NEXTECH

DTS Series User's Manual

REV 4.1

Table of Contents

Table of Contents 2
Introduction 3
- Before Use 3
- Operation Overview 3

Powering the DTS 4
Using the DTS 4
- Fitting Accessories 4
- Powering up 5
- Basic Functions 6
- Main Menu 9
  1. AUTO-OFF 10
  2. PASS-FAIL 10
  3. MEMORY 13
  4. CALIBRATION 14
  5. DIAGNOSTIC 14
  6. ABOUT 15

DTS Specifications 16
Conversion Factor 18
Warning 19

Introduction

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

The DTS, being simple to operate, can measure Torque both Clockwise (CW) and Counterclockwise (CCW) accurately.

Nextech offers software and accessories to make your torque tester even more versatile. Visit our website www.forcetorque.com or contact your Nextech Distributor for more information.

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.

Please read the entire manual carefully before using the Nextech Torque tester. Make certain that any person using or having access to the torque tester reads and understands the entire manual beforehand.

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 Function 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 4 Nickel Metal Hydride AAA rechargeable batteries. For safety reasons, the batteries are discharged during transportation.

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. When subsequent recharges are necessary, it is recommended that the DTS is charged for 8 hours.

Battery Indicator

Battery level > 5.0V

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 shown 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, provided that no load has been applied to the instrument, the display will show all zeros. 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 and audible beep and OL symbol will blink on the display until load is released 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

Clockwise (CW) Torque is displayed on the DTS and recognized by the symbol

Counter-clockwise (CCW) Torque is displayed on the DTS and recognized by the symbol

Display of Clockwise/Counter-Clockwise

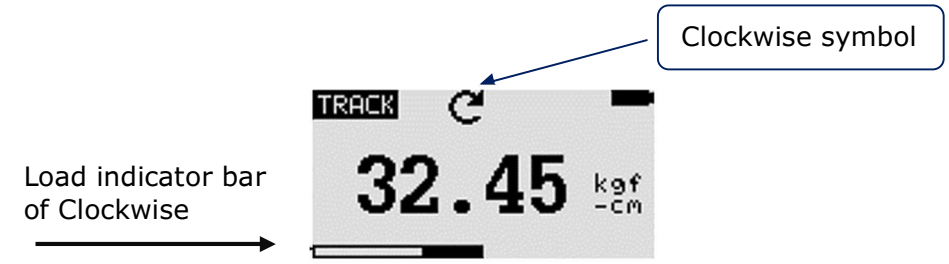

Figure 2a Clockwise display

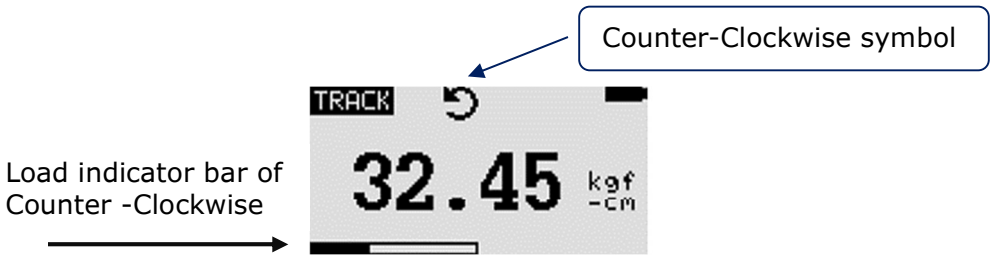

Figure 2b Counter-Clockwise display

The “Load Indicator Bar” alerts the operator of how much load has been applied to the load sensor.

- CW Torque, the indicator bar moves from right to left.
- CCW Torque, the indicator bar moves 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: N-m, kgf-cm, kgf-m, in-lbf or 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 DTS automatically converts readings as new unit of measure is 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 the MODE key until the TRACK appears 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.

