INSTRUCTIONS

Electronic Torque Wrench, Screwdriver and Torque Tester Instructions

.... Contents ....

INSTRUCTIONS

Basic Description

These Electronic Torque Tools are "State of the Art" devices, With Intelligent Technology, Organic LED display (OLED). They are Menu Driven with Total Traceability. Demonstrated to have better than 1% Accuracy. They are Simple to Set and Calibrate and come complete with ISO 6789-2003 Certification.

These Torque Tools are, Hand-held Torque Measuring Instruments which provide Precision Accuracy with High Repeatability. Presets can be set to provide the user with Visual & Audio Signal's during Torque measurements. The OLED also has visual Low Battery Indicator. Use the wrench's for Preset Value Approach, Fastener Overload, Range Overload, Maximum Mechanical Overload.

Recommended Use;
The Electronic Torque Tools are specifically designed for use in all Industrial Sectors and Applications where High Accuracy and Repeatability combined with a Complete Torque Data Management & Control System are Standard Requirements.

Basic Characteristics;
Accuracy: Right hand side torque = 1%,   Left hand side = 1% of Actual Reading
Resolution: 0.05 to 50Nm & 0.1 to 1000Nm
Alarms: Preset Value Approach, Range Overload, Mechanical
                         Overload, Low Battery, Memory Full.
Memory Capacity:2094 Values
Battery Life: Sleep Mode 5,000 Hrs, Operational Mode 160 Hrs.

Care Guidelines;
These Instruments should be handled with care. Do not subject to Torque Loads in excess of the Model Range.
Do not use Tool to loosen fasteners tightened beyond Max Tool Capacity - Never apply extensions to Tool without contacting your supplier.
Do not Drop or Subject to Impact Blows - Provide adequate storage to Protect from Damage - Adhere to Safety Instructions

Changing the Battery on Wrenches -   Note: Battery life should last 160hrs+
 1.Unscrew the metal End Cap on the handle of the wrench.
 2.Remove the four AAA cell batteries and replace with new.
 3.Screw back the metal End cap.
 4.Check to ensure the date and time are correct

Ratchet head guidelines;

1) Store in a dry location
2) Oil Frequently to prevent Ratchet head seizing
3) Do not exceed specified torques
4) Do not use external forces on Ratchet (i.e. Hammer)

Max Torque for 1/4" Ratchet = 30 Nm

Max Torque for 3/8" Ratchet = 135 Nm

Max Torque for 1/2" Ratchet = 340 Nm

PCFE Basic Description;

<u>Select port</u>: select communication port you wish to use to communicate with the wrench

<u>Change password:</u> Type current password. Type new password. Confirm new password

<u>Current mode:</u> Select mode you wish wrench to operate in. Selection will take effect after data is stored using 'store to wrench button'

<u>Current units:</u> Select the units you wish wrench to operate in. Selection will take effect after data is stored using 'store to wrench button'

<u>Current language:</u> Select the language you wish wrench to operate in. Selection will take effect after data is stored using 'store to wrench button'

<u>Wrench span:</u> The span of measurement of the wrench for example Span 100Nm would have a range of 2-100Nm.

<u>Period of calibration:</u> Set number of days to next calibration or it can be set by Number of measurements.

<u>Calibrated on</u>: Date of last calibration.

<u>Activate calibration:</u> Activates the calibration option in the wrench menu. You must begin calibration before the wrench powers down.

<u>Default calibration:</u> Allows wrench reset. All data/settings stored in the wrench will be cleared and default calibration values for the wrench's specific calibration span will be programmed.

<u>Power off wrench:</u> Allows soft power down of the wrench.

<u>Store to wrench:</u> Store all current pc front settings to wrench. Wrench will automatically power down after store.

<u>Load from file:</u> Loads a previously created file containing preset data, into the PCFE front preset window (top left).

<u>Save to file:</u> Saves PCFE displayed preset data to file.

<u>Clear all presets</u>: Clears presets from the PCFE presets window.

<u>To set a preset:</u> Click on any preset location number in the PCFE presets window. Set the required nominal, min, max Tolerance and units. Store settings to the wrench.

<u>Continuous upload:</u> Allows real time communication of measurements to the PCFE. Wrench must be connected to the PC.

