


TORQUE CERTIFICATION SYSTEM (TCS)
For Use with TCS Software (Version 2.0.X)



1 / 1

Calibration Services Ltd
Calibration Street
Labtown
CL12 3AB

Declaration of Conformance
In accordance with ISO 6789-1:2017
Declaration Number : 7

Customer : Tool Supplies
Address : Tool Street
Tooltown
TO13 4SW

Model : 11034 Serial No : 32145
Measurement Range : 1.000 - 20.000 N·m Inspector : JDK

Date of Test : 08/08/2017 Direction : Clockwise
As Left

Set Torque	Min	Max	Actual Readings				
1.000	0.960	1.040	0.942*	0.966	0.972	1.028	1.045*
12.000	11.520	12.480	12.248	12.338	12.455	12.583*	12.422
20.000	19.200	20.800	19.261	19.101*	19.735	20.905*	20.658

Out of tolerance readings are marked with an asterisk (*)

The maximum permissible deviation of ±4% is in accordance with ISO 6789-1:2017
The test was performed at an ambient temperature between 18°C and 28°C and did not fluctuate by more than ±1°C during the test. The maximum relative humidity did not exceed 90%

Test carried out by : Calibration Services Ltd
Quality Manager : JS
MEASUREMENT SYSTEM USED
Measurement Device Model : 43258
Measurement Device Serial No : 90350
Measurement Device Certificate : 654984
Transducer Model : 50772.LOG
Transducer Serial No : 12345
Transducer Certificate : 324567
The measurement system used for this conformance test complies with the requirements of ISO 6789-1:2017 Section 6.1
The maximum measurement error of the measurement system does not exceed ¼ of the maximum permissible relative deviation of the torque tool
The maximum measurement error of the measurement system is 0.140%
The measurement uncertainty interval of the measurement system is 0.409%
The uncertainties are for a confidence probability of not less than 95%.
Laboratory No : 763

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INTRODUCTION

The Torque Certification System (TCS) is PC software designed with a user friendly interface that will enable certificate generation and archiving for all types of torque tools.

Departments (or Customers) can be created and Tools added to them. The method of calibrating a Tool is defined in the Tool Template and each Tool must have a Tool Template attached to it. Norbar Tool Templates come as part of the software and non Norbar Tool Templates can be generated and then attached to Tools.

TCS uses a serial interface for connection to Norbar instruments with an RS232 output. Calibration Certificates can be generated as the values are sent from the instrument in real time.

Note: TCS can be used to generate Declarations of Conformance to ISO 6789-1:2017, but not Calibration Certificates to ISO 6789-2:2017.

FEATURES AND FUNCTIONS

- Norbar standard Tool Templates for N·m, lbf·ft, lbf·in & kgf·cm are supplied pre-loaded.
- Serial Port connection to Norbar instruments such as TTT, TST, Pro-Test & TruCheck™ Plus with an RS232 output.
- Database for archiving of calibration certificates for Torque Tools.
- Multilingual Calibration Certificate (English / Finnish / French / German / Hungarian / Italian / Norwegian / Polish / Russian / Spanish).
- Declaration of Conformance templates to ISO 6789-1:2017
- Calibration certificate templates for PneuTorques, etc.
- Compatible with Windows® XP, 7, 8.1 & 10

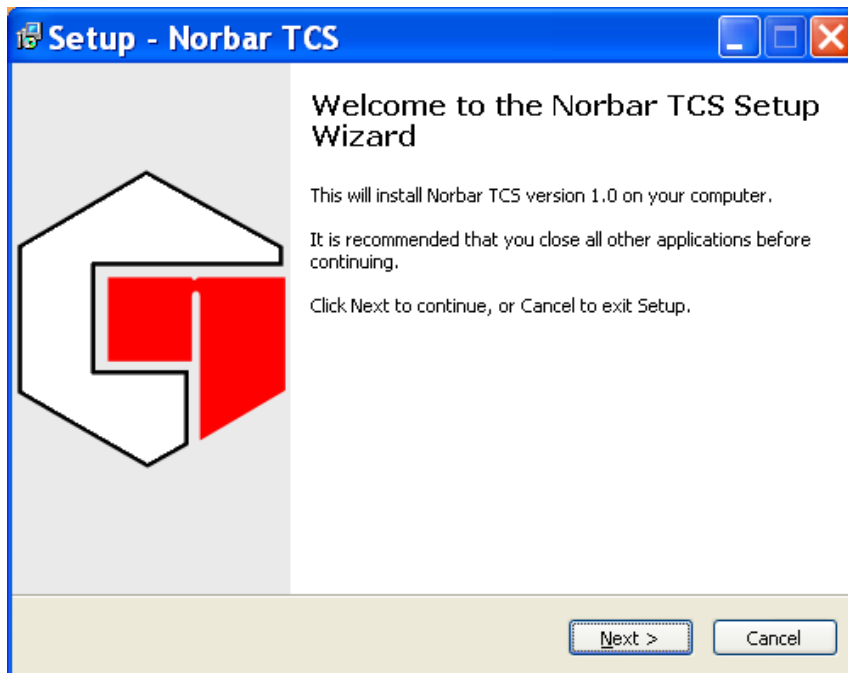
INSTALLING TCS

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

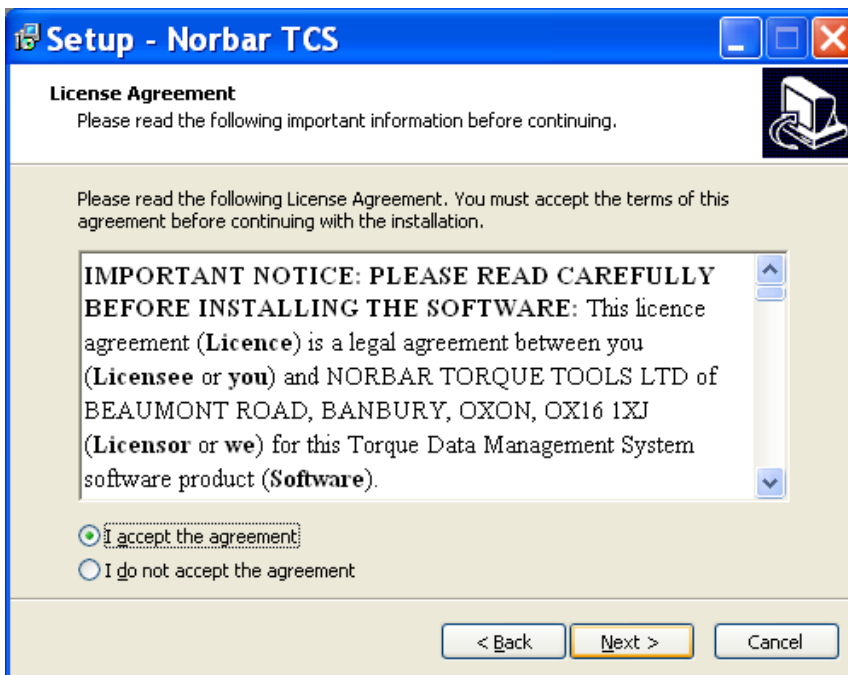
Download TCS from the Norbar website (www.Norbar.com). Go to the Products tab and click to select “Calibration Certificate Software” and then follow the on screen instructions.

Double left click on **SetupNorbarTCS20X** (where X represents the latest software revision number) in your installation directory and follow the on screen instructions.

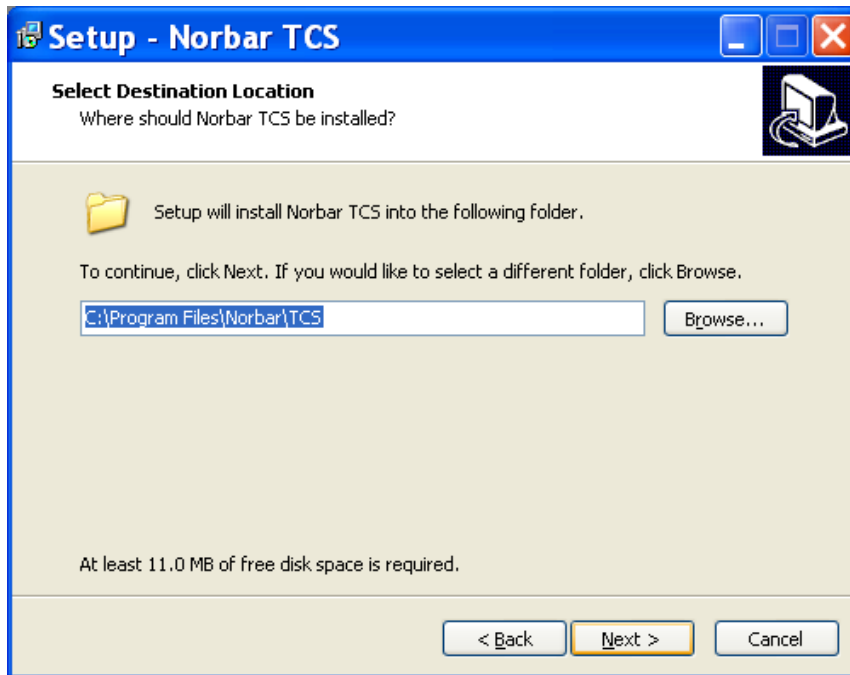
TIP: Backup your database before uninstalling your old version of TCS. Use the restore database option after your new version of TCS has been installed. See page 45



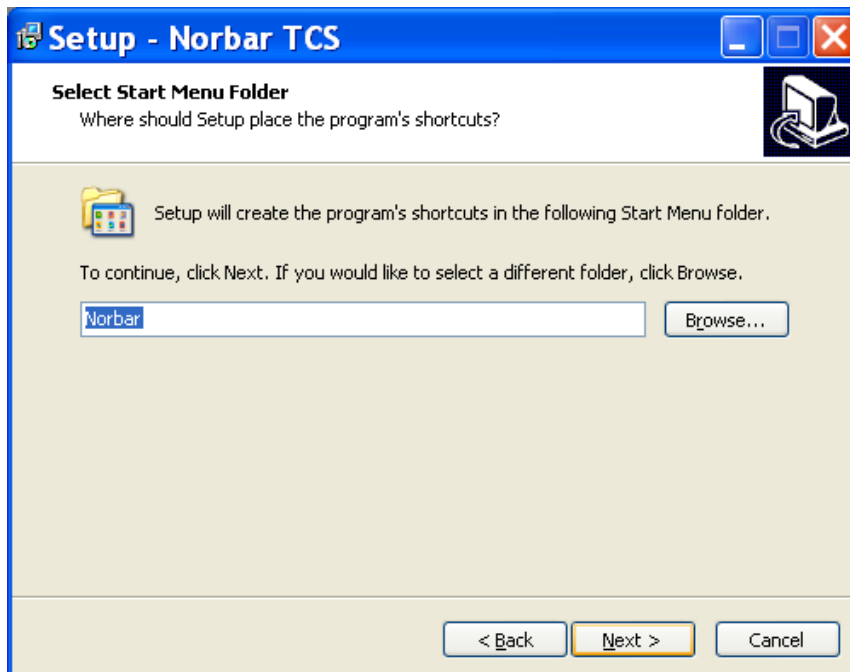
Left click on **Next**.



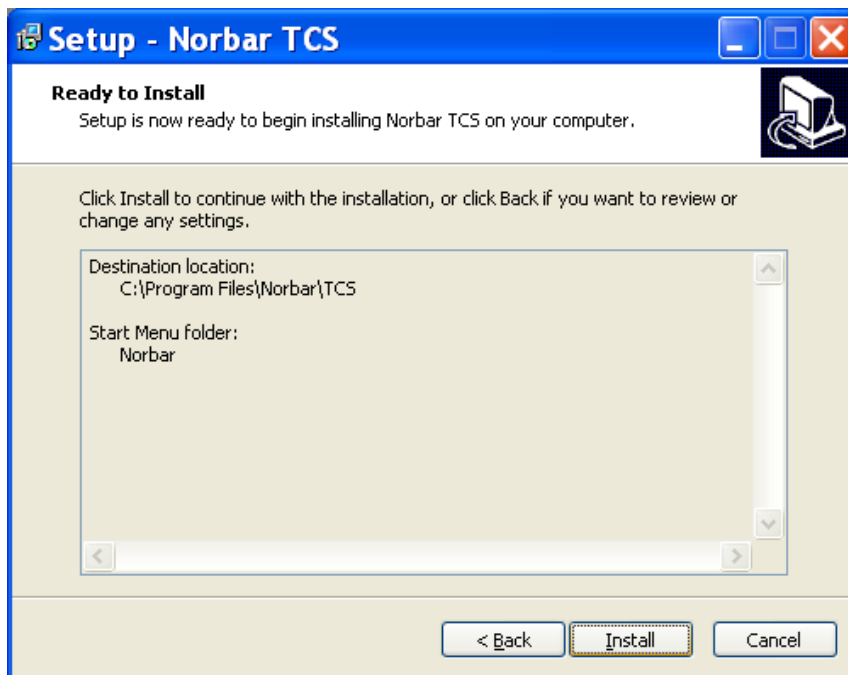
Read the Licence agreement and left click on **I accept the agreement** if you wish to proceed, then left click on **Next**.



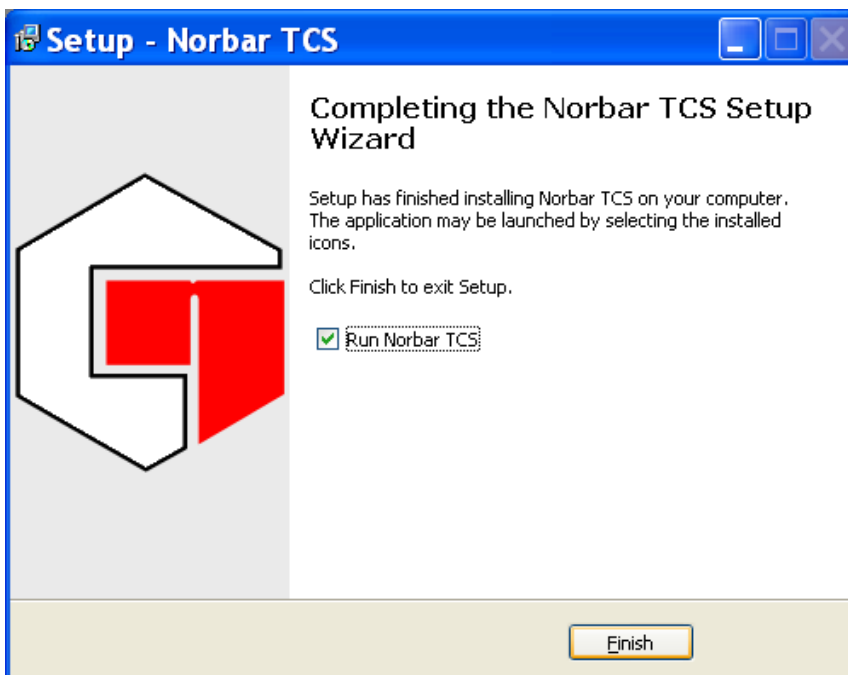
NOTE: For 64 bit versions the destination location will be C:\Program Files (x86)\Norbar\TCS. Change location and \ or left click on Next.



Change the folder name and / or left click on **Next**.



NOTE: For 64 bit versions the destination location will say **C:\Program Files (x86)\Norbar\TCS**. Left click on **Install** to install TCS onto your computer.



