Sauter GmbH
Ziegelei 1
D-72336 Balingen
E-Mail: info@kern-sohn.com

Tel.: +49-[0]7433- 9933-0
Fax: +49-[0]7433-9933-149
Internet: www.sauter.eu

Instruction Manual
Digital Torquemeter

Importør:
Impex Produkter AS
Gamle Drammensvei 107
1363 Høvik
www.impex.no
info@impex.no
Tel.: 22 32 77 20

SAUTER DA

V. 1.1
11/2017
GB

PROFESSIONAL MEASURING

DA-BA-e-1711

GB

SAUTER DA

V. 1.1 11/2017

Instruction Manual digital Torquemeter

Thank you for buying a digital SAUTER Torquemeter. We hope you are satisfied with your high quality instrument and its big functional range. Although this Torque meter is a complex and advanced instrument, its ruggedness will allow many years of reliable use if you take good care by appropriate operating use and maintenance. Please read the following operating instructions carefully and always keep this manual within easy reach.

If there are any queries, wishes or helpful suggestions, do not hesitate to call our service number.

Summarize:

1 Before use

Upon receiving the unit, please check that no physical damage has occurred to the packaging, plastic case or the instrument itself. If any damage is evident, please contact SAUTER company immediately.

2 Operation Overview

The most commonly used features (such as displaying Torque, peak hold, zero and changing of displayed units) can all be done by pressing a single dedicated key identified on the front panel,-see chapter *Basic Functions*
You can press a menu key to access the tester configuration- see the *Main Menu* section.

3 First use

The DA is supplied with a set of Nickel Metal Hydride 4xAAA rechargeable batteries. For safety reasons during transportation the batteries are shipped discharged and disengaged from the power system. Please connect the battery to the device before turning it on initially. To obtain a maximum battery life, we recommend charging them with the charger/adaptor supplied for at least 14-16 hours, when you first receive the instrument.

3.1 Battery indicator

Battery level > 5.0 V

5.0 V > Battery level > 4.9 V > Battery level > 4.8 V

4.8 V > Battery level > 4.7 V

Battery level < 4.7 V

If battery level is less than 4.6 V, The “battery empty” message will be displayed and the tester will turn off automatically.

Important: Only use the adaptor/charger supplied.

4 Using the DA Torque tester

4.1 Before powering on

Insert the 4 rubberized mounts into any holes that match the bottle or jar size. The item should be inserted fully and lock to the key slot. The rubberized mounts should not turn themselves when the test object is being placed in between them. The rubberized coating will help to provide a better grip when clamping it, e.g. the bottle. Make sure no weight or any force is applied onto the plate at the time of powering on.

4.2 Powering on

As show in Figure 1 the control panel has eight keys.

Figure 1: Operation keys

To power on the tester press the ON/OFF key. A short self test runs through, in which the display will show the capacity in Newton.

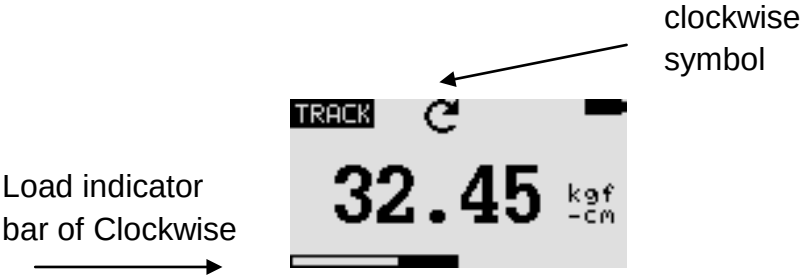
After the self test, providing no load has been applied to the instrument, the display will show all zeroes. This is because the tester re-zeroes itself during the self-test routine.

Do not overload the load sensor. This will cause irreparable damage. Torque greater than 120% of full-scale will produce an audible beep and OL (overload) symbol will blink on the display until the load is released and RESET key is pressed.
To power off the tester, press the ON/OFF key.
All the current settings are saved when the tester is turned off and the tester will operate in the same mode when powered on again.