<u>Upload all:</u> Displays all stored wrench measurement data in the the PCFE data window (lower left)

INSTRUCTIONS

Clear: Clears the wrench measurement data displayed on the PC.

Clear wrench data: Clears the wrench measurement data displayed on the PCFE and in the wrench.

Unit conversion: Allows user to change the units of the displayed measurement data on the PCFE.

Sort by preset: Sort the displayed measurement data and group according to ascending preset numbers.

Save as an excel file: Save the current displayed measurement data as an excel file.

The PCFE measurement data window displays stored wrench measurements showing wrench memory location, date and time, torque value.
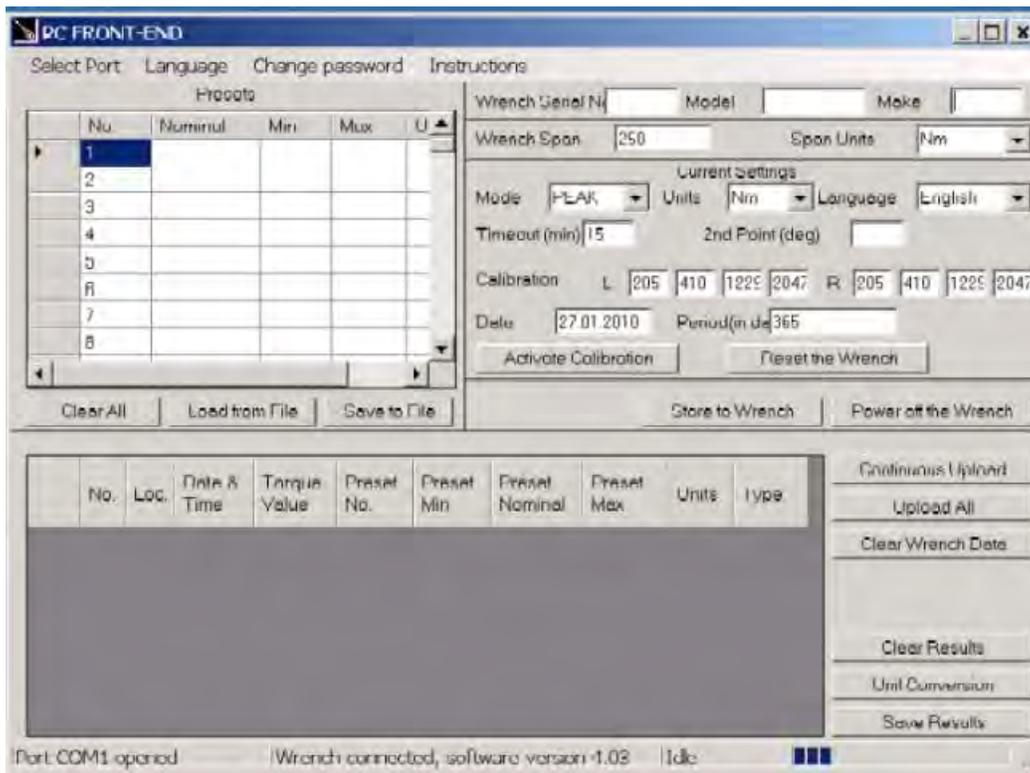
OLED Display
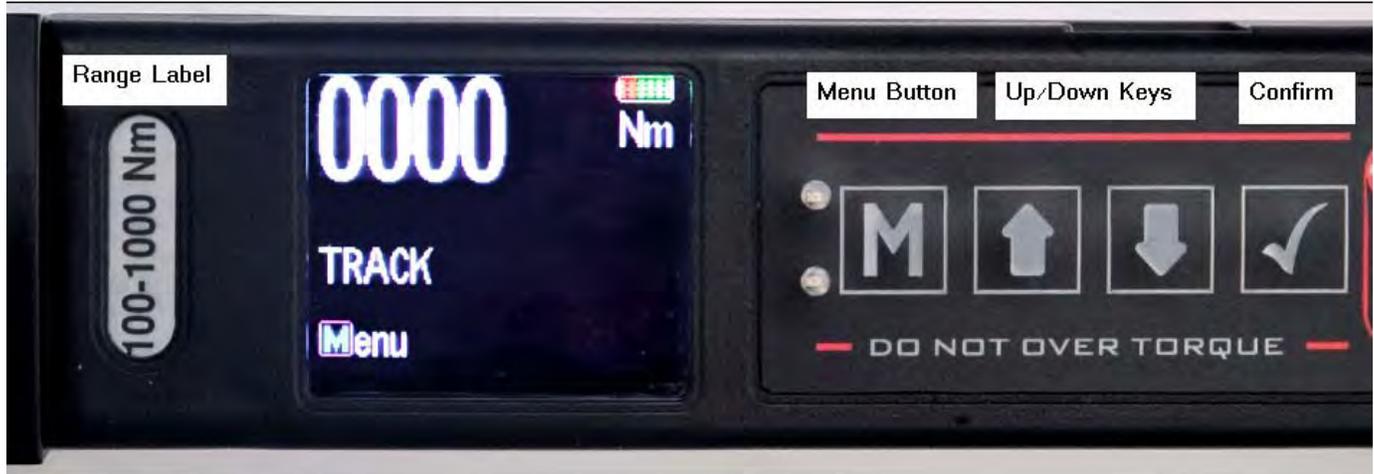
Reading starts at 2% of Maximum with an Accuracy of 1% beginning at 10% of Maximum (Threshold to Maximum Span).