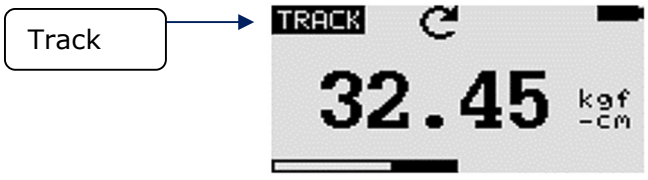

Figure 3a Track

First Peak mode

Press the MODE key until the F-PEAK appears on the display. The display will show the maximum tensile Torque. See Figure 3b

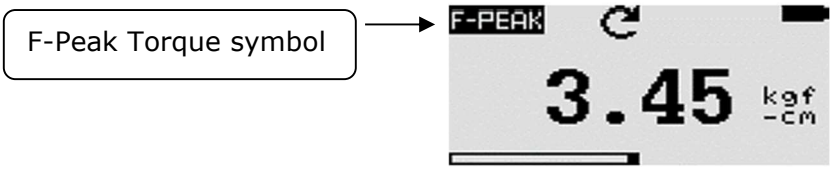

Figure 3b F-Peak Torque

Peak mode

Press the MODE key until the PEAK appears on the display. The display will show the maximum compressive Torque. See Figure 3c

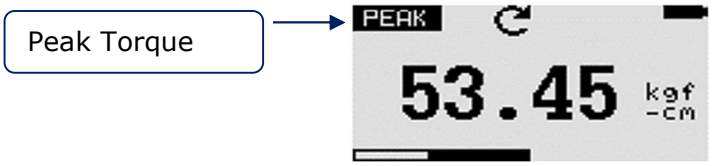

Figure 3c Peak Torque

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

Backlit Display When you press any key or apply Torque to the load sensor greater than 0.5% of full scale, the backlight will be active for 60 seconds.

Saving readings to memory Any reading can be saved any time by pressing the MEM/ENTER key. A total of 500 readings can be stored in the database including the reading unit.

Output signals The displayed reading may be transmitted to a PC by pressing the PRINT key or sending a request command from PC to the tester. The command can be through R232 or USB Port.

Command	Action
pressing PRINT key	Send live reading value from unit if current mode is track mode. Send F-peak Torque value from unit if current mode is F-peak Torque mode. Send F-peak value from unit if current mode is F-peak mode.
UPLOAD ALL	Send all memory

Main Menu

Press MENU/ESC key to access the main menu. To move between the options listed on the main menu page, press UP and DOWN arrow keys to move the cursor. Press ENTER to select the sub-menus, activate features, 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.

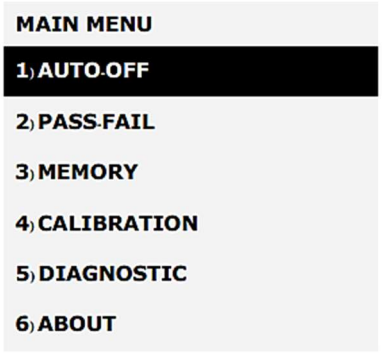

Figure 4 Main Menu

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 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.

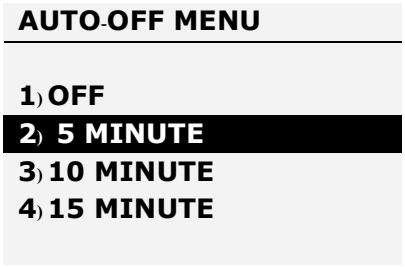

Figure 5 AUTO-OFF Menu

Use UP and DOWN key to move the cursor. Press the ENTER key to select auto-off option and return to the Main menu page.

2. **PASS–FAIL** The Pass-Fail feature used to set a defined acceptable maximum and minimum Torque gap for measuring. It activates by setting the lower level and per 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 to the main menu page.

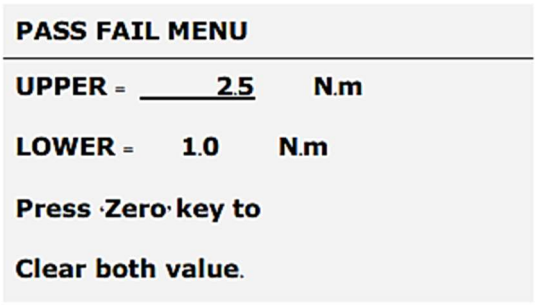

Figure 6 PASS-FAIL menu

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 the RIGHT Arrow key to change the unit. Press ENTER to save setting and return to main menu page.

