TAKING THE RISK
OUT OF TIGHTENING

ET-cal II Compact
Torque Calibration Analyser
(0.1 – 17 N.m)

Drehmoment Eichgeräte – Dynamometres D'etalonage
Analizadores Del Par – Bilancia Torsiometrica

CE

Watch our Videos
YouTube
Broadcast Yourself™

Operators Manual

Instruction Part Number P30390 Issue 2

Torque Calibration Analyser - ET-cal II Compact

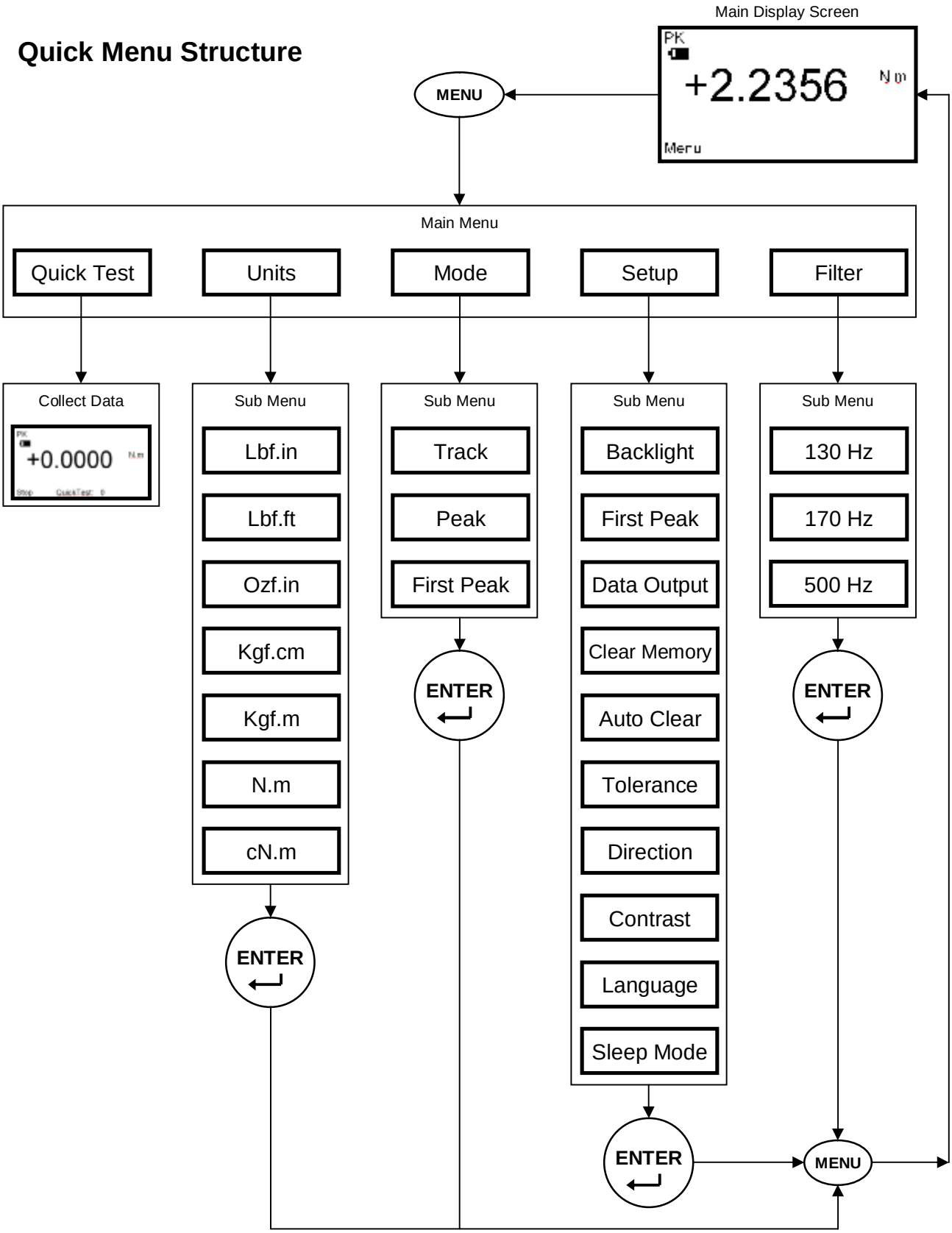
Products:	ET-cal 1, 5, 10, 17
System Accuracy:	+/- 0.5% of reading from 20% to 100% of full scale. +/- 1% of reading from 10% to 20% of full scale.
Calibration Period:	Every 12 Months or 5000 cycles (minimum)