Press ⓜ to select the required Menu option and ☑ to select

Language Mode - Keypad Function:

1. Press [M] to Scroll to the Language Menu

2 Press [✓] to enter Lang Menu

3 Press [↑] [↓] to Scroll to Language Required

4 Press [✓] to Confirm operation in this Language.

The Languages of Operation available to the User are;

English, Chinese, French, German, Italian, Polish, Portuguese, Russian, Spanish

Unit Mode - Keypad Function:

1 Press [M] to Scroll to Units Menu

2 Press [✓] to enter Units Menu

3 Press [↑] [↓] to Scroll to Units Required

4 Press [✓] to confirm selected units

The following Units of Measure are available;
kgf.cm - kgf.m - cN.m - N.m - ozf.in - lbf.in - lbft.ft

Date Mode - Keypad Function:

1 Press [M] to Scroll to the Date Menu

2 Press [✓] to enter Date Menu

3 Press [↑] [↓] to to Set the min/Hour

4 Press [✓] to Confirm
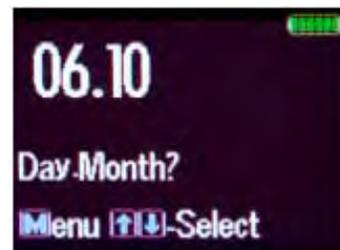
To Set Day/ Month / Year - repeat Steps 3 & 4

Trac Mode: As Torque is applied to the Wrench it will actively display the applied Torque reading to the Max Span of the Device. On removal of the Torque Load the display will return to Zero.

1 Press [M] to Scroll to Trac Mode

2 Press [✓] to operate in Trac Mode

Peak Mode: In Peak Mode the Torque Reading will remain Displayed when the Torque Load is removed. The User has the option to store the reading in Memory. If storage of the reading is not required the User may continue to the next measuring task.

1 Press [M] to Scroll to Peak Mode

2 Press [✓] to select Peak Mode and then apply Torque

3 Press [✓] to store the Peak Value Recorded if required.

If Storage is not required then apply New Torque

Set Mode: **This mode allows the user to set the limits for Torque, Just Move and Torque and angle. The operator can choose to set Torque values by % or by tolerances. The OLED display will be Green approaching Preset tolerances and will change to Red if exceeded.**

Set Mode - Torque & Angle

1 Press [M] to Scroll to Set Mode, Press [✓] and you'll see option to "Set Torque" or "Set Torque and Angle" or "Just Move Preset"