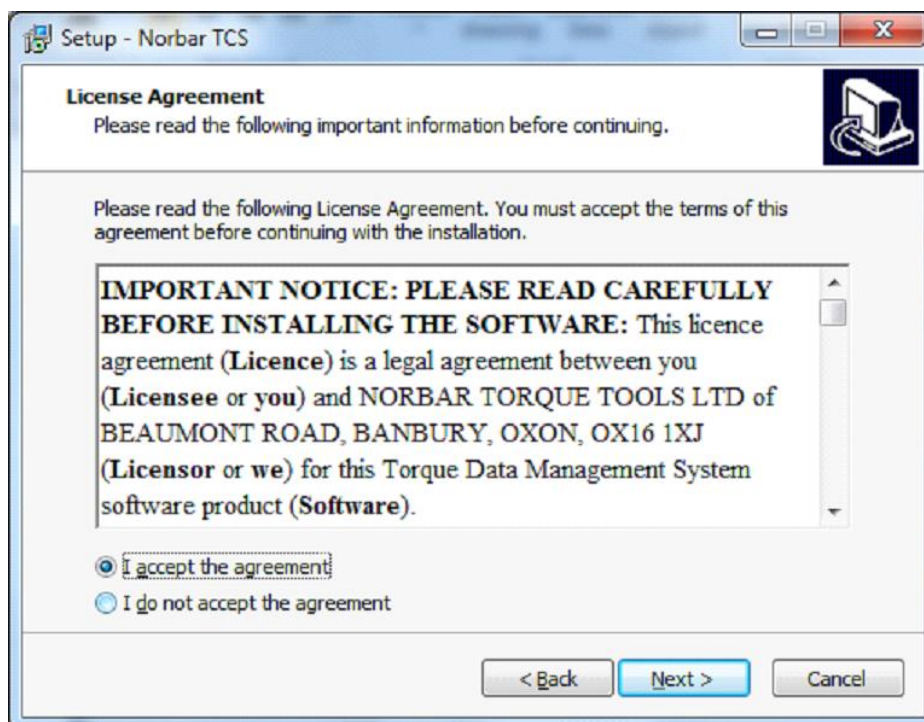
Left click on the option required, and then left click **Finish**.

After Installation a TCS icon will be placed on the desktop.

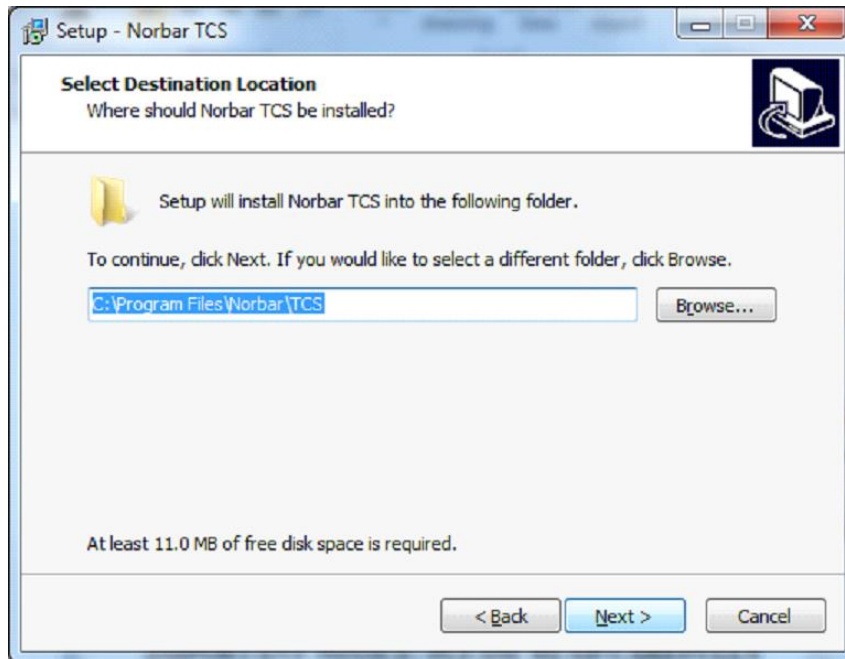
Windows® 7, 8.1 & 10



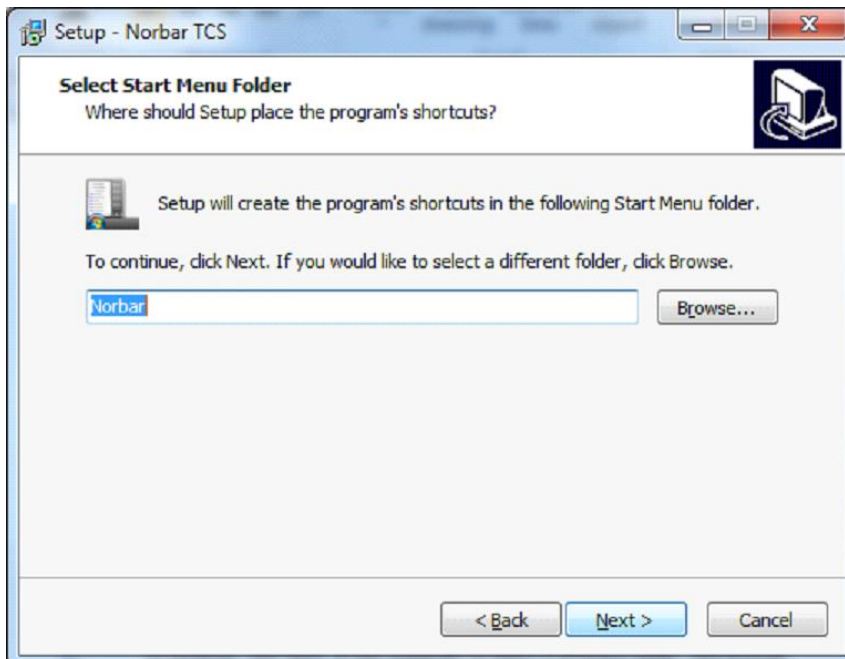
Left click on **Next**.



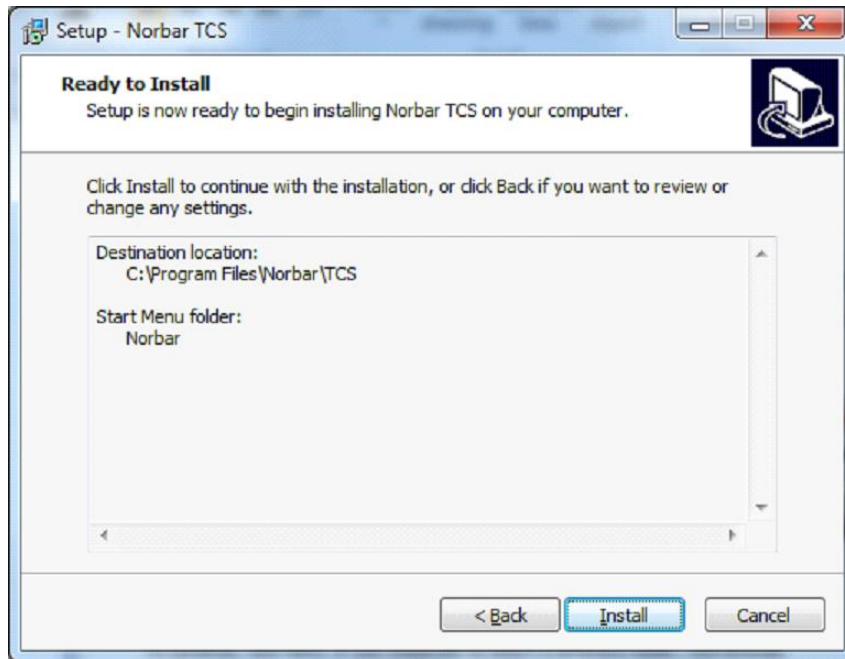
Read the Licence agreement and left click on **I accept the agreement** if you wish to proceed, then left click on **Next**.



NOTE: For 64 bit versions the destination location will say C:\Program Files (x86)\Norbar\TCS. Change location and / or left click on Next.



Change the folder name and / or left click on **Next**.



NOTE: For 64 bit versions the destination location will say C:\Program Files (x86)\Norbar\TCS. Left click on Install to install TCS onto your computer.

After installation a TCS icon will be placed on the desktop.

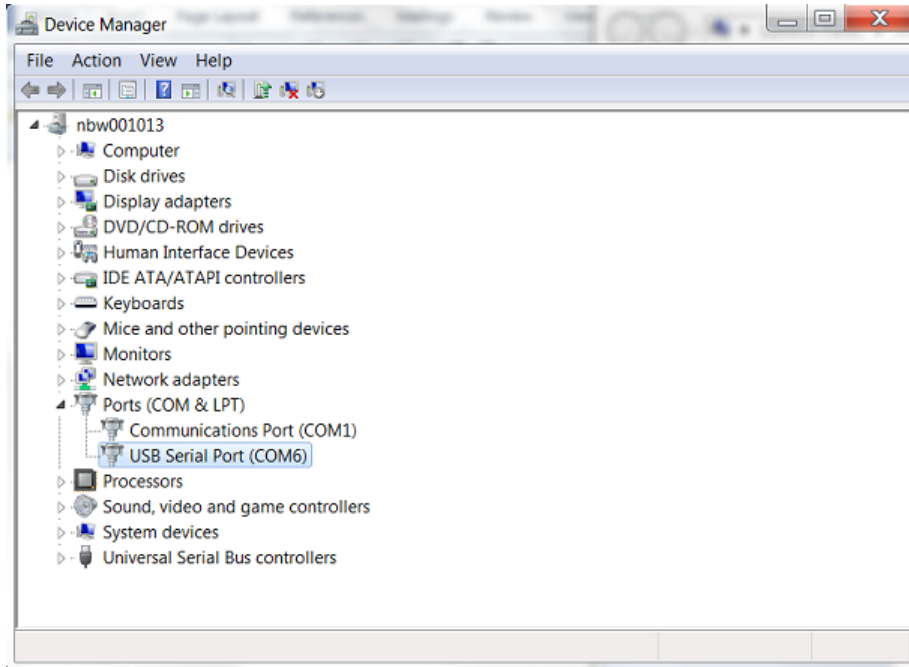
CONNECTING NORBAR TORQUE MEASURING INSTRUMENTS TO TCS

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

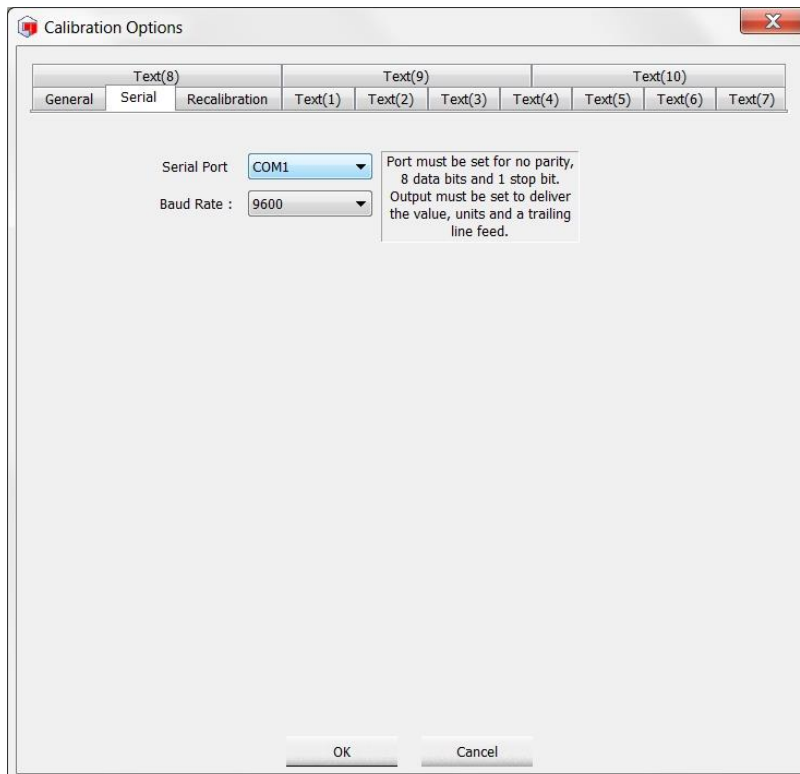
Instruments manufactured before 2005 that were not supplied with a serial data lead will require a 'Serial Data Lead Kit' part number 60248.

RS232 to USB Convertor

PC's without an RS232 interface connector can be connected to instruments with an RS232 connector using a commonly available RS232 to USB converter (not supplied). After installation of the converters driver software on your PC, navigate to the device manager to view the Com Port that has been assigned to the converter as shown below.



The same Com Port must be specified in the TCS calibration options as shown below. For more information on Calibration Options, see page 35.



STARTING TCS

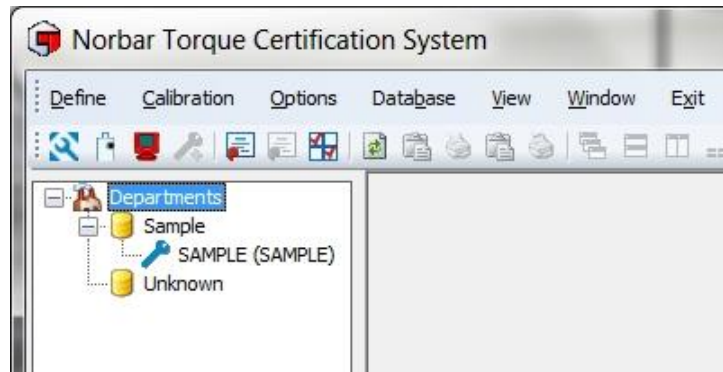
- 1) Start TCS by double left clicking on the desktop icon.



- 2) The Initializing TCS message box will be shown. Wait until initialization has finished.



- 3) Screen shown on power up with Sample Department and Tools added.



TIP: Left click ICON on shortcut bar for quick selection of Tool Templates etc.

TCS 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.

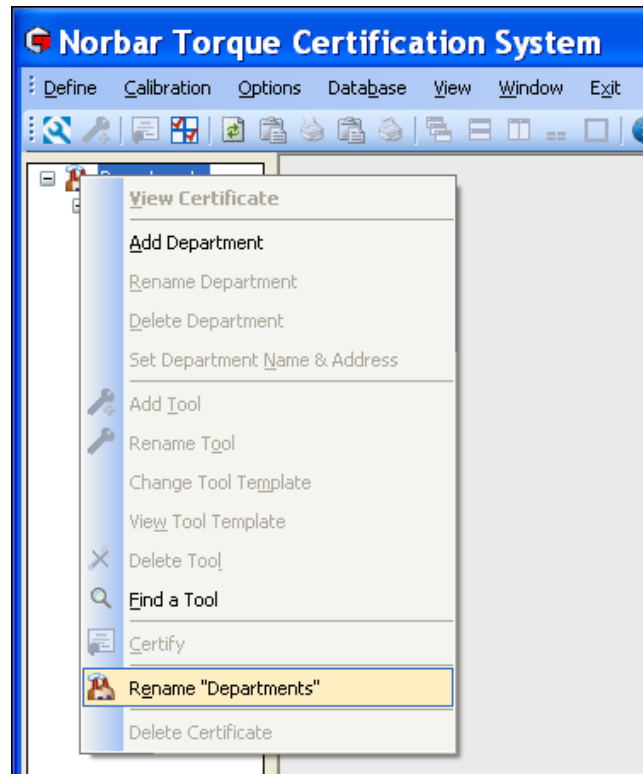
TIP: Delete or rename the Sample Department if it is not required.

DEPARTMENTS (CUSTOMERS)

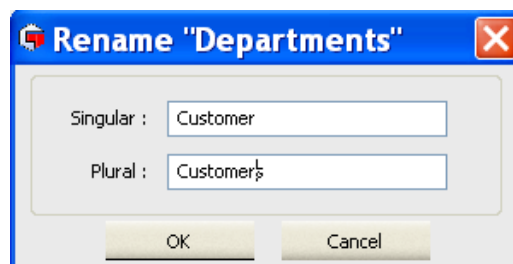
After installation of TCS, the default name is "Departments".

Rename Departments (Customers)

Departments can be renamed to anything you choose, but this has been primarily designed to be customers. Typical applications may be to use "Departments" for a single Factory environment and use "Customers" for a Calibration lab environment.



