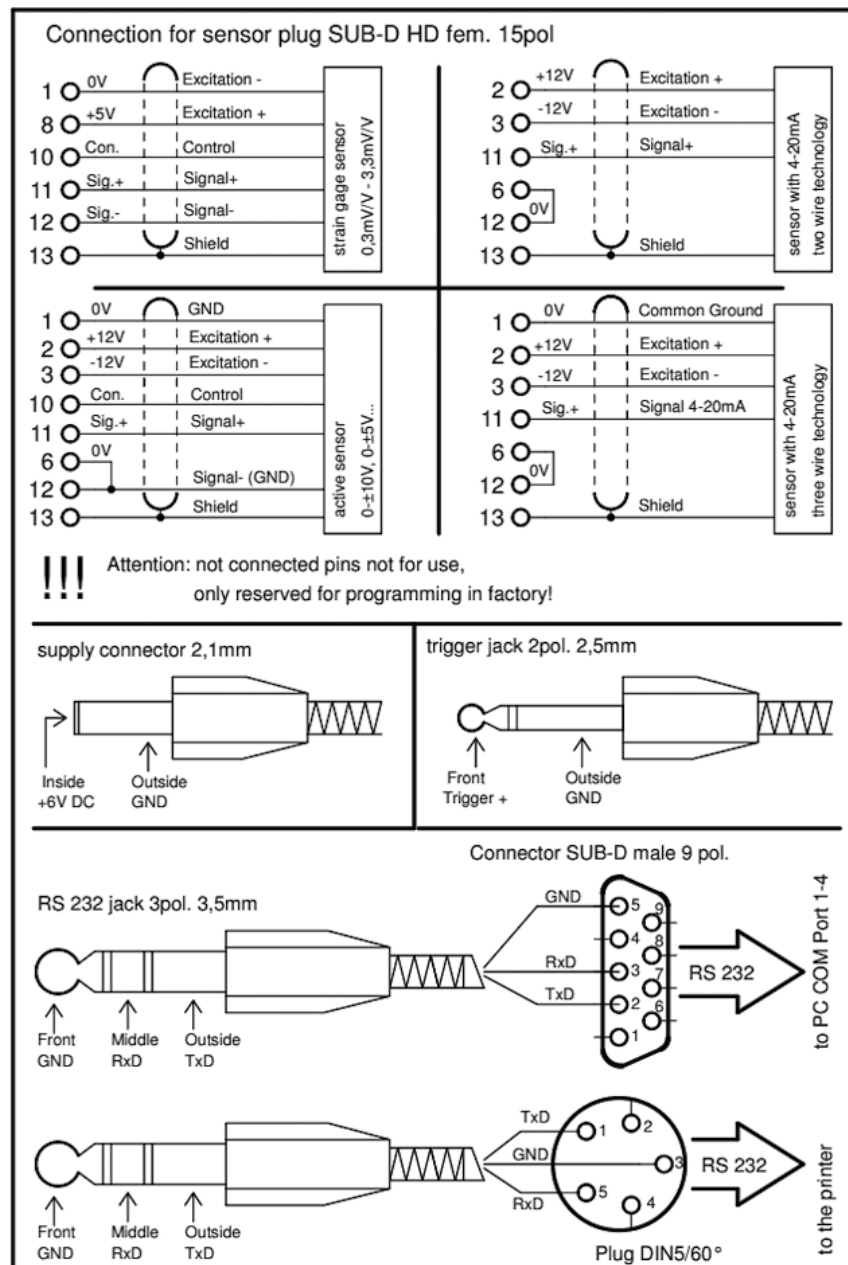
Trigger input

- Depending on adjustment, data can be logged or interface data can be issued. This input has a high sampling rate, thus very short pulses are detected.