2 If you are setting a Torque only preset see page 8 of these instructions.

3 Press [↑] [↓] To select select "set Torque and Angle" [✓] when high-lighted green

4 Press [↑] [↓] To select the Preset number you want to use and

5 Press [↑] [↓] to select your preset Torque and [✓]

6 Press [↑] [↓] To set the Angle preset Value and [✓]

7 Press [M] To go to Preset menu

8 Press [↑] [↓] To select the Preset location

9 Press [✓] To select your required Preset and take measurements

10 Press [✓] To store the readings you are taking

Set Mode - Torque

1 Press [M] to Scroll to Set Mode

2 Press [✓] to select & [↑] [↓] to select type of Preset, Set Torque or Torque and Angle

3 Press [✓] to select Torque

4 Press [↑] [↓] to select Set by % or Set by Tolerance

5 Press [↑] [↓] to Scroll to required Preset No. (1 to 99)

5 Press [✓] to Confirm Preset No. selected

6 Press [↑] [↓] to Set Nominal Value and [✓]

7 Press [↑] [↓] to Set Your Low Value and [✓]

8 Press [↑] [↓] to set your High Value and [✓]

9. Use [M] to select Preset from the menu to use this set-up

To set a Preset as a +/- % Deviation of the Nominal Value,
Please select "Set Torque" and then select "by %"

Set Mode - Just Move Preset

This allows the user to change the default Just Move Angle to any Angle between 1 and 10 degrees - The operator Can do this using the PCFE or using the Wrench.

1 Press [M] to Scroll to Set Mode

2 Press [✓] to select & [↑] [↓] to select type of Preset, Just Move in this case

3 Press [✓] to select Just Move once it's high-lighted green

4 Use the [↑] [↓] to select between 1 and 10 degrees and press [✓]

5 Use [M] to select Just Move and the default Angle will be changed

Just Move: This function will display the Torque that was applied after 3 degrees of movement, It will also show the final Torque and angle that were applied by the user. The screen will change to Red once the Just move Angle threshold is passed and the Buzzer will sound. The user can set the Just move degree in the "Set" menu option or using the PCFE software. The Final torque and final Angle that was achieved will also be displayed as shown. The default Just Move Angle is 3 degrees.

1 Press [M] to Scroll to Just Move Mode

2 Press [✓] to select Just Mode and then apply Torque and Angle

3 Press [✓] to store the 3 degree Torque Value and the Final Torque and Angle value

If Storage is not required then apply New Torque and Angle measurement

Just Move Default to 3 degrees   Just Move Measurement   Just move result

Just Angle: This function will display the Peak Torque and Peak angle that were applied during the Torque operation. The user can store the result at the end of each measurement.

1 Press [M] to scroll to Just Angle and [✓] to select

2 Take a Torque and Angle reading

3 Press [✓] to store the result or apply another torque to continue

Preset Mode: This Mode allows the User to take measurements based on the Nominal, TMax & TMin of Torque Settings with the relevant Warning Signals activated.

Min Value - The Green LED on keypad will Flash & the Buzzer will Sound intermittently, The OLED display will change to green

Nom Value -The Green LED on keypad will switch on & the Buzzer will sound continuously, The OLED display will be Green

Max Value - The Red LED will Flash continuously and the Buzzer will sound continuously and the OLED will change to Red.

Preset Mode - Keypad Function

1 Press [M] to Scroll to Preset Mode

2 Press [✓] to Enter Preset Mode

3 Press [↑] [↓] to select your preferred Pre-set No. (1 TO 99)

4 Press [✓] to operate within this preset parameter

5 Press [✓] to store the applied Torque (Torque and Angle) if required.

Recall Mode: This mode allows the User to view the Stored Torque & angle Data. Only Locations containing data will be displayed. Note that as data is stored the locations are populated sequentially from 01 to 2094

Recall Mode - Keypad Function

1 Press [M] to Scroll to Recall Mode

2 Press [✓] to enter and view Memory Locations, Results and Functions

3 Press [↑] [↓] to scroll through locations that contain data.

Upload Mode: This Mode allows the User to
Upload Stored Torque Data from an individual or range of locations.
In Upload Mode the Wrench must be connected to a PC running the
PC FRONT-END Software (PCFE) via the USB Port on the Wrench
and PC.