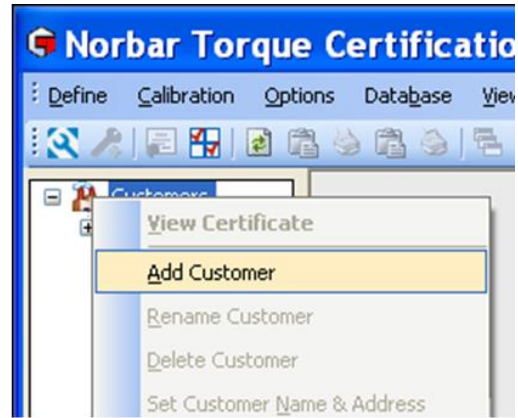
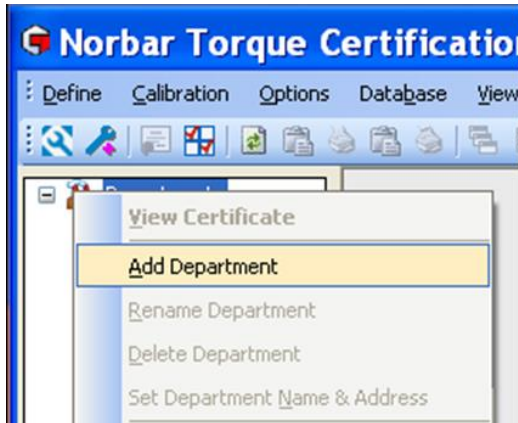
- 1) Left click on the **Departments** icon.
- 2) Right click on **Rename Departments**.



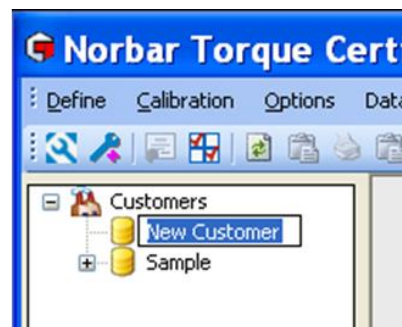
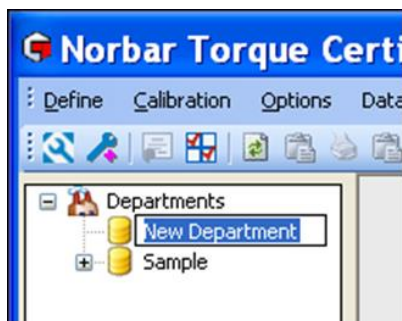
- 3) Enter required text and click **OK**.

Add Department (Customer)

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



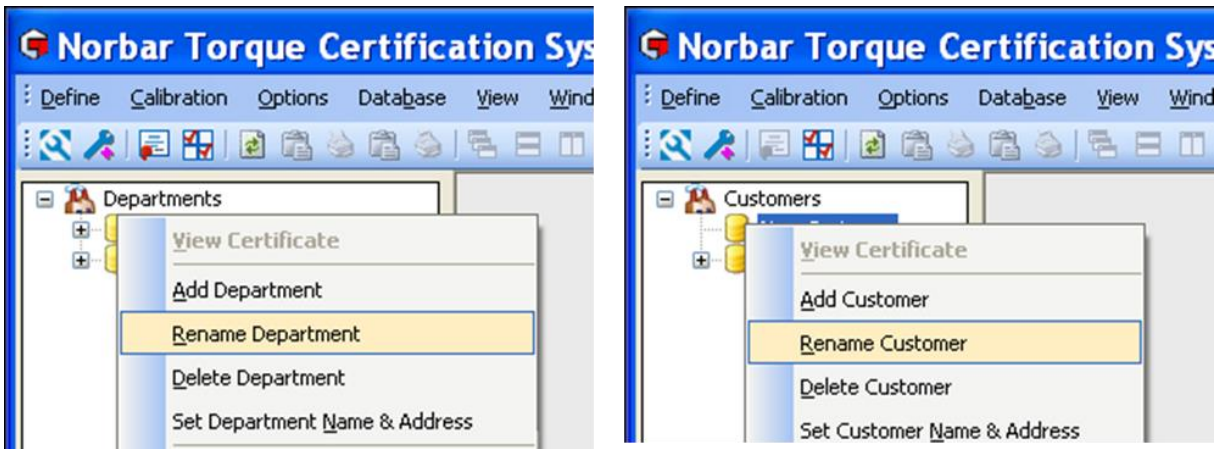
- 3) Type in your required Department (Customer) name or identification and press Return.



TIP: Departments (Customers) can also be added by right clicking on an existing Department (Customers) icon and selecting Add Department (Add Customer) from the drop down menu.

Rename Department (Customer)

- 1) Right click on the required Department (Customer) you wish to rename, and then left click on **Rename Department (Rename Customer)** on the drop down menu.

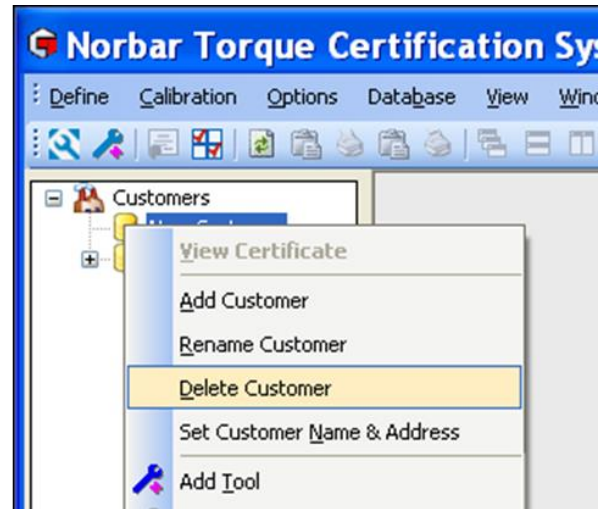
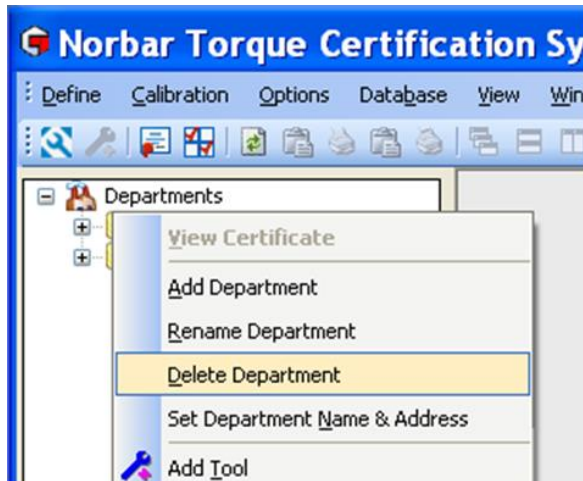


- 2) Type in the new Department (Customer) name or identification and press return.



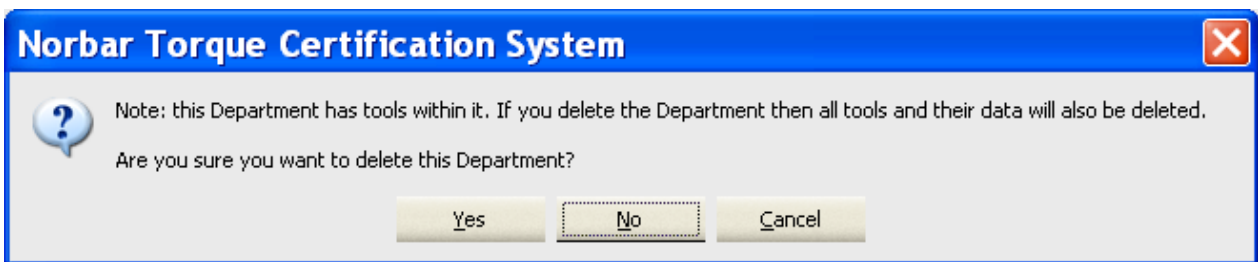
Delete Department (Customer)

- 1) Right click on the required Department (Customer) you wish to delete.



- 2) Left click on **Delete Department (Delete Customer)** on the drop down menu.

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

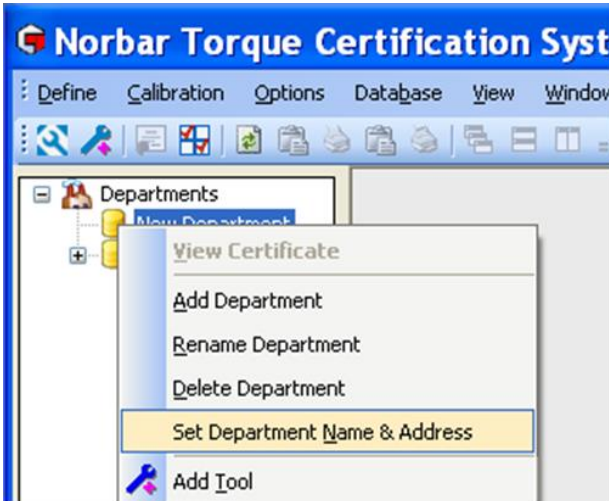


- 3) Left click on the required option **Yes, No** or **Cancel** as required.

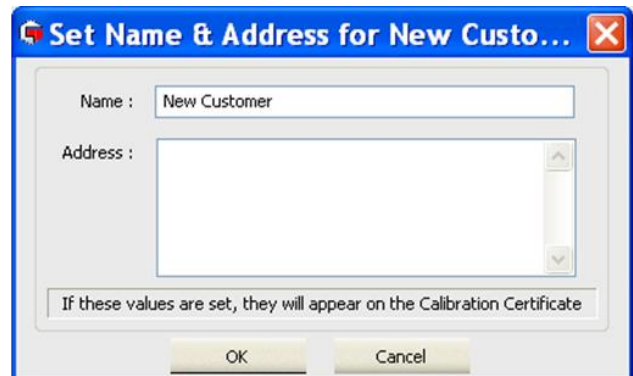
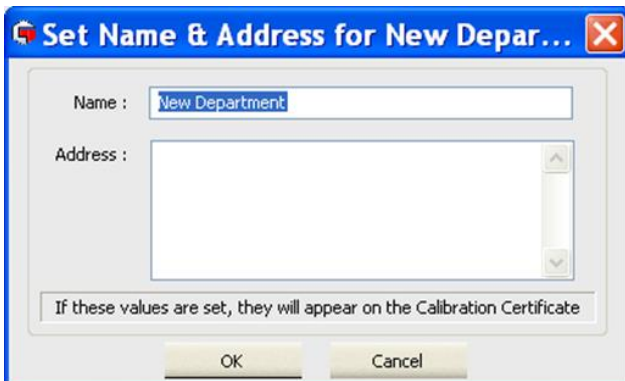
Set Name & Address for Department (Customer)

This will be added to any calibration certificates created for a Tool for that Department (Customer).

- 1) Right click on the Department (Customer) you wish to add an Address for.




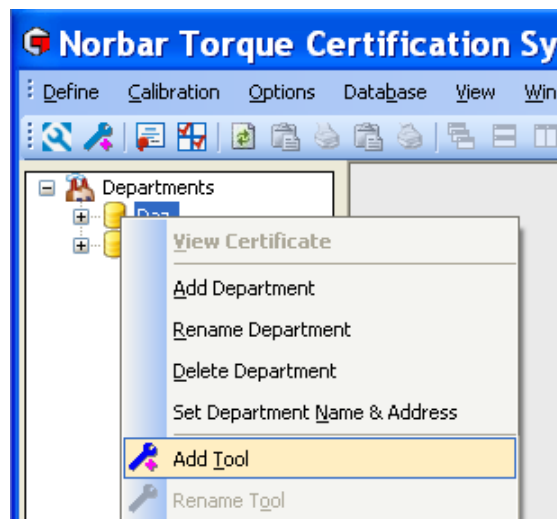
- 2) Left click on **Set Department (Customer) Name & Address** on the drop down.



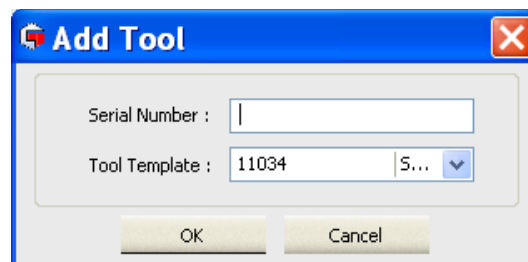
- 3) Click in the Address space and type required text, then press **OK**.

Add Tool to a Department (Customer)

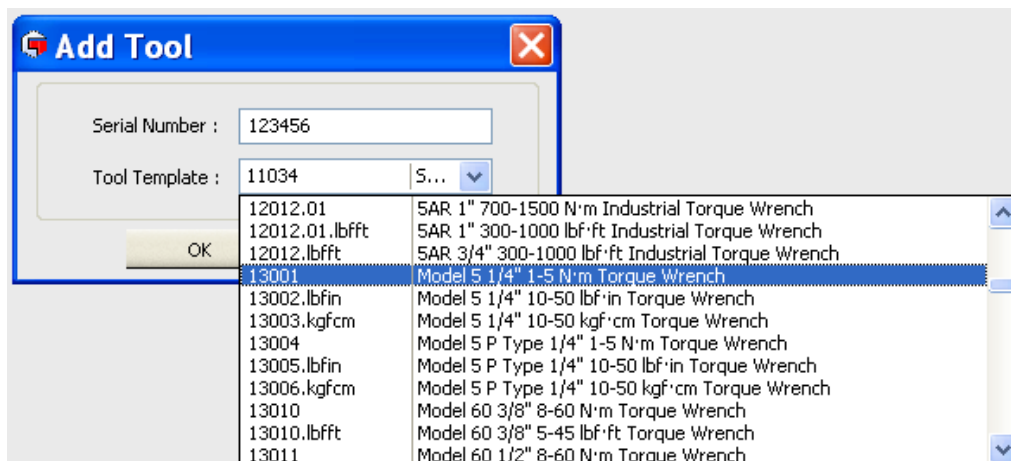
- 1) Right click on a Department (Customer) and left click on **Add Tool** from the drop down menu or left click on the  icon on the TCS tool bar.



- 2) Enter the **Tool Serial Number** which could be entered with a bar code reader (not supplied).




- 3) Choose a **Tool Template** for the drop down menu to assign to that tool.

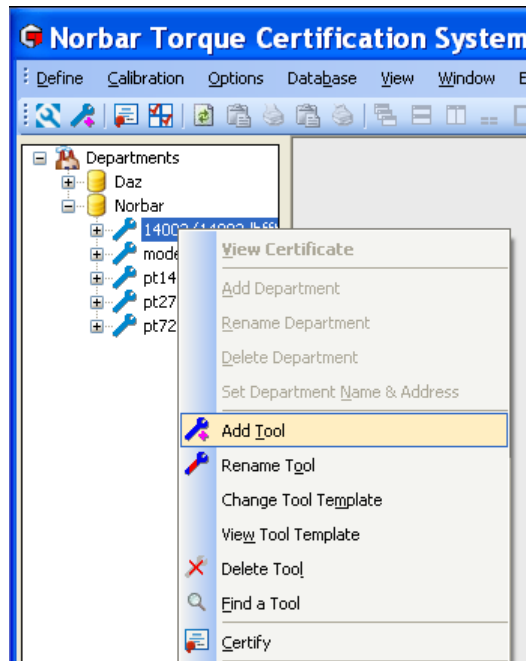


- 4) Press **OK** to add the Tool to the Department (Customer).

TIP: Tools and their associated certificates 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. Alternatively left click on the short cut icon  on the TCS tool bar to Add a Tool.

