



# TORQUE DATA MANAGEMENT SYSTEM (TDMS) FOR USE WITH TDMS SOFTWARE (VERSION 4.0.X)



Part Number 34342 | Issue 11 | Original Instructions (English)

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# T-BOX SOFTWARE COMPATIBILITY

	Instrument	TDMS Software 37748 Versi			
Instrument Software Versions		3.3.X	4.0.X		
T-Box	< 1.0.2.24	Not compatible	Not compatible		
Model # 43236	1.0.2.24	OK (limited)	Not compatible		
	< 2.2.0.X	Not compatible	Not compatible		
T-Box XL™ Model # 43258	2.2.0.X	OK	Not compatible		
	3.0.0.X	Not compatible	OK		

Ensure T-Box / T-Box XL<sup>™</sup> & TDMS are compatible as shown in table below.

## INTRODUCTION

The Torque Data Management System (TDMS) is PC software designed to complement the T-Box XL<sup>™</sup> Torque measuring instrument. The user friendly interface will enable certificate generation and data archiving for all types of torque tools.

Torque, Torque and Angle or Torque and Speed graphs captured on the T-Box XL<sup>™</sup> can be sent to TDMS to be viewed, stored and printed.

Data can be exported to Microsoft<sup>®</sup> Excel<sup>®</sup> and/or any other equivalent packages via the Clipboard.

Part numbers covered by this manual: 37748 Torque Data Management Software (TDMS) available on part number 61132 (USB Flash Drive supplied with T-Box XL<sup>™</sup>).

## FEATURES AND FUNCTIONS

- USB connection to Norbar T-Box XL<sup>™</sup> instrument for fast data transfer.
- Data transfer between TDMS and T-Box XL<sup>™</sup> via a USB stick.
- Norbar standard Tool Templates for N·m, lbf·ft, lbf·in & kgf·cm are supplied pre-loaded.
- Generate calibration certificates from other Norbar instruments (e.g. TTT, TST & Pro-Test) via RS232.
- Database for archiving of data for calibration (and Use) of Torque Tools.
- Statistical Process Control (SPC) output (including standard deviation, Cp & Cpk) with histogram of results.
- Set up individual (or multiple) T-Box XL<sup>™</sup>'s with Tools, Tool Templates, Targets and Non-Smart Transducers via the synchronisation options or USB stick.
- Multilingual Calibration Certificate (English / Finnish / French / German / Hungarian / Italian / Norwegian Polish / Russian / Spanish).
- Calibration certificate templates to ISO6789-2:2017.
- Declaration of conformance templates to ISO6789-1:2017.
- Uncertainty data management system for ISO6789-2:2017 tools.
- Calibration certificate templates for PneuTorque<sup>®</sup>, etc.
- Ability to add a Setting (i.e. p.s.i.) and setting values against Torque calibration results on a Calibration Certificate.
- Torque vs Air pressure graphs can also be saved, viewed and printed.
- Compatible with Windows<sup>®</sup> XP, 7, 8.1 & 10

## UPGRADING TDMS FROM AN OLDER VERSION

If an older version of TDMS is installed and you want to transfer your old database to the new version, follow the procedure below. If this is the first time TDMS has been installed, skip to the INSTALLING TDMS section (page 5).

- 1. Open your existing TDMS program.
  - Note: Make sure you have generated all the certificates you need from any existing calibration data.

Select Database menu then select Backup. Enter backup file name and click Save.



2. Uninstall the old version of TDMS.

On your computer go to Control Panel – Programs and Features – Select Norbar TDMS version X.X – Click 'Uninstall' (or 'Remove') and then click 'Yes' to confirm you want to un-install TDMS.

- 3. Install the new version of TDMS Follow section INSTALLING TDMS (page 5) for detailed instructions
- 4. Open the new version of TDMS.
- 5. Select **Database** menu then select **Restore**.

Browse to previously backup up database file, select it then press **Open** Press **Yes** in the next message box.

Wait for 'The database has been restored' message to appear, press OK

Note: If Automatic Synchronization is turned on (ticked) in the Options menu, turn it off (un-ticked)

#### 6. Select Database menu then select Reload Standard Templates

Press Yes in the next message box.

When the 'Keep uncertainty data' message appears, press No

7. Check the T-Box XL<sup>™</sup> software version is **3.0.0.X** (where **X** is a number)

To check the T-Box XL<sup>™</sup> software version, press the '**Date/Time**' button in the top left corner of the measure screen. The software version will be displayed as '**T-Box XL Version X.X.X.X**'

If the T-Box XL<sup>™</sup> needs updating, connect it to your computer with a USB cable. When TDMS has confirmed it is connected, use the update T-Box XL function.

Follow section DATABASE / UPDATE APPLICATION (page 81) for detailed instructions.

- With the T-Box XL<sup>™</sup> connected to your computer with a USB cable, check TDMS has confirmed it is connected, select **Options** menu then select **Send Updates Now**. Press **Yes** in the next message box.
- 9. TDMS upgrade is now complete

Note: Automatic Synchronization can now be turned on again, if required.

## **INSTALLING TDMS**

- 1. Plug Norbar USB Flash Drive into PC.
- 2. Go to START MY COMPUTER and click **Removable Disk (?)**.

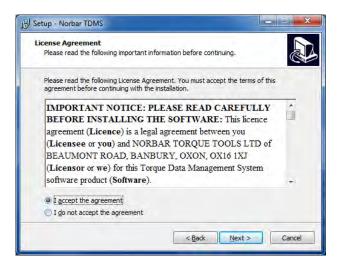


NOTE: You may need administrative privileges to be able to install the software.

- 3. Open SetupNorbarTDMS.4.0.X (where X represents the latest software revision number).
- 4. The instructions are based on a Windows<sup>®</sup> 7 installation, with notes for other platforms.
- NOTE: If during installation an "Unknown Publisher" message is shown, select "Run".

	Welcome to the Norbar TDMS Setup Wizard
~	This will install Norbar TDMS version 2.2 on your computer.
	It is recommended that you close all other applications before continuing.
5	Click Next to continue, or Cancel to exit Setup.
	Next > Cancel

The welcome screen is shown. Click Next.

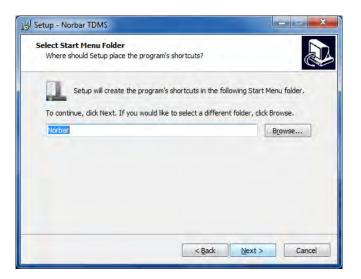


The license agreement is shown. Read and click I accept the agreement to proceed. Click Next.

etup - Norbar TDMS	
Select Destination Location Where should Norbar TDMS be installed?	
Setup will install Norbar TDMS into the fo	llowing folder.
To continue, dick Next. If you would like to select	
as programmiles you bar (rome	Browse
At least 30.5 MB of free disk space is required.	

NOTE: For 64 bit versions the destination location will be C:\Program Files (x86)\Norbar\TDMS.

The destination location is shown. Change location if required. Click Next.



The start menu folder is shown. Change the folder name if required and click Next.

Setup - Norbar TDMS	
Ready to Install	
Setup is now ready to begin installing No	rbar TDMS on your computer.
Click Install to continue with the installati change any settings,	ion, or dick Back if you want to review or
Destination location: C:\Program Files\Norbar\TDMS	*
Start Menu folder:	
Norbar	
4	
	< <u>Back</u> Install Cancel

NOTE: For 64 bit versions the destination location will be C:\Program Files (x86)\Norbar\TDMS.

The ready to install screen is shown. Click Install.



If Windows Mobile Device Centre is not installed the above message will be shown. Click No.

5. The following "ActiveSync" is only required for Windows® XP



If a newer version of ActiveSync is required the above message will be shown. Click OK.

ficrosoft ActiveSync 4.5 Velcome to Microsoft ActiveSync 4.5 Setup fick Next to install Microsoft ActiveSync 4.5 on your computer.	Microsoft ActiveSync 4.5	_		
	Microsoft ActiveSync 4.5			
lick Next to install Microsoft ActiveSync 4.5 on your computer.	Velcome to Microsoft ActiveSync 4.5 Setu	IP .		
	lick Next to install Microsoft ActiveSync 4	.5 on your comp	outer.	
< Back Next > Cancel		Hud	(	Cancel

The ActiveSync Welcome screen is shown. Click Next.



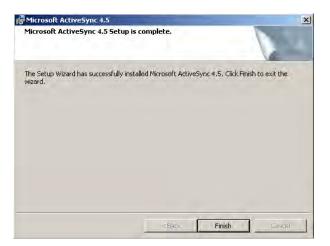
The ActiveSync License Agreement screen is shown. Read then click I accept the terms in the license agreement. Click Next.

Microsoft ActiveSync 4.5 Customer Information	_	
Please enter your information.		
User Name:		
Darren Guliver		
Organization:		
Norbar Torque Tools		

The ActiveSync Customer Information screen is shown. Enter User Name and Organisation. Click Next.

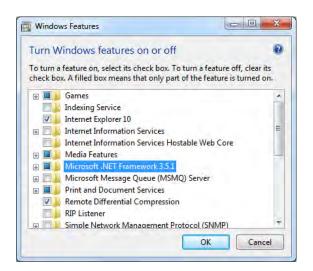
Ready to Install the Program The wizard is ready to begin installation. Setup is ready to begin installing Microsoft ActiveSync 4.5	Microsoft ActiveSync 4.5			
Setup is ready to begin installing Microsoft ActiveSync 4.5				
				1
	Setup is ready to begin installing Microsoft	ActiveSync 4.5	5	
< Back Install Cancel			1	1 6

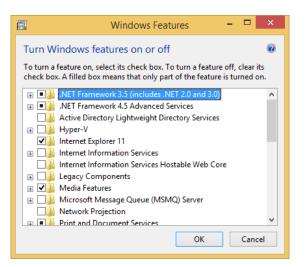
The ActiveSync Ready to Install the Program screen is shown. Click Install.



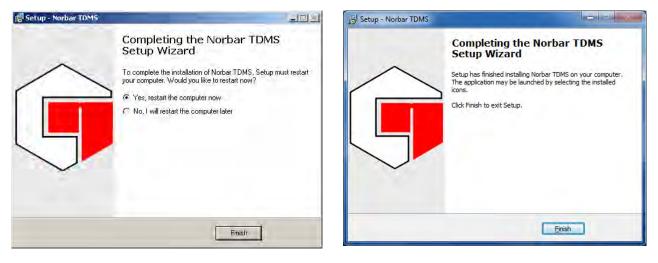
The ActiveSync setup is complete. Click Finish.

Windows<sup>®</sup> 7, 8.1 & 10 computers require ".NET Framework". If required select *control panel* then *programs and features* to ensure ".NET FRAMEWORK" is ON.





To adjust select *Turn Windows features on or off.* Internet access may be required for the computer to obtain the latest software updates.



6. For Windows<sup>®</sup> XP click 'restart the computer now'. Click **Finish**.

NOTE: This screen may be different if you are just installing TDMS and not Active Sync.

- 7. After Installation a TDMS icon will be placed on the desktop.
- 8. TDMS installation is complete.

## CONNECTING A T-BOX XL<sup>™</sup> TO TDMS

1. Select desktop icon to start TDMS.



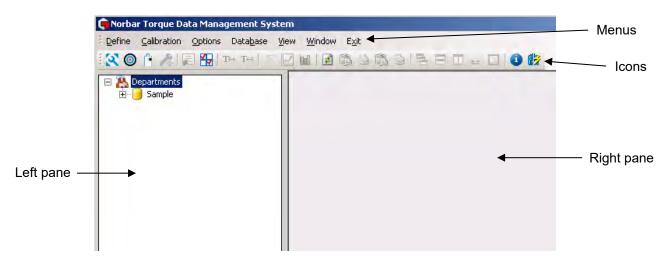
The Initialising TDMS message box will be shown.

Wait until initialization has finished.

Note: Initialization is quicker after the first time TDMS is opened.



Norbar TDMS screen is shown: Screen shown on power up with Sample Department and Tools added.



Menus give access to the software features.

Icons allow quick selection of the main features.

The left pane is used to organise the tools & results in a structure.

The first level of the structure is "Departments"; so tools can be allocated to different departments within an organisation. The first level name can be changed, for example to "Customers" so tools can be allocated to each customer.

The second level of the structure is 'tools', these are listed in numerical order.

The third level of the structure contains the details on each tool; these can include Work ID, calibration data, certificates, graph data, etc.

The right pane is used to show results.

TDMS comes with a Sample department, Sample Tool & Sample Tool Template already created. These are for information only and should be deleted when not required. Norbar standard Tool Templates for N·m, lbf·ft, lbf·in & kgf·cm are also pre-loaded.

TIP: Delete or rename the Sample department if it is not required.

2. Plug USB host cable (part no 39483 supplied with T-Box XL<sup>™</sup>) between USB Type B connector on the back of the T-Box XL<sup>™</sup> and the USB Type A connector on a PC



Before T-Box XL<sup>™</sup> is connected, the bottom left of the TDMS window will show:

- 3. Switch on T-Box XL<sup>™</sup>. Refer to T-Box XL<sup>™</sup> operators manual. It is recommended to use the T-Box XL<sup>™</sup> on mains power.
- 4. Wait until T-Box XL<sup>™</sup> is displaying the Measure screen.
- 5. Wait for the connection message to appear on the T-Box XL<sup>™</sup> display.
- 6. When TDMS connects to a T-Box XL<sup>™</sup>, the bottom left of the TDMS window will show:



When successfully connected, the following will be shown.


# NOTE: No calibration data, graphs, tests will be shown if none have been performed on the T-Box XL<sup>™</sup> connected.

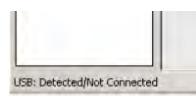
When you connect and synchronise T-Box XL<sup>™</sup> for the 1<sup>st</sup> time, TDMS creates an 'unknown' department. Rename as required.



The following message will be displayed when connection is established and data is being transferred.



If T-Box XL<sup>™</sup> cannot connect, you will see the following:



Disconnect the USB cable, wait 10 seconds and then re-connect.

NOTE: If T-Box XL<sup>™</sup> is connected to a PC <u>before</u> TDMS is opened the Windows mobile screen may be shown (see example). Please ignore this screen. When TDMS is opened the Windows mobile screen will disappear.



# CONNECTING OTHER NORBAR TORQUE MEASURING INSTRUMENTS TO TDMS

Norbar instruments such as TTT, TST, & Pro-Test can be connected to TDMS with an RS232 interface cable (part no 39264). The TruCheck<sup>™</sup> Plus must use RS232 interface cable (part no 39297). These cables are included with the Instruments when purchased new from Norbar.

Instruments manufactured before 2005 that were not supplied with a serial data lead will require a 'Serial Data Lead Kit' Part number 60248.

## DISCONNECTING A T-BOX XL<sup>™</sup> FROM TDMS

- 1. If available, select 'Safely Remove Hardware' in the bottom right hand corner of your desktop
- 2. Disconnect USB lead from either the T-Box XL<sup>™</sup> or PC. TDMS will display 'USB: Not Present'.

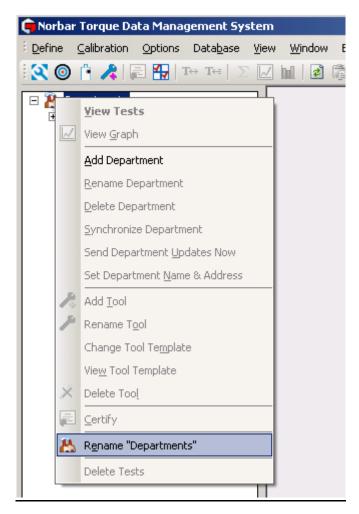
NOTE: Wait at least 10 seconds before re-inserting the lead if required.

# DEPARTMENTS (CUSTOMERS)

#### **Rename Departments**

Departments represents the name of the structure that holds the tools being processed; the name 'departments' represents the areas of use within a single factory.

For a Calibration laboratory environment the 'departments' name could be changed to 'customers'; other names will suit different applications.



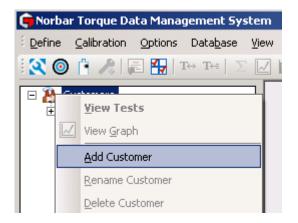
- 1. Right click **Departments** icon to show the drop down menu.
- 2. Select Rename Departments.

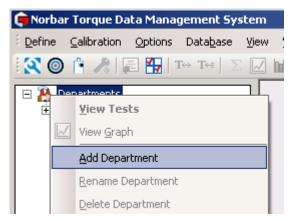
💼 Rename "D	epartments"	×
	Customer Customer&	
	OK Cancel	

3. Enter required text and click **OK**.

## Add Department (Customer)

- 1. Right click **Departments (Customers)** icon to show the drop down menu.
- 2. Select Add Department (Add Customer) from the drop down menu.





3. Enter required Department (Customer) name or identification and press enter.

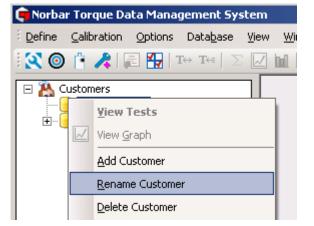


📻 Norba	r Torque Da	ata Mana	gement Sy	stem
Define	Calibration	Options	Database	View
80	1 1 1		Des Tee	
	ustomers Engineerin	g		
	New Custo	omer		

## Rename Department (Rename Customer)

- 1. Right click on the **Department (Customer)** to show the drop down menu.
- 2. Select Rename Department (Rename Customer).