Note that the PCFE must have USB drivers installed for communication
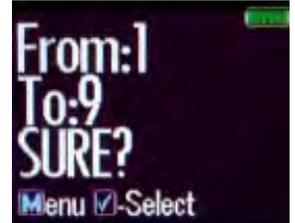
1 Press [M] to scroll to Upload Mode

2 Press [✓] to enter Upload Mode

3 Press [✓] to select "From" and [↑] [↓] to select the first location to upload

4 Press [✓] to confirm "From" location

5 Press [✓] to select "To" location and [↑] [↓] for end location to be uploaded

6 Press [✓] to confirm, you are asked if your Sure press [✓] to confirm

Clear Mode: This Mode allows the User to Clear the Stored Torque Data
from an individual or range of locations.

Note: Before clearing the selected range and as a safety precaution, the
user will be asked are they sure they wish to clear selected data. This can
be done by pressing the confirm button.

1 Press [M] to Scroll to Clear Mode

2 Press [✓] to enter Clear Mode

3 Press [↑] [↓] to select "From" range to be cleared and press [✓]

4 Press [↑] [↓] to confirm "To" range to be cleared

5. Press [✓] to confirm and you will be asked if your "Sure?"

6 Press [✓] to confirm and that Range of data is cleared from the wrench memory

Wrench Calibration:

Calibration is achieved using four Measuring Points, namely 10%, 20% , 60%
and 100% of Maximum Span of the Wrench. In Calibration Mode the Wrench will
automatically display these Measuring Point Values initially for the Right
Hand and then for the Left Hand. **All Products should be 1% accurate**

**Calibration Mode is only accessible through the Master & Distributor Versions of
the PC Front End. The End User cannot access the Calibration Mode.
Please ensure that certified calibration systems such as a Norbar ISO 1000
Transducer system are used when calibrating the Torque wrenches, These devices
are themselves accurate to 0.25%**

Note:De-stressing wrench implies that the wrench is torqued to it's maximum span

Calibrate Mode Note: Ensure date & time on wrench are correct

1 Connect wrench to PCFE software and Click the Activate Calibrate Button

2 Press [M] on the Wrench to scroll to Calibrate Mode
   Place Wrench onto Calibration Unit. De-stress on the CW (Clockwise) direction

3 Press [✓] to activate Calibrate Mode (The Wrench OLED will now
   display a reading of 10% of the Maximum Span of the Wrench)

4 Apply Torque to the Wrench until the Reading on the Calibration Rig is
   equal to the Reading on the Wrench (10% of Maximum Span)

5 Press [✓] to confirm that the First Point of Calibration is now set

6 Now Measurement Point No.2 (20% of Maximum Span) will appear on the
   Wrench OLED Display. Therefore repeat Steps No.4 & No. 5

7 Now Measurement Point No.3 (60% of Maximum Span) will appear on the
   Wrench OLED Display. Therefore repeat Steps No.4 & No. 5

8 Now Measurement Point No.4 (100% of Maximum Span) will appear on the
   Wrench OLED Display. Therefore repeat Steps No.4 & No. 5

9 Repeat Step No's 1 to 8 for the Left Hand calibration
.
10 Once calibration is complete select Trac mode on wrench.
    On the Left hand side check wrench accuracy at 20%, 60% and 100% according
    IS06789-2003. Now De-stress on Right hand side and repeat step 10

Torque and Angle Calibration:

1. Immediately after the regular Calibration the user is prompted to "wait" - the Gyroscope is doing a self test at this stage

2. The user is then prompted to rotate the wrench by 180 degrees and press ☑ to complete the calibration

Communication to PCFE:

To Establish Communication with the Wrench - Using RS232 Cable

1. Place the RS232 Cable in the COM 1 PC Port. Note: Available PC Port configurations may vary. It is important that communications are attempted with the correct PC Port. The PC Link has been designed for connection with the standard 9-Way D-Type PC Port.

2. Place the other end of the cable into the wrench Jack Plug socket.

3. Switch on the wrench by pressing any button on the wrench. Select the correct Com port on the PCFE. Now the PCFE will automatically connect to the wrench and the screen will fill with data from the wrench

4. When you are finished communicating with the wrench, remove the cable from the wrench.

Communication using USB Cable:

1. The installation checks the PC for the .net framework and installs it from the web if required.

2. Install the USB driver - It can be found at C:/program files/PCFE/Front-end/USB drivers
   After PCFE installation, the PC wizard will ask you to install this driver for the new hardware

3. The PCFE Icon is on the desktop, the password is "master" - you can re-size the screen and it will remember this setting on next time of opening.