3.5 Pin assignment



Pin assignment of the sensors



4. Manual Operation

4.1 Menu description

1 MEASURE	Measuring mode
SENSOR__	Sensor selection for measuring mode, sensor 0 - 9 Selection of the sensor parameter set of the measurement. The sensor parameter set must comply with the connected sensor.
2 SYSTEM	All system parameters are stored in this menu column.
2.1 LANG	Language adjustment The menu language is available in English, German, French and Spanish.
2.2 INFO	Information query was factory-configured and is not modifiable.
SW no.	Firmware version
2.3 SCI	Interface configuration
BAUD	Baud rate adjustment; it must comply with the receiver (PC or printer).
SCI MODE	The interface configuration only refers to the measuring mode, not the log mode!
SCI off	Interface switched off
HAND	When pressing ENTER in the measuring mode, a measured value is displayed.
AUTO ¹	Interval time, adjustable from 10 ms to 1 h (at high measuring rate only possible with the highest baud rate).
TRIGGER	At rising edge on the trigger input, in measuring mode a measured value is displayed.
INTERFAC	Interface selection
USB	USB interface is activated
RS232	RS232 interface is activated
2.4 RATE	Measuring rate¹ and average value
RATE	Measuring rate adjustment, selectable from 1/s to 1000/s. For fast procedures (screw joint, insert press...) always select a fast measuring rate, e.g. 1000/s, for very slow procedures select a small rate, e.g. 1/s.
AVERAGE	Average determination, the numbers indicate the average determination by the amount of measurements. Applicable for e.g. vibrations, control oscillations...
2.5 PASS	Password query
RATE	Entering password 9373 allows to change to menu 3 ADJUST . Here, the sensor parameters can be changed.
2.6 LCD	LCD contrast adjustment If the LCD becomes unreadable by external influences, e.g. solar radiation, heat or cold, the LCD contrast can be changed by pressing key ▲ or ▼.

¹If the SCI → AUTO interval time is shorter than the adjusted measuring rate, the same measured value will be issued on the interface until a new value is entered.

2.7 LOGG

LOGGMODE

LOGG off
Hand
AUTO

DIAGRAM
WINDOW

LOGGSEND

LOGGDEL

2.8 DATE

DATE

TIME

3 ADJUST

Sensor__
POINTDIS

UNIT
ADJUST

DESIG

Data logger adjustments

Data logger configuration

Off-switch for logger operation, measuring mode possible, only.

With each keystroke on **ENTER** a log value is accepted.

Adjustment of the measurement intervals for the automatic measured value storing.

With each rising edge of the trigger signal, a log value is accepted. The window operation is started by a rising trigger edge and can be finished only by a falling edge. During this time, measured values are stored in 1 ms raster in the data logger.

Log values are issued through the interface, press **ENTER** twice.

Log values are deleted after a safety query. Before deleting, please assure that the data was received.

Data and time adjustment

Date

Time

Adjustmenu

This menu is active only, if the password has been entered in menu mode 2.5 PASS. For the adjustment, the sensor must be connected to the sensor socket.

Sensor number or the name of the sensor which shall be adjusted. Final measurement value of the sensor with decimal indication e.g. 1000; 100.0; 10.00; 1,000. The numerical values are variable, 4 digits are available. Change to menu mode POINTSDIS. After pressing **ENTER**, the final measurement value of the sensor can be entered. With keys ▲ and/or ▼ the first digit can be edited, go to the next figure by pressing **ENTER**. When all 4 digits are edited, the decimal point gets shifted by keys ▲ and/or ▼. Press **ENTER** to complete the entry, the final value will then be stored in the 7280 measuring amplifier.

Entry of the physical unit e.g. kg, Ncm, t, gr, kN, Nm, bar..

Sensor type selection (active with 100 % control signal, active without 100 % control signal, passive with 100 % control signal, passive without 100 % control signal, 4-20 mA.

Name of the sensor e.g. sensor 1, 2, 3, DR-2112, silo, tank, mixer, scale 1, motor, test 1...

4.2 Measuring with 7280

Measuring with 7280

selected sensor is:	Force sensor with meas. range	200 kN
	Sens.:	2 mV/V
	Designation e.g.:	Squeezer
	Parameter set: Sensor no.:	3
	Option:	100 % Cal. control

In order to be able to now measure with this sensor, the sensor „SQUEEZER“ is selected in the measuring mode. During a measurement, a minimum and maximum value buffer can be called up with the arrow keys, the in each case displayed minimum or maximum value can be deleted with ENTER.

If the measured value should be sent through an interface to a pc or printer, the baud rate must be adjusted to the receiver and the operating mode must be chosen in the case of SCI-MODE. For example: HAND, a measured value with time is displayed during every keystroke on ENTER while measuring.