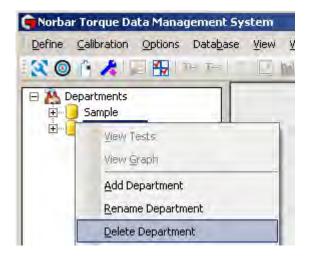
3. Enter new Department (Customer) name or identification and press enter.

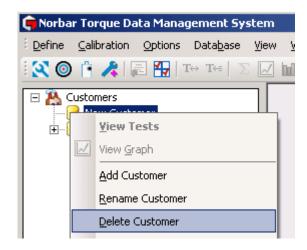




## Delete Department (Delete Customer)

1. Right click on the Department (Customer) to show the drop down menu





2. Select Delete Department (Delete Customer).

If a Department (Customer) has tools and data associated with it, you will see the following message.

Torque I	)ata Management 5	ystem			×
2	Note: this deparment deleted.	has tools within it. I	f you delete the dep	partment then all tools and their data	i will also be
	Are you sure you wan	t to delete this depa	artment?		
		Yes	No	⊆ancel	

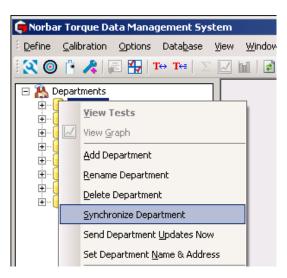
Select Yes, No or Cancel as required.

#### Synchronize Department (Customer)

**Synchronize Department (Customer)** receives any calibration and test data for any tool from the T-Box XL<sup>™</sup> into TDMS and then TDMS sends back the Department Tools, Tool Templates, Targets & Transducer data.

This option is only active when '**USB Connected**' is shown in the bottom left hand corner of TDMS after connecting to a T-Box XL<sup>™</sup> via USB.

- 1. Right click on the **Department (Customer)** that T-Box XL<sup>™</sup> data is to be received from, to show the drop down menu.
- 2. Click Synchronize Department (Customer) on the drop down.

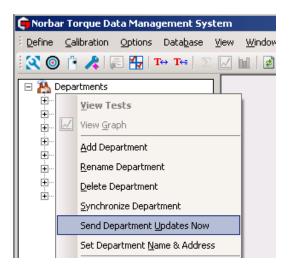


#### Send Department (Customer) Updates Now

**Send Department Updates Now** overwrites any Tools & Tool Template data stored on the T-Box XL<sup>™</sup> with those currently stored in the TDMS Department you have selected. Only these Tools will appear in the T-Box XL<sup>™</sup> for selection.

This option is only active when '**USB Connected**' is shown in the bottom left hand corner of TDMS after connecting to a T-Box XL<sup>TM</sup> via USB.

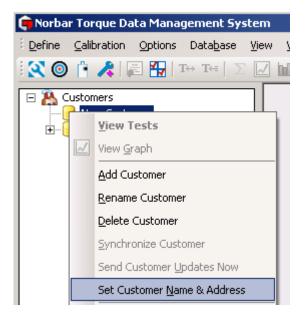
- 1. Right click on the required Department (Customer) you wish to download to T-Box XL<sup>™</sup>, to show the drop down menu.
- 2. Click Send Department Updates Now.

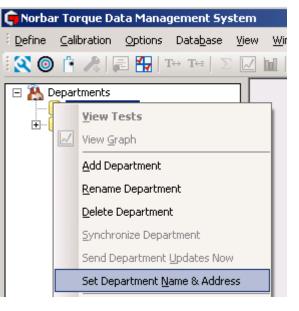


## Set Name & Address for Department (Customer)

The Name & Address set will be specific to one Department (Customer). If set the Name & Address will appear on all calibration certificates created for a Tool in that Department (Customer).

1. Right click on the Department (Customer) to show the drop down menu.





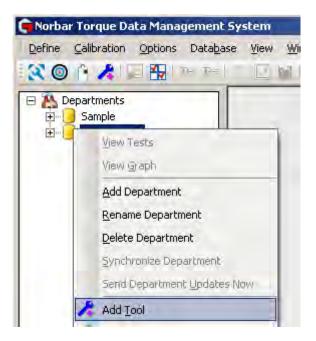
2. Click Set Department (Customer) Name & Address.

🛑 Set Name &	Address for Engineering	💼 Set Name &	Address for Norbar	×
Name :	Engineering	Name :	Norbar	
Address :		Address :	Beaumont Rd Banbury Oxon OX16 1XJ	×
If these value	ues are set, they will appear on the Calibration Certificate	If these value	ues are set, they will appear on th	e Calibration Certificate
	OK Cancel		OK Can	cel

3. Enter name & address. Click OK.

## Adding a Tool to a Department (Customer)

1. Right click on a department (Customer) to show the drop down menu & click Add Tool (or click 📌 ).



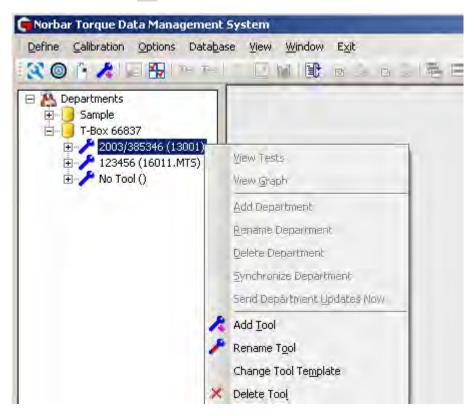
- 2. Enter **Tool Serial Number** which could be entered with a bar code reader (not supplied).
- 3. Choose a **Tool Template** from the drop down menu to assign to that tool.

dd Tool		×
Serial Number :	123456	
Tool Template :	11034	SLO St 💌
	11034	SLO Steel Knob 3/8" 1-20 N·m Torque Wrench
	11035	SLO Steel Knob 3/8" Fixed Head 1-20 N·m Torque Wrench
OK	11036	No.4 22mm Spigot 130-550 N·m Industrial Torque Wrench
	11037	SLO Steel Knob 1/4" 1-20 N·m Torque Wrench
	11066	SL1 Steel Knob 3/8" 8-54 N·m Torque Wrench
	11067	SL1 Steel Knob 1/2" 8-54 N·m Torque Wrench
	11068	SL2 Steel Knob 1/2" 30-150 N·m Torque Wrench
	11069	SL3 Steel Knob 1/2" 50-230 N·m Torque Wrench
	11085	No.4 P Type 22mm Spigot 130-550 N m Industrial Torque Wrench
	11086	SLO P Type 3/8" 1-20 N m Torque Wrench
	11087	SLO Plastic Knob 3/8" 4-20 N·m Torque Wrench
	11088	SLO P Type 9 x 12mm female 1-20 N m Torque Wrench

- 4. Select OK.
- TIP: Tools and their associated data can be moved between departments (Customers) by clicking on the Tool and holding down the left hand mouse button and dragging from one department (customer) to another, then releasing the left hand mouse button.

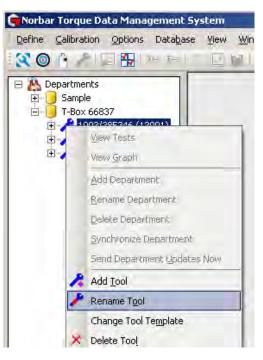
# TOOLS

Expand the Departments (Customers) tree and right click on the required **Tool** and select the required option from the drop down menu (Or select ).



## Rename Tool

- 1. Right click the **Tool** in the left hand tree structure to show the drop down menu.
- 2. Select Rename Tool.
- 3. Type in serial number and press Enter.



#### Change Tool Template

- 1. Right click the **Tool** in the left hand tree structure to show the drop down menu.
- 2. Select Change Tool Template.
- 3. Click **Tool Template** drop down **I**, then select the **Tool Template**.
- 4. Press OK.

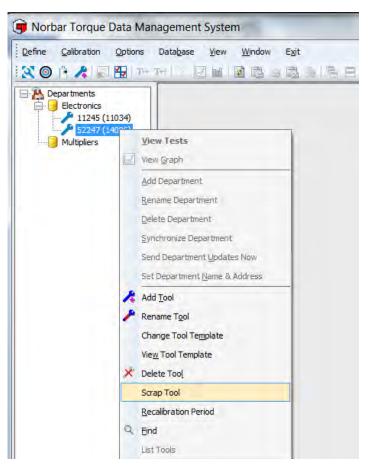
Change Tool Temp		
Serial Number :	2009/234567	
Tool Template :	16011	PT 1 6 💌
	16011	PT 1 680 N·m 1" sq.dr.
ОК	16011.AUT 16011.MTS	PT 1 680 N·m 1" sq.dr. Auto 2SP PT 1 680 N·m 1" sq.dr. MTS
	16011.X 16011.XAUT	PT 1 680 N·m 1" sq.dr.Remote PT 1 680 N·m 1" sq.dr.Auto 25P Remote
	16011.XMTS	PT 1 680 N m 1" sq.dr.MtS Remote
	16013	PT 2 1700 N m 1" sq.dr.
	16013.AUT	PT 2 1700 N·m 1" sq.dr.Auto 2SP
	16013.MTS	PT 2 1700 N·m 1" sq.dr.MTS
	16013.X	PT 2 1700 N·m 1" sq.dr.Remote
	16013.XAUT	PT 2 1700 N·m 1" sq.dr.Auto 2SP Remote
	16013.XMTS	PT 2 1700 N·m 1" sq.dr.MTS Remote

#### View Tool Template

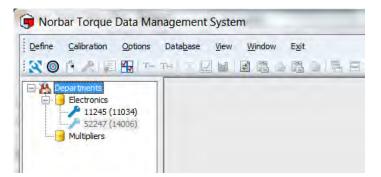
- 1. Right click the **Tool** in the left hand tree structure to show the drop down menu.
- 2. Select View Tool Template.
- 3. Select OK.

#### Scrap Tool

1. Right click the **Tool** in the left hand tree structure to show the drop down menu.



2. Select Scrap Tool and the tool will appear greyed out

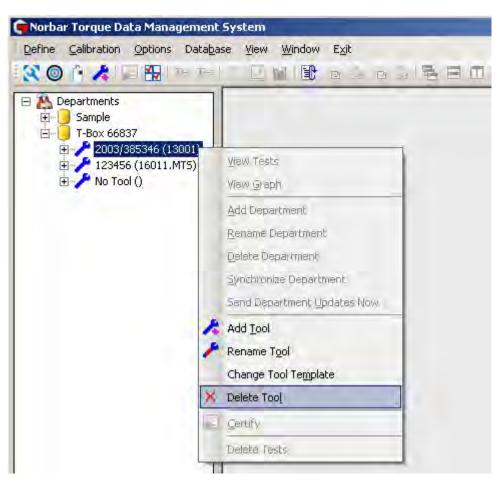


3. The tool will no longer be included in any lists (e.g. Tools requiring Recalibration list), but any tool data will be kept for future reference.

A tool can be 'Un-Scrapped' by selecting Scrap Tool from the drop down menu again.

#### **Delete Tool**

1. Right click the **Tool** in the left hand tree structure to show the drop down menu.



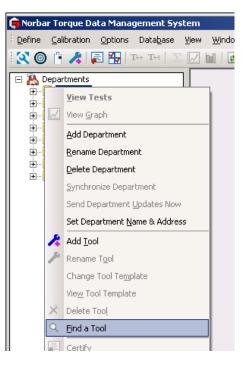
2. Select **Delete Tool** to show the screen below.



3. Select **Yes**, **No** or **Cancel**.

#### Find a Tool

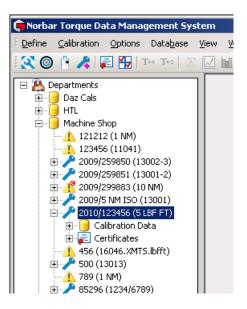
- 1. Right click the **Departments** in the left hand tree structure to show the drop down menu.
- 2. Select **Find a Tool**.



3. Enter the **Tool Serial Number** and select **OK**.

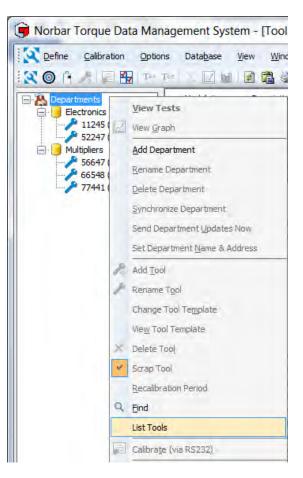
Ģ	Find a Tool	×
	Tool Serial Number : 2010/123456	
L	OK Cancel	

4. The Tool will be highlighted in the left hand tree structure.

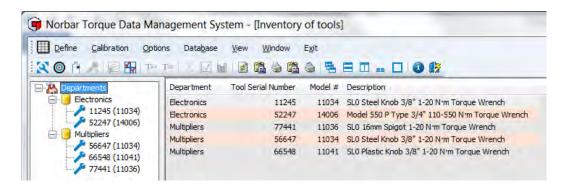


#### **Tool Lists**

1. Right click the **Departments** in the left hand tree structure to show the drop down menu.



2. Select List Tools and the Tool List will be displayed in the right pane



3. The Tool List can be printed or copied.

Individual department Tool Lists can be produced by right clicking the individual department name and again selecting **List Tools**.

## TOOL TEMPLATES

There are 2 variants of Tool Template:

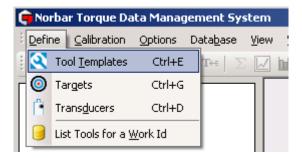
- 'ISO 6789' for Torque Wrenches & screwdrivers
- 'Other' Type Tool Templates for PneuTorques, EvoTorques etc.

When a Tool Template is attached to a Tool and sent to a T-Box XL<sup>™</sup> when synchronizing, the Tool can be selected on the T-Box XL<sup>™</sup> for Calibration or Use and T-Box XL<sup>™</sup> will operate according to the settings for the Tool Template.

TIP: To reduce the number of Tool Templates you have to scroll through on the T-Box XL<sup>™</sup>, delete the ones you do not require and connect to T-Box XL<sup>™</sup>. Use Send Updates Now to remove the unwanted Tool Templates from T-Box XL<sup>™</sup>.

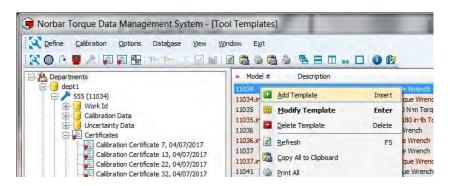
#### Add Tool Templates

1. Select the **Define** menu then select **Tool Templates** (or select **()**).



2. The list of Tool Templates is shown in the right pane.

🍺 Norbar Torque Data Mar	nagement Syste	em - [Tool Templates]	
i 💽 Define Calibration Op	itions Data <u>b</u> ase	<u>V</u> iew <u>W</u> indow E <u>x</u> it	
🛛 🔇 🎯 🖪 🧶 🗟 🔛	T⇔ T⇔ ∑	🖂 🔟   🗄 🛍 🍐 🖻 🍐   🖥 🗖 🔲 💶 🔲   ? 🕼	
🖃 🤼 Departments	🔺 Model #	Description	Tool Type
New Department	11034	SLO Steel Knob 3/8" 1-20 N·m Torque Wrench	ISO 6789
	11035	SLO Steel Knob 3/8" Fixed Head 1-20 N·m Torque Wrench	ISO 6789
🗄 🚽 Sample	11036	No.4 22mm Spigot 130-550 N°m Industrial Torque Wrench	ISO 6789
🗄 🖂 Unknown	11037	SLO Steel Knob 1/4" 1-20 N·m Torque Wrench	ISO 6789
1	11066	SL1 Steel Knob 3/8" 8-54 N·m Torque Wrench	ISO 6789
-	11067	SL1 Steel Knob 1/2" 8-54 N·m Torque Wrench	ISO 6789
-	11068	SL2 Steel Knob 1/2" 30-150 N·m Torque Wrench	ISO 6789
	11069	SL3 Steel Knob 1/2" 50-230 N·m Torque Wrench	ISO 6789
	11085	No.4 P Type 22mm Spigot 130-550 N·m Industrial Torque Wrench	ISO 6789
-	11086	SLO P Type 3/8" 1-20 N·m Torque Wrench	ISO 6789
-	11087	SLO Plastic Knob 3/8" 4-20 N·m Torque Wrench	ISO 6789
	11088	SLO P Type 9 × 12mm female 1-20 N·m Torque Wrench	ISO 6789
-	11089	SLO P Type 3/8" Fixed Head 1-20 N·m Torque Wrench	ISO 6789
	11090	SLO P Type 16mm Spigot 1-20 N·m Torque Wrench	ISO 6789
	11117	Model 300 P Type 16mm Spigot 30-300 N·m Torque Wrench	ISO 6789
	11122	SLO 9 × 12mm female 4-20 N·m Torque Wrench	ISO 6789
	11123	SLO Plastic Knob 1/4" 4-20 N·m Torque Wrench	ISO 6789
	11125	SLO Plastic Knob 3/8" Fixed Head 4-20 N·m Torque Wrench	ISO 6789
	111126	CLO 14-mar Calendi 4 DO Mura Tanana Uluarak	100 (200



- 3. Right click in the stored Tool Templates window (right pane) to show the drop down menu.
- 4. Select Add Template.