The PCFE communication operates as follows;

Firstly connect USB cable to PC and to the Wrench or screwdriver and power up the tool.

Open the PCFE with "master" as the password, This password can be changed see page 16

Select Com port;

there will be two options;

1. Com Port 1 - this will allow you to connect the older type tools using the RS232 cable.

2. Com port x - it 's a virtual port and will vary from PC to PC.

Note; After you configure or view data on the Wrench and disconnect from PCFE, select Com port 1 afterwards to close the virtual port.

Wrench Data Transfer Protocol:

General

The data transfer protocol allows measurement data along with the associated date/time stamps
and pre-set limits to be transferred from the wrench to other equipment such as a PC or a PLC
controller.
Data can be transferred in either ASCII or binary formats and data transfer can be on a measurement by measurement basis or as a complete upload of internal memory.

Data Link Settings
All data is transferred in 8 bit bytes, single start bit, single stop bit, no parity at a speed of 9600
bits per second.

ASCII data transfer.
For this the ASCI menu item must be selected on the wrench.
Individual measurement transfer
This is initiated by transmitting the ASCII character 'm' to the wrench. Once the wrench
receives this it remains in individual measurement transfer mode until it powers down.
Data can be transferred from the wrench whenever the 'Store?' prompt is ticked in peak
or preset
mode.
The data format is as follows,
Day,Month,Hour,Minutes,Torque value,Torque units,Preset index,Preset high setting,
Preset low setting,Preset nominal value,Preset units
Each item is separated by a comma and can be used to feed a CSV spreadsheet file.
In peak mode the pre-set values (high, low and nominal) are set at 0.

Block transfer
This is initiated by transmitting the ASCII character 'b' to the wrench. Once the wrench
receives this it transfers the entire data memory contents to the external device. The data
is
separated into individual measurements containing the date/time stamp, measured value
and
pre-set data, as described in the data format above. The first measurement data are
transmitted
immediately after reception of the 'b' character.
After each measurement data are transmitted the wrench waits for a 'ready to receive'
signal in
the form of the ASCII character 'r'. Once this is received the next measurement data are
transmitted.
When all memory data has been transmitted the wrench will respond with the ASCII
character
'e'.

Binary Data Transfer

For this the BIN menu item must be selected on the wrench.
This is similar to the ASCII data transfer.
Returned data format is as follows
Day (1 Byte) Month (1 Byte) Hour (1 Byte) Minutes (1 Byte) Torque value (3 Bytes)
Torque
units indicator (1 Byte, see below) Pre-set index (1 Byte) Pre-set high setting (3 Bytes)
Pre-set
low setting (3 Bytes) Pre-set nominal setting (3 Bytes) Pre-set units indicator (1 Byte)
There are no separators between the different data items.
The torque and pre-set units are expressed as follows,
Units Units indicator byte contents
LBFT 0
LBIN 1
OZIN 2
NM 3
CNM 4
MKG 5
CMKG 6

Individual measurement mode
This is initiated by transmission of the single byte hex value 6D

Block transfer mode
This is initiated by the transmission of the single byte binary value 62
The clear to send character is single byte binary 72
When all data is transferred the wrench responds with a single byte binary 65

PCFE INSTRUCTIONS:

Changing the Password;

Only available in the "Master Version" of the PC Front End.

1. Click " Change Password" on the PCFE

2. Enter the "Current Password" ("master" is the default password)

3. Enter New Password in "New Password Box"

4. Enter New Password in "Confirm Password Box" to Confirm.

The Default Password for access to Master PCFE is "master ". The Default Password for
the Distributor PCFE is "distr"
Passwords must be changed by
Distributor / Calibration Vendor
prior to End User Usage.