4.3 Basic functions

Clock-Wise (CW) Torque is displayed on the DA and recognized by the symbol, Counter Clock-Wise (CCW) Torque is displayed on the DA and recognized by the symbol

4.3.1 Display of Clockwise/Counter Clockwise



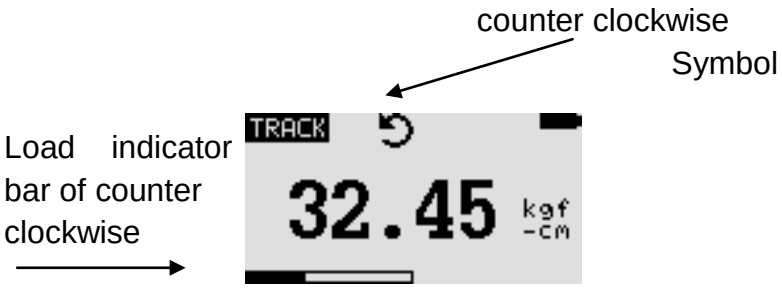


Figure 2 Clockwise and counter clockwise displays

A load indicator bar alerts the operator to show how much load has been applied to the load sensor.
At CW (clockwise) Torque the indicator bar moves from right to left. For CCW (counter-clockwise) Torque the indicator bar moves from left to right.

4.3.2 Zeroing the tester

During the operation of the tester it is often necessary to zero the display, so it does not become part of the measured reading. Press and release the ZERO key.

4.3.3 Changing the unit of measurement

You can choose the following units of measure depending on the capacity of your tester: N-m, kgf-cm, kgf-m, in-lbf, ft-lbf.
To change the display units, press the UNITS key. Each successive key press will select the next available units until the tester returns to its original setting. The DA automatically converts readings as soon as a new unit of measurement is selected.

Note*: All units may not be displayed depending on tester's capacity.*

4.3.4 Changing the mode of measurement

You can choose the following modes of measurement: Track, First Peak-Torque, and Peak-Torque,

To change the display mode, press MODE key. Each successive key pressed will select the next available modes until the tester returns to its original setting.

4.3.5 Track mode

Press MODE key until "Track" appeared on the display. The display will now indicate Torque applied in both directions as they are applied to the load sensor and maintain the live display. See Figure 3a:

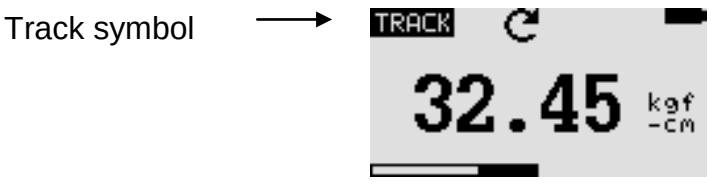


Figure 3a Track

4.3.6 First Peak mode

Press MODE key until" F-Peak" appeared on the display. The display will show the maximum tensile Torque. See Figure 3b:

Peak Torque symbol →

Figure 3b F-Peak Torque

4.3.7 Peak mode

Press MODES key until "Peak" appears on the display. The display will show the maximum compressive Torque. See Figure 3c:

Peak Torque symbol →

Figure 3c Peak Torque

4.3.8 Resetting the tester

Press RESET key to clear both maximum registers and prepare for detecting the next maximum readings.

4.3.9 Backlit Display

When pressing any key or applied Torque to the load sensor greater than 0.5 % of full scale, the backlight will switch on for 60 seconds.

4.3.10 Saved reading to memory

Any reading can be saved anytime by pressing MEM/ENTER key. A total of 500 readings can be stored in the database include the reading unit.

4.3.11 Output signal

The displayed reading may be transmitted to PC by pressing the PRINT key or by sending a request command from PC to the tester. The command can be sent by either RS232 or USB port.

RS-232 Command	Action
"m"	Changing measure mode.
"u"	Changing measure unit.
"z"	Zero the gauge.
"r"	Reset the gauge.

RS232 command	Action
"l"	Send live reading value with unit.
"p"	Send peak tension value with unit.
"c"	Send peak compression value with unit.
"x" or pressing PRINT key	Send live reading value with unit, if current mode is track mode. Send peak tension value with unit, If current mode is peak tension mode. Send peak compression value with unit. If current mode is peak compression mode.
"d"	Send memory
"!"	Send information of gauge (model, capacity, serial number, firmware revision, original offset, current offset, overload count).

4.4 Main Menu

Press MENU/ESC key to access the main menu. To move between the option listed on the main menu page, press UP and DOWN arrow keys to move the cursor. Press ENTER to select the sub-menus, activate feature and enter values. Within sub-menus UP, DOWN, LEFT and RIGHT arrow keys will also change numerical values. Press ESC to return to the main menu page.