" 1-20 N·m Torque Wrench
lass A 🔻
n 👻
mm 💌

- 5. From the 'Tool' tab enter the **Model #** and **Description** for the new tool
- 6. Select the **Tool Type** drop down **I** and select the Tool Template.

					 _
ISO	6789	Туре	I Clas	s A	•
			I Clas		
ISO	6789	Туре	I Clas	s B	
ISO	6789	Type	I Clas	s C	
ISO	6789	Туре	I Clas	s D	
ISO	6789	Type	I Clas	sЕ	
ISO	6789	Туре	II Cla:	ss A	
ISO	6789	Туре	II Clas	ss B	
ISO	6789	Туре	II Cla:	ss C	
ISO	6789	Туре	II Clas	ss D	
ISO	6789	Туре	II Cla:	ss E	
ISO	6789	Туре	II Cla:	ss F	
ISO	6789	Туре	II Cla	ss G	
	er				

Note: Some of the following fields in the Tool Template will be greyed out depending on which Tool Type is selected

- 7. Enter the Rated Capacity and torque units.
- 8. Enter Lower Limit of Measurement Range, in the same units as the tools rated capacity.
- 9. Enter **End fitting length** and select **units** (mm or inch). Leave blank if the tool doesn't use an interchangeable end fitting.
- 10. Select Output drive positions (4 or 6). Select 4 for a square drive or 6 for a hexagon drive.
- 11. Select Interface positions (4 or 6). Select 4 for a square drive or 6 for a hexagon drive.

#### 12. Select the 'Test' tab

Tool Test Setting	g Values L	Incertainty				
Modes Available	Dial	Screwd	river 🔲 H	ydraulic	Click	
	Stall	Pulse	V G	raph	Set All	
Number of Tests	5					
Upper Limit	4	%				
Lower Limit	4	%				
Set Points (%)	20	60	100	0	0	Default
Change to Values						1
Expected measureme	nt error		3.000			
Expected relative unce	ertainty inte	rval :			]	
	C	ж	c	ancel		

- 13. Select **Modes Available** by ticking / un-ticking the boxes. Only the modes ticked (selected) will be available when the Tool Template is used on a T-Box XL<sup>™</sup>.
- 14. Enter **Number of Tests**. This is the number of readings taken at each Target value. This is greyed out for 'ISO 6789' Tool Types.
- 15. Enter **Upper Limit**. This is the Upper Calibration Limit and is a percentage of reading at each Set Point. This is greyed out for 'ISO 6789' Tool Types.
- 16. Enter **Lower Limit**. This is the Lower Calibration Limit and is a percentage of reading at each Set Point. This is greyed out for 'ISO 6789' Tool Types.
- 17. Click each Set Point (%) to change if required.
  Only the number of values for the tool type will be available.
  The value can be up to 3 decimal places i.e. 26.087 for ISO 6789 & Other type Tool Templates.
  These must be entered incrementing from the smallest to the largest.

Click Change to Values / Change to % to enter set points in torque units or %.

Click Default to set values to 20%, 60% and 100% if required.

 Enter Expected measurement error. This is the expected maximum percentage error of reading for this model of tool.
 This is entered out for (Other' Teel Time)

This is greyed out for 'Other' Tool Type.

 Enter Expected relative uncertainty interval. This is the expected maximum relative uncertainty interval, expressed as a percentage value, for this model of tool. This is greyed out for 'Other' Tool Type.

Note: If this value is not yet known, leave it blank until a value is established from calibrating more specimens of this model of tool.

#### 20. Select the 'Setting Values' tab

Tool	Test	Setting Values	Uncertainty			
		Add	Setting to Certifi	cate		
	Settin	ng Units :				
Defau	ılt Setting	g Values				
		_				

21. Click **Add Setting to Certificate** tick box to add a setting to the certificate i.e. pressure. This is greyed out for 'ISO 6789' Tool Types.

Enter Setting Units e.g. P.S.I.

Enter **Default Setting Values** for each Set Point. The values can be changed during the calibration if necessary.

#### 22. Select the 'Uncertainty'

ool Test S	Setting V	alues Uncertainty	
Resol	lution : (	)	
Reproduc	ibility (		Test Data
Loading	Point (	)	Test Data
Output I	Drive : (	)	Test Data
Inter	face : (	)	Test Data
		ОК	Cancel

Note: Uncertainties are greyed out for 'Other' Tool Type. They are also not used for ISO 6789-1:2017 Declarations of Conformance tests so can be left blank if not performing ISO 6789-2:2017 Certificates of Calibration on this model of tool.

- Enter **Resolution** uncertainty value for this model of tool. This is a torque value in the same units as the tool. This is greyed out and forced to a value of zero for Type II, Class B, C, E and F tools
- 24. Enter **Reproducibility** uncertainty value for this model of tool if known, or use Test Data (see below). This is a torque value in the same units as the tool. This is greyed out and forced to a value of zero for Type II, Class B, C, E and F tools

Press the Test Data button to view/use reproducibility uncertainty test data for this model of tool.

25. Enter Loading Point uncertainty value for this model of tool if known, or use Test Data (see below). This is a torque value in the same units as the tool. This is greyed out and forced to a value of zero for Type I, Class D and E and Type II, Class D, E and F tools.

Press the Test Data button to view/use loading point uncertainty test data for this model of tool.

26. Enter **Output Drive** uncertainty value for this model of tool if known, or use Test Data (see below). This is a torque value in the same units as the tool. This should be set to zero if the output drive of the tool doesn't rotate.

Press the **Test Data** button to view/use output drive uncertainty test data for this model of tool.

27. Enter **Interface** uncertainty value for this model of tool if known, or use Test Data (see below). This is a torque value in the same units as the tool. This should be set to zero if no interface (adaptor) is used between the output drive of the tool and the calibration system.

Press the Test Data button to view/use interface uncertainty test data for this model of tool.

28. Press 'OK' button to save Tool Template.

## Uncertainty Test Data

To View/Use uncertainty test data, press the Test Data button next to the respective uncertainty value from the tool template 'Uncertainty' tab.

Model # :	11034	
Description :	SLO Steel Knob 3/	3" 1-20 №m Torque Wrench
Date	Tool #	brep value
18/06/2018 08:	52 555	0.046
18/06/2018 08: 18/06/2018 08:		0.075 0.040
No. of Too No. of Tes		Default Value 0
No. of Tes		Default Value 0
No. of Tes Mean bre Min bre	ts: 3 ep: 0.054 ep: 0.040	Default Value 0
No. of Tes Mean bre Min bre	ts: 3 ep: 0.054	Default Value 0

This lists by date and time individual uncertainty tests which have been performed on this model of tool. In the above example 3 reproducibility uncertainty tests have been performed on 2 different tools of model number 11034.

The uncertainty value calculated from each test is shown in the 3<sup>rd</sup> column of the list ('brep value' in this case).

Note: Individual tests can be deleted using the right mouse button menu.

Underneath the list of tests some statistics are shown:-

No. of Tools	Indicates the number of different tools tested
No. of Tests	Indicates the total number of tests
Mean brep	Shows the mean value of brep from all results
Min brep	Shows the minimum value of brep from all results
Max brep	Shows the maximum value of brep from all of the results

The 'Update to X.XXX' button is used to update the tools value of brep to the calculated mean value.

The 'Reset to X.XXX' button is used to change the tools value of brep back to the default value.

The 'Leave as X.XXX' button leaves the tools value of brep unchanged from its previous value.

If the uncertainty data for a given model of tool is not available (e.g. from the manufacturer) then uncertainty data should continue to be obtained until at least 10 different tools have been tested. Then any further ISO 6789-2:2017 Calibrations of that model of tool can be performed without the need to carry out the uncertainty tests. The validity of the uncertainty data should however be reviewed systematically.

# TIP: To use an uncertainty value from a specific tools uncertainty test, rather than using the mean value, type the individual tests uncertainty value (e.g. 'brep value') into the 'Default Value' field and then press the 'Reset to X.XXX' button.

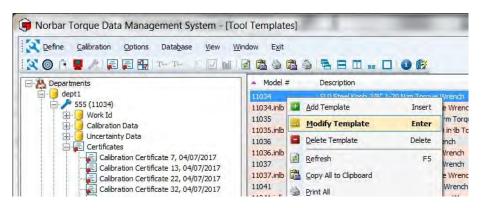
To view individual tests results, double click on the test in the list.

Mode	el # :	11034		
Descrip	tion :	SL0 Steel	I'm Torque Wrench	
Tool Ser	ial #	555		
D	ate :	18/06/20	18 08:52	
Uncertainty Value :		0.0455283	999999998	
Sequence 1	Sec	juence 2	Sequence 3	Sequence 4
1.029	0.987		1.024	1.030
1.028	0.986 0.985 0.986		1.026 1.029	1.032
1.024				1.035
1.018			0.98	86
1.017	0.9	86	1.029	1.026

This shows the readings taken during that test and the calculated uncertainty value for that individual test.

## Modify Tool Template

1. Select the **Define** menu then select **Tool Templates** (or select **(**).)



2. Right click the Tool Template to show the drop down menu then select Modify Template.

Model # :	11034				
Description :	SL0 Steel Kn	ob 3/8" 1-20	N·m Torque W	rench	
Тооі Туре	ISO 6789 Typ	oe II Class A	•		
Rated Capacity :	20.000	N'm	•		
Lower Limit of Measu	irement Range	1.0			
End fitting length :		mm	*		
Output drive positions	4	•			
Interface positions :	4	•			

3. Make changes (see Add Tool Template section for more information) then select OK.

### Delete Tool Template

- 1. Select the **Define** menu then select **Tool Templates** (or select 🔯 ).
- 2. Right click the **Tool Template** you wish to delete to show the drop down menu. Select **Delete Template**.

🗙 Define Calibration Options Database View Wi	ndow Exit				
	Model :	#	Description		
			dd Template Iodify Template	Insert Enter	ue Wrend ue Wren Nim Tor
🛱 🧕 Uncertainty Data	11035.inl 11036		elete Template	Delete	80 in 1b
Certificates Calibration Certificate 7, 04/07/2017 Calibration Certificate 13, 04/07/2017 Calibration Certificate 22, 04/07/2017	11037 11037.inl		efresh opy All to Clipboard int All	F5	Wrench Wrench ue Wren e Wren

3. Select **Yes**, **No** or **Cancel**.

Torque Data Managem	ent System		x
Are you sure yo	ou want to dele	ete this tool templat	e?
Yes	No	Cancel	

4. If a Tool Template has been assigned to a Tool, you will see the following message.

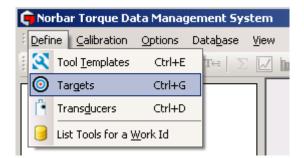


Refer to the Delete Tool section for more information.

## TARGETS

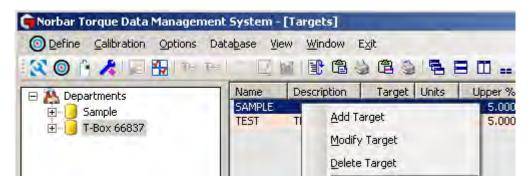
A Target is a Torque value which has an upper and lower limit. To obtain SPC data on a Work ID (i.e. USE), a Target must be in use when the test results are being taken.

1. Select the **Define** menu then select **Targets** (or select **((**)).



The targets are shown in the right hand pane.

NOTE: To Modify or Delete a Target, you need to right click on the required Target.



2. Right click on a target to show the drop down menu. Options include Add, Modify, Delete, etc.

## Add Target

- 1. Select the **Define** menu then select **Targets** (or select **(()**). Targets are shown in the right hand pane.
- 2. Right click on a target to show the drop down menu. Select Add Target.

Name :		
Description :		
Target :	N:m +	
Upper Limit	5.0000 %	
Lower Limit	5.0000 %	
Direction :	O O O Both	
Number of Readings		
Tool Stop	0	
	Internal Snug Torque Trigger	
Snug Torque		
	Angle Limits?	
Angle Direction	🔆 🕖 🗇 🛈 🛞 Both	
Angle Target		
Upper :		
Lower :		
Next Target :	· · · · · · · · · · · · · · · · · · ·	

- 3. Ensure the cursor is blinking in the **Name** entry box and Type required text.
- 4. Select the **Description** entry box and enter the required text.
- 5. Select the **Target** entry box and enter the required value.
- 6. Select the Torque units drop down 🗾 and left click on desired units.

Nim	•
Nim	
dN·m	
cN1m	
kgf m	
kgf•cm	
gf m	
gf•cm	
lbf•ft	
lbf <sup>.</sup> in	
ft·lb	
in·lb	
ozfrin	
in 'oz	

- 7. Select the **Upper Limit** entry box and enter the required value (up to 2 decimal places i.e. 4.15). This is the Torque Upper Limit as a percentage of the Target value.
- 8. Select the **Lower Limit** entry box and enter the required value (up to 2 decimal places i.e. 3.85). This is the Torque Lower Limit as a percentage of the Target value.
- 9. Select the desired **Direction** of operation for limits.

```
Direction : C 🚺 C 🜔 🖲 Both
```

- 10. Select the **Number of Readings** entry box and enter the value if required. This value defines the number of tests to be taken for the Target value. This is termed "# of Tests" on the T-Box XL<sup>™</sup>.
- 11. Select the **Tool Stop** entry box if required and enter the required value. Tool Stop is used to provide a stop signal for an external pneumatic, hydraulic or electric tool.
- NOTE: This is intended for use with PneuTorques so the 'Lower limit' does not have to be used as a stop signal.
- 12. Select the **Internal Snug Torque Trigger** tick box if required. Enabling (Ticking) this option allows the user to define a Torque value at which the Angle starts reading i.e. Torque followed by Angle.
- 13. Select the **Snug Torque** entry box and enter the required value. This will be greyed out if 'Internal Snug Torque Trigger' has not been ticked.
- 14. Select **Angle Limits?** Tick box if required. Select direction of operation for **Angle limits**.

Angle Direction : 🤇	υ U	୍ ପ୍	O Both
---------------------	--------	------	--------

- 15. Select Angle Target entry box and enter the required value. This value is in degrees.
- 16. Select the **Upper** entry box and enter the required value. This is the Angle Upper Limit value in degrees.
- 17. Select the **Lower** entry box and enter the required value. This is the Angle Lower Limit value in degrees.
- 18. Select the **Next Target** drop down **I** and select the required Target from the list.
- 19. Select the '**ISO Timing**' tick box to enable the 80% to 100% timing indicators associated with ISO 6789:2017
- 20. Select **OK** to save the Target in TDMS. This Target will be sent to a T-Box XL<sup>™</sup> when next synchronizing with TDMS.

#### Modify Target

- Select the **Define** menu then select **Targets** (or select **(**). Targets are shown in the right hand pane.
- 2. Right click on a Target to show the drop down menu. Select Modify Target.

Name :	TSP10	
Description :	SLIPPER WRENCH	
Target :	8.0000 Nrm -	
Upper Limit	5.0000 %	
Lower Limit	5.0000 %	
Direction :	● () () () () Both	
Number of Readings	5	
Tool Stop	0	
	Internal Snug Torque Trigger	
Snug Torque		
	Angle Limits?	
Angle Direction	: <ul> <li>(a)</li> <li>(b)</li> <li>(c)</li> <li>(c)</li></ul>	
Angle Target		
Upper :		
Lower :		
Next Target :		
	ISO Timing	

Refer to the Add Target section for more information.

3. Make necessary changes then select OK

#### **Delete Target**

- 1. Select the **Define** menu then select **Targets**. (or select **(**). Targets are shown in the right hand pane.
- 2. Right click on a Target to show the drop down menu. Select Delete Target.

Select the **Target** you wish to delete in the right hand pane. The following screen will be shown, left click on **Yes**, **No** or **Cancel**.



## TRANSDUCERS

Any transducers used for ISO 6789:2017 Calibrations or Conformances or non-ISO Calibrations should be added to the Transducer register.

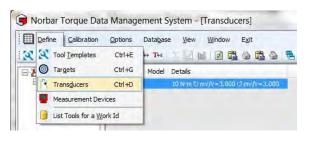
Note: If any of the transducers are not SMART, entering either of the mV/V values will enable them to synchronise with the T-Box XL<sup>™</sup> instrument.

#### Add Transducer

 Select **Define** menu then select **Transducers** (or select ).

Transducers are shown in the right hand pane.

2. Right click on a **Transducer** to show the drop down menu.



Define Calibratio	n <u>O</u> ptions	Database View	Window	Exit	
🗙 🎯 († 📕 🤼 )		T++ T+=   🔄 📝 🍿			9 1
	▲ Se	Model Details			
Sample Sample SAMPLE		Add Transducer	3.000	(5 m)/V=3.0	00
		Edit Transducer			
		Delete Transduce	r		

#### 3. Select Add Transducer.

#### SMART transducers:-

Fill in:-Serial Number Model Calibration Certificate No./s Capacity Units Transducer Uncertainty Transducer Uncertainty Interval

The 2 uncertainty values should be the highest 'Expanded Uncertainty' and 'Uncertainty Interval' values from the certificate/s

All other fields should be left blank

ransducer	
Serial Number	12345
Model	50593.LOG
Calibration Certificate (CW)	123456
Calibration Certificate (CCW)	
Capacity :	100 N·m 👻
Transducer Uncertainty :	0.24
Transducer Uncertainty Interval :	0.36
ී mv/V ;	mV/V
් mv/V ;	mV/V
	Supports Angle Measurement
Pulses per Revolution	
ОК	Cancel

Non-SMART	transducers:-
	than our door d.