Should data be logged, adjust operating mode in the logger mode, e.g. choose AUTO and range time e.g. 10 sec and enter the measuring mode. A measured value with time is now stored every 10 sec. In the mode LOGGSEND, these data then can be sent through the interface.

Key assignment:

Key	Measuring mode
▲	Press = TARA
▼	MEASURING --- MIN --- MAX --- MEASURING
ENTER	at MEASURING: send data at LOGG: store measured value at MIN: delete MIN at MAX: delete MAX
ESC	Back to menu / Press 3 sec. Press = Off

4.2.1 Negative zero output

With no sensor parameter set, a negative zero output from the sensor can be entered (manually by hand). A negative zero output can only read in directly from the sensor with teach-in (function adjustment).

4.2.2 Stored adjustment values

The stored adjustment value are not displayed. This will only stored inside the device and can't be changed manually.

4.3 Sensor parameters

After the password (9373) input in the system, the sensor can be applied in the calibrating menu.

Following parameters are available:

Sensor_	Sensor no 3	Sensor 0 - 9 possible
POINTDIS	200.0	Adjust meas. range and decimal point (max. 9999)
UNIT	_kN	1 – 3 digit unit possible
DESIGN	Squeezer	up to 8 digit name (or numbers) freely optional
ADJUST	PAS_nCON	Select passive without cal. control
0 % LOAD	Relieve sensor	0% value of sensor, indication 0 is assigned
100 % CON	Autom. calibration	100 % value of sensor will be assigned to indication 200 kN
SAVE	ENTER or ESC	Confirm or reject

4.4 ADJUST Adjustment menu

3 ADJUST

Adjustment menu

This menu is active only, if the password has been entered in menu mode 2.5 PASS. For the adjustment, the sensor must be connected to the sensor socket.

Sensor_	Sensor number or the name of the sensor which shall be adjusted.
POINTDIS	<p>Final measurement value of the sensor with decimal indication e.g. 1000; 100,0; 10.00; 1.000; ...</p> <p>The numerical values are variable, 4 digits are available. Change to menu mode POINTDIS. After pressing ENTER, the final measurement value of the sensor can be entered. With keys ▲ and/or ▼ the first digit can be edited, go to the next figure by pressing ENTER. When all 4 digits are edited, the decimal point gets shifted by keys ▲ and/or ▼. Press ENTER to complete the entry, the final value will then be stored in the 7280 measuring amplifier.</p>

UNIT	Entry of the physical unit, e.g. Kg, Ncm, t, kN, Nm, bar ...
DESIG	Name of the sensor, e.g. 1, 2, 3, DR 2112, silo, tank, mixer, scale1, motor, test1...
ADJUST	<p>Sensor type selection:</p> <p>ACTIVE without control signal, for transmitter 0-10 V</p> <p>CURRENT for transmitter 4-20 mA.</p> <p>PASSIVE without control signal, for strain gauge (load) sensors</p>

4.5 Adjustment procedure

ACT nCON Active sensor without 100 % control signal

with following adjustment possibilities:

- adjust 0 % load and 100 % load
- adjust 0 % load and enter hub
(100 % load in V - 0 % load in V)
- enter 0 % load in V and the hub
(100 % load in V - 0 % load in V)

Select between 0 % load or nominal value by pressing ▲ or ▼

0 % LOAD unload sensor

or NOMVALUE input of the nominal value in V

Select between load or nominal value by pressing ▲ or ▼

100 % LOAD Adjustment by 100 % load (apply nominal load)

or NOMVALUE input of the nominal value in V

SAVE Query for takeover of the adjusted data

PAS nCON Passive Sensor without 100 % control signal

with following adjustment possibilities:

- adjust 0 % load and 100 % load
- adjust 0 % load and enter 100 % load in mV/V
- enter 0 % load in mV/V and 100 % load in mV/V

Select between load or nominal value by pressing ▲ or ▼

0 % LOAD unload sensor.

or NOMVALUE input of the nominal value in mV/V

Select between 100 % load or nominal value by pressing ▲ or ▼

100 % LOAD adjustment by load (apply nominal load).