Features

- For use with torque screwdrivers, torque wrenches and non-impact power tools
- Selection of three operating modes: (Track, Peak and First Peak)
- Units of torque measurement: (ozf.in, lbf.in, lbf.ft, cN.m, N.m, kgf.m, kgf.cm).
- Features built-in Quick Test operation.
- Includes PC Windows based software programs:
- Easy to use Menu Structure.
- Six-digit display.
- Ability to download readings to PC via RS-232 or via USB
- Real time out via RS-232
- High Capacity Li-Ion Batteries for long life.
- The unit will store a total of up to 150 data points.
- Real time graph of torque vs. time using associated PC Windows software.
- Go / No Go LEDs that identify high, low or out of tolerance readings.
- Three low-pass filter settings (130, 170 and 500 Hz)

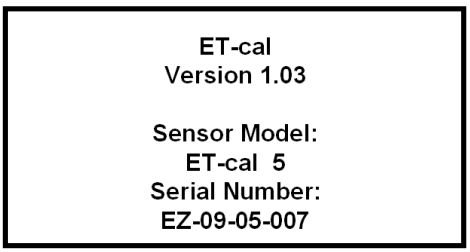
Contents

Quick Menu Structure

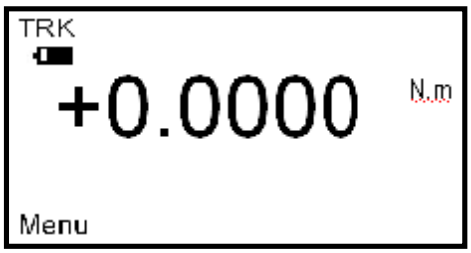


Screen Display

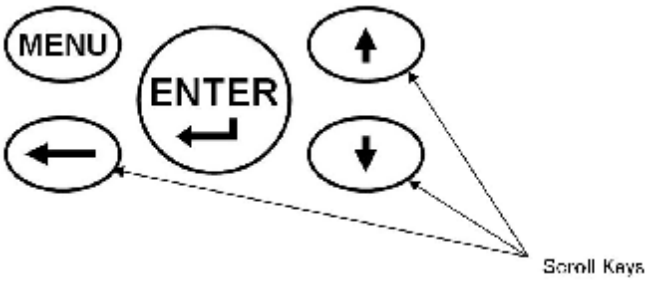
When the Analyser is turned on it will display a screen similar to that below for 5 seconds and then go into Reading Mode.



The Reading Mode screen will appear as shown below:



Keypad

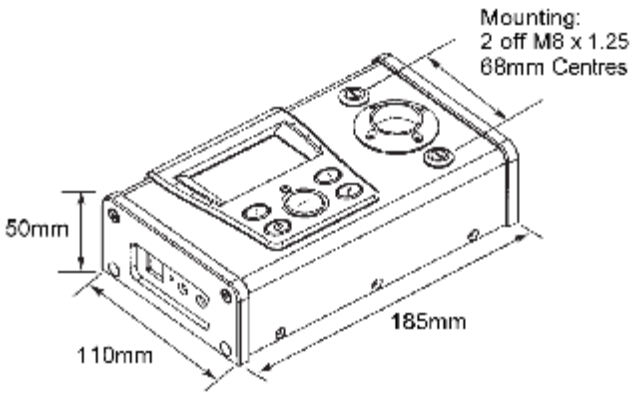


The Menu key is used to access the available menu items. The scroll keys allow scrolling though various menu items. The Enter key is used to select a menu item and is also used to clear readings from the display if the unit is in Manual Clear mode.

Mounting

The Analyser should be mounted to a workbench before operating. This is critical for the safety of the operator as well as for the accuracy of torque measurements during operation.

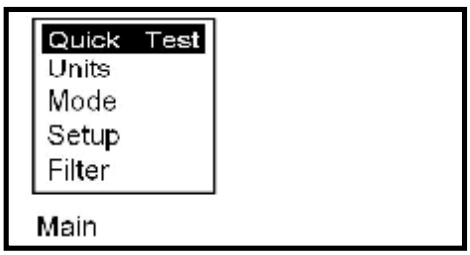
The ET-cal employs two spring loaded mounting screws from the unit into the mounting surface. To access these, remove the two threaded plastic plugs to reveal the M8 Cap Head Bolts underneath.

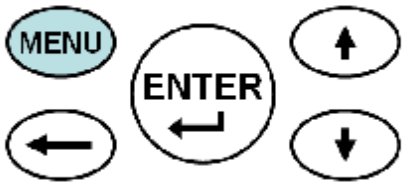


Note: Always ensure the unit is secure before operating,
Remember that a loose analyser can influence the validity of torque readings.