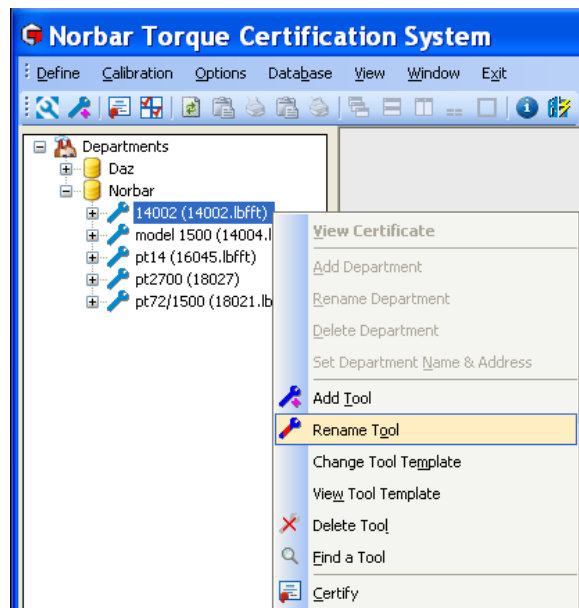


Add Tool

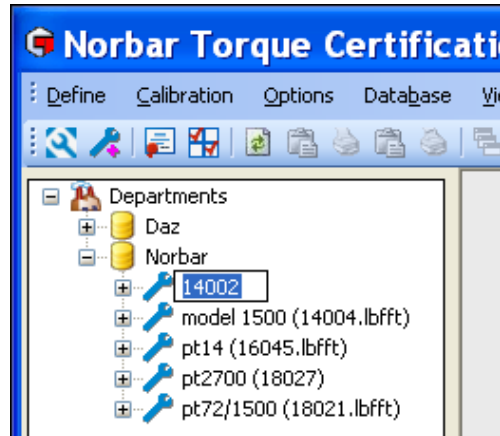
The procedure for adding a tool is specified on page 17.

Rename Tool

- 1) Right click on the **Tool** you wish to **Rename** in the left hand tree structure.
- 2) Left click on **Rename Tool** on the drop down menu.

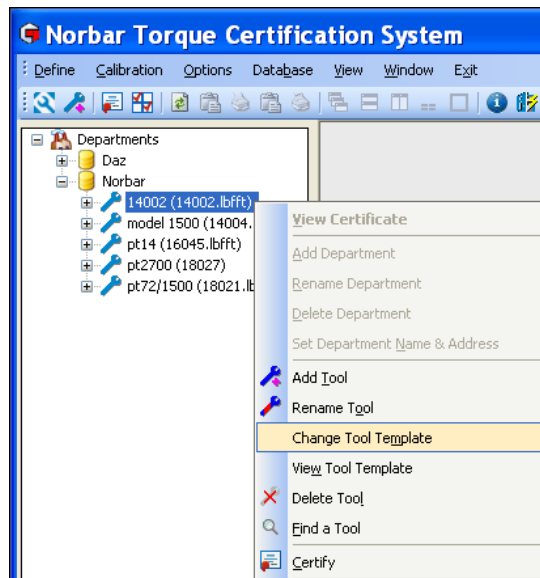


- 3) Type in required serial number and press Enter.

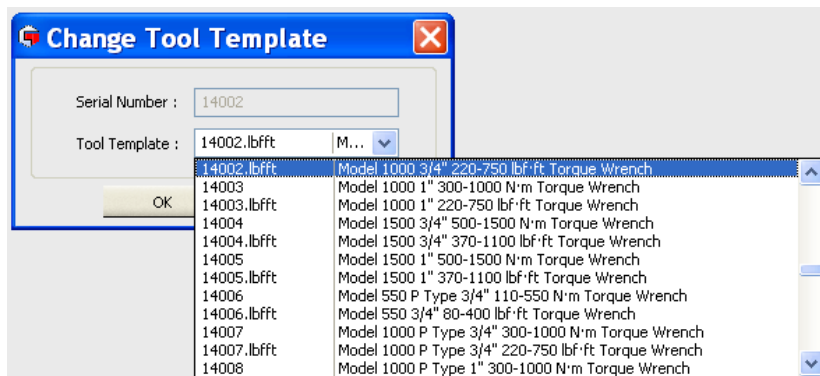



Change Tool Template

- 1) Right click on a **Tool** you wish to change the **Tool Template** for, to select that Tool.



- 2) Left click on **Change Tool Template** on the drop down menu.



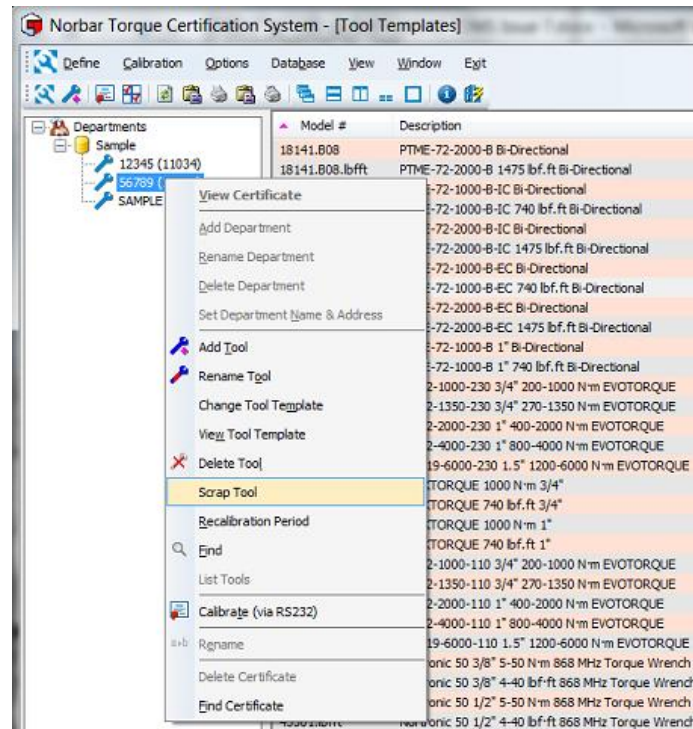
- 3) Left click on the Tool Template drop down , then left click on the required **Tool Template** to select it.
- 4) Press **OK** to finish.

View Tool Template

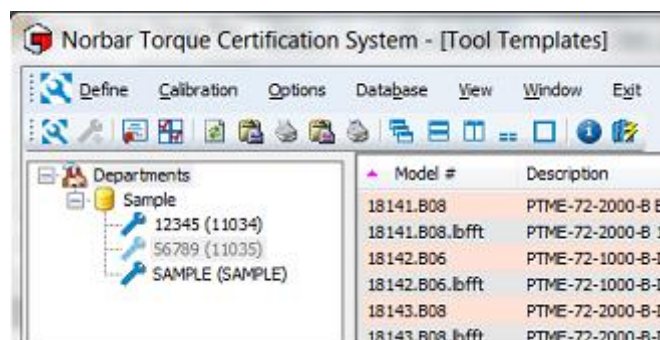
- 1) Right click on a **Tool** you wish to view the **Tool Template** for.
- 2) Left click on **View Tool Template** on the drop down menu.
- 3) Press **OK** to finish.

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

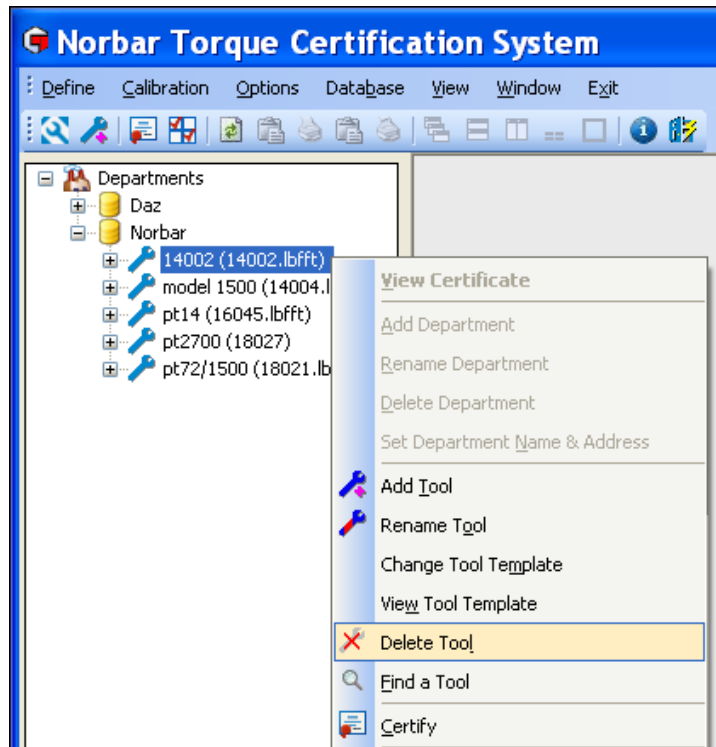


- 3) The tool will no longer be included in any lists (e.g. Tools requiring Recalibration list), but any tool data will be kept for future reference.

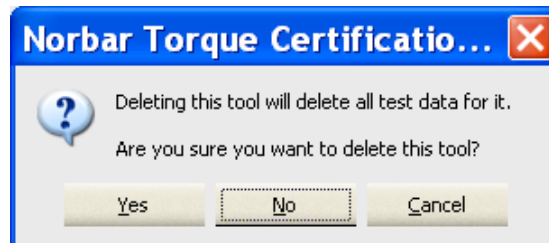
A tool can be 'Un-Scrapped' by selecting **Scrap Tool** from the drop down menu again.

Delete Tool

- 1) Right click on a **Tool** you wish to **delete** to select that Tool.



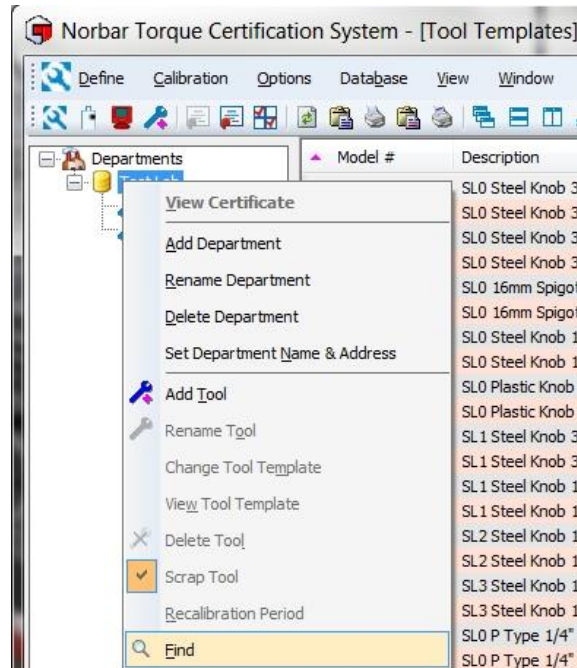
- 2) Left click on **Delete Tool**. The screen below will be shown if you have previously created certificates for that Tool.



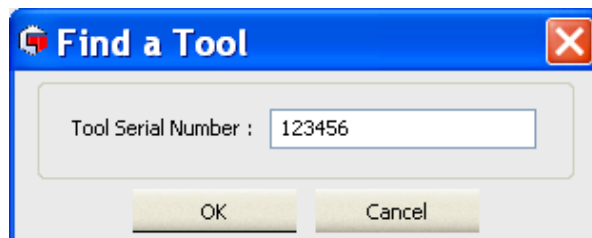
- 3) Left click on **Yes**, **No** or **Cancel** as required.

Find a Tool

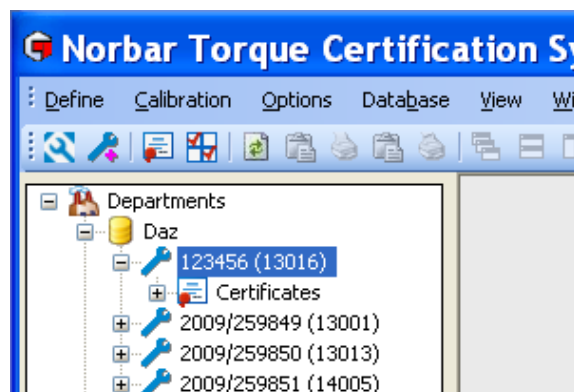
- 1) Right click on Departments in the left hand tree structure, and then left click on **Find** on the drop down



- 2) Enter the **Tool Serial Number** and left click on **OK**.

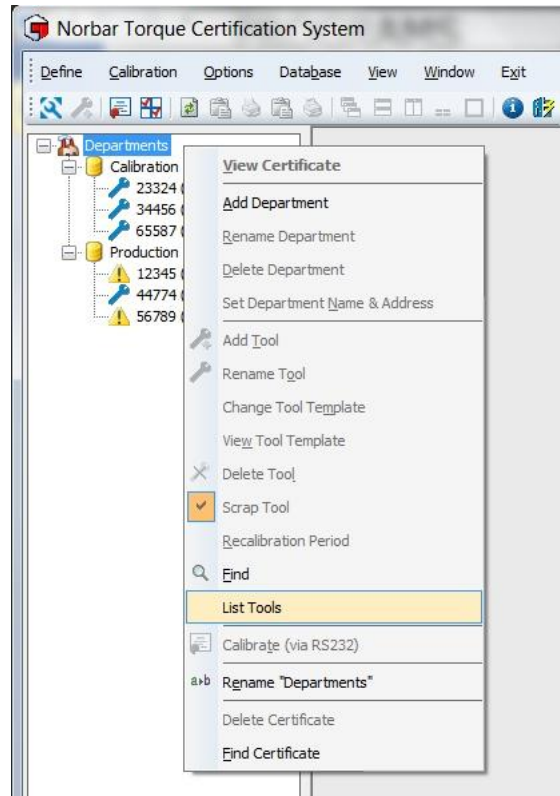


- 3) The required Tool will be highlighted in the left hand tree structure.

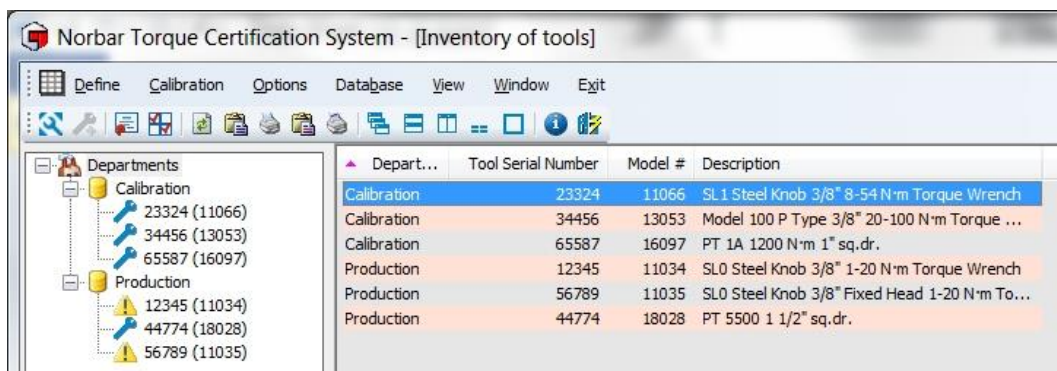


Tool Lists

- 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

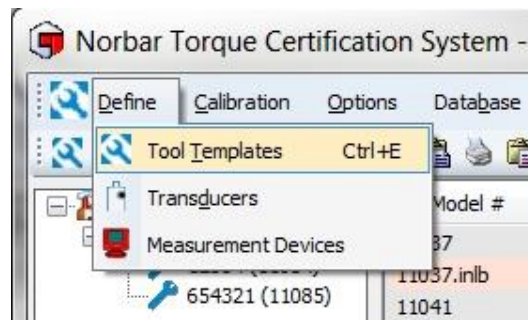
There are 2 variants of Tool Template – ‘ISO 6789’ for Torque Wrenches and Torque Screwdrivers and ‘Other’ Type Tool Templates for PneuTorques etc.

The Tool Template defines how the Conformance test or Calibration is to be performed i.e. how many set points and the number of readings at each set point.

