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DTS Series User's Manual

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Introduction

Thank you for choosing the Nextech DTS series instrument. With correct use and regular re-calibration it will give many years of accurate and reliable service.

The DTS can measure Torque both in Clock-Wise (CW) and Counter Clock-Wise (CCW) accurately, while being simple to use by the operator.

Nextech offers software and accessories to make your Torque tester even more versatile. Ask your Nextech distributor for additional information or visit our website at www.Torquetorque.com

Before Use

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

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 font panel-see the *Basic Functions* section.

You can press a menu key to access the tester configuration- see the *Main Menu* section.

Powering the first time

The DTS is supplied with a set of Nickel Metal Hydride 4xAAA rechargeable batteries. For safety reasons during transportation the batteries are shipped discharged. To obtain maximum battery life we recommend that you charge them with the charger/adaptor supplied for at least 14-16 hours when you first receive the instrument.

Battery Indicator

Battery level > 5.0 V

5.0 V > Battery level > 4.9 V


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 power down automatically.

Important: Only use the adaptor/charger supplied.

Using the DTS

Fitting Accessories

If a power torque tools are used, the rundown adapter provided can be inserted to the torque transducer head. For wrench and torque screwdriver, you may need a matching adapter.

Powering up

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

Figure 1 DTS control panel

To power up the tester press the ON/OFF key. A short self-test runs during 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 symbol will blink on the display until load is release and RESET key is pressed.

To power down the tester press the ON/OFF key.

**All the current settings are saved when the tester is turned off and the tester will function in the same mode when powered up again.*

Basic Functions

Clock-Wise (CW) Torque are displayed on the DTS and recognized by the symbol . Counter Clock-Wise Torque are displayed on the DTS and recognized by the symbol

Display of Clockwise/Anti-Clockwise

Figure 2 Clockwise and Anti-Clockwise displays

A load indicator bar alerts the operator to how much load has been applied to the load sensor.

CW Torque the indicator bar is move from right to left. For CCW Torque the indicator bar is move from left to right.

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.

Changing the unit of measure You can choose from the following units of measure depending on the capacity of your tester: mN.m, N.m, gmf.cm, kgf.cm, Oz.in or lbf.in.

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 DTS automatically converts readings as new unit of measure are selected.

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

Changing the mode of measure You can choose from the following modes of measure: Track, First Peak-Torque, and Peak-Torque,

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

Track mode Press MODE key until the "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

Track symbol

Figure 3a Track

First Peak mode Press MODE key until the" 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

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

Peak Torque symbol

Figure 3c Peak Torque

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

Backlit Display When you press any key or applied Torque to load sensor greater than 0.5 % of full scale the backlight will go on for 60 seconds.

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

Computer Control of Torque Tester A computer can control the Torque tester by sending either RS232, or USB commands.

Command	Action
"m"	Changing measure mode.
"u"	Changing measure unit.
"z"	Zero the tester.
"r"	Reset the tester.

Output signal The displayed reading may be transmitted to PC by pressing the PRINT key or sending request command from PC to the tester. The communication port are either RS232, or USB port.

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

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.

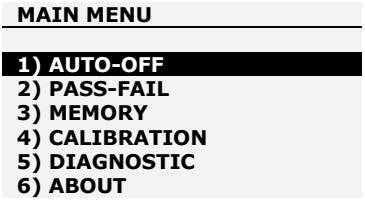


Figure 4 Main Menu

1) AUTO-OFF Press the MENU key, the display will show 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 down after 5,10 and 15 minutes (depend on Auto-off time) since the last key press. The *AO* will appear in the main display if you activate this feature.

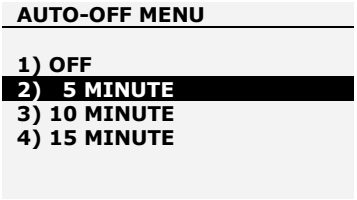


Figure 5 Auto-Off Menu

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 used to set a defined acceptable maximum and minimum Torque gap for measuring. It activate 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*. Any reading values outside this gap (higher or lower), the display will show message *FAIL*. If you activate this feature the *PF* symbol will display 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 the main menu page.

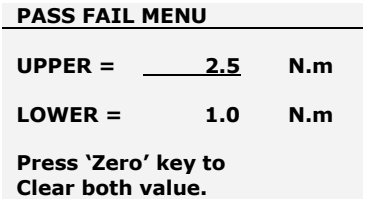


Figure 6 Pass-Fail Menu

Use LEFT ARROW keys to move 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 to save setting and return to main menu page.