Menu Selections

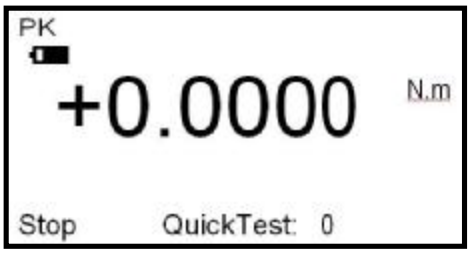
Pressing the "Menu" Key will present the following Screen:
1. Use the Scroll Up or Down key to toggle through: Quick Test, Units, Mode, Setup & Filter.
2. Press Enter key to select a choice.





Selecting Quick Test

Selecting Quick Test
Setup any operational parameters such as Auto Clear before starting a Quick test as settings can not be changed during a Quick Test operation.
1. Press Menu button.
2. With the Quick Test selected, press Enter key



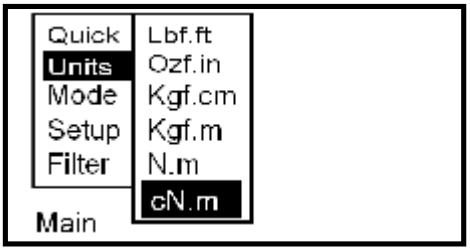
Once the Quick test is started the "Menu" indication at the bottom left of the ET-cal screen will change to "Stop". When the desired number of readings are collected, press the Menu key to end the Quick test.

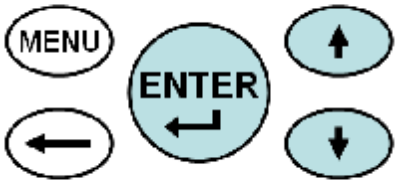
Note: Quick Test must be used in conjunction with **Peak** or **First Peak** Modes.
Not suitable for use with Track Mode

Selecting Units

1. From the Menu, Select Units and press Enter.
2. Use the Scroll Up or Down key to select Unit.
3. Press Enter key to confirm.

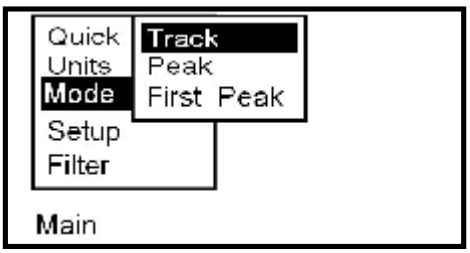
Note: cN.m is the last item on the menu. Scroll down to access.

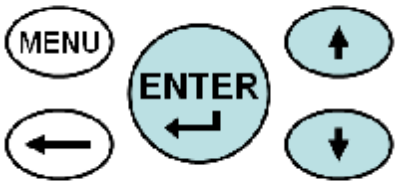




Selecting Mode Options

1. From the Menu, select Mode and press Enter.
2. Use the Scroll Up or Down key to select Mode.
3. Press Enter key to confirm.
4. The Main (or reading screen) will display the value of the selected Mode.

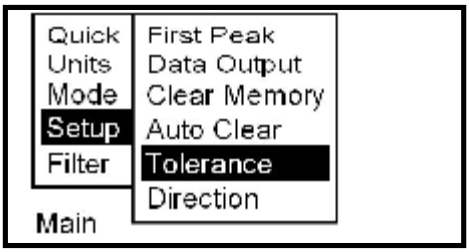


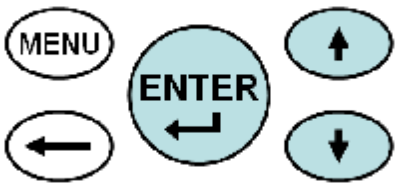


Selecting Setup

1. From the Menu, select Setup and press Enter.
2. Use the Scroll Up or Down key to select option
3. Press Enter key to confirm.

Note: Contrast, language and Sleep are also available. Scroll Down to access.





A signal produced as a result of dynamic motion consists of noise that needs to be cleaned in order to process information in the main signal. This process of cleaning or filtering noise is done by using an electronic system called a Filter.
The ET-cal product utilizes hardware low pass filters prior to A/D conversion and software averaging after to clean the main signal and cut undesired high frequency signals. This way the digital output code does not contain erratic aliased harmonic information. The three filter settings in the ET-cal are:

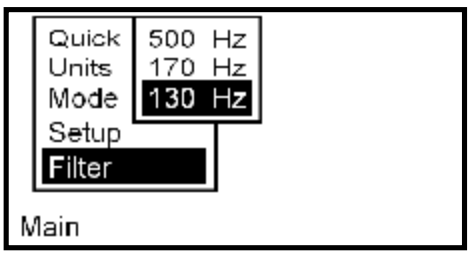
1) 130Hz: At this frequency setting the user will see a decrease in torque values when the speed of an electric tool is increased. The low frequency setting and software averaging cuts off any high undesirable signals resulting in low torque values with increased RPM.