* Pass-Fail feature will automatically disable if you set LOWER and UPPER = 0N.m
* LOWER must be less than the UPPER

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

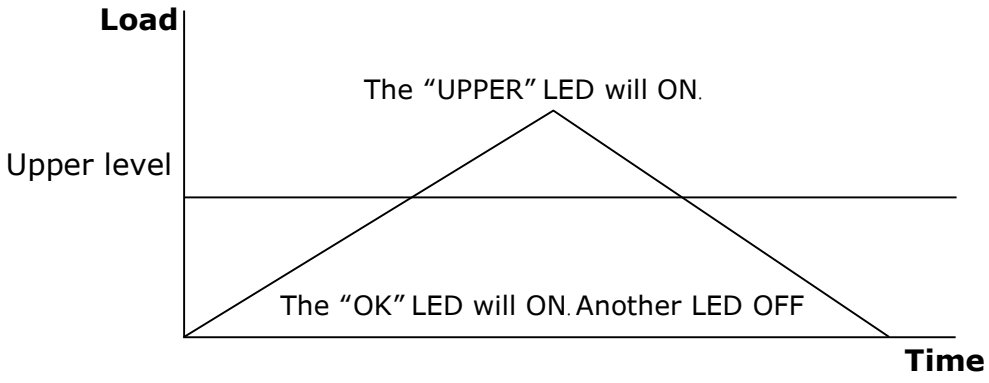

Figure 6a

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

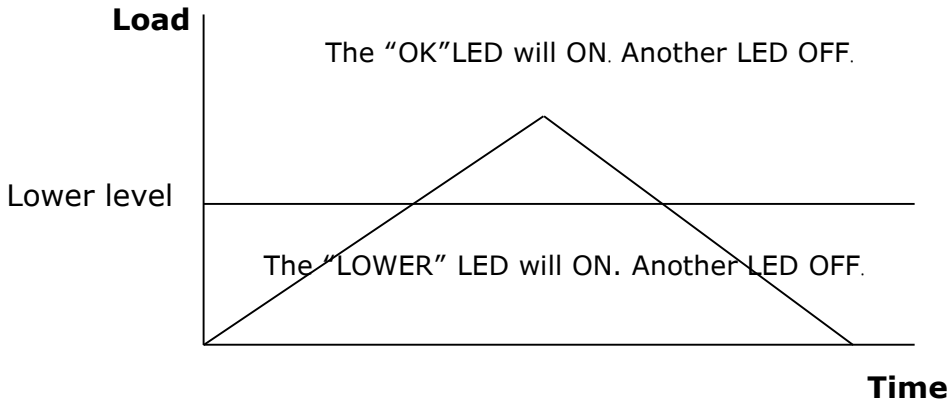

Figure 6b

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

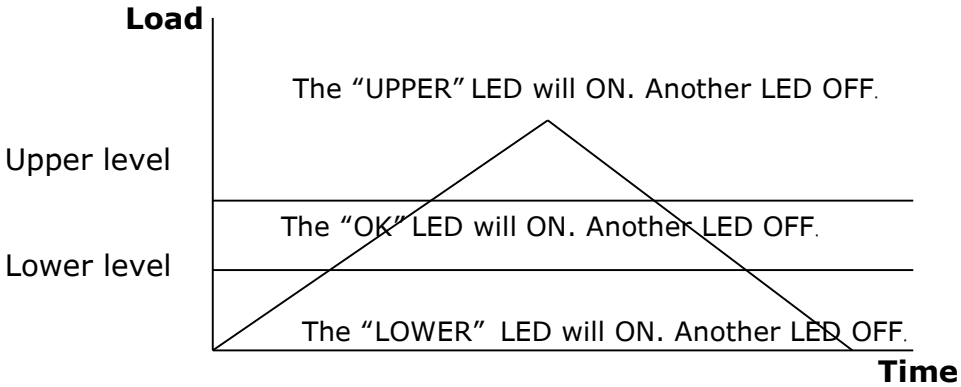

Figure 6c

3. MEMORY This function is used to view the saved record, delete current record, delete all record and print data of the saved record.

To access the MEMORY menu, go to the main menu page, press UP and DOWN to move the cursor point to the MEMORY and press ENTER key. The display will show the memory page. Press ESC key to return to the main menu page.

Notice the number of records saved at the top right corner. (This is record 3 of the total 3 records saved)

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.

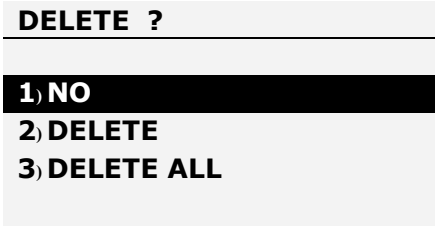

Figure 7b Memory Delete Menu

Press UP and DOWN to select the delete option,

If you select NO and press ENTER key, the tester will return to memory page.