MAIN MENU

1) AUTO-OFF

2) PASS-FAIL

3) MEMORY

4) CALIBRATION

5) DIAGNOSTIC

6) ABOUT

Figure 4 Main Menu

1) AUTO-OFF Press the MENU key, the display will show the main menu page and use UP and DOWN to move the cursor point to *AUTO-OFF*. Press the ENTER key. The display will show the Auto-off menu page. Press ESC key to return to the main menu page.
An Auto-off feature can be enabled to conserve battery power where the tester powers off after 5,10 and 15 minutes (depending on Auto-off time) since the last key being pressed. The *AO* will appear in the main display if you activate this feature.

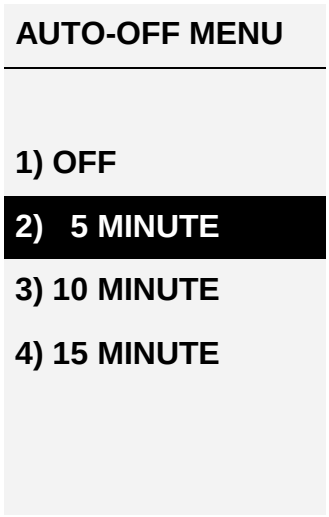


Figure 5 Auto-Off Menu

Use UP and DOWN key to move the cursor. Press the ENTER key to select auto-off option and return to main menu page.
2) PASS-FAIL the Pass-Fail feature is used to set a defined acceptable maximum and minimum Torque gap for measuring. It is activated by setting the lower level and upper level Torque limit. If the Torque value is within the gap level, the display will show message *PASS*. At any reading values outside this gap (higher or lower), the display will show the message *FAIL*. If you activate this feature, the *PF* symbol will be displayed on main display.
To access *PASS-FAIL* menu, Press UP and DOWN to move the cursor point to *PASS-FAIL* and press the ENTER key the display will show the Pass-Fail menu page. Press ESC key to return to the main menu page.

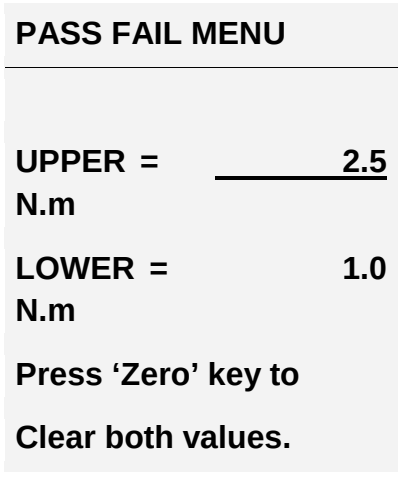


Figure 6 Pass-Fail Menu

Use LEFT ARROW keys to move the cursor point to *the desired value*. Use UP and DOWN keys to change the value, press and hold to scroll values. Use RIGHT ARROW key to change the unit. Press ENTER key to save setting and return to main menu page.

Pass-Fail feature will automatically be disabled if setting LOWER and UPPER = 0 N. LOWER must be less than the UPPER.