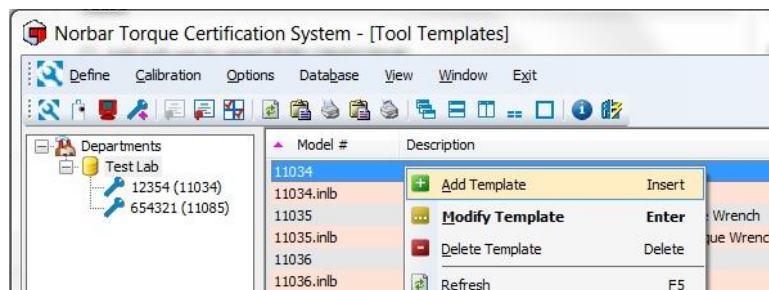
TIP: To reduce the number of Tool Templates you have to scroll through, delete the ones you do not require.

Add Tool Template

- 1) Left Click on the **Define** tab on the main title bar to show the dropdown menu and then left click on **Tool Templates**. Alternatively left click on the short cut icon  on the TCS tool bar. The Tool Templates will be listed in the right hand pane.



- 2) The list of Tool Templates is shown below.



- 3) Right click in the stored Tool Templates window and left click on the **Add Template** from the drop down menu.

Model # :

Description :

Tool Type: ISO 6789 Type I Class A

Rated Capacity : 0.000 N.m

Set Points (%) 20 60 100 0 0


Number of Tests 5

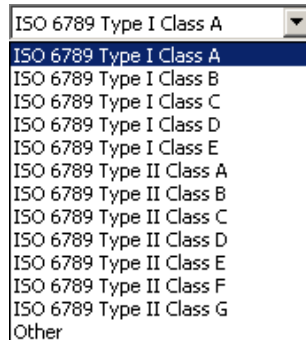
Upper Limit 6 %

Lower Limit 6 %

End fitting length : mm

Expected measurement error


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

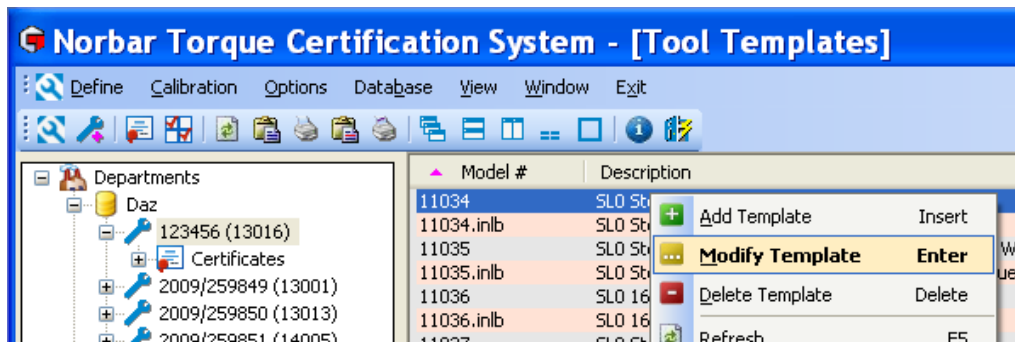


See page 33 for definition of ISO 6789 Hand Tool classes.

- 6) Enter the **Rated Capacity** and torque **units**.
- 7) Click in each of the **Set Point (%)** to change if required.
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.
- 8) Enter **Number of Tests**. This is the number of readings taken at each Target value.
This is greyed out for 'ISO 6789' Tool Types.
- 9) 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.
- 10) 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.
- 11) If the tool uses an interchangeable end fitting, enter the effective **End Fitting Length** and **Units** (mm or inch)
- 12) Enter **Expected measurement error**. This is the expected maximum percentage error of reading for this model of tool.
This is greyed out for 'Other' Tool Type.
- 13) Left click **OK** when finished.


Modify Tool Template

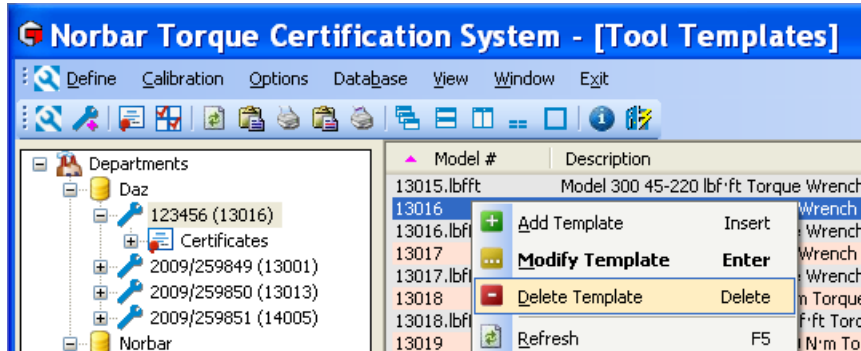
- 1) Left Click on the **Define** tab on the main title bar to show drop down menu, then left click on **Tool Templates**. Alternatively left click on the short cut icon  on the TCS tool bar.



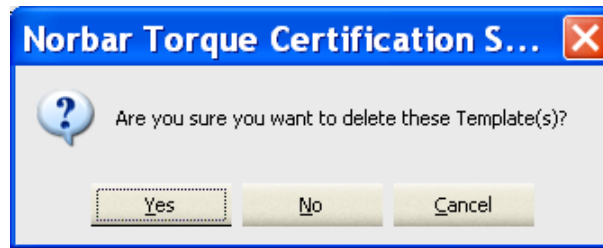
- 2) Right click on the **Tool Template** you wish to modify and left click on **Modify Template** from the drop down menu to show the 'Modify Tool Template' screen.
- 3) See **Add Tool Template** on page 24 for more information.
- 4) Make necessary changes and left click **OK**.

Delete Tool Template

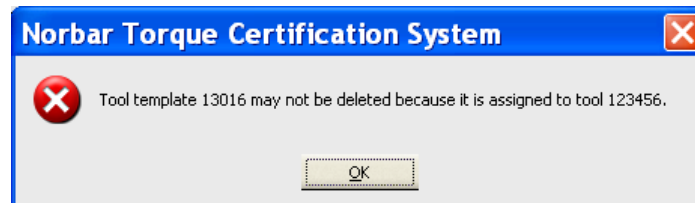
- 1) Left Click on the **Define** drop down on the main title bar and then left click on **Tool Templates**.
Alternatively left click on the short cut icon  on the TCS tool bar.
- 2) Right click on the **Tool Template** you wish to delete to show the drop down menu and left click on **Delete Template**.



- 3) Left click on **Yes**, **No** or **Cancel** as required.



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




In this case you will have to delete the Tool first, see page 21 for more information.

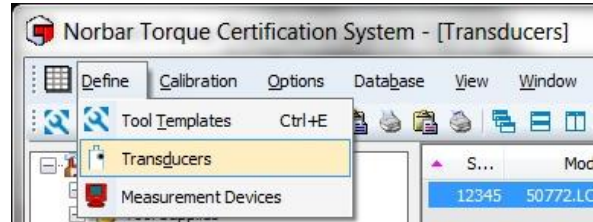
TRANSDUCERS

Any transducers used for ISO 6789-1:2017 Conformances or non-ISO Calibrations should be added to the Transducer register.

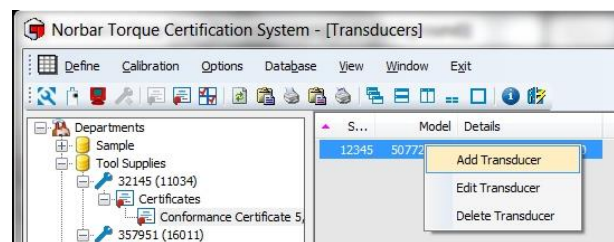
Add Transducer

1. 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.



3. Select **Add Transducer**.

Fill in:-

Serial Number

Model

Calibration Certificate No./s

Capacity

Units

Transducer Uncertainty


Transducer Uncertainty Interval

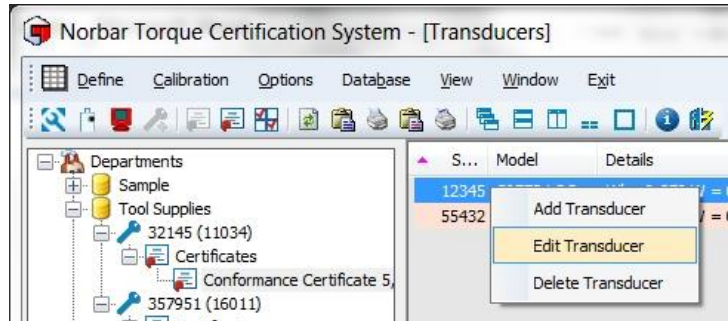
The 2 uncertainty values should be the highest 'Expanded Uncertainty' and 'Uncertainty Interval' values from the certificate/s

Serial Number	55432
Model	50593.LOG
Calibration Certificate (CW)	544213
Calibration Certificate (CCW)	
Capacity :	100 N·m
Transducer Uncertainty :	0.24
Transducer Uncertainty Interval :	0.36

OK Cancel


Edit Transducer

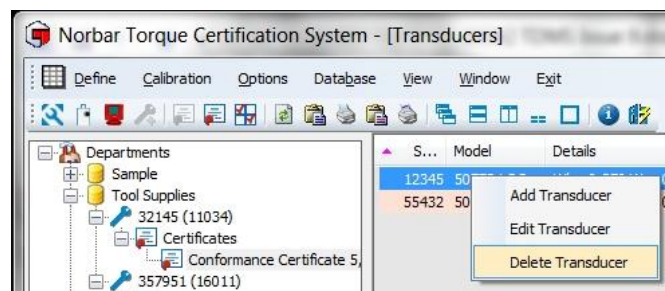
1. Select the **Define** menu then select **Transducers** (or select ).
Transducers are shown in the right hand pane.
2. Right click on a **Transducer** to show the drop down menu.
3. Select **Edit Transducer**.



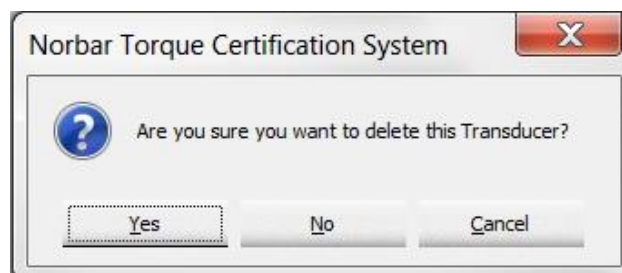
4. The Edit Transducer screen is shown.
See **Add Transducer** section for more information.
Make required changes then select **OK**

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 6789-1:2017 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™), 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 select ).



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

The dialog box shows the following fields filled in: Serial Number: 90350, Model: 43258, Device Certificate: 445512, Device Uncertainty: 0.14. Other fields like 'Integrated Transducer Certificate (CW)', 'Integrated Transducer Certificate (CCW)', 'Transducer Uncertainty', and 'Transducer Uncertainty Interval' are empty. 'OK' and 'Cancel' buttons are at the bottom.

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

The dialog box shows the following fields filled in: Serial Number: 65478, Model: 43213, Device Certificate: 213546, Device Uncertainty: 0.14, Integrated Transducer Certificate (CW): 654887, Transducer Uncertainty: 0.21, and Transducer Uncertainty Interval: 0.32. 'OK' and 'Cancel' buttons are at the bottom.

Integrated System (e.g. Pro-Test):-

Fill in:-

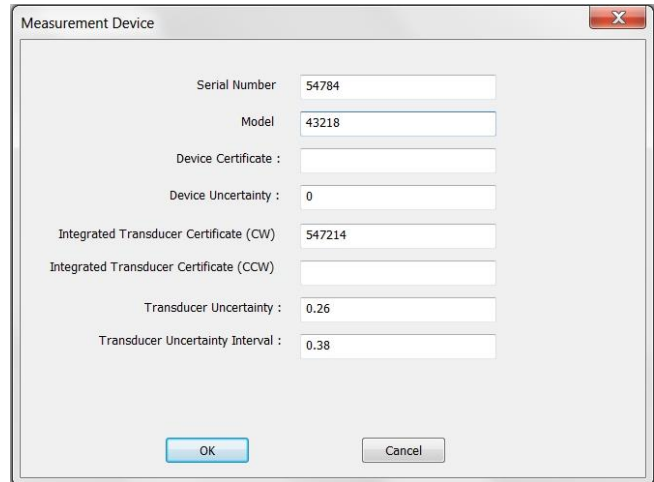
Serial Number

Model


Integrated Transducer Certificates Number/s

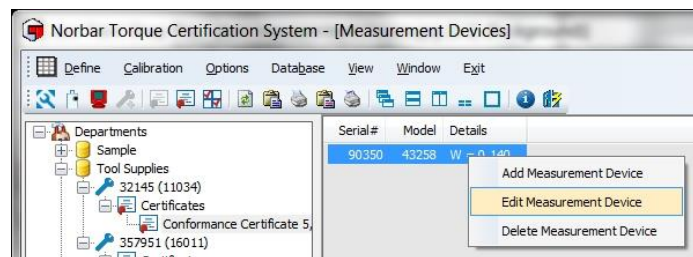
Transducer Uncertainty

Transducer Uncertainty Interval



Edit Measurement Device

1. 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 **Edit Measurement Device**.




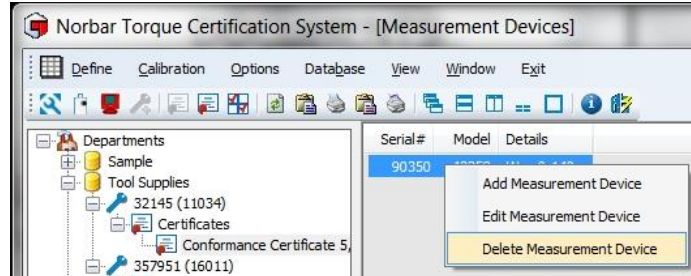
4. The Edit Measurement Device screen is shown.

See **Add Measurement Device** section for more information.

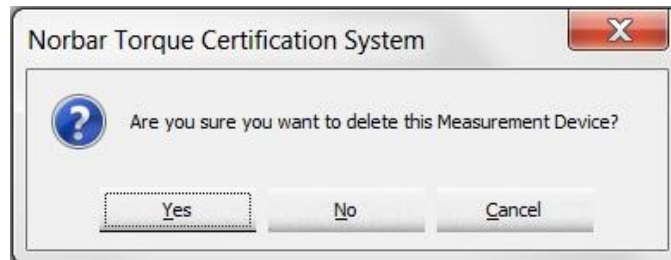
Make required changes then select **OK**

Delete Measurement Device

1. 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**.

HAND TORQUE TOOL CLASSIFICATION

The TCS tool templates conform to ISO 6789-1:2017 classifications for hand torque tools. A summary of the classifications are given below; for full details please refer to the ISO standard.

Tool Type I: Indicating torque tools (The torque exerted is indicated on scale, dial or display).

Tool Type II: Setting torque tools (A signal is given when the pre-set torque value is met).

Type	Class	Description	Example
I	A	Wrench, torsion or flexion bar	
	B	Wrench, rigid housing, with scale or dial or display	
	C	Wrench, rigid housing and electronic measurement	
	D	Screwdriver, with scale or dial or display	
	E	Screwdriver, with electronic measurement	
II	A	Wrench, adjustable, graduated or with display	
	B	Wrench, fixed adjustment	
	C	Wrench, adjustable, non-graduated	
	D	Screwdriver, adjustable, graduated or with display	
	E	Screwdriver, fixed adjustment	
	F	Screwdriver, adjustable, non-graduated	
	G	Wrench, flexion bar, adjustable graduated	

Each TOOL TYPE has several classes to determine the measurement points, number of measurements & permissible deviation.