If you select DELETE and press ENTER key, the tester will delete current saved record and return to memory page.

If you select 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 the status of the load cell. If you suspect that the 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.

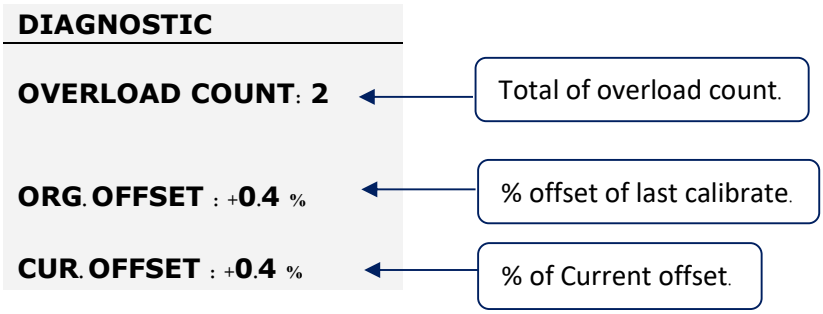

Figure 8 Diagnostic Menu

- If the % offset is between 5% - 10%, please contact your supplier to arrange a recalibration of the 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 the main menu page.

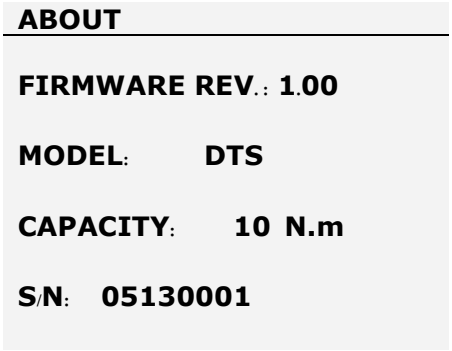

Figure 9 About Menu

DTS Specifications

Capacity and Divisions

Model	N-mm	N-cm	N-m	Kgf-cm	Kgf-m	In-lbf	Ft-lbf
DTS 0.5	500.0 x 0.1	50.00 x 0.01	0.5000 x 0.0001	5.098 x 0.001	0.0509 x 0.0001	4.425 x 0.001	0.3688 x 0.0001
DTS 1	1000.0 x 0.2	100.00 x 0.02	1.0000 x 0.0002	10.196 x 0.002	0.1019 x 0.0001	8.852 x 0.002	0.7374 x 0.0002
DTS 5	5000 x 1	500.0 x 0.1	5.000 x 0.001	50.98 x 0.01	0.5098 x 0.0001	44.25 x 0.01	3.688 x 0.001
DTS 10	10000 x 2	1000.0 x 0.2	10.000 x 0.002	101.96 x 0.02	1.0196 x 0.0002	88.52 x 0.02	7.374 x 0.002
DTS 20	20000 x 5	2000.0 x 0.5	20.000 x 0.005	203.90 x 0.05	2.0390 x 0.0005	177.00 x 0.05	14.750 x 0.005
DTS 50	-	5000 x 1	50.00 x 0.01	509.8 x 0.1	5.098 x 0.001	442.5 x 0.1	36.88 x 0.01
DTS 100	-	10000 x 2	100.00 x 0.02	1019.6 x 0.2	10.196 x 0.002	885.2 x 0.2	73.74 x 0.02
DTS 200	-	20000 x 5	200.00 x 0.05	2039.0 x 0.5	20.390 x 0.005	1770.0 x 0.5	147.50 x 0.02
DTS 500	-	-	500.0 x 0.1	5098 x 1	50.98 x 0.01	4426 x 1	368.7 x 0.1

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:	100 x 200 x 50 mm.
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
Screen Refresh Rate:	0.10 S
Output:	USB 8 data bits, 1 Start bit, 1 Stop bit, no parity, Baud rate: 38400
Communication Port:	Both R232 & USB are ready. No selection on the menu required
Display:	128 x 64 pixel dot matrix display
Unit of measurement:	N-mm, N-cm, N-m, kgf-cm, kgf-m, in-lbf, ft-lbf,
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	0.098066	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

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 fastened properly by 4 bolts and nuts 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 measures 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 the wrong charger may result in overload and explosion of NiMH rechargeable battery inside the monitor.**

NEXTECH

For support & services, contact us at **info@nextechglobal.co.th**

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