Example 1 LOWER LEVEL = 0 N-m, UPPER LEVEL = 20 N

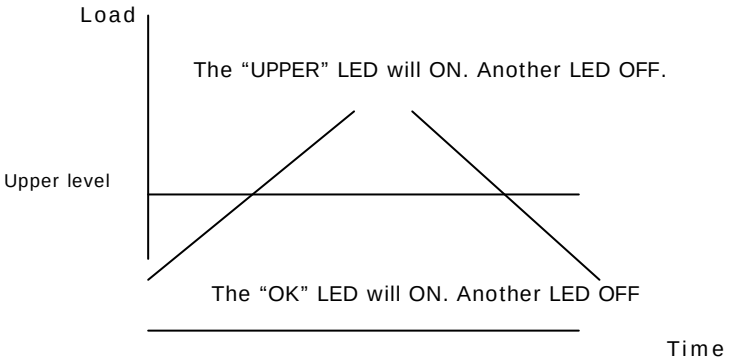


Figure 6b

Example 2 LOWER LEVEL = 20 N-m, UPPER LEVEL = 0 N-m

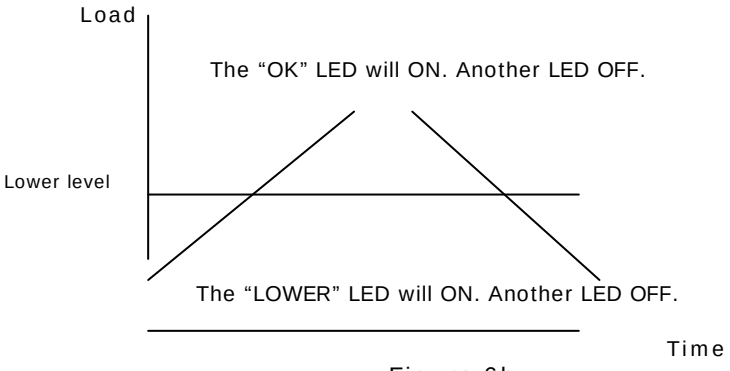


Figure 6b

Example 3 LOWER LEVEL = 10 N-m, UPPER LEVEL = 20 N-m

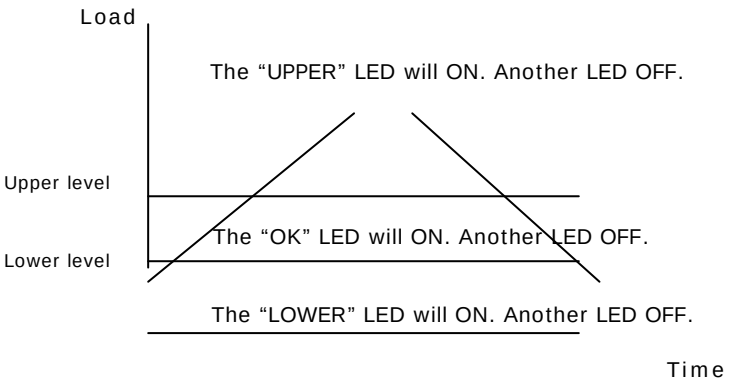


Figure 6c

3) MEMORY This is used to view the saved records, delete current records, delete all records and print data of the saved records.
To access *MEMORY* menu, go to the main menu page press UP and DOWN to move the cursor point to *MEMORY* and press ENTER key the display will show the memory page. Press ESC key to return to main menu page.

Figure 7a Memory Page

Press UP and DOWN to change memory page, press and hold to scroll to change memory page. Press PRINT key to print the memory to the serial port. Press ZERO key to access the *DELETE* menu.

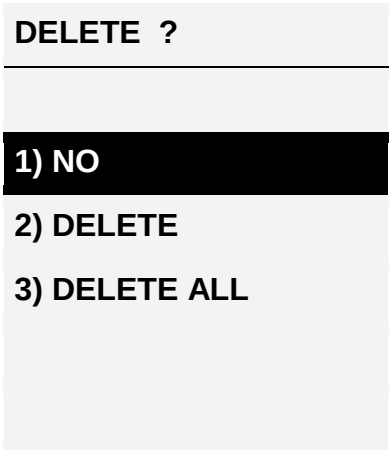


Figure 7b Delete last Menu
Press UP and DOWN to select the delete option. If you selected *NO* and press ENTER key, the tester will return to memory page. If you selected *DELETE* and press ENTER key, the tester will delete the current saved records and return to memory page. If you selected *DELETE ALL* and press ENTER key, the tester will delete all saved records and return to memory page.

4) CALIBRATION This is used by service technicians when calibrating the tester. Contact your SAUTER distributor or SAUTER directly for details.

5) DIAGNOSTIC This is used to check the status of the load cell. If you suspect that your load cell transducer has sustained an overload, it is possible to check the status of the load cell immediately.
Place the tester horizontally on the flat level surface and go to main menu page. Use UP and DOWN key to move the cursor point to *DIAGNOSTIC* and press ENTER key. The display will show Diagnostic menu page. Press ESC to return to main menu page.

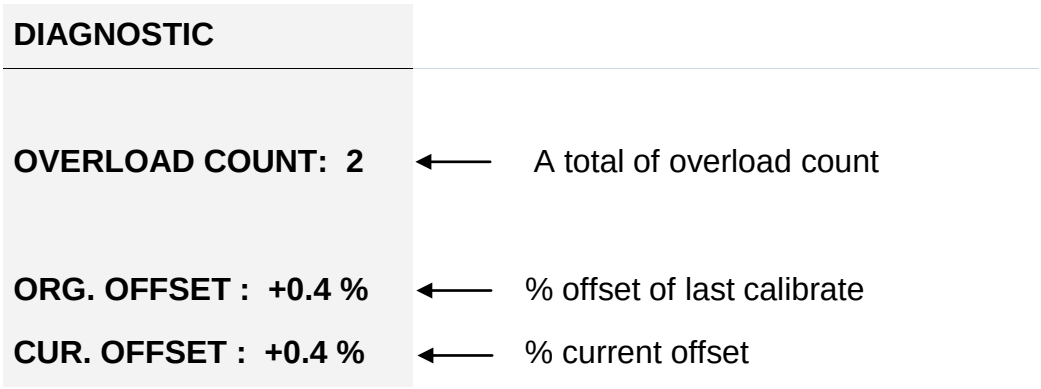


Figure 8 Diagnostic Menu

If the % offset is between 5% - 10 % please contact your supplier to arrange a recalibration of your tester.