or NOMVALUE input of the nominal in mV/V

SAVE Query for takeover of the adjusted data

Adjustment procedure

CURRENT **Sensor with 4 ... 20 mA**

with following adjustment possibilities:

- adjust 0 % load and 100 % load
- adjust 0 % load and 100 % load in mA
- enter 0 % load in mA and 100 % load in mA

Select between 0 % load or nominal value by pressing ▲ or ▼

0 % LOAD unload sensor

or NOMVALUE input of the nominal value in mA (fixed value 4-20 mA)

Select between 100 % load or nominal value by pressing ▲ or ▼

100 % LOAD adjustment by 100 % load (apply nominal load / nominal torque)

or NOMVALUE input of the nominal value in mA

SAVE Query for takeover of the adjusted data



If a sensor cannot be selected and/or does not change to the measuring mode, there was a false adjustment for this sensor / parameter set. → Re-adjustment

4.6 Operating and function principle of the date logger in 7280 measuring amplifier

The data logger can, if the 7280 measuring amplifier is not in the measuring mode, be read by the menu option 2.7 LOGG - SENDING or by the command „A“ via the interface. Outside of the measuring mode the data logger is deleted only by the menu option 2.7 LOGG - DELETION.

If the 7280 measuring amplifier is in the measuring mode, the data logger can be read with the command „A“ and be deleted with the command „B“.

If the measuring mode is being switched on from the menu option 1 MEASURING-sensor selection, the starting time of the measurement, the current sensor designation, the final value of the measuring range, the adjusted measuring rate and the logger mode (e.g.: AUTO 1 ms) are saved in the logger.

NOTE: All previous measured values are deleted here!

With the read-out of the data logger via the serial interface different adjustments of the 7280 are sent.

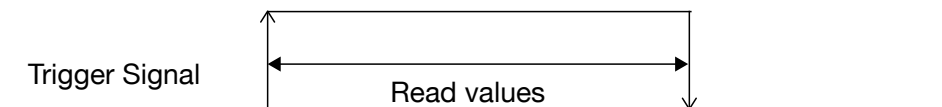
- a.) letter head
- b.) starting time of the measurement
- c.) sensor designation
- d.) display final value
- e.) adjusted measuring rate
- f.) adjusted logger mode
- g.) thereafter the measured values

In the HAND MODE the measured values are always logged with the time. With the data in the AUTOMODE the measured value is logged. A time can be assigned to each measured value by the indicated starting time.

Since in GRAPHS and in the WINDOW MODE trigger events smaller than 1 sec can occur, an additional time log is not possible.

4.7 Adjustments in the LOGG mode

LOGG OUT	Here the data logger is switched off. the logg mode in the measuring mode is switched to "LOGG OUT" as soon as the entire data logger has been edited.
HAND	In this mode a measured value is written into the data logger when the enter key was pressed at the 7280. By an additional logg of time, there is a assignment for each measured value.
AUTO	In this mode in the adjusted delay a measured value is written into the data logger. By the stored starting time there is a time assignment for each measured value.
GRAPH	In this mode at a trigger event a measured value is written into the logger. Since the trigger pulses occur in 10 ms raster, an additional logg of the time is not possible. The flank of the trigger pulse must stand on HIGH for 4 ms at last. Afterwards on LOW for at least 6 ms.
WINDOW	This mode reacts to in increasing and/or decreasing flanks. At an increasing flank the logging of the measured values is started. From now on the measured values are written in the data logger with 1 ms raster. A decreasing flank ends the recording.



Memory depth of data logger - see chapter 5.1

5. Remote

5.1 Serial interface



For the serial data transmission the 7280 measuring amplifier uses a RS232 or an USB interface. The PC manages the USB interface as a virtual COM port. For the use of the USB interface, must have a windows operating system (2k, XP, Vista, 7) and the burster präzisionsmesstechnik gmbh & co kg USB driver must be installed (see chapter 3 - further documentation). After the driver installation, the virtual COM port can be used as described below.

Transfer rate / specification RS232 (V.24) / USB

Parity:	none	} 8N1
Number of data bits:	8 (1 Byte)	
Stop bit:	1	
Baud rate	adjustable (2400, 4800, 9600, 19200, 38400, 115200 Baud)	



In the USB mode, the baud rate in the 7280 measuring amplifier and the connected device must match.