Fill in:-Serial Number Model Calibration Certificate No./s Capacity Units Transducer Uncertainty Transducer Uncertainty Interval mV/V value/s Angle Measurement data (if applicable)

Note: Only Non-Smart transducers will be synchronised with a T-Box XL<sup>™</sup>

Transducer				
Serial Number	55246		_	
Model	50523.ET	5	_	
Calibration Certificate (CW)	774564			
Calibration Certificate (CCW)				
Capacity :	25	N°m	•	
Transducer Uncertainty :	0.34			
Transducer Uncertainty Interval :	0.49			
진 mv/V :	2.3441	mV/V		
ڻ mv/V :		mV/V		
	Support	ts Angle Measu	rement	
Pulses per Revolution				
ОК		Cancel	].	

### Edit Transducer

- 1. Select the **Define** menu then select **Transducers** (or select **[]**). Transducers are shown in the right hand pane.
- 2. Right click on a **Transducer** to show the drop down menu.
- 3. Select Edit Transducer.

Define Calibration	Options Datab	ase <u>V</u> iew	Window	Exit		
🗙 🔘 🖻 📕 🥂 🛛	<b>⊇ 🔁 🚮 T</b> ↔ <b>T</b> ¢		M 🖻 🛱	6	01	E
Departments	Se Mod	el Details				l
E Sample	SAMPLE	10 N m 2	1 mu N = 3 000	Time Ar-2	000	1
Unknown			Add Trans	ducer		
			Edit Transe	ducer		
			Delete Tra	nsducer		

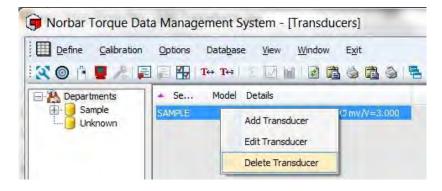
4. The Edit Transducer screen is shown.

See Add Transducer section for more information.

Make required changes then select  $\mathbf{OK}$ 

#### **Delete Transducer**

1. Select the **Define** menu then select **Transducers** (or select **)**. Transducers are shown in the right hand pane.



- 2. Right click on a **Transducer** to show the drop down menu.
- 3. Select Delete Transducer.



4. Select Yes, No or Cancel.

## MEASUREMENT DEVICES

Any measurement devices used for ISO 6789:2017 Calibrations or Conformances or non-ISO Calibrations should be added to the Measurement Device register.

Note: A measurement device can be a display instrument (e.g. a T-Box XL<sup>™</sup>), which connects to external transducers listed in the transducer register and can also be a self-contained device with its own display and integral transducer.

#### Add Measurement Device

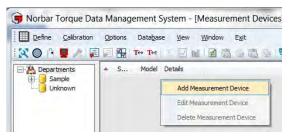
1. Select **Define** menu then select **Measurement Devices** 

(or	coloct	-	١
(Or	select		).

Define	<u>Calibration</u>	Options	Data <u>b</u> ase <u>V</u> iew <u>W</u> indow E <u>x</u> it
X X Tool	Templates	Ctrl+E	+ 14   5 🗹 🖬 🗟 🛱 🌢 🛱
Targ	lets	Ctrl+G	Model Details
E Tran	ns <u>d</u> ucers	Ctrl+D	10 N m C mv/V=3.000 (5 mv/V=3.000
👿 Mea	surement Dev	vices	
List	Tools for a W	ork Id	

Measurement devices are shown in the right hand pane.

2. Right click on the **Right Pane** to show the drop down menu.



#### 3. Select Add Measurement Device.

**Display devices** (e.g. T-Box XL):-Fill in:-Serial Number Model Device Certificate number Device Uncertainty

All other fields should be left blank

leasurement Device	-	
Serial Number	90350	
Model	43258	
Device Certificate :	445512	
Device Uncertainty :	0.14	
Integrated Transducer Certificate (CW)		
Integrated Transducer Certificate (CCW)		
Transducer Uncertainty :	0	
Transducer Uncertainty Interval :	0	
ок	Cancel	

#### Display device with an integral transducer:-

(e.g. TST - Torque Screwdriver Tester) Fill in:-Serial Number Model Device Certificate number Device Uncertainty Integrated Transducer Certificates Number/s Transducer Uncertainty Transducer Uncertainty Interval

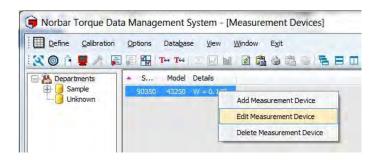
Serial Number	65478	
Model	43213	
Device Certificate :	213546	
Device Uncertainty :	0.14	
Integrated Transducer Certificate (CW)	654887	
Integrated Transducer Certificate (CCW)		
Transducer Uncertainty :	0.21	
Transducer Uncertainty Interval :	0.32	

Integrated System (e.g. Pro-Test):-Fill in:-Serial Number Model Integrated Transducer Certificates Number/s Transducer Uncertainty Transducer Uncertainty Interval

Aeasurement Device	X
Serial Number	54784
Model	43218
Device Certificate :	
Device Uncertainty :	0
Integrated Transducer Certificate (CW)	547214
Integrated Transducer Certificate (CCW)	
Transducer Uncertainty :	0.26
Transducer Uncertainty Interval :	0.38
ОК	Cancel

#### Edit Measurement Device

- Select the **Define** menu then select **Measurement Devices** (or select **I**). Measurement Devices are shown in the right hand pane.
- 2. Right click on a **Measurement Device** to show the drop down menu.
- 3. Select Edit Measurement Device.



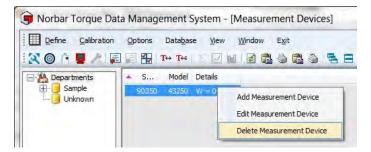
4. The Edit Measurement Device screen is shown.

See Add Measurement Device section for more information.

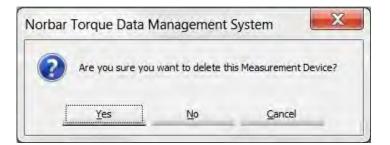
Make required changes then select OK

#### **Delete Measurement Device**

- Select the **Define** menu then select **Measurement Devices** (or select **!!**). Measurement Devices are shown in the right hand pane.
- 2. Right click on a Measurement Device to show the drop down menu.



3. Select Delete Measurement Device.



4. Select **Yes**, **No** or **Cancel**.

## WORK ID

A Work ID is a name of a collection of tests done on an application e.g. Lorry Axle.

A Work ID can also be added to a calibration i.e. to identify the person who carried out that calibration.

Statistical Process Control (SPC) can also be performed on the archived Work or Calibration data as well as the ability to view histograms of the archived data.

#### View Work ID Tests

- 1. Expand the tree structure under a Tool by clicking the + in front of the Tool.
- 2. Click the + in front of Work ID.
- 3. Right click on the desired Work ID to show the drop down menu.
- 4. Select **View Results**. The results will be shown in the right hand pane.

🖨 Norbar Torque Data Management System - [Tests for 2003/385346 for Work Id AXLE]							
Efine Calibration Options I	Data <u>b</u> ase <u>V</u> iew <u>W</u> indow	E <u>×</u> it					
🛛 🔇 🎯 🖪 🥕 🛱 🖬 To T	#   D 📈 🔟   🗄 🛍	i 🍐 🖻 i	9 🖣 E	3 🕮 == 🗖	? 🛃		
	Time	Target	Torque U	nits Angle	Direction		
New Department	26/05/2009 10:16:16		5.2650 N	'm	Clockwise		
	26/05/2009 10:16:19		5.1680 N	'm	Clockwise		
	26/05/2009 10:16:22		5.0900 N	'm	Clockwise		
SAMPLE (SAMPLE)	26/05/2009 10:16:25		5.1980 N	'm	Clockwise		
	26/05/2009 10:16:28		5.1640 N	'm	Clockwise		
123456 (16045)	26/05/2009 10:16:31		5.1060 N	'm	Clockwise		
📋 👍 2003/385346 (13001)	26/05/2009 10:16:34		5.1160 N	'm	Clockwise		
🖻 🔚 Work Id	26/05/2009 10:16:36		5.1600 N	'm	Clockwise		
<pre> <none></none></pre>	26/05/2009 10:16:39		5.1830 N	'm	Clockwise		
AXLE	26/05/2009 10:16:41		5.1820 N	'm	Clockwise		
	26/05/2009 10:17:07	5.0000	5.1990 N	'm	Clockwise		
🗄 🖂 Calibration Data	26/05/2009 10:17:10	5.0000	5.1580 N	'm	Clockwise		
🗄 📈 Graph Data	26/05/2009 10:17:16	5.0000	5.1650 N	'm	Clockwise		
2009/123456 (13004)	26/05/2009 10:17:20	5.0000	5.1980 N	'm	Clockwise		
	26/05/2009 10:17:22	5.0000	5.2200 N	'm	Clockwise		
	26/05/2009 10:17:25	5.0000	5.0760 N	'm	Clockwise		

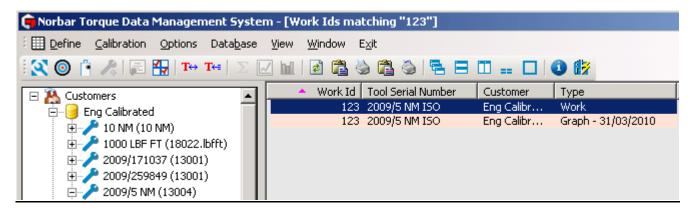
#### List Tools for a Work ID

1. Select **Define** menu then select **List Tools for a Work ID**.

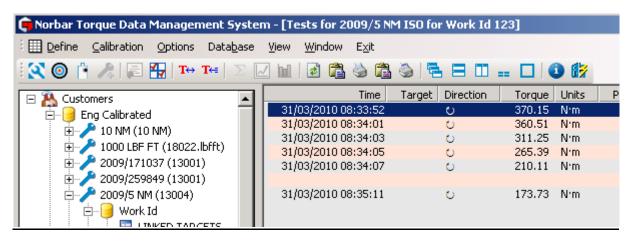


2. Enter the Work ID you are looking for & select OK.

💼 List Tools f	or a Work Id		×
Work Id :	123	ch	
	ОК	Cancel	



3. Double click on the Work ID in the left hand tree structure to view the results (or graph) in the right hand pane.

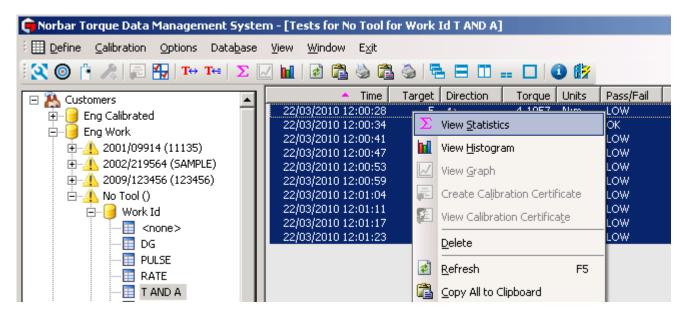


#### **View Statistics**

1. Right click the Work ID for a **Tool** in the left hand tree structure to show the drop down menu.

#### 2. Select View Tests.

3. Select the Tests to view Statistics for by left clicking on the first test, then hold down shift and left click on the last test. The selected tests will be highlighted in blue, as shown below:



 Right click on the highlighted results window (in the right pane) then right click to show the drop down menu. Select View Statistics (or select ∑).

	Tool Serial Number : No Tool
	Work Id : T AND A
	Date: 22/03/2010 12:00
View <u>H</u> istogram	Torque Values : 4.1057, 5.1005, 4.2637, 4.591, 3.7466, 4.4329, 4.3045, 4.3194, 4.2674, 3.8675 N·m
🍓 Print	Number of Readings : 10
2 Lunc	Mean : 4.2999
	Minimum : 3.7466
	Maximum : 5.1005
	Standard Deviation : 0.37668
	Target : 5
	Upper Limit : 5.25
	Lower Limit : 4.75
	Cp (3 sigma) : 0.22123
	Cpk (3 sigma) : -0.39829
	Cp (6 sigma) : 0.11062
	Cpk (6 sigma) : -0.19914
Number of v	values above Upper Limit : 0
Number of	values below Lower Limit : 9
	Values out of range : 90 %

- 5. Right click on the statistics results to see options for View Histogram or Print.
- TIP: Statistics can be viewed for Torque values taken with or without a valid Target, but all tests must share the same Target value.

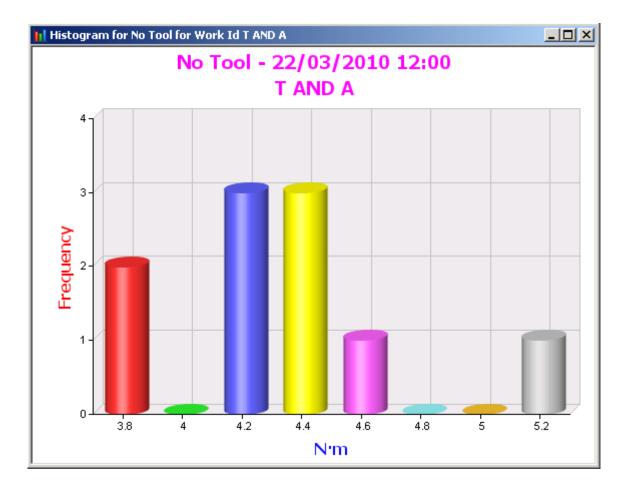
## **SPC** Calculations

Term	Mathematical equation	Comment
No readings	Ν	The number of readings
Minimum		The smallest reading.
Maximum		The largest reading.
Mean	Sum of readings / N	This is the average reading.
Sigma	The square root of: Σ(reading-mean)² / (N-1)	Also known as standard deviation, this shows how close together the readings are.
Cp (3 sigma)	(Upper limit – Lower limit) / 6 sigma	This is the capability index, showing the process capability potential. It takes no account of how centred the process is. A value of 1.33 or more is desirable.
Cpk (3 Sigma)	lesser of: (Upper limit-mean) / 3 sigma or (mean – Lower limit) / 3 sigma	This indicates whether the process will produce units within tolerance. If the process is centred on the nominal value then Cpk will have a value equal to Cp. A negative value shows mean is outside tolerance. A value of 1.33 or more is desirable.
Cp (6 sigma)	(Upper limit – Lower limit) / 12 sigma	This is the capability index, showing the process capability potential. It takes no account of how centred the process is.
Cpk (6 Sigma)	lesser of: (Upper limit - mean) / 6 sigma or (mean – Lower limit) / 6 sigma	This indicates whether the process will produce units within tolerance. If the process is centred on the nominal value then Cpk will have a value equal to Cp. A negative value shows mean is outside tolerance.

The SPC calculations depend on the number of readings selected and if a Target with limits was used.

#### **View Histogram**

- 1. Right click on a **Work ID** for a Tool in the left hand tree structure to show the drop down menu.
- 2. Select View Tests.
- 3. Select the Tests to view a Histogram for by left clicking on the first test, then hold down shift and left click on the last test.
- 4. Right click on the test results window to show the drop down menu.
- 5. Select View Histogram from the drop down menu (or select 📊 icon).



## CALIBRATION MENU

#### **Calibration Options**

- Select Calibration menu then select Options (or select icon).
- 2. Select the **General** tab, this contains header information for all certificates.

The **Next Certificate Number** is generated automatically.

The **Standard** can be entered. This will be included on non-ISO certificates.

The **Company Name** and address (shown as **Header Line 1**, **2** and **3**) can be entered, these will appear at the top of the certificate.

The Quality Manager can be entered.

The **Always show signature text on certificate** will add "Signature" and an area to be signed.

The Laboratory Number can be added.

The Certificate Logo can be changed and position altered.

The **Accept Low Results as valid** option will allow a calibration certificate with low calibration results to be created.

3. Select the Serial tab.

This information is required to perform calibrations or conformances via RS232.

Select Serial Port to match the torque instrument.

Select Baud Rate to match the torque instrument.



💼 Norbar Torque Data Management System							
E <u>D</u> efine	⊆alib	ration	Options	Data <u>b</u> ase	⊻iew	Window	Exit
: 🔍 🎯		Certify	/			Ctrl+	Т
	4	Option	IS			Ctrl+0	• <b>–</b>
- <b>-</b>	×	List To	ols requirin	ıg <u>R</u> ecalibrati	on		
		List To	ols with Ca	libration Dat	a and n	o Certificat	e
÷	) Unl	known					_

	Text(8)				Text(9)			T	ext(10)	
Seneral	Senal	Recalibra	tian	Text(1)	Text(2)	Text(3)	Text(4)	Text(5)	Text(6)	Text(7)
Next	Compar Heade Heade Quality I	tandard : ny Name er Line 1 : er Line 2 : er Line 3 : Manager :	Test New New Nort		1					
				e text on Cen	tificate	✓ Accept	Low Result	s as valid		
	Certificate Not Set	Number : Logo :	343.	Change	Breview					
	•	rbar	×	Position fro box (in cen From Left From Top Width :	timetres) : 0.10 0.10	я				

4. Select the **Recalibration** tab.

Select **Recalibration Frequency** to set specific value for the tool.