**Pass-Fail feature will automatically disabled if you set LOWER and UPPER = 0 N.*

**LOWER must be less than the UPPER.*

example LOWER LEVEL = 0 N.m, UPPER LEVEL = 20 N.m

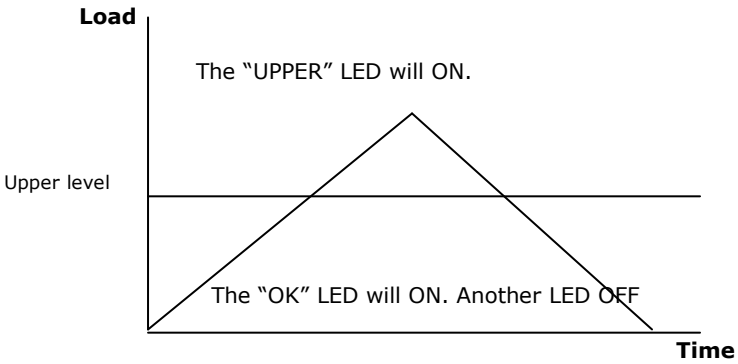


Figure 6a

example LOWER LEVEL = 20 N.m, UPPER LEVEL = 0 N**.**m

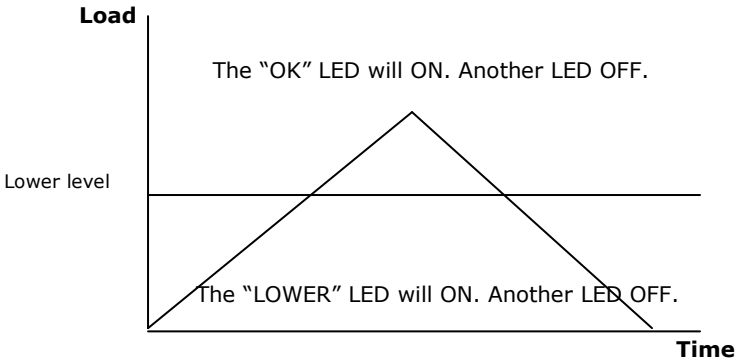
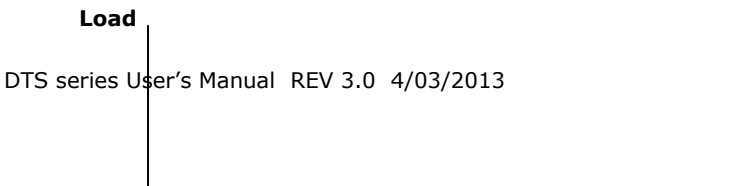


Figure 6b

example LOWER LEVEL = 10 N.m, UPPER LEVEL = 20 N.m



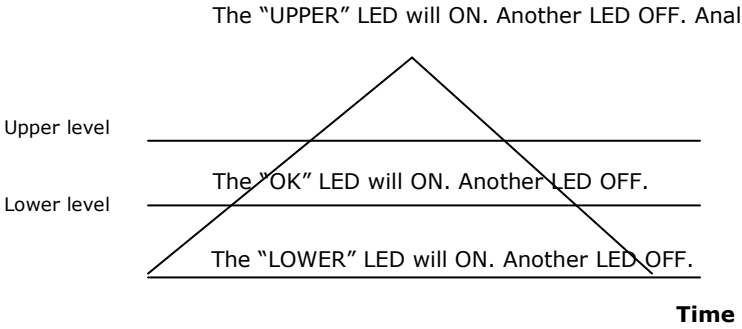


Figure 6c

3) MEMORY This use to view the saved record, delete current record, delete all record and print data of the saved record.

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 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 current saved record and return to memory page. If you selected *DELETE ALL* and press ENTER key the tester will delete all saved record and return to memory page.

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

5) DIAGNOSTIC This is used to check 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.

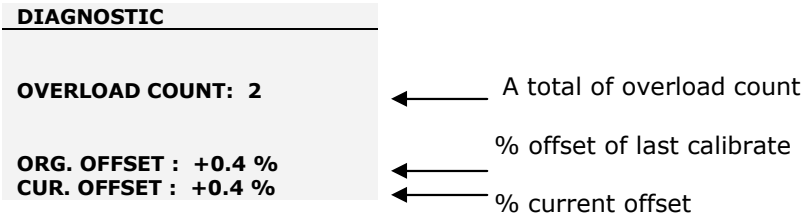


Figure 8 Diagnostic Menu

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

If the % offset is greater 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.

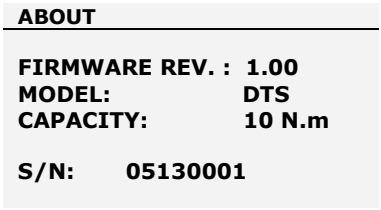


Figure 9 About Menu

WARNING !

1) Overloading the transducer does not only damage the transducer but may break the transducer head and could result in injury!

2) The transducer must be fastening properly by 4 bolts and nut to the work surface, either horizontally or vertically. Failing to do so may result in damage to the transducer and could result in injury to the operator.

3) Ensure that torque wrench's driver has engaged the transducer socket properly when operating. The transducer head may be damaged if not engaged properly and could result in injury to the operator.

4) Please make sure that you have safety gear and safety measure when applying torque to the transducer and when calibrating the transducer.

5) Do not use charger other than supplied with unit or recommended for replacement. Using a wrong charger may result in overload and explosion or Ni-MH rechargeable battery inside the monitor.

DTS Specifications

Capacity and Divisions

Model	N-m	kgf-cm	kgf-m	in-lbf	ft-lbf
DTS 0.5	0.5 x 0.0001	5.099 x 0.001	0.0509 X 0.0001	4.425 x 0.001	0.3687 x 0.0001
DTS 1	1 x 0.0002	10.2 x 0.002	0.1020 X 0.0001	8.850 x 0.002	0.7375 x 0.0002
DTS 5	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
DTS 10	10 x 0.002	102 x 0.02	1.02 x 0.0002	88.50 x 0.02	7.375 x 0.002
DTS 20	20 x 0.002	204 x 0.05	2.04 x 0.0005	177.0 x 0.05	14.75 x 0.005

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:	100x200x50 cm.
Weight:	1.8 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:	14-16 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: 38400
Communitcation 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

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

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