Protocol overview

Via the serial interface, the 7280 measuring amplifier can issue the measured values individually or automatically. The commands can be send to the 7280 measuring amplifier via a termal program or a PLC.

Following commands are available:

Command overview

ASCII	HEX	Description	in measuring mode	not in measuring mode
k	0x6B	ENTER	✓	✓
l	0x6C	▲	✓	✓
m	0x6D	▼	✓	✓
n	0x6E	ESC	✓	✓
A	0x41	Read-out data logger	✓	✓
C	0x43	Read-out current sensor parameters	✓	✓
D	0x44	Read-out status	✓	✓
E	0x45	Read-out complete status	✓	✓
g	0x67	Change protocol setup	✓	✓
0	0x30	Continuous measured value query (signed integer)	✓	
1	0x31	Query of max. value (signed integer)	✓	
2	0x32	Query of min. value (signed integer)	✓	
3	0x33	Tare of display	✓	
4	0x34	Reset max. value	✓	
5	0x35	Reset min. value	✓	
6	0x36	Actuate 100 % 100 % control signal - for sensors with 100 % control resistance	✓	
7	0x37	Switch-off 100 % 100 % control signal for sensors with 100 % control resistance	✓	
B	0x42	Delete data logger	✓	
a	0x61	Write time		✓
b	0x62	Read-out time		✓
c	0x63	Write company head		✓
e	0x65	Write all sensor parameters (not supported yet)		✓
f	0x66	Read-all sensor parameters (not supported yet)		✓



In Menu 3: ADJUST → UNIT and ADJUST → DESIG the adjustments can be changed by the commands “l” and “m”



5.2 Read-out of current sensor parameters

Sensor designation	8 Byte	ASCII
Final displayed value	2 Byte	compressed BCD-figure
Unit	3 Byte	ASCII
Sensor type and digit	1 Byte	0xAB: A ... Sensor type, B ... digit (binary coded)
		Sensor type:
		0xxxxx xxxx
		0000 ... active with 100% 100% control signal adjust 0% load and 100% load
		0001 ... active without 100% 100% control signal adjust 0% load and 100% load
		0010 ... active without 100% 100% control signal adjust 0% load and 100% load V
		0011 ... active without 100% 100% control signal adjust 0% load V and 100% load V
		0100 ... passive with 100% 100% control signal adjust 0% load and 100% load
		0101 ... passive without 100% 100% control signal adjust 0% load and 100% load
		0110 ... passive without 100% 100% control signal adjust 0% load V and 100% load mV
		0111 ... passive without 100% 100% control signal adjust 0% load mV and 100% load mV/V
		1000 ... current adjust 0% load and 100% load
		1001 ... current adjust 0% load and 100% load mA
		1010 ... current adjust 0% load mA and 100% load mA
		Digit:
		0xxxxx xxxx
		000 ... _5000__
		001 ... _5,000__
		010 ... _50,00__
		011 ... _500,0__
		100 ... 5,000__
0%load	2 Byte	HEX value (MSB/LSB)
100% load	2 Byte	HEX value (MSB/LSB)

5.3 Read-out complete status

Status	2 Byte	general error condition of the 7280 measuring amplifier
--------	--------	---

5.4 Read-out complete status

	Status	2 Byte	General error condition of the 7280 measuring amplifier
Meas. rate	1 Byte	0x01 ... 1000/sec 0x02 ... 100/sec 0x03 ... 10/sec 0x04 ... 1/sec	
Average value	1 Byte	0x01 ... x/1 0x02 ... x/2 0x04 ... x/4 0x08 ... x/8 0x10 ... x/16 0x20 ... x/32	
SCI_MODE	1 Byte	0x00 ... interface is off mode 0x04 ... hand mode 0x08 ... automatic mode 0x0C ... trigger mode	
SCI_MODE_DELAY	1 Byte	0x02 ... 10 ms 0x03 ... 100 ms 0x04 ... 1 s 0x05 ... 10 s 0x06 ... 1 min 0x07 ... 10 min 0x08 ... 1 h	
LOGGMODE	1 Byte	0x00 ... logger is off mode 0x04 ... hand mode 0x08 ... automatic mode 0x0C ... DIAGRAM mode 0x10 ... windows mode	
LOGGMODE_DELAY	1 Byte	0x01 ... 1 ms 0x02 ... 10 ms 0x03 ... 100 ms 0x04 ... 1 s 0x05 ... 10 s 0x06 ... 1 min 0x07 ... 10 min 0x08 ... 1 h	
Language	1 Byte	0x00 ... GERMAN 0x02 ... ENGLISH 0x04 ... FRENCH 0x06 ... SPANISH	
Protocol status	1 Byte	0xxxxx xxxx (binary coded) 1 ... do not send final character 1 ... send CR/LF 1 ... send CR 1 ... send LF	