Type	Class	Number of Set Points	Number of Measurements (at each point)	Permissible Deviation (+/-%)	
				Max Torque Value ≤10N·m	Max Torque Value >10N·m
I	A	3	5	6	6
	B	3	5	6	4
	C	3	5	6	4
	D	3	5	6	6
	E	3	5	6	4
II	A	3	5	6	4
	B	1	10	6	4
	C	1	10	6	4
	D	3	5	6	6
	E	1	10	6	6
	F	1	10	6	6
	G	3	5	6	6

TCS automatically calculates the limits to ISO 6789-1:2017 by the following method:

$$\text{Deviation} = \frac{(\text{Displayed reading} - \text{Target value})}{\text{Target value}} \times 100$$


Example -

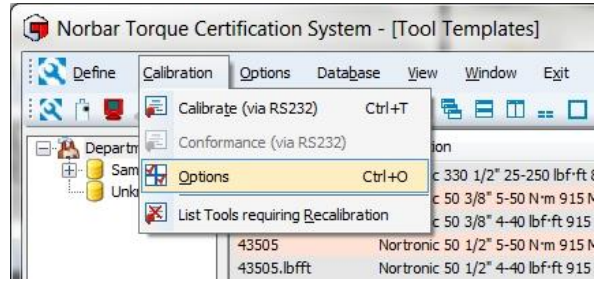
100 N·m Type II Class B with Permissible Deviation = ± 4%

Lower Limit = 96.0 N·m	$(96 - 100)/100$	= - 4%
Upper Limit = 104.0 N·m	$(104 - 100)/100$	= +4%

CALIBRATION MENU

Calibration Options

1. 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.

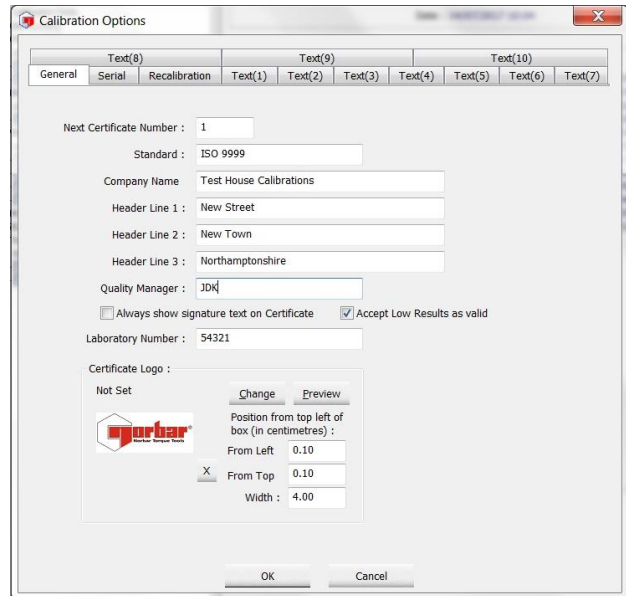
The **Quality Manager** can be entered.

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.

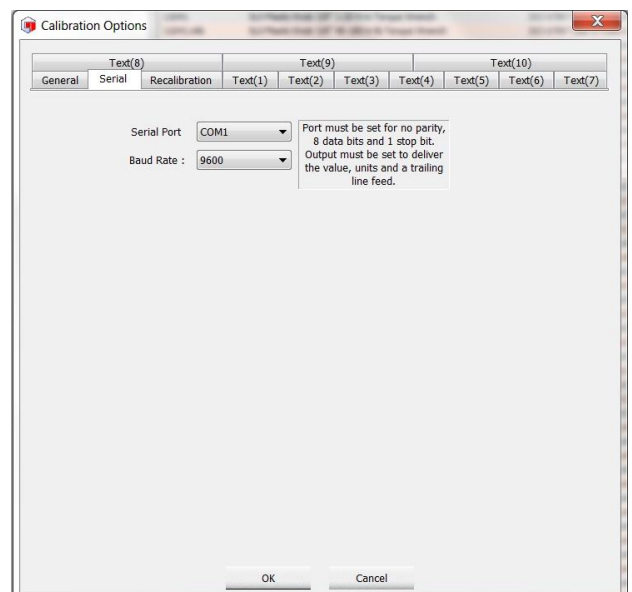


3. Select the **Serial** tab.

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

Select **Serial Port** to match the torque instrument.

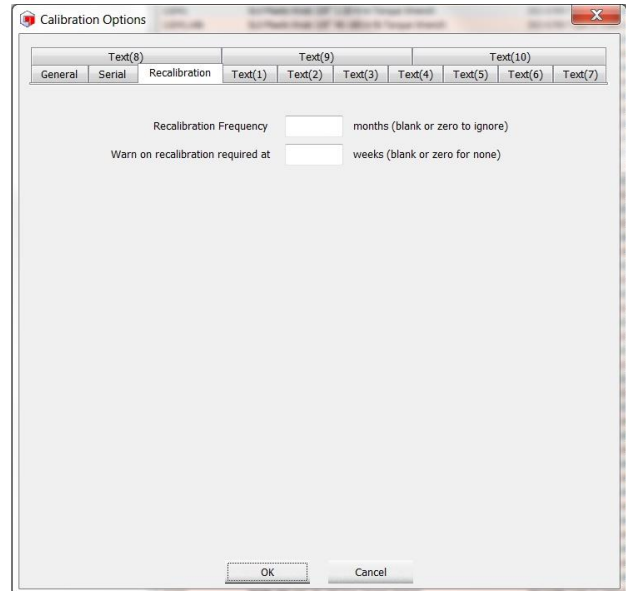
Select **Baud Rate** to match the torque instrument.



- Select the **Recalibration** tab.

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

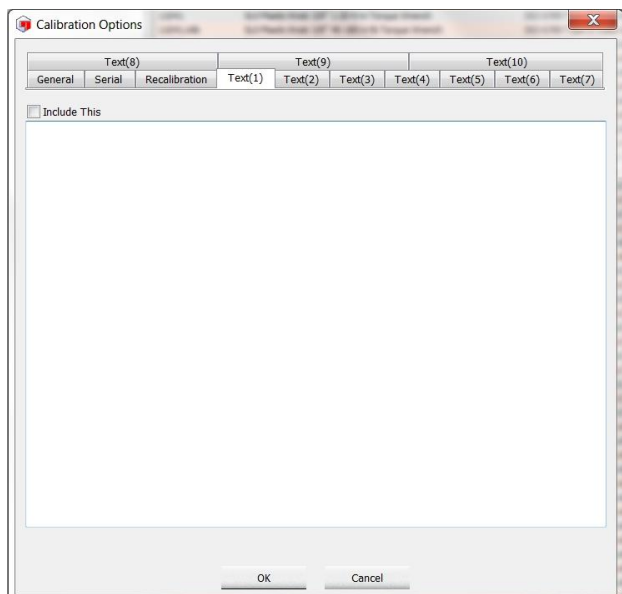
Select **Warn on recalibration required at** to set value for recalibration warning.




- 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.

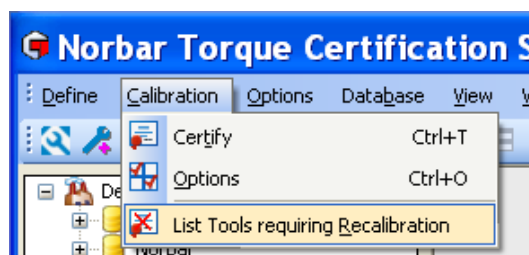


List Tools Requiring Recalibration

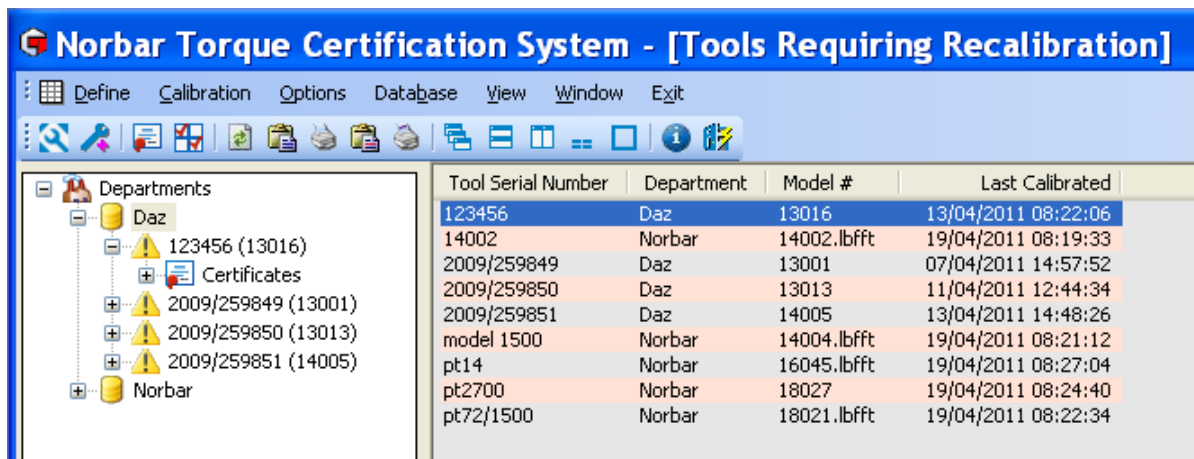
Tools requiring re-calibration will be preceded by a warning symbol in the left hand tree structure)  .

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 on the Calibration Options (see previous section).

- Left click on the Calibration tab.
- Left click on List Tools requiring Recalibration_on the drop down.

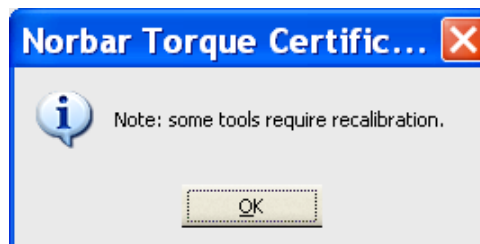


- 3) Double left click on a Tool in the right hand pane to highlight that Tool in the left hand pane.



TIP: The  symbol disappears when a certificate is generated.

- 4) If a recalibration period has been defined and some tools require recalibration you will see the following message when starting TCS.



- 5) Click OK to continue.

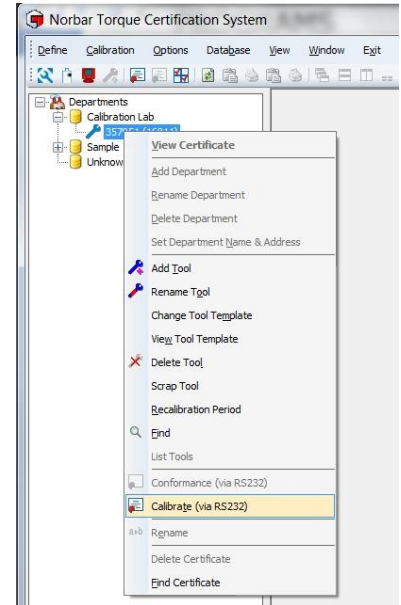
Calibrate (via RS232)

This option is for generation of non-ISO calibration certificates via the RS232 interface.

Ensure the Calibration Options are set up correctly.

Calibrate (via RS232) is only available for non-ISO tool types.

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



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.

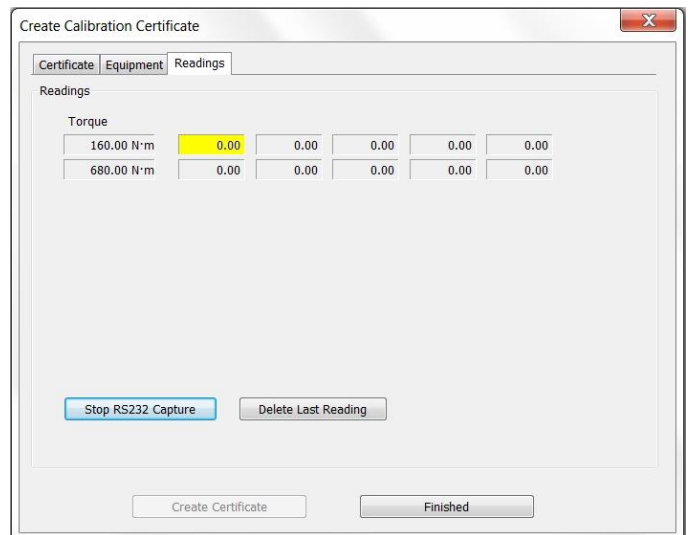
Check the current certificate numbers are correct and that the uncertainty values are correct. If not, correct them in the Measurement Device and Transducer registers.

9. Select **Readings** tab

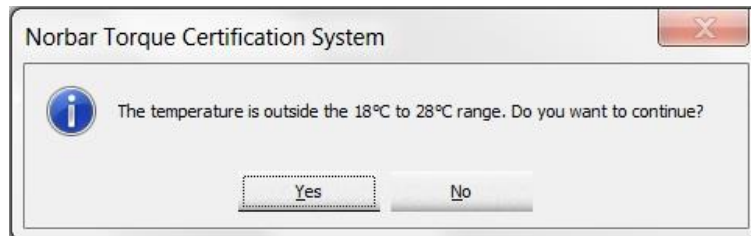
Press 'Start RS232 Capture' button

Perform calibration, sending readings via RS232

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



If the entered temperature is below 18°C or above 28°C the following message will appear:-




Press 'Yes' to continue with the calibration or 'No' to abort the calibration.

Continue taking readings until the calibration is complete



10. Press 'Create Certificate' button

Note: Calibrate (via RS232) can only be used for non-ISO (Other) tool types.

1 / 1

Certificate of Calibration
Certificate Number : 1

Model : 16011Serial No : 357951

Maximum Capacity : 680.0 N.mInspector : JDK

Date of Calibration : 09/09/2017

As Found

Set Torque	Min	Max	Actual Readings					
160.0	152.0	168.0	167.3	167.7	168.4*	167.5	167.5	
680.0	646.0	714.0	717.2*	716.2*	715.4*	714.8*	713.2	

Out of tolerance readings are marked with an asterisk (*)

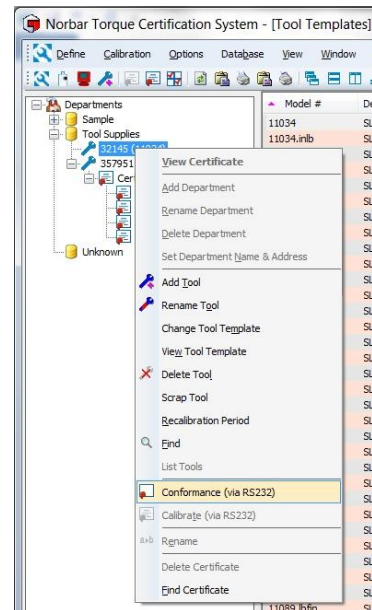
MEASUREMENT SYSTEM USED
Measurement Device Model : 43258
Measurement Device Serial No : 90360
Measurement Device Certificate : 654984
Transducer Model : 50772 LOG
Transducer Serial No : 12345
Transducer Certificate : 324567
The measurement uncertainty interval of the measurement system is 0.409%
The uncertainties are for a confidence probability of not less than 95%.

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.

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

The screenshot shows the 'Create Declaration of Conformance' dialog box with the 'Certificate' tab selected. The 'Tool' section contains the following fields: Serial Number (32145), Type (11034), Rated Capacity (20 N·m), and Measurement Range (1,000 - 20,000 N·m). The 'Certificate' section contains: Inspector (JDK), Number (blank), Direction (Clockwise selected), Temperature (20 °C), and Certificate Text (As Found). Buttons for 'Create Certificate' and 'Finished' are at the bottom.



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.