Select **Warn on recalibration required at** to set value for recalibration warning.



5. Select the **Text(1)** tab.

Use **Text(1)** to **Text(10)** to enter extra details that will appear on the calibration certificate.

Use the **Include This** option to include / exclude text as required.



### List Tools Requiring Recalibration

Tools requiring re-calibration will be preceded by a warning symbol <u>A</u> in the left hand window (pane).

This symbol will only appear if the Recalibration Frequency has been specified in the **Calibration Options** settings and the last time the Tool was calibrated is less than the number specified on **Warn on recalibration required at** within the **Calibration Options**.

1. Select the Calibration menu then select List Tools requiring Recalibration.



2. Select the tool in the right hand pane as shown below.

💼 Norbar Torque Data Management System - [Tools Requiring Recalibration]								
EDefine Calibration Options Database	<u>V</u> iew <u>W</u> indow E <u>x</u> it							
🔣 🎯 🛉 🥕 层 🏭 To Tet   🖂	🖂 🖬 🛛 🖻 🛱 🍓 🛱	) 🍯 🗧 🗖	🖽 💷 🔲 🚯					
🖃 🥂 Customers	🔺 Tool Serial Number	Customer	Model # Last Calibrated					
	1	Unknown	11034					
	1,2-3	Unknown	654321					
	2	Unknown	11117					
Test error	2DP	Unknown	decim					
	60 NM	Unknown	11162					
	123	Unknown	11034					
	123-234	Unknown	HYD					
	123-345-789	Unknown	10 NM					
	123-456	Upknown	10 NM					

3. Either right click to show the drop down menu then choose **Select** or double left click to find the tool in the left pane.

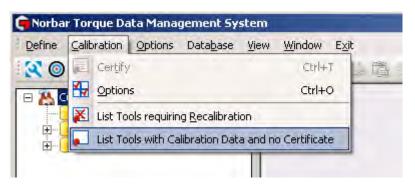
TIP: The A symbol disappears when a certificate is generated from Calibration Data.

4. If a recalibration period has been defined and some tools require recalibration you will see the following message when starting TDMS. Click **OK** to continue



#### List Tools with Calibration Data and no Certificate

1. Select the Calibration menu then select List Tools requiring Recalibration.



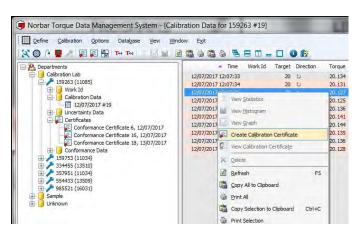
2. Select the tool in the right hand pane as shown below.

🖶 Norbar Torque Data Management System - [Tools which have Calibration Data but no Certificate]							
End Define Calibration Options Data	base <u>V</u> iew <u>W</u> indow Eg	⊻it					
🔇 🔘 🛉 🦧 🕞 🏪 Too Too I	∑ 🔽 🖬   🛃 🚵	) 🛱 🌢 🗧 🖬 🖬	] == 🔲 🚺 🕼				
🖂 🎘 Customers	Tool Serial Number	Customer	<ul> <li>Calibration</li> </ul>	Calibration Id			
	10 NM	Eng Calibrated	12/04/2010	203			
	2009/5 NM	Eng Calibrated	12/04/2010	201			
	2009/5 NM	Eng Calibrated	12/04/2010	202			
Test error	2009/5 NM ISO	Eng Calibrated	12/04/2010	198			
🗄 🖂 Unknown	2009/5 NM ISO	Eng Calibrated	12/04/2010	199			
	999	Unknown	12/04/2010	200			
	123456	Unknown	09/04/2010	193			
	100454	11-1	00/04/2010	104			

3. Double left click on a Tool to highlight that Tool in the left pane.

### Create Calibration Certificate from T-Box XL<sup>™</sup> Calibration Data

- 1. Calibrate a **Tool** on T-Box XL<sup>™</sup> and then Synchronize with TDMS.
- 2. Select **Calibration Data** to show results in the right hand pane.
- 3. Right click on the Calibration Data to show the drop down menu.
- 4. Select Create Calibration Certificate



# NOTE: The <u>M</u> icon will be shown in front of a Tool that has been calibrated but no certificate has been created.

Certificate Equipment	Readings
Fool	
Serial Number	159263
Type :	11085 💌
Rated Capacity :	20 N'm 💌
Fixed Value :	20.000 N°m
Certificate Inspector : Number	JDK (leave blank to use the next
Direction :	Clockwise     Counter Clockwise     Not Specified
Temperature	20 °C
Certificate Text :	As Found 👻
Additional Results	Select Results

- 5. Select or enter an Inspector (this must be entered).
- 6. Enter Certificate Number (if required)
- 7. Enter the **Temperature** (in degrees C) that the calibration was performed (this must be entered).
- 8. Enter Certificate Text

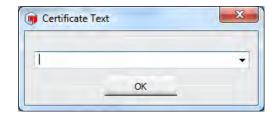
Choose either **As Found** or **As Left** from the drop down or enter your own text.

9. If the same tool has other calibration data to put on the same certificate, press Select Results

This feature allows clockwise & anti-clockwise as well as 'as found' & 'as left' results to be included on the same certificate.

To add another calibration to the same certificate double click on the required results.

10. If adding an additional calibration the **Certificate Text** screen will appear.



Use the pull down option To select **As found**, **As left** or enter your own text. Select OK.

11. Select the **Equipment** tab to review the calibration equipment used to perform the calibration

Certificate Equipment	Readings	
Measurement / Display D	evice	
Serial Number	000000	*
Model	43258	-
Certificate :	111111	
Expanded Uncertainty :	0.14	
Fransducer		
Serial Number	12345	-
Model	50593.LOG	-
Certificate :	222222	
Expanded Uncertainty :	0.25	
Uncertainty Interval :	0.35	

Note: Check the current certificate numbers are correct and that the uncertainty values are correct. If not, correct them in the Measurement Device and Transducer registers.

12. Select the **Readings** tab to review the calibration readings

Certificate Equip	nent Readings	
Readings		
Torque		
20.000 M	rm 20,134 20,131 20,127	20.125 20.136
2010001	20.141 20.144 20.135	20.136 20.128
	LONG TA COLLEGE COLLEGE	20.120

Press the 'Create Certificate' button.

### Create Certificate - ISO 6789 Tool Types

For ISO 6789 tool types, make sure the respective tool template has its uncertainty values entered under the tool template 'Uncertainty' tab.

If any of the required uncertainty values are equal to zero, the following message will appear:-

ne or more of the se 000. Do you want to			anity van	Jes is
Res	solution :	0.200		
Reprodu	ucibility :	0.054		
Loadin	g Point :	0.120		
Outpu	It Drive :	0.151		
In	terface :	0.000		
Do not warn about	this tool	again		

If the uncertainties set to zero are valid (e.g. no adaptor was used in the above example), then you can tick the 'Do not warn about this tool again' tick box and press 'Continue'.

If the zero values are not valid (e.g. they haven't been entered yet), then press 'Cancel' and enter the uncertainty values into the respective tool templates 'Uncertainty' tab.

If the measurement device and transducers combined uncertainty values are too high, the following message will appear:-

Norbar	r Torque Data Management System	X
8	The measurement systems uncertainty interval is too high to calibrate this torque tool to ISO6789-2:	2017
	OK	

Check the measurement device and transducer uncertainty values are correct. Check the respective tool templates 'Expected relative uncertainty interval' value is correct.

The measurement systems combined uncertainty interval can be no greater than  $\frac{1}{4}$  of the tools expected relative uncertainty interval for an ISO 6789-2:2017 calibration.

If the tool was calibrated below 18°C or above 28°C the following message will appear:-



Check the correct temperature was entered.

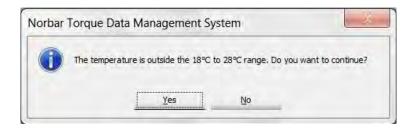
If the measurement system and temperature comply with ISO 6789-2:2017, the certificate will be generated:-

	phe ber Torque To	ols (				alibrati 5789-2:2017 ber : 27	ion	17
Customer :		c	alibration	Lab				
Model :		1	1085			Serial No :	159	263
Fixed Value	e.	2	0.000 N·n	n		Inspector :	JOL	¢
Date of Cali	oration : 1	2/07/2017	7			Direction :		Clockwise
As Found								
Set Torque		Actu	ual Readi	ngs	1.1	Mean	Expanded Uncertainty	Uncertainty Interval
20.000	20.134	20,131	20.127	20.125	20.136	20.134	1.238%	1.962%
				20,136	20.128			
The maximu ±3.000% for The calibrati more than ±	m relative this tool on was p 1°C during	e uncertar erformed g the calit	nty interv	% is withi al 1.962% bient temp	n the exponent	the expected etween 18°C	rement error, ±3.00 I relative uncertain C and 28°C and did id not exceed 90%	ty interval, not fluctuate by
The maximu ±3.000% for The callbrati more than ± Quality Man MEASUREN Measureme Measureme	im measu im relative this tool on was po 1°C during ager : JD IENT SYS INT Device Int Device	rement er e uncertar erformed g the calit K STEM USI Model : 4 Serial No	at an amb pration. The pration. The SD 3258 1000000	% is withi al 1.962% bient temp he maxim	n the exponent	the expected etween 18°C	f relative uncertain	ty interval, not fluctuate by
The maximu ±3.000% for The calibrati more than ± Quality Man. MEASUREN Measuremen Measuremen Transducer Transducer	m measu m relative this tool on was pi 1°C durini ager : JD JENT SYS ht Device nt Device the Device to Device to Device Serial No Certificate	rement er e uncertar g the calit K STEM USI Model : 4 Serial No Certificat 0593.LOC : 12345 : 22222	at an amb oration. Th ED 3258 : 000000 e : 111111	% is withi al 1.962% bient temp he maxim	n the expo is within perature b um relativ	the expected etween 18°C re humidity d	f relative uncertain	ty interval,
I he maximu ±3.000% for The calibrati more than ± Quality Man MEASUREN Weasuremen Weasuremen Transducer Transducer Transducer The measur Section 4.3 The relative	im measu im relative this tool on was pi 1°C durin ager : JD IENT SYS nt Device nt Device Model : 50 Serial No Certificate ament sys uncertain	rement er e uncertar g the calit K STEM USI Model : 4 Serial No Certificat 0593,LOC : 12345 : 222222 stem used ty interval	at an amb pration. The ED 3258 : 000000 e : 111111 i for this c of the min	% is with al 1.962% blent temp he maxim calibration easureme	n the expo is within berature b um relativ	the expected etween 18°C re humidity d with the req	t relative uncertain ≎ and 28°C and did id not exceed 90%	ty interval, not fluctuate by 789-2:2017
The maximult3.000% for The calibrati more than ± Quality Man. MEASUREN. Measuremen Measuremen Transducer Transducer Transducer Transducer Transducer Transducer Transducer Transducer Transducer Transducer Transducer Transducer Transducer Transducer Transducer Transducer Transducer	im measu im relative this tool on was pint "C during ager : JD IENT SYS INT Device th Device th Device th Device th Device th Device th Device th Device th Device th Device th Device th Device th	rement ei uncertai e uncertai g the calit K STEM USI Model : 4 Serial No Certificat 0593, LOC : 12345 : 222222 stem usec ty interval of th	at an amb oration. The ED 3258 2000000 e 111111 i i f for this c of the mine to rque	% is within al 1.962% blent temp he maxim alibration easureme tool	n the exp is within perature b um relativ complies ent system	the expected etween 18°C re humidity d with the req	d relative uncertain c and 28°C and did id not exceed 90% uirements of ISO 6 ceed ¼ of the expl	ty interval, not fluctuate by 789-2:2017
I he maximu ±3.000% for The calibrati more than ± Quality Man. MEASUREN Weasuremen Measuremen Measuremen Transducer Transducer Transducer Transducer Section 4.3 The relative erelative unce	im measus im measus this tool on was pint of during ager : JD IENT SYS int Device th Device th Device th Device th Device th Device th Device th Device th Device th Device th Device th Device th D	rement ei uncertai e uncertai g the calit K STEM USI Model : 4 Serial No Certificat 0:12345 : 222222 stem used ty interval erval of th rement er	at an amb oration. The ED 3258 - 000000 e - 111111 i for this c of the mine torque ror of the	% is within al 1.962% bient temp he maxim calibration easureme tool measure	n the explosion of the	the expected etween 18°C re humidity d with the req does not ex	d relative uncertain C and 28°C and did id not exceed 90% uirements of ISO 6 ceed ¼ of the expi %	ty interval, not fluctuate by 789-2:2017
I he maximu ±3.000% for The calibrati more than ± Quality Mann MEASUREN Measuremen Measuremen Transducer Transducer Transducer Transducer Transducer Transducer Transducer Transducer Transducer The measure Section 4.3 The relative relative transection the measure The measure The measure The measure The measure The measure The measure	im measu im relative this tool on was p 1°C durin 1°C durin gger : JD IENT SYS ht Device nt Device nt Device to Device Model : 50 Serial No Certificate ament sys uncertain trainty int m measu ament unc	rement er e uncertal g the caliti K Model : 4 Serial No Certificat 0593.LOC : 12345 : 22222 stem used ty interval erval of th rement er certainty i	at an amb pration. The ED 3258 0000000 e 111111 for this c of the mine torque ror of the interval of	% is within al 1.962% bient temp he maxim he maxim calibration easureme tool measure the measure	n the explosion of the	the expected etween 18°C re humidity d with the req does not ex em is 0.080% system is 0.2	d relative uncertain C and 28°C and did id not exceed 90% uirements of ISO 6 ceed ¼ of the expi %	ty interval, not fluctuate by 789-2:2017
I he maximu ±3.000% for The calibrati more than ± Quality Man MEASUREN Measuremen Measuremen Transducer Transducer Transducer Transducer Section 4.3 The relative relative unce	im measu m relative this tool on was pi 1°C durin- ager : JD IENT SYS IN Device IN Device Nodel : 50 Serial No Certificate ament sys uncertainty int m measu ament unc nties are	rement er e uncertal g the caliti K Model : 4 Serial No Certificat 0593.LOC : 12345 : 22222 stem used ty interval erval of th rement er certainty i	at an amb pration. The ED 3258 0000000 e 111111 for this c of the mine torque ror of the interval of	% is within al 1.962% bient temp he maxim he maxim calibration easureme tool measure the measure	n the explosion of the	the expected etween 18°C re humidity d with the req does not ex em is 0.080% system is 0.2	d relative uncertain C and 28°C and did id not exceed 90% uirements of ISO 6 ceed ¼ of the expi %	ty interval, not fluctuate by 789-2:2017

## Create Certificate - Non-ISO (Other) Tool Type

For non-ISO (Other) tool type, the respective tool templates uncertainty values under the 'Uncertainty' tab are not needed, so are greyed out.

If the tool was calibrated below 18°C or above 28°C the following message will appear:-



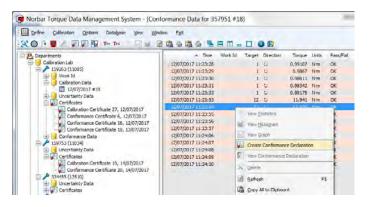
Pressing 'Yes' will generate the certificate:-

Jurhar	Cen	tificate <sub>Certifica</sub>			ion	2		17.
Customer - Model :	Calibrat	ion Lab		Serial No :		98	5521	
Maximum Capacity =	680,00 N·m		b	Inspector :		JDK		
Date of Calibration   17/0: As Left	7/2017		,	Direction :			G	ockwise
Set Torque	1	Min	Max		Actu	a) Readi	ngs	
	160.00	152.00	168.00	163.90	163.90	166.20	166.20	166.20
	680.00	646.00	714.00	681.30	685.70	687.80	724.90*	693.30
Out of tolerance readings								
Out of tolerance readings Quality Manager : JDK MEASUREMENT SYSTE Measurement Device Mo Measurement Device Ser Measurement Device Ser Transducer Model : 5059 Transducer Serial No : 12 Transducer Certificate : 2	del ; 43258 fal No 1903 tificate : 112 3.LOG 2345							
Quality ManagerJDK MEASUREMENT SYSTE Measurement Device Mo Measurement Device Ser Measurement Device Car Transducer Model . 5059 Transducer Serial No : 12 Transducer Certificata . 2 Transducer Certificata . 2	del : 43258 fial No : 903: tificate : 112 3.LOG :345 22222 ainty interva	233 I of the mean						
Quality Manager : JDR MEASUREMENT SYSTE Measurement Device Mo Measurement Device Ser Measurement Device Cer Transducer Model : 5059 Transducer Serial No : (2 Transducer Certificate : 2	del : 43258 fial No : 903: tificate : 112 3.LOG :345 22222 ainty interva	233 I of the mean						

### Create Declaration of Conformance from T-Box XL<sup>™</sup> Conformance Data

Note: Declarations of Conformance can only be produced for ISO 6789 tool types. Declarations of Conformance do not use uncertainty values in the respective tool templates 'Uncertainty' tab.