Write time:

Write time is identical to data block receipt of time. However, the data block for writing is protected with a check sum and the referring weighted check sum.

Read time:

With following read-out:

DAY.MONTH.YEAR

2xSpace

HOURS:MINUTES:SECONDS

Write company head:

The entry ends either if 256 characters are received or if the character ETX (0x03) Strg-C is contained in the character string.

Read company head:

By this command, the company head, which is stored in the 7280 measuring amplifier, is read-out.

Write all parameters:

The writing data block of all sensor parameters is identical with the receiving data block for reading all parameters. However, for the writing of the sensor parameters a check sum and the referring weighted check sum is required.

Read all parameters:

The read-out of all parameters from sensor 1 to sensor 10 occurs in following sequence:

Sensor designation

Final displayed value

Unit

Sensor type (adjustment type) / decimal point

Adjustment values 0 % load, 100 % load with 2 Bytes each

See command "read current sensor parameters".

Change protocol setup:

Protocol status

1 Byte

0xFFFF XXXX (binary coded)

|||| ||||

|||| |||1

... do not send final character

|||| ||1

... send CR/LF

|||| |1

... send CR

|||| 1

... send LF

Calculation of the check sum (CS) and the weighted check sum (gewCS):

The calculation occurs via all parameter bytes (without the command byte). At the CS all bytes are added (overflows are not considered here). For the calculation of the gewCS, the CS is added to the gewCS. At overflow, the gewCS is incremented by 1.

5.5 Format of the serial interface output

Operation via serial interface/USB

Output format in SCI mode:

HAND		Sign, value, unit, time and CRLF
AUTO	10 ms	value (signed integer) and CRLF
	100 ms	value (signed integer) and CRLF
	1 s	Sign, value, unit, time and CRLF
	10 s	Sign, value, unit, time and CRLF
	1 min	Sign, value, unit, time and CRLF
	10 min	Sign, value, unit, time and CRLF
	1 h	Sign, value, unit, time and CRLF
TRIGGER		value (signed integer) and CRLF

Output format in LOGG mode:

HAND	Sign, measured value, unit, time and CRLF
AUTO	Sign, measured value, unit and CRLF
DIAGRAM	Sign, measured value, unit and CRLF
WINDOW	Sign, measured value, unit and CRLF

5.6 Adjustments in the SCI mode

SCI off:	With this adjustment, measured values transfer from the 7280 measuring amplifier is disabled, but the 7280 measuring amplifier can be controlled via the 7280 commands.
HAND:	In this mode a measured value is issued via the serial interface when ENTER is pressed at the 7280 measuring amplifier.
AUTO:	In this mode a measured value is issued via the serial interface in the adjusted delay.
TRIGGER:	At a trigger event in this mode, a measured value is issued via the serial interface. The trigger pulses can occur in 10 ms raster. The flank of the trigger pulse must be on HIGH for at least 4 ms. Then it must be on LOW for at least 6 ms.

5.7 Transfer rate / specification RS232 (V.24) / USB

Parity:	none
Number of data bits:	8 (1 Byte)
Stop bit:	1
Baud rate:	adjustable (2400; 4800; 9600; 19200; 38400; 115200)



In the USB mode, the baud rate in the 7280 measuring amplifier and in the connected device must match.

5.8 Link connection to USB

To establish a connection between 7280 and a PC, the user can install the USB driver on his PC. In 2.3 SCI/INTERFACE choose “USB” as the interface and in 2.3 SCI/BAUD set the desired BAUD rate. Then connect the 7280 to your PC and start the software. Under the menu point settings/interface select the COM port with the name “XXXXX USB Sensor” and select in the same menu the same BAUD rate as in 7280. After that, the communication is established and can be used exactly as directed by the RS232 interface.