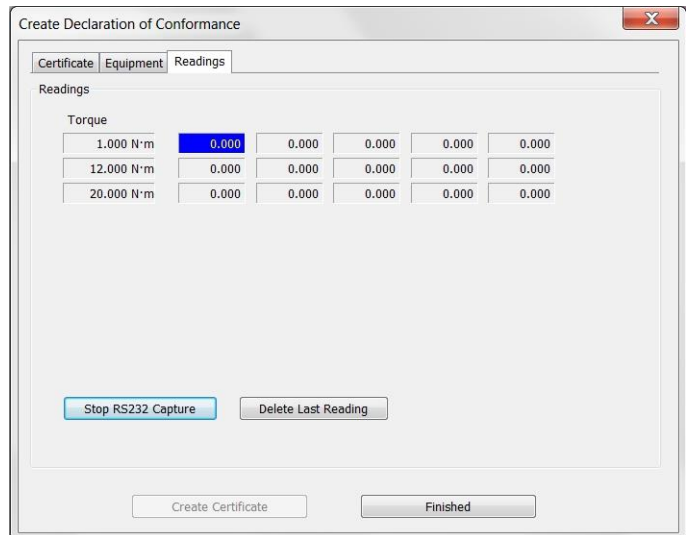
The screenshot shows the 'Create Declaration of Conformance' dialog box with the 'Equipment' tab selected. The 'Measurement / Display Device' section contains: Serial Number (90350), Model (43258), Certificate (112233), and Expanded Uncertainty (0.14). The 'Transducer' section contains: Serial Number (12345), Model (50593.LOG), Certificate (222222), Expanded Uncertainty (0.25), and Uncertainty Interval (0.37). Buttons for 'Create Certificate' and 'Finished' are at the bottom.

9. Select **Readings** tab

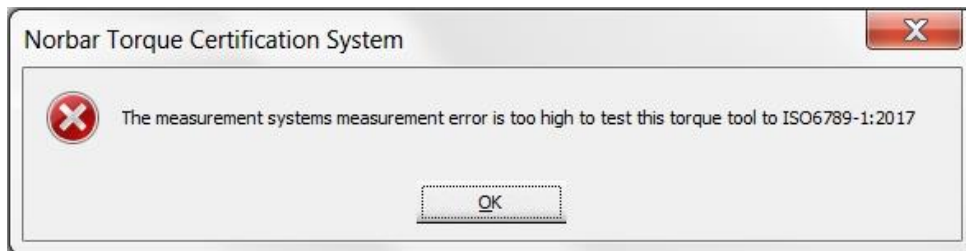
Press 'Start RS232 Capture' button

Perform conformance test, sending readings via RS232

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



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



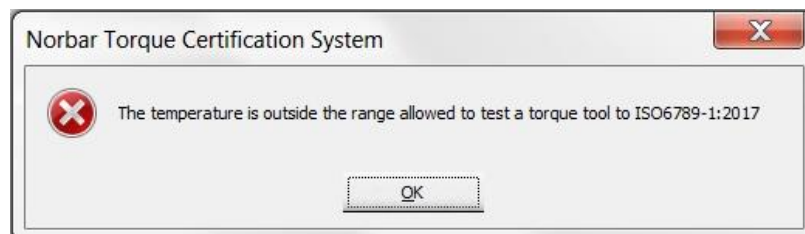
Check the measurement device and transducer uncertainty values are correct.

The measurement systems maximum relative error can be no greater than ¼ of the tools maximum permissible relative deviation.

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

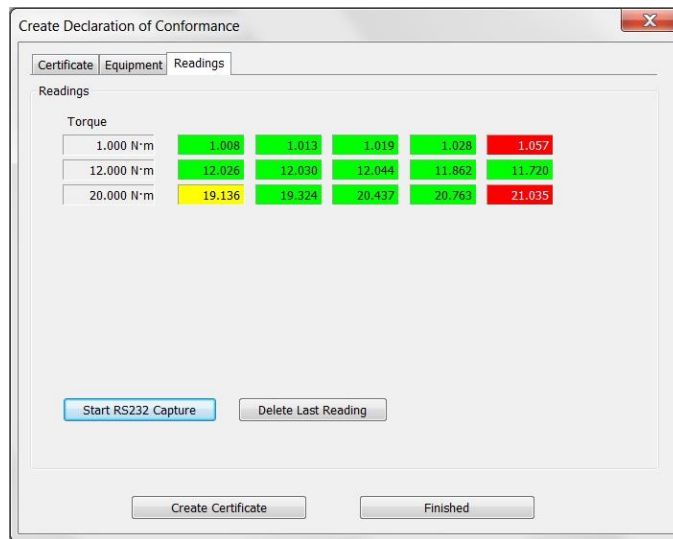
The tools maximum permissible relative deviation uses the 'Expected measurement error' in the tool template. If this value is blank or is greater than the default maximum permissible relative deviation defined in ISO6789-1:2017 (section 5.1.5), the 'Upper Limit' and 'Lower Limit' values in the tool template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

If the temperature entered is below 18°C or above 28°C the following message will appear:-



Check the correct temperature was entered.

- Continue taking readings until the conformance test is complete



- Press 'Create Certificate' button

1 / 1

Declaration of Conformance
In accordance with ISO 6789-1:2017
Declaration Number : 41

Customer : Calibration Lab
Model : 11034
Measurement Range : 1.000 - 20.000 N·m

Serial No : 357951
Inspector : JDK

Date of Test : 18/07/2017
Direction : Clockwise

As Found

Set Torque	Min	Max	Actual Readings				
1.000	0.960	1.040	1.008	1.013	1.019	1.028	1.057*
12.000	11.520	12.480	12.026	12.030	12.044	11.862	11.720
20.000	19.200	20.800	19.136*	19.324	20.437	20.763	21.035*

Out of tolerance readings are marked with an asterisk (*)

The maximum permissible deviation of $\pm 4\%$ is in accordance with ISO 6789-1:2017
The test was performed at an ambient temperature between 18°C and 28°C and did not fluctuate by more than $\pm 1^\circ\text{C}$ during the test. The maximum relative humidity did not exceed 90%
Quality Manager : JDK

MEASUREMENT SYSTEM USED

Measurement Device Model : 43258
Measurement Device Serial No : 90350
Measurement Device Certificate : 112233

Transducer Model : 50593.LOG
Transducer Serial No : 12345
Transducer Certificate : 222222

The measurement system used for this conformance test complies with the requirements of ISO 6789-1:2017 Section 6.1

The maximum measurement error of the measurement system does not exceed $\frac{1}{4}$ of the maximum permissible relative deviation of the torque tool

The maximum measurement error of the measurement system is 0.120%

The measurement uncertainty interval of the measurement system is 0.407%


The uncertainties are for a confidence probability of not less than 95%.

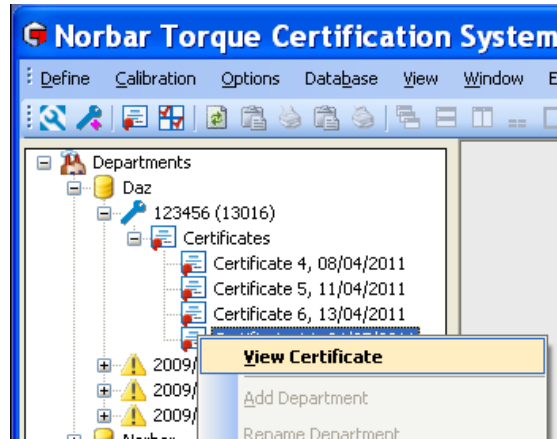
Laboratory No : 543

Signature :

CERTIFICATES

View Certificate

- 1) Click the + in front of the Certificate icon under a Tool on the left hand pane to expand the view and double left click the required Certificate icon to view that certificate. Alternatively select required certificate in the left hand pane and left click the  icon on the TCS toolbar.



- 2) Left click on **View Certificate** on the drop down menu.


There are 2 types of certificate:-

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

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


An ISO 6789 tool can only contain 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.

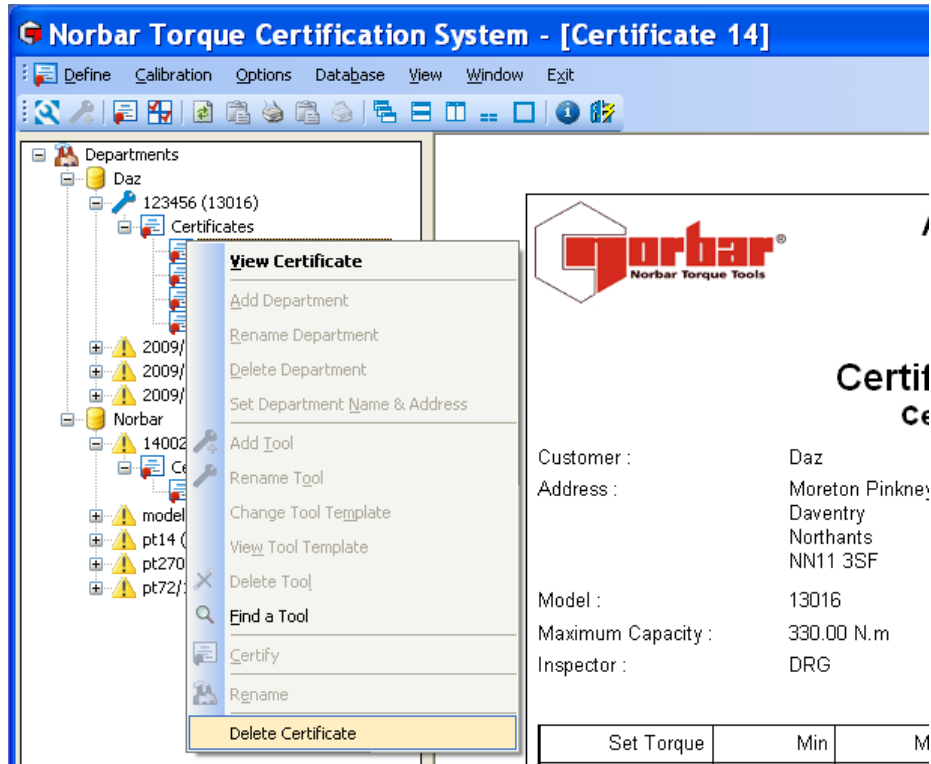
ISO 6789-1:2017 Declarations of Conformance have additional statements which are required by the standard.

	Calibration Services Ltd Calibration Street Labtown CL12 3AB		1 / 1					
	Certificate of Calibration Certificate Number : 3							
Model :		16011	Serial No :	357951				
Maximum Capacity :		680.0 N-m	Inspector :	JDK				
Date of Calibration : 08/08/2017								
As Found								
	Set Torque	Min	Max	Actual Readings				
	160.0	152.0	168.0	163.6	163.6	173.2*	168.6*	167.0
	680.0	646.0	714.0	701.8	702.1	714.4*	709.6	705.3
Out of tolerance readings are marked with an asterisk (*)								
Calibration carried out by : Calibration Services Ltd								
Quality Manager : JS								
MEASUREMENT SYSTEM USED								
Measurement Device Model : 43258								
Measurement Device Serial No : 90350								
Measurement Device Certificate : 654984								
Transducer Model : 50772.LOG								
Transducer Serial No : 12345								
Transducer Certificate : 324567								
The measurement uncertainty interval of the measurement system is 0.408%								
The uncertainties are for a confidence probability of not less than 95%.								
Laboratory No : 763								

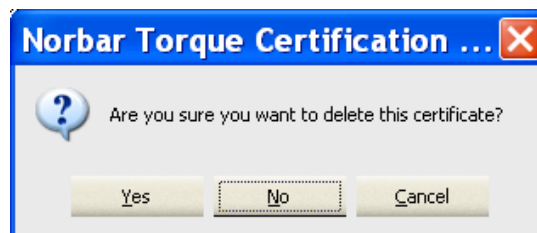
- 3) Left click on the Certificate to enlarge the view, press and hold down the CTRL key and left click on the certificate to reduce the view.

Delete Certificate

- 1) Click the **+** in front of the Certificate icon under a Tool on the left hand pane to expand the view and double left click the required Certificate icon to view that certificate. Alternatively select required certificate in the left hand pane and left click the  icon on the TCS toolbar.



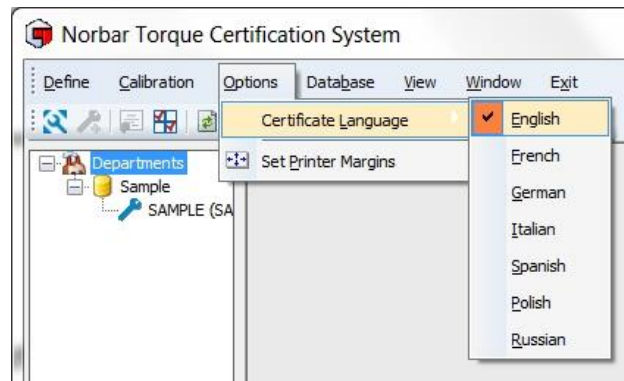
- 2) Left click on **Delete Certificate** on the drop down menu.



- 3) Left click on **Yes**, **No** or **Cancel** as required.

OPTIONS

Change Certificate Language



This will change the language for all New and Archived Calibration Certificates.

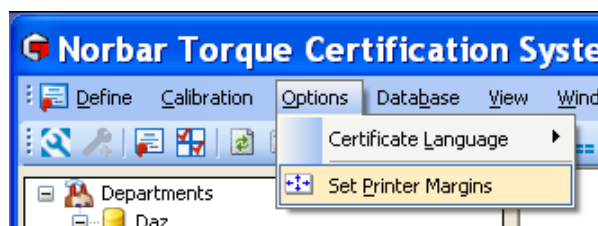
- 1) Right click on **Options** on the TDMS tool bar.
- 2) Right click on **Certificate Language**.
- 3) Right click on the **desired language**.

TIP: Certificates that were opened to view before changing the Certificate Language will be shown in the language prior to the change. Close the certificate window and re-open to view the certificate in the chosen language.

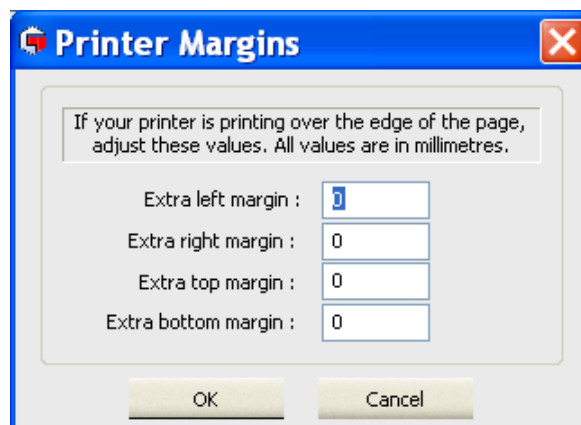
Set Printer Margins

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

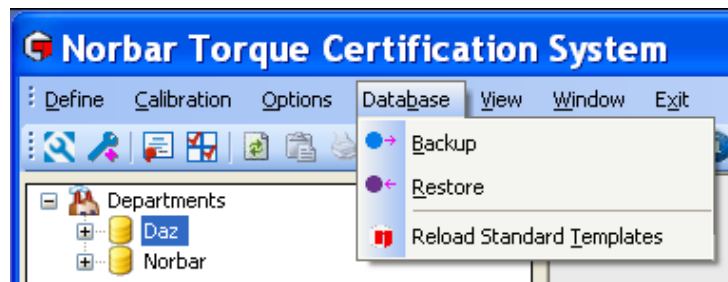
- 1) Left Click the **Options** tab.
- 2) Left click **Set Printer Margins**.



- 3) Click in each box and type in desired value.

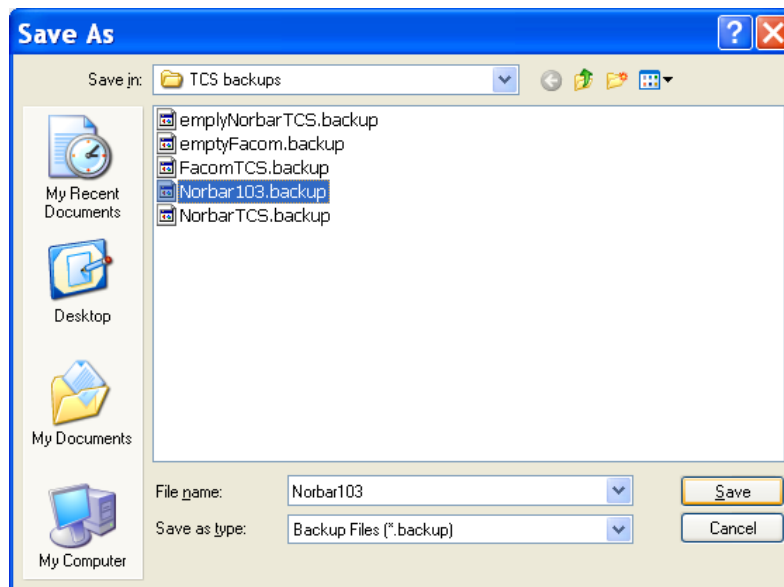


DATABASE



Backup Database

All data can be backed up to a location specified by left clicking Database and then left clicking Backup. Type in the backup file name and left click save.