- 1. Conformance test a **Tool** on T-Box XL<sup>™</sup> and then Synchronize with TDMS.
- 2. Select **Conformance Data** to show results in the right hand pane.
- 3. Right click on the Conformance Data to show the drop down menu.
- 4. Select Create Conformance Declaration



Certificate Equipment	Readings
Tool	
Serial Number	357951
Туре:	11034 👻
Rated Capacity :	20 N'm 💌
Measurement Range :	1,000 - 20.000 N°m
Certificate Inspector :	
	(leave blank to use the next
Inspector : Number	(leave blank to use the next
Inspector : Number	(leave blank to use the next
Inspector : Number Direction :	(leave blank to use the next       O Clockwise     Counter Clockwise       25     oC
Inspector : Number Direction : Temperature	(leave blank to use the next       O Clockwise     Counter Clockwise       25     oC

- 5. Select or enter an **Inspector** (this must be entered).
- 6. Enter Certificate Number (if required)
- 7. Enter the **Temperature** (in degrees C) that the calibration was performed (this must be entered).
- 8. Enter Certificate Text

Choose either **As Found** or **As Left** from the drop down or enter your own text.

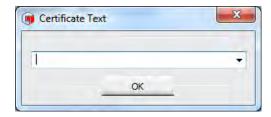
9. If the same tool has other conformance data to put on the same declaration of conformance, press **Select Results** 

This feature allows clockwise & anti-clockwise as well as 'as found' & 'as left' results to be included on the same declaration of conformance.

To add another calibration to the same declaration of conformance double click on the required results.

10. If adding an additional conformance the **Certificate Text** screen will appear.

Use the pull down option To select **As found**, **As left** or enter your own text. Select OK.



11. Select the **Equipment** tab to review the calibration equipment used to perform the conformance test

Certificate Equipment	Readings		
Measurement / Display [	Device		
Serial Number	000000	*	
Model	43258	*	
Certificate :	111111		
Expanded Uncertainty :	0,14		
Fransducer			
Serial Number	12345	*	
Model	50593.LOG	-	
Certificate :	222222		
Expanded Uncertainty :	0.15		
Uncertainty Interval :	0.21		

Note: Check the current certificate numbers are correct and that the uncertainty values are correct. If not, correct them in the Measurement Device and Transducer registers.

12. Select the Readings tab to review the conformance test readings

Certificate	Equipment	Readings					
Readings							
Torqu	Je						
	1.000 N°m	0.991	0.987	0.986	0.983	0.982	
1	2.000 N°m	11.941	11.936	11.937	11.933	11.932	
2	0.000 N°m	19.335	19.328	19.323	19,324	19,325	

Press the 'Create Certificate' button.

If the measurement device and transducers uncertainty values are too high, the following message will appear:-



Check the measurement device and transducer uncertainty values are correct.

The measurement systems maximum relative error can be no greater than  $\frac{1}{4}$  of the tools maximum permissible relative deviation.

The measurement systems maximum relative error is calculated by taking the transducers expanded uncertainty value from it uncertainty interval value.

The tools maximum permissible relative deviation uses the 'Expected measurement error' value under the 'Test' tab of the tool template. If this value is blank or is greater than the default maximum permissible relative deviation defined in ISO6789-1:2017 (section 5.1.5), the 'Upper Limit' and 'Lower Limit' values under the same tab will be used.

If the tool was conformance tested below 18°C or above 28°C the following message will appear:-



Check the correct temperature was entered.

If the measurement system and temperature comply with ISO 6789-1:2017, the declaration of conformance will be generated:-

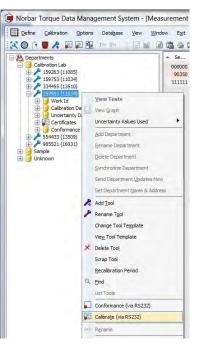
Rober Brigger Jack Dec	Iaration In accordance Declaration	with ISO 67	80-1:2017		9		17
Model: 110	bration Lab 34 0 - 20,000 N·m		Serial No . nspector :			7951 XK	
Date of Test : 12/07/2017 As Found		Ţ	Direction			c	lockwise
Set Torque	Min	Max	-	Acti	ual Readl	ngs	
1.00	0 0.960	1.040	0.991	0.987	0.986	0.983	0.982
12.00	0 11.520	12.480	11.941	11.936	11.937	11.933	11.932
20.00	19.200	20.800	19,335	19.328	19.323	19.324	19.325
	ant temperatur		18°C and	28°C and		uctuate b	y more
than ±1°C during the last. The me Quality Manager : JDK	ilent temperatur ximum relative h	e between	18°C and	28°C and		luctuate b	y more
The test was performed at an ambi- than ±1°C during the test. The me Quality Manager : JDK MEASUREMENT SYSTEM USED Measurement Device Model - 432 Measurement Device Certificate	kient temperatur ximum reletive t 58 100000	e between	18°C and	28°C and		luctuate b	y more
than ±1°C during the test. The me Quality Manager : JDK MEASUREMENT SYSTEM USED Measurement Device Model - 432 Measurement Device Serial No : 1	sient temperatur ximum relative f 58 100000 111111	e between humidity did	18°C and not exce	28°C and ed 90%i	t did not f		y more
than 11°C during the test. The ma Quality Manager : JDK MEASUREMENT SYSTEM USEC Measurement Device Serial No : ( Measurement Device Certificate Transducer Model : 50593.LOG Transducer Serial No : 12345 Transducer Serial No : 12345 Transducer Gertificate : 222222 The measurement system used ft 6789-1:2017 Section 6.1 The maximum measurement errop permissible relative deviation of th	Nent temperatur ximum relative f 58 K00000 111111 r this conformar of the measure le torque tool	e between numidity did noe test con ment system	18°C and not axea applies with a does no	28°C and ed 90%	i did not fi	of ISO	
than ±1°C during the test. The ma Quality Manager : JDK MEASUREMENT SYSTEM USED Measurement Device Model - 432 Measurement Device Certificate : Transducer Model : 50593.LOG Transducer Senal No : 12345 Transducer Certificate : 222222 The measurement system used fo 6789-1:2017 Section 6.1 The maximum measurement error permissible relative deviation of the The maximum measurement error	Nent temperatur ximum relative f 58 K00000 111111 or this conformar of the measure to forgue tool of the measure	e betwoen in numidity did ice test con ment system ment system	18°C and not axea nplies with n does no n is 0.120	28°C and ed 90% ) the requ of exceed	i did not fi	of ISO	
than ±1°C during the test. The ma Quality Manager : JDK MEASUREMENT SYSTEM USED Measurement Device Model - 432 Measurement Device Certificate Transducer Model : 50593.LOC Transducer Senal No: 12345 Transducer Certificate : 222222 The measurement system used for 6789-12017 Section 6.1 The maximum measurement erro permissible relative deviation of the masurement erro The measurement uncertainty inte	Nent temperature ximum relative f 58 000000 111111 r this conformar of the measure to fibe measure to fibe measure rival of the measure	e betwoen in numidity did nce test con ment system ment system roent system	18°C and not exce nplies with n does no n is 0.120 rstem is 0	28°C and ed 90% h the requ of exceed 3% .407%	i did not fi	of ISO	
than ±1°C during the test. The ma Quality Manager : JDK MEASUREMENT SYSTEM USED Measurement Device Model - 432 Measurement Device Certificate : Transducer Model : 50593.LOG Transducer Senal No : 12345 Transducer Certificate : 222222 The measurement system used fo 6789-1:2017 Section 6.1 The maximum measurement error permissible relative deviation of th The maximum measurement error	Nent temperature ximum relative f 58 000000 111111 r this conformar of the measure to fibe measure to fibe measure rival of the measure	e betwoen in numidity did ince test con ment system ment system room system	18°C and not exce nplies with n does no n is 0.120 rstem is 0	28°C and ed 90% h the requ of exceed 3% .407%	i did not fi	of ISO	

### Calibrate (via RS232)

This option is for generation of certificates via the RS232 interface. Ensure the Calibration Options are set up correctly. Calibrate (via RS232) is available for all tool types.

1. Select the tool to be calibrated, then select **Calibrate (via RS232)** from the right mouse button menu

ertificate Equipment F	Readings				
ool					
Serial Number	357951				
Туре :	11034		*		
Rated Capacity :	20	N•m	•		
Measurement Range :	1.000 - 20:000	N°m			
Certificate					
Inspector :	JDK	*			
Number		(leave blank to use th	e next		
Direction :	Clockwise	Counter Clockwise	O Not Specifi	ed	
Temperature	21 •0				
Certificate Text :	As Found	÷			
			Select R	esults	



- 2. Select or Enter an Inspector (this must be entered).
- 3. Enter Certificate Number (if required).
- 4. Select Direction required
- 5. Enter the **Temperature** (in degrees C) that the calibration was performed (this must be entered).
- 6. Enter Certificate Text

Choose either **As Found** or **As Left** from the drop down or enter your own text.

7. If the same tool has other calibration data to put on the same certificate, press Select Results

This feature allows clockwise & anti-clockwise as well as 'as found' & 'as left' results to be included on the same certificate.

To add another calibration to the same certificate double click on the required results.

8. Select Equipment tab

Select the Measurement / Display Device Serial Number from the drop down list.

Select the Transducer Serial Number from the drop down list.

Note: If using the Measurement Devices integral transducer, leave Transducer Serial Number blank.

Check the current certificate numbers are correct and that the uncertainty values are correct. If not, correct them in the Measurement Device and Transducer registers.

Certificate	Equipment	Readings		
leasureme	nt / Display	Device		
Se	erial Number	90350	•	
	Model	43258	*	
	Certificate	112233		
Expanded	Uncertainty :	0.14		
ransducer				
Se	erial Number	12345		
	Model	50593.LOG	-	
	Certificate	222222		
Expanded	Uncertainty :	0.25		
Uncertai	nty Interval	0.37		

#### 9. Select Readings tab

Press 'Start RS232 Capture' button

Perform calibration, sending readings via RS232

A reading can be deleted by pressing the 'Delete Last Reading' button

ertific	cate Equipment	Readings				
eadir	ngs					
1	orque					
T	1.000 N°m	0.000	0.000	0.000	0.000	0.000
T	12.000 N·m	0.000	0.000	0.000	0.000	0.000
T	20.000 N·m	0.000	0.000	0.000	0.000	0.000
C	Stop RS232 Ca	pture	velete Last Rea	ading		

Continue taking readings until the calibration is complete

Certificate	Equipment	Readings					
Readings							
Torqu	ie						
	1.000 N·m	1.029	1.033	1.030	1.025	1.024	
1	2.000 N°m	12.179	12.299	12.413	12.270	11.795	
2	0.000 N·m	20.650	20.533	20.421	20.247	19.714	
Sta	art RS232 Ca	pture	Delete Last Re	ading			

- 10. Press 'Create Certificate' button
- Note: Calibrate (via RS232) can be used for ISO 6789 and non-ISO (Other) tool types. The certificate generated is formatted dependant on the tool type.

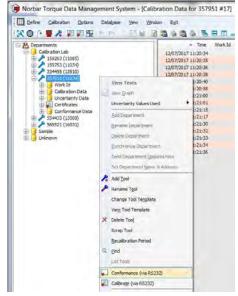
9-	rba	<b>F</b> ,	Certif	icate cordance ertifica	of C with ISO te Num	alibrati 6789-2:2017 ber : 40	on	1/
Customer : Model : Measureme	nl Range	1	alibration 1034 000 - 20 (			Serial No : Inspector .	357 JDI	7951 K
Date of Calif As Found	oration : 1	8/07/2017				Direction		Clockwise
Set Torque		Actu	al Readin	ngs		Mean	Expanded Uncertainty	Uncertainty Interval
1,000	1.029	1.033	1,030	1.025	1.024	1.028	11.532%	14.394%
12.000	12.179	12.299	12.413	12.270	11.795	12.191	2,011%	3.669%
20.000	20,650	20.533	20.421	20.247	19.714	20.313	1.739%	3.374%
tool The maximu ±3.000% for	m measu m relative this tool	rement er uncertai	ror 3.327	% is large	er than the % is large	e expected m	easurement error, pected relative uni	±3.000% for this certainty interval.
tool The maximu ±3.000% for The calibrati	im measu im relative this tool on was pe 1°C during ager : JD	rement er uncertail arformed g the calit K	ror 3.327 nty interve at an amb pration. Ti	% is large a) 14.394 bient temp	er than the % is large perature b	e expected m in then the ex	easurement error,	±3.000% for this certainty interval.
tool The maximu ±3.000% for The calibrati more than ± Quality Mana	im measu im relative this tool on was pe 1°C during ager : JD IENT SYS nt Device at Device	rement er arformed g the calit K TEM USE Model : 4 Serial No	nty interva at an amb pration. Th ED 3258 : 90350	% is large a) 14.394 blent temp te maxim	er than the % is large perature b	e expected m in then the ex	easurement error, pected relative unit	±3.000% for this certainty interval, I not fluctuate by
tool The maximu ±3.000% for The calibrati more than ±' Quality Mana MEASUREM Measuremer Measuremer Measuremer Transducer I Transducer I	im measu im relative this tool on was pe 1°C during ager : JDI IENT SYS ht Device ht Device ht Device Serial No Certificate	rement er euncertai g the calit K Model: 4 Serial No Certification 593.LOG : 12345 : 222222	ror 3.327 nty interva at an amb oration. Th ED 3258 : 90350 a: 11223	% is large a) 14.394 bient temp ne maxim	er than the % is large perature b um relativ	e expected m in then the ex- netween 18°C	easurement error, pected relative unit	±3.000% for this
tool The maximu ±3.000% for The calibrati more than ±' Quality Mans MEASUREM Measuremen Measuremen Transducer f Transducer f Transducer f The measure	im measu im relative this tool on was put "C during ager : JD IENT SYS ht Device th Device th Device Model : 50 Serial No Certificate ement sys	rement er e uncertai arformed g the calit K TEM USI Model : 4 Serial No Certificativ 0593.LOG 12345 : 222222 tem used ty interval	ror 3.327 nty interva at an amb oration. Th ED 3258 : 90350 a: 11223 i for this c of the me	% is large a) 14,394 dient temp he maxim 3 alibration easureme	er than the % is large perature t um relativ complies	e expected m r then the ex- retween 18°C ve humidity d	easurement error, pected relative uni and 28°C and did id not exceed 90%	±3.000% for this certainty (nterval I not fluctuate by 1789-2:2017
tool The maximu ±3.000% for more than ± Quality Mana MEASUREM Measuremer Measuremer Transducer 1 Transducer to Transducer 1 Transducer 1 Transducer 3 Transducer 1 Transducer	im measu im relative this tool on was pe 1°C during ager : JD EENT SYS ht Device ht Device the Device the Device the Device the Device the Device the Device the Device the Device the Device the Device the Device the Device the Device the Device the Device the Devi	rement er e uncertai g the calit K TEM USE Model: 4 Serial No Certificat 593.LOG 12345 : 22222 tem used ty interval of th	ror 3.327 nty interva at an amb oration. Th ED 3258 : 90350 a : 11223 i for this c of the me intertorque	% is large a) 14,394 <sup>4</sup> bient temp te maxim a alibration sasureme tool	er than the % is large berature b um relativ complies ent system	e expected m r then the ex- retween 18°C ve humidity d	easurement error, pected relative un- and 28°C and did d not exceed 90% uirements of ISO 6 ceed % of the exp	±3.000% for this certainty (nterval I not fluctuate by 1789-2:2017
tool The maximu 23.000% for The calibrati more than ± Quality Mana MEASUREM Measuremer Measuremer Transducer I Transducer I The relative uncer	im measu im relative this tool on was po- 1°C during ager : JDi EENT SYS in Device the Device the Device the Device Model : St Serial No Certificate ement sys uncertain trainty int m measu	rement er arformed g the calit K TEM USB Model: 4 Serial No Certificati 0593.LOG :12345 : 222222 tem used ty interval erval of th rement er	ror 3.327 hty interva- at an amb oration. The D 3258 1 90350 a 112233 1 for this c of the me te forque ror of the	% is large a) 14.394 bient temp re maxim a maxim alibration sasureme tool measure	er than the % is large perature to um relativ complies int system ment system	e expected m in then the ex- in then the ex- tension of the then the ex- tension of the then the then the then the is with the req is does not ex-	easurement error, pected relative un- and 28°C and dic d not exceed 90% uirements of ISO 6 ceed % of the exp	±3.000% for this certainty (nterval I not fluctuate by 1789-2:2017
tool The maximu 23.000% for The calibrati more than ±' Quality Mans MEASUREN Measuremer Measuremer Measuremer Measuremer Transducer 1 Transducer 1 Transducer 3 The relative relative unce The maximu The maximu The maximu	im measu im relative this tool on was per 1°C during ager : JD IENT SYS ht Device at Device th Device th Device Model : 50 Serial No Certificate ement sys uncertain trainfy int m measu ement unc nties are	rement er arformed g the calit K TTEM USI Model: 4 Serial No Certificati S93.LOG : 12345 : 222222 tem used ty interval erval of the rement er certainty in	ror 3.327 hty interva at an amb pration. The D 3258 : 90350 a : 11223 i for this c of the me torque ror of the interval of	% is large a) 14.394 bient temp re maxim a maxim a alibration sasureme tool measure the measure	er than the % is large perature b um relativ complies ent system ment system	a expected m in then the ex- interveen 18°C re humidity d is with the req is does not ex- term is 0.120% system is 0.420	easurement error, pected relative un- and 28°C and dic d not exceed 90% uirements of ISO 6 ceed % of the exp	±3.000% for this certainty (nterval I not fluctuate by 1789-2:2017
tool The maximu ±3.000% for an example and the calibratil more fhan ± Quality Mana Measuremer Measuremer Measuremer Measuremer Transducer 1 Transducer 1 Transduc	im measu m relative this tool on was pe 1°C during ager : JD IENT SYS ht Device ht Dev	rement er arformed g the calit K TTEM USI Model: 4 Serial No Certificati S93.LOG : 12345 : 222222 tem used ty interval erval of the rement er certainty in	ror 3.327 hty interva at an amb pration. The D 3258 : 90350 a : 11223 i for this c of the me torque ror of the interval of	% is large a) 14.394 bient temp re maxim a maxim a alibration sasureme tool measure the measure	er than the % is large perature b um relativ complies ent system ment system	a expected m in then the ex- interveen 18°C re humidity d is with the req is does not ex- term is 0.120% system is 0.420	easurement error, pected relative un- and 28°C and dic d not exceed 90% uirements of ISO 6 ceed % of the exp	±3.000% for this certainty (nterval I not fluctuate by 1789-2:2017

### Conformance (via RS232)

This option is for generation of declarations of conformance via the RS232 interface. Ensure the Calibration Options are set up correctly. Conformance (via RS232) is only available for ISO 6789 tool types.