Language:
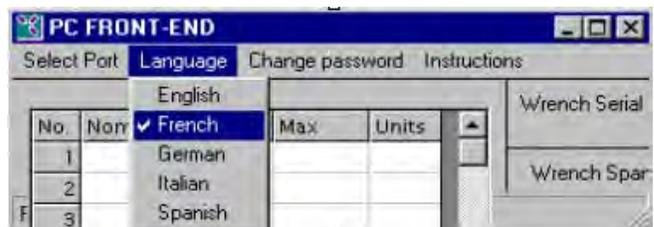
**The PCFE languages available include;
English, French, German, Italian, Polish, Portuguese, Spanish,
Russian and Chinese**

PCFE Window:
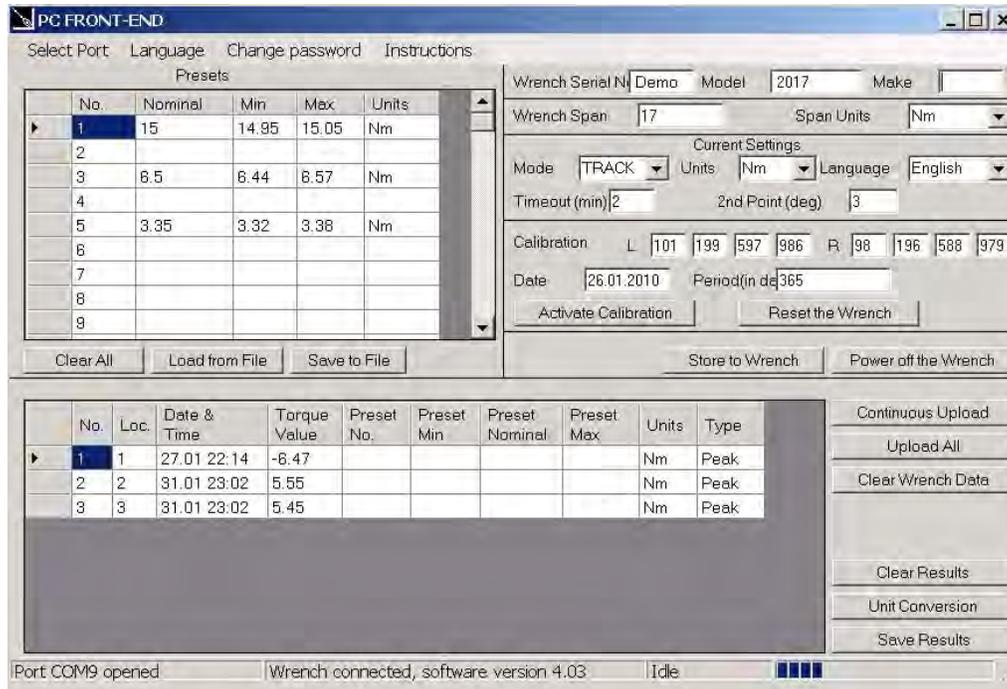
The Top half of the PCFE displays Wrench Configuration data

The Bottom section allows the user to manage the stored wrench data

The right upper half of the PCFE windows, displays data such as Wrench serial Number, Make, Model, Wrench Span and Units of measurement.

The date of calibration and the period of calibration are also shown in this section.

The left upper section displays the Presets stored in the wrench - the user can choose to use the PCFE to set the preset's or it can be done manually on the wrench.

The bottom half of the PCFE window displays any stored measurements on the wrench It displays wrench location number, date and time of reading, Torque readings, Preset data, units of measurement and the mode that was used to take the torque measurement.

Serial Number, Model and Make
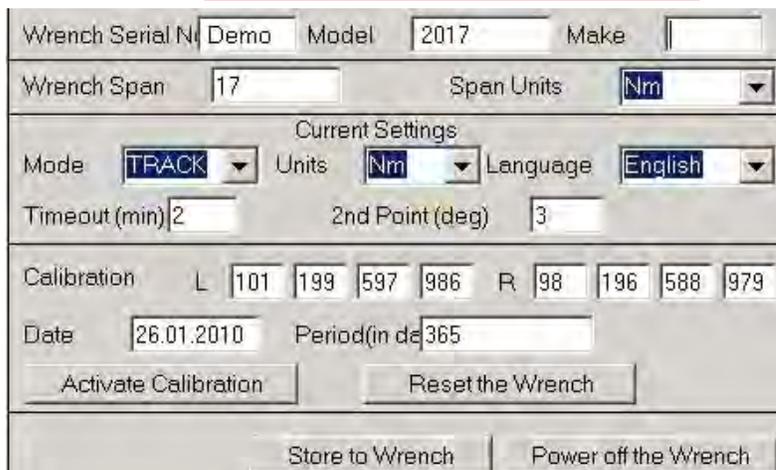
Wrench Span and units - Change these and tool must be re-calibrated