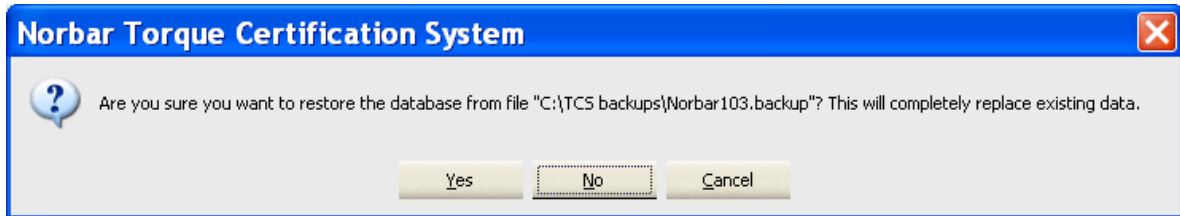


TIP: It is recommended that you regularly back up your database.

Restore Database

NOTE: If the database being restored is from a previous version of TCS (e.g. TCS version 1.1.1), it is important to Reload Standard Templates after the database is restored so that the Set Points are corrected for ISO 6789-1:2017.

Data can be restored from that location by left clicking Database and then left clicking Restore, select the backup file and then left click open. The following message will be displayed:-



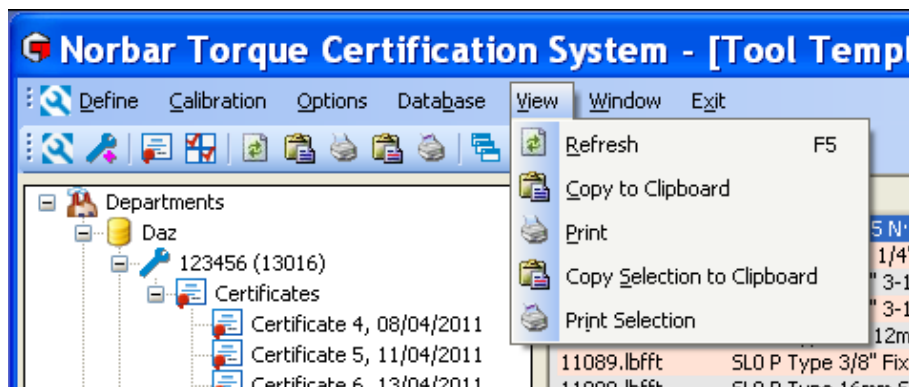
NOTE: Clicking on Yes will overwrite the current database and all unsaved data will be lost.

Reload Standard Templates

Use this option to reload the Standard Norbar Tool Templates into TCS. These are built into TCS and this option can be particularly useful if a Tool Template has been deleted and is now required, or if you are restoring a database from an older version of TCS.

To Reload Standard Templates select **Reload Standard Templates** from the **Database** menu

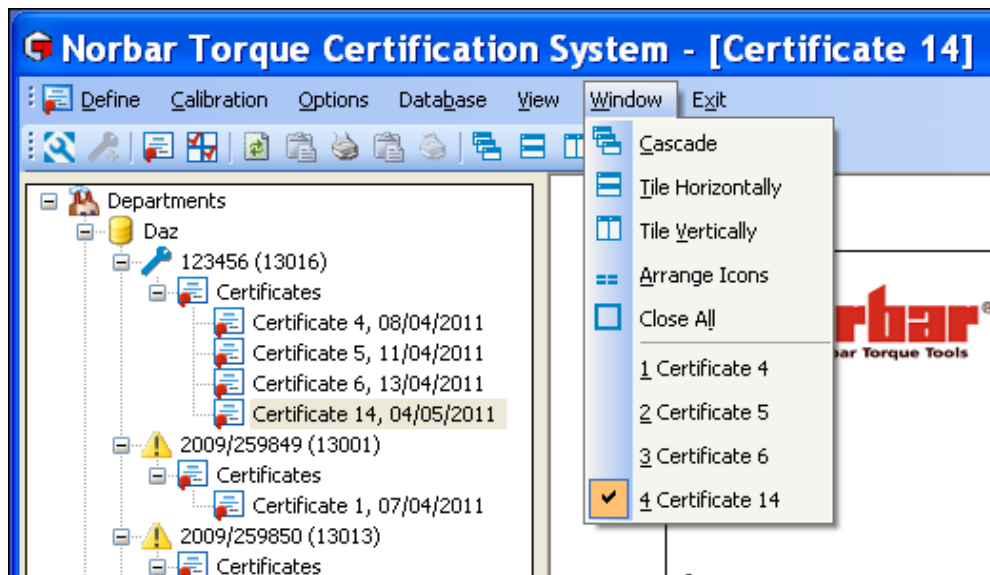
VIEW



- 1) Left click **Refresh** to redraw the current window.
- 2) Copy the data in the right hand pane and paste into another application such as Microsoft® Excel® or Word® etc. using **Copy to Clipboard** or **Copy Selection to Clipboard** by highlighting the required data.
- 3) The User can print data in the right hand pane using **Print** or **Print Selection** by highlighting the required data.

WINDOW

Left click the **Window** tab on the TCS toolbar, and then left click on desired window option. These options are intended for use when multiple windows are open so that they can be viewed simultaneously. These options can also be selected directly from the TCS toolbar.




CURRENTLY OPEN WINDOWS

This is shown on the bottom right of TCS.



Click on icon to go to currently open window

ABOUT TCS

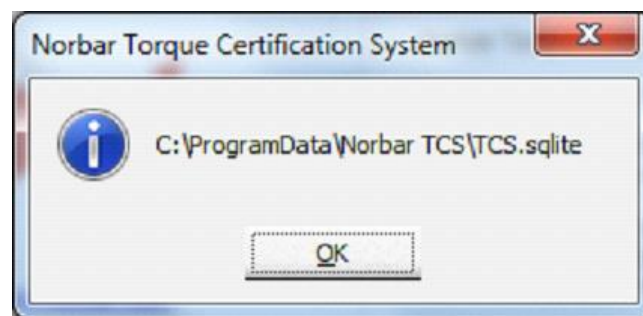
Left click on the  icon on the TCS shortcut bar.

This will show the version number of the software.



Left click **OK** to cancel.

Left click **Database File...** to show where the TCS database is stored. Left click **OK** to exit.






















This is in a different location for Windows XP as shown below.



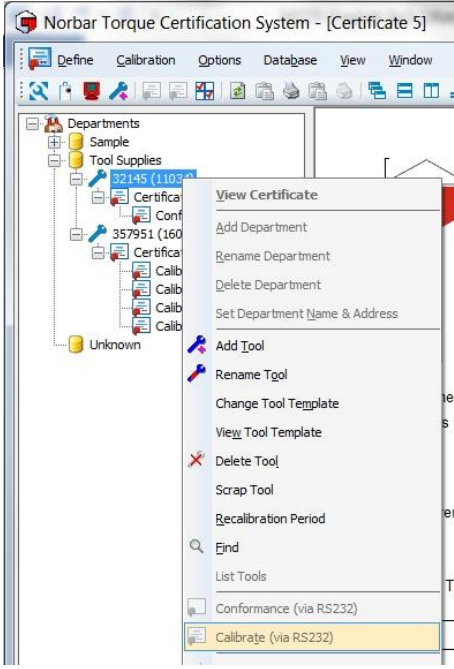
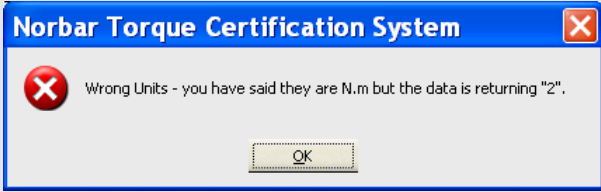
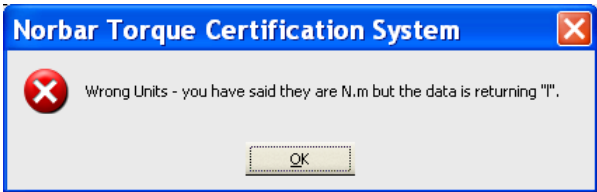

NOTE: For 64 bit versions, this may be shown as **C:\ProgramData(x86)\TCS\NorbarTCS.sqlite**

KEY TO SHORTCUT ICONS

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

Icon	Shortcut To
	Define Tool Templates (Ctrl+E)
	Define Transducers (Ctrl+D)
	Define Measurement Devices
	Add Tool
	Calibration (via RS232) (Ctrl+T)
	Conformance (via RS232)
	Calibration Options (Ctrl+O)
	Refresh (F5)
	Copy All to Clipboard
	Print All
	Copy Selection to Clipboard
	Print Selection
	Cascade Windows
	Tile Windows Horizontally
	Tile Windows Vertically
	Arrange Iconized Windows
	Close All Windows
	About TCS
	Exit TCS

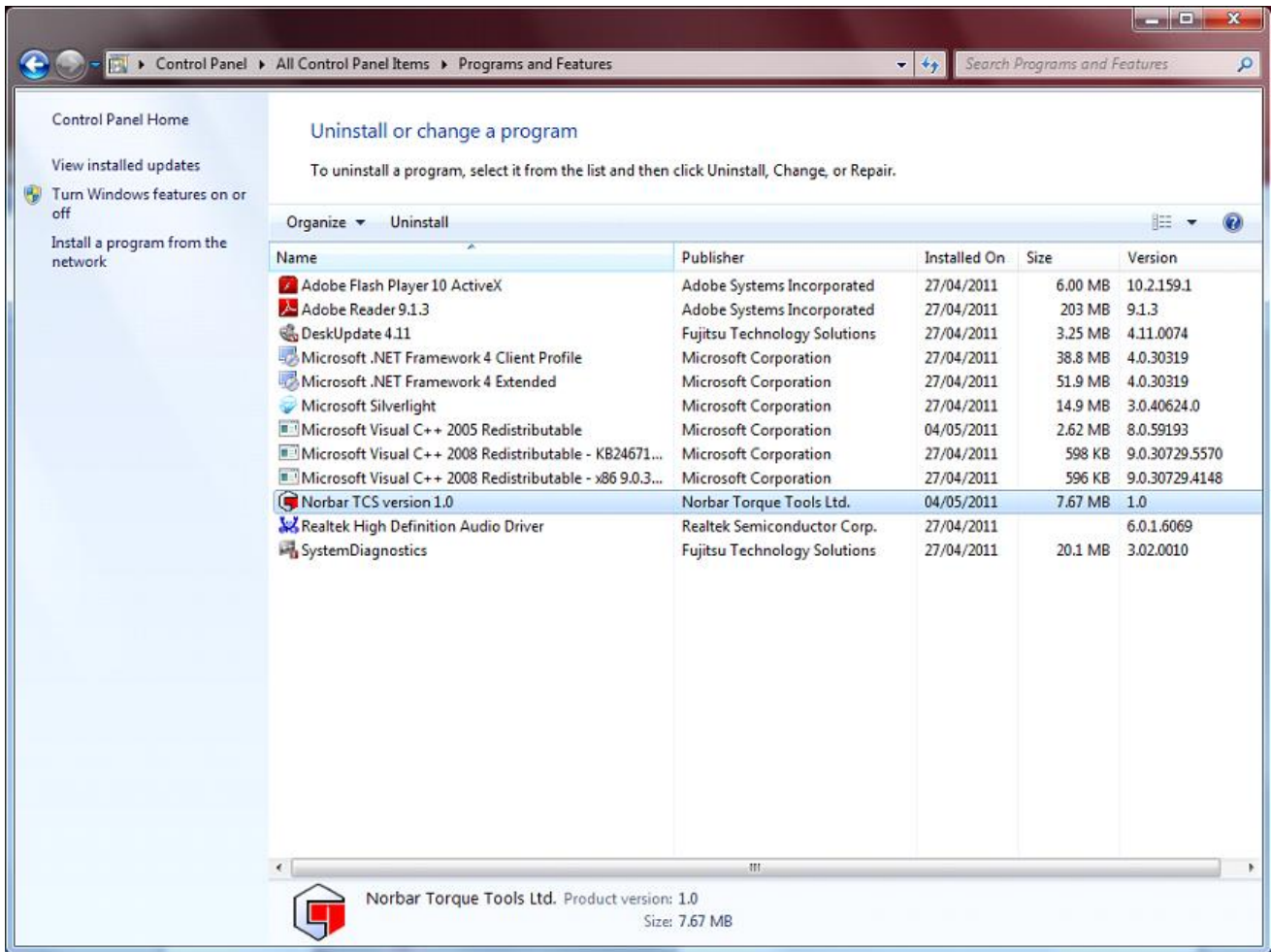
TROUBLE SHOOTING

Problem	Likely Solutions
<p>Calibrate and Conformance options are always greyed out</p> 	<p>a) No valid Comm port has been selected in Calibration Options.</p> <p>b) Newer computers may not be equipped with an RS232 port and this option will always be greyed out.</p> <p>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 TCS Calibration Options. See page 10.</p>
<p>Calibration error message</p> 	<p>If this message box appears, change the set up options of the connected Instrument to remove the Time and Date from the serial output.</p>
<p>Calibration error message</p> 	<p>If this message box appears, the connected Instrument's measurement units are different to the tool being calibrated</p>
<p>COM port error</p> 	<p>Ensure your RS232 to USB converter is still plugged in and active.</p>

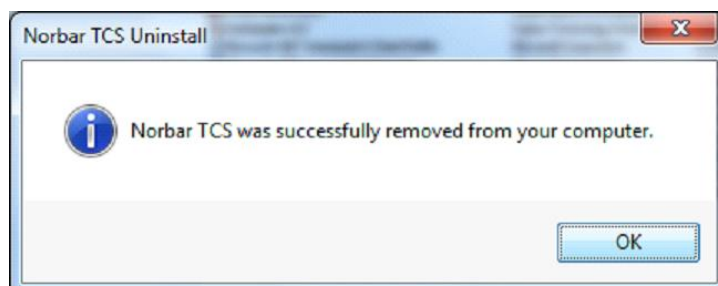
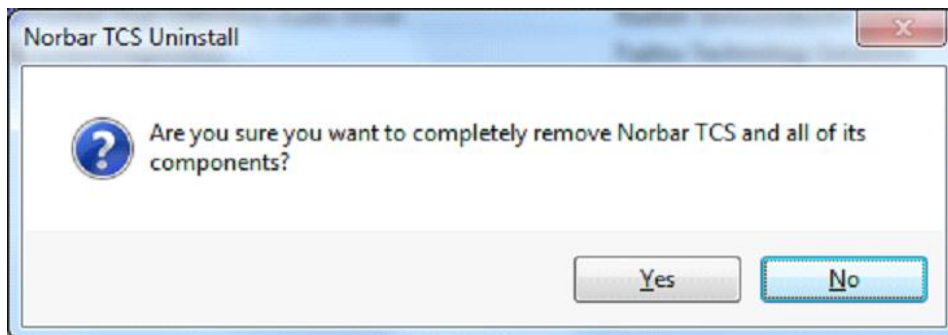
UNINSTALLING TCS

Go to Control Panel – Programs and Features– Select Norbar TCS version X.X.X – Click ‘Uninstall’

NOTE: For Windows XP go to the control panel – Add or Remove Programs – select Norbar TCS Version x.x – click ‘Remove’



Left click ‘Yes’ to confirm you want to un-install TCS.



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