5.9 Measuring rate 1000/s and LOGG Mode 1 ms

During a measurement at a rate of 1000/s and active LOGGING mode with 1 ms can read via the PC software in the section Data Logger no readings. This is because, that the measurement values are written 10 x faster in the device's internal memory, as they can be output via interface.

6. Technical Data

Accuracy:	0.1 % F.S. \pm 1 digit
Measuring rate:	1 / 10 / 100 / 1000 sec.
Average values:	x/1, x/2, x/4, x/8, x/16, x/32
Display counts:	\pm 9.999 + 3 dig. unit
Zero point alignment:	automatic/manual
Sensor selection for measurement mode:	10
Data logger mode:	window, diagram, manual, auto
Memory values:	max. 15288
Bridge resistance of the strain gauges:	350 ... 2000 Ω
Sensitivity, passive:	\pm 3.3 mV/V
Sensitivity, active:	\pm 10 V
Input resistance:	approx. 100 k Ω
Sensitivity, current:	0/4 ... 20 mA an at 75 Ω
Connection technology:	2 or 3 wire
Voltage supply passive/active:	5 V / 20 mA \pm 12 V / over 100 mA \pm 12 V altogether max. 120 mA
Working time with 50 % circle duration with accus:	
passive sensors	> 20 h
active sensors	> 8 h
Nominal temperature range:	+ 15 °C ... + 35 °C
Range of operating temperature:	+ 5 °C ... + 45 °C
Storage temperature range:	- 10 °C ... + 70 °C
Dimensions (D x W x H):	200 x 100 x 40 [mm]
Protection class:	IP40



7. Programmer Example

Given :	Load cell model 8524-6050	strain gauge 350 Ω
	Range:	50 kN
	Output signal:	1.5016 mV/V
	Zero output without fitting parts:	0.0020 mV/V

Adjustment procedure

The 7280 gets activated by pressing the **ENTER** key.
The following screen is displayed:

1 MEASUR

By pressing **▲** or **▼** you get to the next screen.

2 SYSTEM

Now press **ENTER** the following screen is displayed:

2.1 LANG

By pressing several times **▲** or **▼** until you get to the following screen:

2.5 PASS

By pressing **ENTER** you takes to the entering of the password:

0 0 0 0

After entering the password (9373), the sensor can be applied in the adjustment menu. (When the beam is below a paragraph you can change this by pressing of **▲** or **▼**).

You get to screen:

3 ADJUST

After pressing **ENTER** you get to the sensor selection 0 - 9, CURRENT, active, sensor test

SENSOR 1

Given :	Load cell model 8524-6050	strain gauge 350 Ω
	Range:	50 kN
	Output signal:	1.5016 mV/V
	Zero output without fitting parts:	0.0020 mV/V

After selection of e.g. „SENSOR 1“ and after push of **ENTER** you get into the mode the sensor can be applied in Adjust measuring range and decimal point (POINTDIS), UNIT and name of the sensor (DESIGN).

POINTDIS

By pressing ▲ or ▼ you get to the following screens:

UNIT

ADJUST

DESIGN

After pressing SENSOR 1 and **ENTER** you get the following screen e.g.

10.00 Nm

Now in this example the number e.g. 50.00 can be set by pressing of ▲ or ▼. If the beam is below the count this can be changed by pressing of ▲ or ▼. The changed count is taken by press of **ENTER**.

After pressing 4 times **ENTER** you can set the decimal point by pressing ▲ oder ▼. If the desired decimal point reached you can taken this by press of **ENTER**.

Now return to the following screen:

POINTDIS

By pressing ▲ you get to the next screen:

UNIT

Given :	Load cell model 8524-6050	strain gauge 350 Ω
	Range:	50 kN
	Output signal:	1.5016 mV/V
	Zero output without fitting parts:	0.0020 mV/V

After pressing **ENTER** you get the following screen e.g.