- Conformance (Via RS232) is only available for ISO 6789 tool type
- Select the tool to be calibrated, then select Conformance (via RS232) from the right mouse button menu

Certificate Equipment	Readings			
Гооі				
Serial Number	357951		1	
Type :	11034		*	
Rated Capacity :	20	N·m	•	
Measurement Range :	1.000 - 20.000	N:m		
Certificate				
Inspector :	JDK	¥		
Number		(leave blank to u	se the next	
Direction :	Clockwise	O Counter Clockw	ise 💿 Not Specifier	6.1
Temperature	21 0	c		
Certificate Text :	As Found	•		
Additional Results			Select Re	sults



- 2. Select or Enter an Inspector (this must be entered).
- 3. Enter Certificate Number (if required).
- 4. Select Direction required
- 5. Enter the **Temperature** (in degrees C) that the conformance test was performed (this must be entered).
- 6. Enter Certificate Text

Choose either **As Found** or **As Left** from the drop down or enter your own text.

7. If the same tool has other conformance data to put on the same certificate, press Select Results

This feature allows clockwise & anti-clockwise as well as 'as found' & 'as left' results to be included on the same certificate.

To add another conformance test to the same certificate double click on the required results.

8. Select Equipment tab

Select the Measurement / Display Device Serial Number from the drop down list.

Select the Transducer Serial Number from the drop down list.

Check the current certificate numbers are correct and that the uncertainty values are correct. If not, correct them in the Measurement Device and Transducer registers.

Certificate	Equipment	Readings	
Measurem	ant / Display i	Device	
S	enal Number	90350	
	Model	43258	
	Certificate :	117233	
Expanded	Uncertainty :	0.14	
ransducer			
S	erial Number	12345	
	Model	50593.LOG	
	Certificate :	222222	
Expanded	Uncertainty :	0.25	
Uncerta	inty Interval :	0.37	

#### 9. Select Readings tab

Press 'Start RS232 Capture' button

Perform conformance test, sending readings via RS232

A reading can be deleted by pressing the 'Delete Last Reading' button

	Equipment	Readings				
Readings						
Torq	Je					
	1.000 N·m	0.000	0.000	0.000	0.000	0.000
1	2.000 N·m	0.000	0.000	0.000	0.000	0.000
2	0.000 N·m	0.000	0.000	0.000	0.000	0.000
St	op RS232 Ca	pture	elete Last Re	ading		

Continue taking readings until the conformance test is complete

ertificate Equipment F	Readings		
eadings			
Torque			
1.000 N·m	1.008 1.013	1.019 1.028	1.057
12.000 N·m	12.026 12.030	12.044 11.862	11.720
20.000 N°m	19,136 19,324	20.437 20.763	21.035
Start RS232 Capt	ure Delete Last Read	ding	

#### 10. Press 'Create Certificate' button

Norber Torque Toels D	ecla	n accordance Declaratio	with ISO 67	89-1-2017				1/
Customer :		tion Lab					7054	
Model : Measurement Range :	11034	20.000 N·m		Serial No : nspector :			7951 )K	
Date of Test : 18/07/2017 As Found				Direction :			c	lockwise
Set Torque		Min	Max		Actu	al Readin	ngs	
	1.000	0.960	1,040	1.008	1.013	1.019	1.028	1.057*
1	2.000	11.520	12.480	12.026	12.030	12.044	11.862	11.720
2	0.000	19,200	20.800	19.136*	19.324	20.437	20.763	21.035
The maximum permissible de The test was performed at an	e marked eviation	d with an aste of ±4% is in a t temperature	risk (*) accordance e between	with ISO	6789-1:20 28°C and	017	77.971	
The measurement system us	e marked aviation a ambier e maxim SED 43258 No : 903 ate : 112 DG 5222	d with an aste of ±4% is in a ti temperature num relative h 50 2233	risk (*) accordance e between uumidity did	with ISO 18°C and not excer	6789-1:21 28°C and ed 90%	017 did not fi	uctuate b	
The maximum permissible de The test was performed at an than ±1°C during the test. The Quality Manager : JDK MEASUREMENT SYSTEM U Measurement Device Serail N Measurement Device Certific Transducer Model : 50593.LC	e marked aviation a ambien e maxim ISED .43258 No : 903 alte : 112 OG 22 ed for th error of o f the to error of	t with an aste of ±4% is in a it temperature uum relative h 50 2233 iis conforman the measure orque tool the measure	risk (*) iccordance a between uumidity did ce test con ment syste ment syste	with ISO 18°C and not excer nplies with m does no m is 0.120	6789-1:2/ 28°C and ed 90% In the require the require the exceed	017 did not fi	of ISO	y more
The maximum permissible de The test was performed at an than ±1°C during the test. The Quality Manager ; JDK MEASUREMENT SYSTEM U Measurement Device Model ; Measurement Device Certific Transducer Model : 65093.LC Transducer Serial No. : 12345 Transducer Serial No. : 12345 Transducer Certificate : 2222 The measurement system us 6789-1.2017 Section 6.1 The maximum measurement The maximum measurement	e marked aviation ambier e maxim ISED .43258 No : 903 ate : 112 OG 22 ed for th error of of the to error of y interva	t with an aste of ±4% is in a it lemperature it more attraction is conformant the measure orque tool the measure of the measure it of the measure	risk (*) incoordance s between numidity did ce test com ment system ment system ment system	with ISO 18°C and not excer nplies with m does no m is 0.120 /stem is 0.	6789-1:2/ 28°C and ed 90% h the requ of exceed 1% 407%	017 did not fi	of ISO	y more

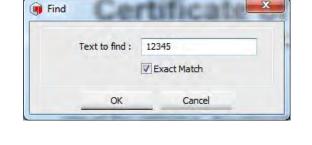
## CERTIFICATES

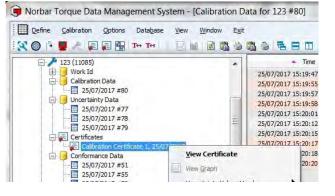
#### **View Certificate**

 Find the tool in the left pane. If required the left pane right mouse button menu and select Find Certificate to search.



2. Select certificate then either double click or select **View Certificate** from the right mouse button menu





3. The certificate is shown in the right pane

There are 3 types of certificate:-

- a. ISO 6789-2:2017 Certificate of Calibration
- b. ISO6789-1:2017 Declaration of Conformance
- c. Non-ISO Certificate of Calibration

They are all formatted differently and contain different information depending on their requirements.

An ISO6789 tool may contain ISO 6789:2017 certificates of calibration and/or declarations of conformance under its 'certificates' folder.

A Non-ISO 'Other' type tool can only contain non-ISO certificates of calibration under its 'certificates' folder

The ISO 6789:2017 certificates and conformances have additional statements which are required by the standard. ISO 6789-2:2017 Certificates of Calibration also have 'Expanded Uncertainty' and 'Uncertainty Interval' columns which are calculated from the actual readings and the tools uncertainty values stored in its tool template.

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4. To view the tools uncertainty values which were used to generate a specific certificate, select 'Uncertainty Values Used' and then 'View' from the right mouse button menu.



	Mean	Expanded Uncentain t		Uncertain	ty Interval	
).641	19.981	3.3	389%		3.676%	
).445						
	expected relat	nterror, ±3.00 ive un certain t				
an the e ween 18		ive un certaint	y interv	val ±3.000	0% for	
an the e ween 18	expected relati 3°C and 28°C	ive un certaint	y interv Print Hide	val ±3.000	0% for	View

The 5 uncertainty values shown are the values which were stored in the respective tool template at the time the certificate was generated.

There are also options to 'Copy' the values to the clipboard or 'Print' them from the same right mouse button menu.

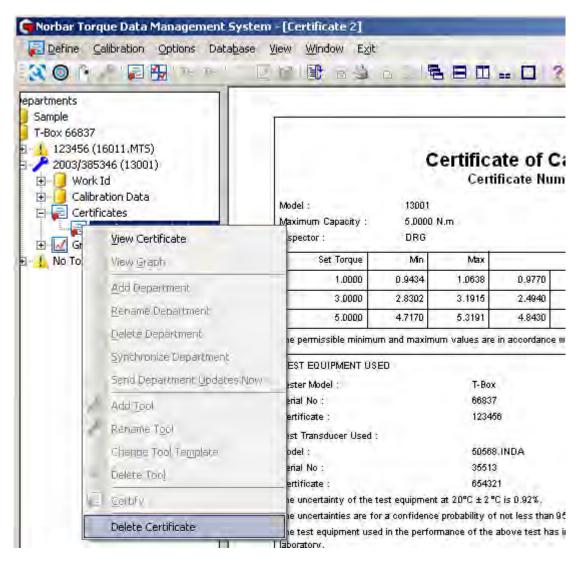
If the uncertainty values for a particular model of tool changes (e.g. more data is collected and more accurate values are calculated) later certificates of the same tool may use slightly different uncertainty values, but a snap shot of the values used for each certificate is stored and can be reviewed as described above for traceability.

Note: ISO 6789-1:2017 Declarations of Conformance and Non-ISO Certificates of Calibration don't use tool uncertainty values, so the 'View', 'Copy' and 'Print' options from the above right mouse button menu will be greyed out.

5. Certificates with Setting Values (e.g. P.S.I.) rhar **Certificate of Calibration** can have the 'Set Torque', 'Min' & 'Max' **Certificate Number : 2** columns made invisible by selecting 18102 B06 Senal No 54479 1.000 0 N m Inspector iK. 'Hide 'Set Torque' etc.' from the right mouse button menu 16/06/2016 Date of Calibration Direction Clockwa As Found Set Torque Mi Ma 4.7 200.0 190.0 210.0 206.1 205.6 205.3 205.8 205.4 1,000.0 20.9 1,030.0 1,029.1 1,029.9 1,026.3 1,015.1 TEST EQUIPMENT USED Tester Model T-Box Serial No 89913 1 en Test Transducer Used Model 60242 Serial No 12345 The uncertainty of the test equipment at  $20^{\circ}$  C  $\pm 2^{\circ}$ C is 0.92% The uncertainties are for a confidence probability of not less than 959 The test equipment used in the performance of the above test has tional traceability through an accredited labo orbar Certificate of Calibration Certificate Number : 2 18102 B06 Serial No. 54479 Model Maximum Capacity 1.000.0 N.m Inspector JK Date of Calibration 16/06/2016 Direction Clockwise As Found PSI Actual Readings 4.7 206.1 205.6 205.3 205.4 205.8 20.9 1 0 3 0 0 1 029 1 1 029 9 1 026 3 1 015 1

#### **Delete Certificate**

- 1. Find the tool in the left pane.
- 2. Select certificate, then select Delete Certificate from the right mouse button menu





3. Select Yes, No or Cancel.

## View Air Pressure Graph

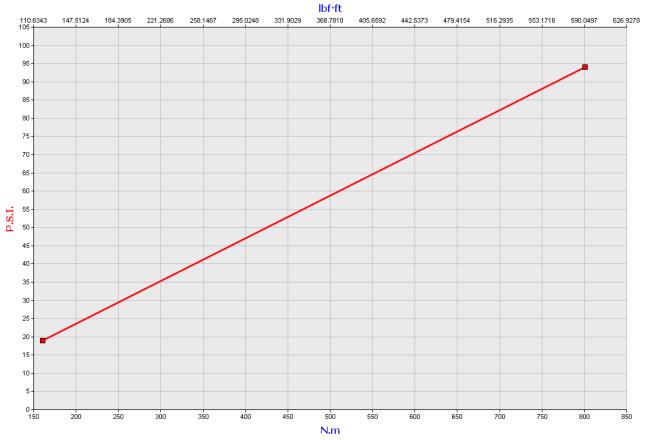
- 1. Find the tool in the left pane.
- 2. Select certificate then right click to View Menu.

Select View P.S.I. Graph.

TIP: Only one air pressure graph can be created from each certificate. If more than one graph is required then create separate certificates.

🗬 Norbar Torque Data Management	System - [123456 -
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Departments     Sample     T-Box 66837     T23456 (16011.MT5)     Calibration Data     T-ID Calibration Data	70,3
1 2003/ View Certificat	e
🕀 🦺 No To View P.S.I. Gra	aph

123444 - 15/05/2014 15:18:19



3. Right click on the graph to show **Print** or **Copy to Clipboard** options.

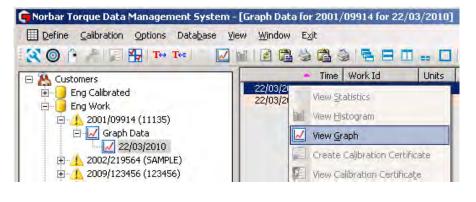
## GRAPHS

- 1. Use T-Box XL<sup>™</sup> 'Graph' mode to take results & transfer results to TDMS.
- 2. Find the tool in the left pane.
- 3. Find the graph data then double left click or press + to expand.
- 4. Select graph then double left click right click to View Menu.

Select View Tests.

5. Select result (in right pane) and right click to view menu.

Select View Graph (or select *M* icon).



6. The graph is shown. Place mouse pointer on graph line to view time / torque / angle data.



Graphs taken and saved on the T-Box XL<sup>™</sup> can be sent to TDMS as Torque vs Time, or Torque & Angle vs Time.

7. Right click on the graph to show a drop down menu.

View options include: View as Torque/Angle v Time View as Torque v Angle View as Torque v Speed.

- 8. The **Print** option will send the graph to a printer.
- 9. The Copy to Clipboard option will send the graph to the clipboard.

~	View as Torque/Angle v Time View as Torque v Angle	
6	View as Torque v Speed Print	
	Copy to Clipboard Export Data	

10. The Export Data option will allow the graphs raw data to be saved as a text file (.txt) or commaseparated values file (.csv) for use in other programs (e.g. Microsoft® Excel®)

An example of a View as Torque v Angle is shown below:



# 2001/09914 - 22/03/2010 14:34:40

## **OPTIONS MENU**

## **USB** Synchronization Options

This option controls the data (Tools, Tool Templates, Targets, Transducers, Test Data (Work ID), Calibration Data and Graphs) sent between TDMS & T-Box XL<sup>™</sup>. Use the **Synchronize Now** and **Send Updates Now** options to control the data sent between single or multiple T-Box XLs.

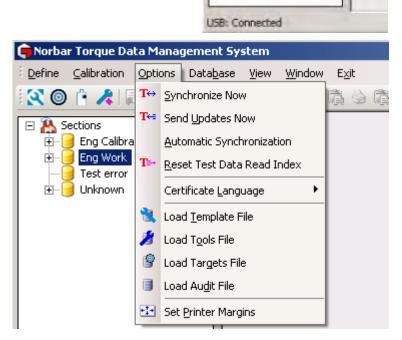
- 1. Ensure TDMS is connected to T-Box XL<sup>™</sup>, see bottom left of TDMS screen.
- 2. Select Options
- 3. Select Automatic Synchronization.

#### If Automatic Synchronization is turned On:

Data is sent from the T-Box XL<sup>™</sup> into TDMS and then TDMS sends back any differences (for Tool, Tool Template, Targets & Transducers data) to the T-Box XL<sup>™</sup>.

#### If Automatic Synchronization is turned Off:

Data is sent manually using **Synchronize Now** or **Send Updates Now**.



- 4 Select **Synchronize Now** (or select <sup>T↔</sup> icon) to:
  - **a.** Send data from T-Box XL<sup>™</sup> to TDMS.
  - b. Send any differences (Tool, Tool Template, Targets & Transducers) from TDMS to T-Box XL™.

This is a manual synchronize and would normally be used after a Send Updates Now has been performed.