If the % offset is bigger than 10%, please contact your supplier to arrange for load cell replacement.
These values are given as an indicator only – the need for calibration/repair may vary according to the individual characteristics of the load cell.
6) ABOUT This shows the information of your tester (Firmware revision, Model, Capacity, Serial number). To access *ABOUT* menu, go to main menu page and press UP and DOWN to move the cursor point to *ABOUT* and press ENTER key. The display will show About menu page. Press ESC key to return to main menu page.

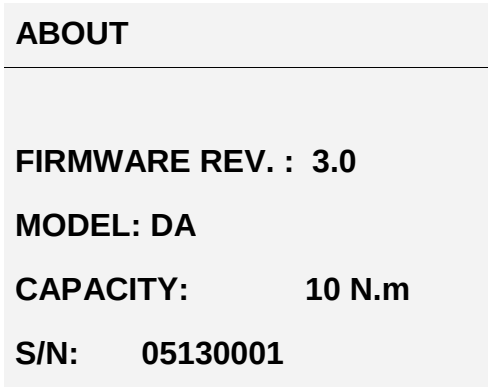


Figure 9 About Menu

4.5 Measurement Practice

For best measurement accuracy keep the Torque/Torque in line with the Torque tester. Alleviate bending loads and torque loads applied to the load cell as they can adversely affect measurement performance.
Always keep the tester below the capacity limit shown on the front of the tester. If the tester is used above this capacity in either Torque or Torque, even for a short time, permanent load cell damage can result. Overload damage is not covered by warranty.

5 Specifications

Capacity and divisions

Model	N-m	kgf-cm	kgf-m	in-lbf	ft-lbf
DA 1-4	1 x 0.0002	10.2 x 0.002	0.1020 X 0.0001	8.850 x 0.002	0.7375 x 0.0002
DA 5-3	5 x 0.001	50.99 x 0.01	0.5099 x 0.1e-3	44.25 x 0.01	3.687 x 0.001
DA10-3	10 x 0.002	102 x 0.02	1.02 x 0.0002	88.50 x 0.02	7.375 x 0.002

Environment:

Operating condition: For indoor use only.
Operating temperature: 60 ºF - 95 ºF (15 ºC - 35 ºC)
Storage temperature: -15 °C to 65 °C.
Humidity: Maximum 70% Relative.

Accuracy

Accuracy(Combined error): ± 0.5 % of full-scale.
Creep: ± 0.02 % of full-scale.
Non-Linearity: ± 0.02 % of full-scale.
Temperature shift at zero load: ± 0.02 % of full-scale/ºC.

Dimension & Weight

Size: 160 x 250 x 100 cm.
Weight: 2.6 kg.

Mechanical Rating

Maximum torque: 120% of rated capacity stated.
Maximum mounting torque: 150% of rated capacity.

Electrical:

Charger rating: 500mA 9 Volts DC.
Charging time: 12-14 hours for full charge.
ADC Sampling Rate: 1,000 Hz
Peak Capture Rate: 0.10 S.
Output: USB 8 data bits, 1 Start bit,
1 Stop bit, no parity
Baud rate: 9600

Communication Port:	Both RS232 & USB are ready. No selection on the menu required.
Display:	128x64 pixel dot matrix display.
Unit of measurement:	N.m, kgf.cm, kgf.m, in.lbs, ft.lbs
Mode of measurement:	Track, Peak, First-Peak.
Minimum torque:	Readable at min 5% of F.S
Auto Reset Range:	Adjustable 2 to 100% of F.S
Pass-Fail Range:	Adjustable 2 to 100% of F.S

6 Conversion Factor

Unit	N-m	kgf-cm	kgf-m	in-lbf	ft-lbf
N-m	1	10.197	0.10197	8.8507	0.73756
kgf-cm	0.0980665	1	0.01	0.86796	0.07233
kgf-m	9.80665	100	1	86.796	7.233
in-lbf	0.11298	1.152	0.01152	1	0.08333
ft-lbf	1.3558	13.8255	0.138255	12	1

Annotation:
To have a look at the CE Declaration of Conformity, please click onto the following link: https://www.kern-sohn.com/shop/de/DOWNLOADS/