_Nm

Now in this example the unit kN can be set by pressing ▲ or ▼. If the beam is below the letter this can be changed by pressing ▲ or ▼. The changed letter is taken by press of **ENTER**.
Now return to the screen:

UNIT

By pressing 2 times ▲ you arrive the following screen:

DESIGN

After pressing **ENTER** you get the following screen:

SENSOR 1

Now it can be changed as for the designation of the UNIT e.g. **Place 1** or similar.

By pressing 1 times ▼ you arrive the following screen:

ADJUST

After pressing **ENTER** you get the following screen:

ACT nCON

ACT wCON

PAS nCON

PAS wCON

CURRENT

With ▲ or ▼ you can toggle through these screens.

Given :	Load cell model 8524-6050	strain gauge 350 Ω
	Range:	50 kN
	Output signal:	1.5016 mV/V
	Zero output without fitting parts:	0.0020 mV/V

We choose for the above sensor the menu „PAS nCON“ ---> passive sensor without control.
After pressing **ENTER** you get the following screen:

0 % LOAD

Load cell is connected and the zero value is stored with **ENTER**.

Or after pressing ▼ you get the second entry menu (0 %)

NOM VAL

The characteristic data is entered according data sheet. In this case 0.020 mV/V.

After pressing **ENTER** you can enter the zero value:

0.020 mV/V

After pressing **ENTER** you can enter the output signal (sensitivity (100 %) NOM VALUE, in this example 1.502 mV/V. If the entering of the value ended the next is “save?”. Press **ENTER** to complete the entry, the final value will then be stored in the 7280 measuring amplifier.

After

0 % LOAD

Load cell is connected and the zero value is stored with **ENTER**.

Now you can choose between two menus

100 % LOAD

Load cell is connected and the 100 % value is stored with **ENTER**.

or

the second entry menu (100 %)

NOM VAL

After pressing **ENTER** you can enter the 100 % value

1.502 mV/V

If the entering of the value ended the next is “save?”. Press **ENTER** to complete the entry, the final value will then be stored in the 7280 measuring amplifier.

8. Automatic OFF at Battery / mains Operation

When the 7280 is connected to the interface and there is no measurement, the automatic OFF function is still active.

After a short time OFF is operative.

Only during a measurement, this function is blocked. If there a short pause, the 7280 switches itself OFF.

9. MISC

9.1 Transportation

Note:



Only transport well packed devices



The device shall not be placed loosely in the package



Protect the device from humidity.

9.2 Initiation and setup

Safety measures before installing:

Caution:



The device may not be connected to mains, directly. The supply voltage is 6 V DC with minimum 1.8 A.

Cable connection

Caution:



Never connect voltage levels to the unused pins!

9.3 Normal operation

EMC

Caution:



The device may not be exposed to a higher EMC than determined by the standard!

Cable

Caution:



Never separate the connectors by pulling on the cables; always pull the plug, directly!

Storage

Note:



Only store the device in dry and dust-free rooms.



Take out the batteries during the storage.

9.4 Maintenance and cleaning

Cleaning

Caution:



Before cleaning, separate the device from voltage supply.

Caution:



Clean the housing with a soft and slightly damp cloth. Do not use solvents as they may damage the front panel labeling and the display.



When cleaning, ensure that no liquid enters the device or connections.

Battery change

Caution:



Note the correct polarity of the batteries.

Preventive maintenance and inspection

Note:



Check the plug connections.

Repair

Note:



The device do not contain any parts that need or can be serviced by the user. Repairs may exclusively ba carried out by burster präzisionsmesstechnik gmbh & co kg. If assumed that safe operation of the device is no longer possible, it must be taken out of operation immediately and also be secured against inadvertent operation. Especially if:

- the device is visibly damaged
- the device is no longer functional
- parts of the device are loose
- the connecting lines show visible defects

9.5 Disposal

Battery disposal:



As an end user, you are required by law (battery ordinance) to return all used batteries and rechargeable batteries; the disposal through household waste is prohibited. By buying the herein described device you are concerned by this law. Please dispose of your batteries and rechargeable batteries correctly. Hand them to waste disposal sites either at your premises or at our company or at any place where batteries/rechargeable batteries are sold.

Equipment disposal:



Please fulfill your legal obligations and dispose of unserviceable equipment in accordance with applicable legal requirements. Thus you contribute to environmental protection.