 Select Send Updates Now (or select <sup>T</sup>← icon) to: Send data (Tool, Tool Template, Targets & Transducers) from TDMS to T-Box XL<sup>™</sup>.

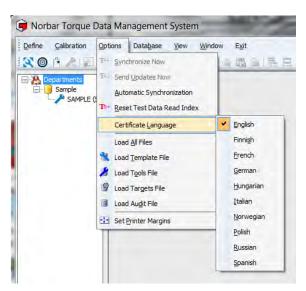
#### NOTE: The old T-Box XL<sup>™</sup> data will be overwritten.

When changes are made in TDMS (to Targets, Tool Templates, Tools, etc) use **Send Updates Now** to download these changes to T-Box  $XL^{TM}$ .

These options are only active when '**USB Connected**' is shown in the bottom left hand corner of TDMS after connecting to a T-Box  $XL^{M}$ .

## Change Certificate Language

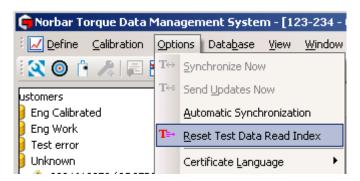
The language will change for all New and Archived Calibration Certificates.



Select **Options** then select **Certificate Language** then select language.

TIP: If a certificate was open before the language change, close the certificate and re-open.

### Reset Test Data Read Index



This should only be selected if you are experiencing loss of data transfer between the T-Box XL<sup>™</sup> and TDMS using either USB synchronization or a USB stick.

Every piece of test data T-Box XL<sup>™</sup> stores has a unique ID in increasing values. So that only the latest data is transferred, TDMS only requests test values with an ID greater than the one it last read for that T-Box XL<sup>™</sup> serial number. When you do a reset it sets this read ID to zero so all test data is transferred. However it also stores the test ID and won't duplicate data it already has stored.

# TIP: If you have already synchronized T-Box XL<sup>™</sup> to TDMS and select Reset Test Data Read Index, the next time that you synchronize with TDMS, some data may be duplicated.

# COPY FROM USB STICK OPTIONS

For remote data transfer (without a USB cable) the data can be sent via a USB stick (memory drive).

#### The files on the USB stick include:

WARNING:

File name	Contents
xxxxxxAudit.txt	Stores the T-Box XL <sup>™</sup> results (data). Where xxxxxx represents the T-Box XL <sup>™</sup> serial number.
Instrument.txt	Stores the instrument settings (not used by TDMS).
Targets.txt	Stores the targets.
Template.txt	Stores the tool templates.
Tools.txt	Stores the tools.
Transducers.txt	Stores the transducers (not used by TDMS).



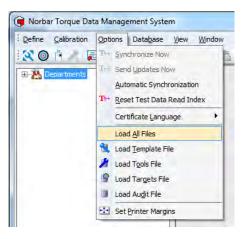
IT IS IMPORTANT THAT FILES ARE LOADED IN THE CORRECT SEQUENCE. IF YOU HAVE CREATED A TOOL, TOOL TEMPLATE OR TARGET SINCE YOUR LAST SYNCHRONIZATION WITH T-BOX XL<sup>™</sup>, THEY MUST BE LOADED IN THE FOLLOWING ORDER:

Tool Template.txt, Tool.txt, Target.txt and finally XXXXXAudit.txt

#### NOTE: If no Tools, Tool Templates or Targets have been created, the user can just load the Audit file.

### Load All Files

1. Select **Options** then select **Load All Files.** 



2. Browse to the required file then select **Open**.

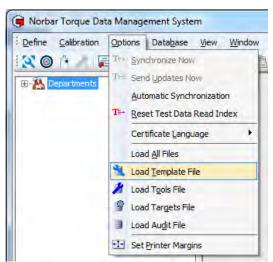
Select XXXXXXAUDIT file & open.

All files will be loaded.

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NELWOIK	Files of type:	Data Files (*.txt)	•	Cancel
		Open as read-only		

## Load Template File

1. Select **Options** then select **Load Template File**.

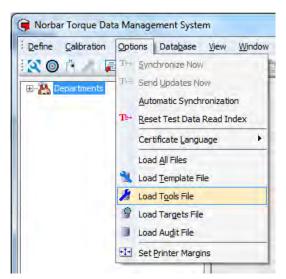


2. Browse to the Template.txt file then select Open.

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My Computer	File name: Files of type:	Templates.to Data Files (* Den as	-			•		Open Cancel

## Load Tools File

1. Select **Options** then select **Load Tools File**.

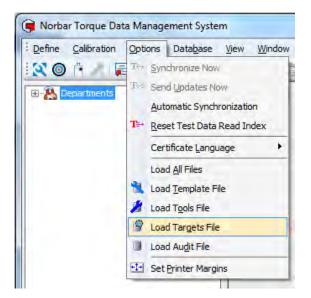


2. Browse to the **Tools.txt** file then select **Open.** 

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	File name:	Tools.txt			•	Open
My Computer	Files of type:	Data Files (*.txt)			-	Cancel
-		🗖 Open as read	-only			

## Load Targets File

1. Select **Options** then select **Load Targets File**.

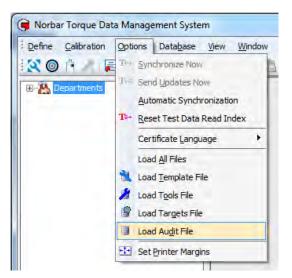


2. Browse to the Targets.txt file then select Open.

Load Targets File	i i	_		_	? ×
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My Computer	File name: Files of type:	Targets.txt Data Files (*.txt)		•	Open Cancel

### Load Audit File

1. Select **Options** then select **Load Audit File**.



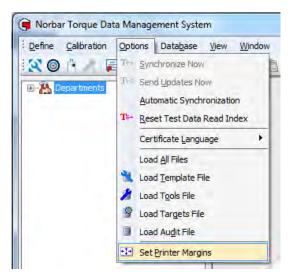
2. Browse to the XXXXXAudit.txt file (where XXXXXX is the T-Box XL<sup>™</sup> serial number) and select Open.

Load Audit File				-		? X
Look in:	USB DISK	(Q:)	•	Ó Ø	*	
My Recent Documents Desktop My Documents	66841 11feb 66841 11feb 66840Audit. 66840Audit. graph_66843 HyperAccess Instrument.t Targets.txt Targets.txt Tools.txt Transducers	txt txt LAudit.txt : License Codes.txt xt xt				
	File name:	66841Audit.txt			•	Open
My Computer	Files of type:	Data Files (*.txt)			-	Cancel
-		🔲 Open as read-only				

## Set Printer Margins

To ensure compatibility with different printers where printouts of reports do not fit on the page:

1. Select **Options** menu then select **Set Printer Margins**.



2. Enter desired values then select **OK**.

Printer Margins		×
If your printer is printing ov adjust these values. All v		
Extra left margin :	۵	
Extra right margin :	0	
Extra top margin :	0	
Extra bottom margin :	0	
ОК	Cancel	

## DATABASE MENU

### Database / Backup

It is recommended to backup the database regularly for security purposes and before updating the TDMS software. Select **Database** menu then **Backup**. Enter file name and select **Save**.

Define Calibration Option	ons Database View Window Exi
🗶 💿 🕴 🥒 📰 🔛	T- ●→ Backup
Departments	• Restore
	Reload Standard Templates
	Update Application

### Database / Restore

Select Database menu then Restore. Select stored file and select Open.

### Database / Reload Standard Templates

The standard templates are built into the TDMS software. Should templates be lost / deleted use this feature to restore the standard templates. Select **Database** menu then **Reload Standard Templates**.

0	Note: this function will R	EPLACE any existi	ng templates with the	same name; any changes you have	e made will be lost.
U	It will NOT remove or all	er any other temp	lates.		
		to proceed?			
	Are you sure you want	to proceed:			

#### Select **Yes** to reload the templates.



You will then be asked whether to 'Keep uncertainty data' or not.

If you select 'Yes', any uncertainty values you have added or changed in any of the standard tool templates will be kept.

If you select 'No', any uncertainty values you have added of changed in the any of the standard templates will be lost and reset to their default values.

### Database / Update Application

Using this feature T-Box XL<sup>™</sup> software can be updated.

- 1. Ensure current T-Box XL<sup>™</sup> is software 2.X.X.X or later. If not contact Norbar for assistance.
- 2. Connect T-Box XL<sup>™</sup> to computer using USB cable.
- 3. In TDMS select Database and Update Application.
- 4. Browse to the new application file.
- 5. Select **NorbarTTCE6.exe** file & click open.

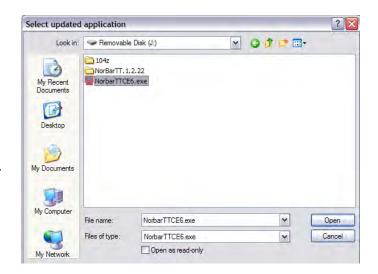
The application will load...

Uploading Application
12%

When complete you will be prompted to power cycle the T-Box XL<sup>™</sup>.



6. The T-Box XL<sup>™</sup> will then ask if you want to 'Use Installed Update?' Select 'Yes'.



## **VIEW MENU**

The **View** menu uses the Information in the right pane.

Ensure the right pane contains the required information before using the View menu.

#### 📻 Norbar Torque Data Management System - [Graph Data for 2009/259849 f Define Calibration Options Database View Window Exit View Graph 🔍 🔘 🕒 T+ T+= N Refresh F5 E 🎦 Sections 19/0 🖻 📙 Eng Calibrated 🔁 Copy to Clipboard 19/0: 2009/259849 (13001) 🗟 Print 🖻 📙 Calibration Data 19/03/2010 #13 Copy Selection to Clipboard 🗄 \overline E Certificates Print Selection E-N Graph Data 19/03/2010

View Option	Details
	Select graph in the left pane, so details appear in the right pane.
View Graph	Select <b>View</b> then select <b>View Graph</b> (or select 屋 icon). The graph is shown in the right pane.
Refresh	Select <b>Refresh</b> to redraw the current window.
Copy to Clipboard	Select <b>Copy to Clipboard</b> to copy the data in the right hand pane, so it is available and paste into another application such as Microsoft <sup>®</sup> Excel <sup>®</sup> or Word <sup>®</sup> etc
Print	Select <b>Print</b> to print the right hand pane.
Copy Selection to Clipboard	Select Copy Selection to Clipboard to copy selected data.
Print Selection	Select Print Selection to print selected data.

## WINDOW OPTIONS MENU

Select **Window** menu then select desired window option (or select icon). Select best option for the windows in use.

Define Calibration Option	ons Data <u>b</u> ase <u>V</u> iew	Window Exit	_
🕄 🔘 🖪 🧶 🗐 🔛	ाम्स 🔟 🛛 🖃 ना	🔁 Cascade	3
A Departments	Time	Tile Horizontally	Trans
New Department	26/05/2009 08:46:45	Tile Vertically	
🗄 🧧 Sample	26/05/2009 08:46:48 26/05/2009 08:46:50	Arrange Icons	
SAMPLE (SAMPL	26/05/2009 08:46:53 26/05/2009 08:46:55	Close All	
<u>1</u> 123456 (16045) <u>1</u> 2003/385346 (1	26/05/2009 08:46:58 26/05/2009 08:47:00	1 Tests for 2003/385346 for Work Id <none></none>	
Work Id	26/05/2009 08:47:03	4.9920 N·m Clockwise	

## **Currently Open Windows**

The current open windows are shown at the bottom right of the TDMS screen.



Click on icon to open window.

## ABOUT TDMS

Select the (1) icon on the TDMS shortcut bar.

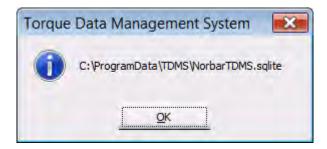
The software version number will be shown.

$\wedge$	Norbar TDMS
and the first of a	Version 4.0.29
Norbar Torque Tools	Copyright © 2009-2018 Norbar Torque Tools, all rights reserved.
www.norbar.com	This software is based in part on the work of the Independant JPEG group and of the Freetype Team.

Click **OK** to cancel.

Click **Database File...** to show where the TDMS database is stored.

The default location is:



NOTE: For 64 bit versions, this may be shown as C:\ProgramData(x86)\TDMS\NorbarTDMS.sqlite

# **KEY TO SHORTCUT ICONS**

These can be used for quick selection from the shortcut bar.

lcon	Shortcut to
2	Define Tool Templates (Ctrl+E)
0	Define Targets (Ctrl+G)
Ê.	Define Transducers (Ctrl+D)
	Define Measurement Devices
*	Add Tool
<b>F</b>	Calibrate (Via RS232) (Ctrl+T)
<b>a</b>	Conformance (Via RS232)
<b>M</b>	Calibration Options (Ctrl+O)
T↔	Synchronise Now
T⇔≡	Send Updates Now
Σ	View Statistics
$\checkmark$	View Graph
	View Histogram
¢	Refresh (F5)
<b>Ē</b>	Copy All to Clipboard
1	Print All
<b>(2</b>	Copy Selection to Clipboard
<b>S</b>	Print Selection
•	Cascade Windows
	Tile Windows Horizontally
	Tile Windows Vertically
==	Arrange Iconized Windows
	Close All Windows
0	About TDMS
67	Exit TDMS

# TROUBLE SHOOTING

Problem	Likely Solutions
TDMS displays <b>USB</b> detected / Not	Unplug the USB Host lead, wait at least 10 seconds and re-insert whilst TDMS has been launched and T-Box XL™ is displaying the Measure screen (Hot-Plug).
<b>Connected</b> and will NOT synchronize with T-Box XL™.	Ensure that you disconnect from USB correctly before removing the lead. Click on 'Safely Remove Hardware' in the bottom right hand corner of your desktop if this option is available to you.
Data does not transfer between T-Box XL™ and TDMS	After installing new T-Box XL <sup>™</sup> software and perhaps TDMS software, if you restore an earlier backup of TDMS and then take some new data on the T-Box XL <sup>™</sup> , the data will NOT get transferred to TDMS when you <b>Connect</b> using active sync or <b>Load</b> from USB stick.
	You will have to use " <b>Reset Test Data Read Index</b> " before synchronizing or loading from USB.
Certify option is always greyed out	No valid COM port has been selected in Calibration Options.
	NOTE: Newer laptop computers are not equipped with an RS232 port and this option will always be greyed out.
	In this case you can use an additional RS232 to USB converter. When you have installed the driver on your computer, use the Device Manager to confirm which COM port has been allocated to you converter. Select the same COM port (Serial Port) in the TDMS Calibration Options.
Certify error message	If a message box appears with Wrong Units – you have said they are N·m but the data is returning "1", this can be fixed by removing Time and Date in the serial output set up.
Searching for the Work Id "none"	When searching for the Work Id "none", you must enter the greater than & less than arrows before and after i.e. <none></none>
Windows <sup>®</sup> 7 Installation	A message box comes up after WMDC installation saying "USB Drivers were not installed". This is Microsoft bug and the T-Box XL™ will synchronize with TDMS.
Takes a long time to transfer Logging data.	It is much quicker to transfer logging data to TDMS via USB stick rather than synchronizing with T-Box XL™.
"Add Tools" is greyed out	Select a department in the left pane.
On preview cannot zoom out	Press <b>SHIFT</b> on the keyboard to change $\bigoplus$ to $\bigcirc$ .
Cannot preview all pages	Press PAGE UP & PAGE DOWN keyboard buttons.

# GLOSSARY OF TERMS

Word or Term	Meaning
#	Number
As Found	Calibration before adjustment.
As Left	Calibration after adjustment.
Capacity	Transducer full scale.
Certificate of Calibration	Document containing the results of an ISO 6789-2:2017 calibration or non-ISO calibration
Declaration of Conformance	Document containing the results of an ISO 6789-1:2017 conformance test
Department	Name of structure in left pane to store data. Can be renamed 'Customer' or other reference.
ISO 6789	Hand torque tool ISO Standard. Has been updated from ISO 6789:2003 to ISO6789:2017, which is now in 2 parts.
ISO 6789-1:2017	Part 1 of the latest version of the Hand torque tool ISO standard. Specifically refers to design conformance
ISO 6789-2:2017	Part 2 of the latest version of the Hand torque tool ISO standard Specifically refers to calibration and measurement uncertainty
My Tools	Database of the tools used.
Rated Capacity	Tool maximum value
SMART Transducer	A transducer that holds its own calibration data (INTELLIGENT).
Snug Torque	Torque value to start measuring angle.
SPC	Statistical Process Control, a method of quality control using mathematical equations.
Target	Torque or Angle value required. Each Target has an Upper Limit and a Lower Limit.
T-Box	Torque measurement instrument.
T-Box XL™	Update of T-Box with larger display.
TDMS	Torque Data Management System – Software included for PC use.
Tool	A reference to the tool being calibrated or used. Eg.: Torque wrenches, PneuTorques, Electric tools, Torque screwdrivers, etc.
Tool Stop	An output used to provide a stop signal for an external pneumatic, hydraulic or electric tool.
Tool Templates	A template holding full details of the tool. All Norbar tools are included.
ТооІ Туре	Classification from ISO 6789.
USB	Universal Serial Bus.
Work Id	Work identification - the reference to the task, application or job. E.g.: a bolted flange, engine cylinder head, vehicle wheel nuts, etc.



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