Current Settings; Mode, Language and units, Power off time

Date of Calibration, Calibration Co-efficients, Duration of calibration

Activate Calibration

Store to wrench - Stores any changes the user makes to the wrench current settings

Set a Preset using the PCFE:

1 Ensure the wrench is connected to the PCFE software

2 Select the preset number or location from 1 to 99 you wish to set

2 When the pop up window appears, fill in required fields and press ok

3 Select Store to wrench and the data is written to the wrench

4 Select Preset option on the wrench and select the preset required
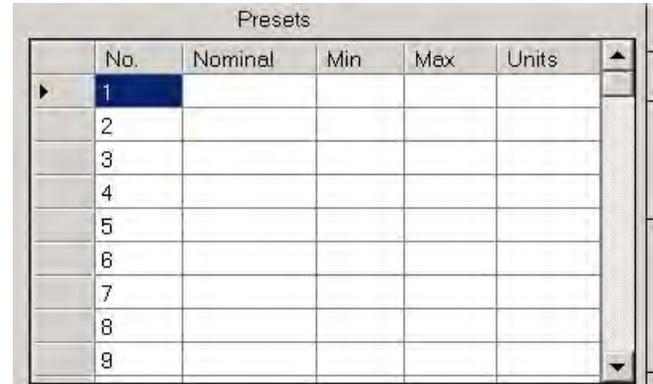
	No.	Nominal	Min	Max	Units	
▶	1					
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					
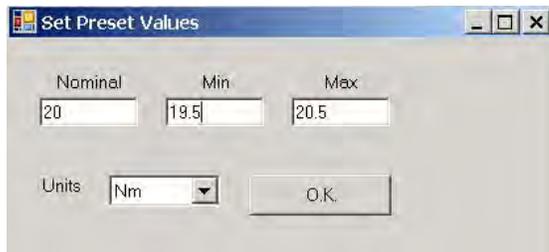
Presets

Set Preset Values

Nominal	Min	Max
20	19.5	20.5

Units Nm   O.K.

Bottom Section of PCFE:

The lower section of the PCFE allows the user to view stored results from the wrench. These results can then be saved as an Excel file for further analysis and to offer the user complete traceability of their torque measurements.

Each row will display the following; Time and date of Torque operation, Torque value and units, If it's a Preset result then the Minimum and Maximum tolerances are displayed along with the nominal setting.

The "Type" Column will display the function that was been used for the Torque operation, In the Example below you can see Peak and Preset.

No.	Loc.	Date & Time	Torque Value	Preset No.	Preset Min	Preset Nominal	Preset Max	Units	Type
1	1	09.02 17:21	10.2	1	10	10.1	10.2	Nm	Preset
2	2	09.02 17:21	11.1	1	10	10.1	10.2	Nm	Preset
3	3	09.02 17:21	10.3	1	10	10.1	10.2	Nm	Preset
4	4	10.02 18:48	-17.5					Nm	Peak
5	5	10.02 18:53	17.4					Nm	Peak
6	6	10.02 18:53	21.1					Nm	Peak

Continuous Upload
Upload All
Clear Wrench Data
Clear Results
Unit Conversion
Save Results

Port COM1 opened | Wrench connected, software version 4.03 | Idle

Shows Com Port Selected | Shows that the wrench is connected | Current Software Version | Indication Bar

Continuous Upload: When the wrench is connected to the PCFE and this is selected then the user can take reading's and by pressing confirm on the wrench the result will be automatically up dated to the PCFE

Upload All: Once the wrench is connected to the PCFE, selecting this option will upload all the wrench stored measurements to the PCFE

Clear Wrench Data: Selecting this option will clear the stored results from the wrench memory

Clear Results: Selecting this button on the PCFE will clear the displayed PCFE results

Unit Conversion: Selecting this button allows the user to convert the displayed PCFE readings between Nm, cNm, lbft, lbins, mkg and cmkg