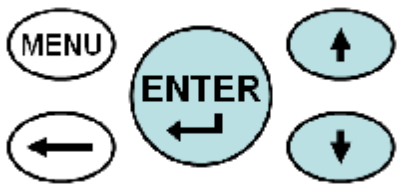
2) 170Hz: At this setting the filter is configured in such a way where the user will see limited or no torque value change with increased speed of an electric tool.

3) 500Hz: This is the standard torque tester frequency setting recommended by ISO for all dynamic tools. At this frequency the user will experience an increase in torque as the speed of an electric tool is increased.

Selecting Filters

1. From the Menu, select Filters and press Enter.
2. Use the Scroll Up or Down key to select option
3. Press Enter key to confirm.





Enter Key

The ENTER key function is used for two functions.

1. Clearing Display

The first function is used to clear any torque reading on the display. When the ENTER key is pressed it also sends the displayed reading to the RS 232 port for printing or downloading to an application program. After sending the data, the readings will automatically be cleared from the display.

2. Validating Setups

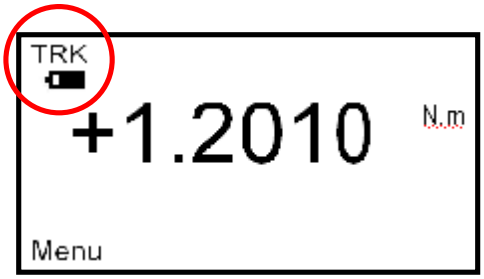
The other function is the validation of user selection during set-ups (see the Mode Selection, Filter Selection, and the Units Selection).

Mode Selection

The ET-cal Torque Tester offers three different modes of displaying torque information during operation (Track, Peak and First Peak). The user will determine which mode is best suited for the application. The use of the three modes is described below.

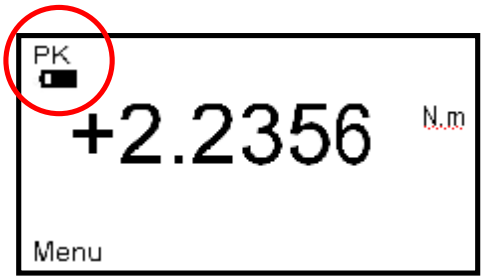
Track

This mode constantly tracks increasing or decreasing torque variations.
Use this mode to monitor varying torque on motors and machinery.
Also for calibration and testing of dial torque products (small wrenches or dial screwdrivers).



Peak

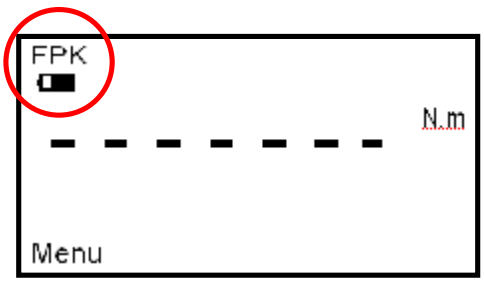
The display retains the highest torque applied. Use this mode during calibration or testing of any hand type torque wrench (dial, beam, and screwdriver), as well as power tools.



First Peak

The display holds the first detected torque peak applied. Before any torque is applied, the display show dashes in the torque value area. Once peak is detected, the display will show the torque value. If a second peak is detected then it will be displayed in the lower right (in small reverse video).

This function is primarily used for testing and calibrating click type mechanical torque wrenches. The ET-cal captures the point where the wrench clicks. This peak may be used for operator training on correct use of the wrench. Always apply torque smoothly to avoid false first peak readings.

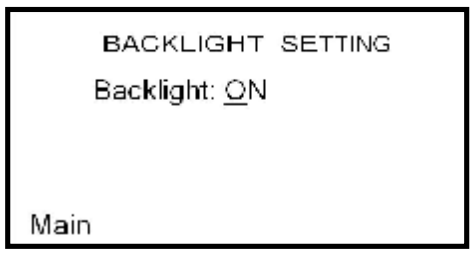


Setup Selection

Backlight

This function allows the user to turn on the display backlight for low light environments.

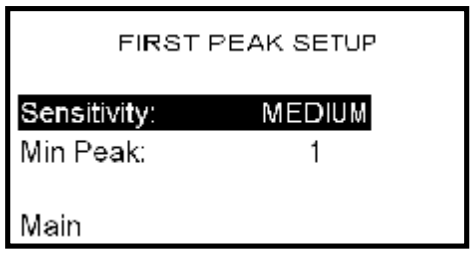
Use the Up / Down Scroll keys to toggle between ON and OFF and press Enter to select the setting.



First Peak Setup

This function allows a user to set up the First Peak settings.

Use the Up / Down Scroll keys to toggle between each setting.
Use the Scroll Left set up the data for each setting
Press enter to save the setting.



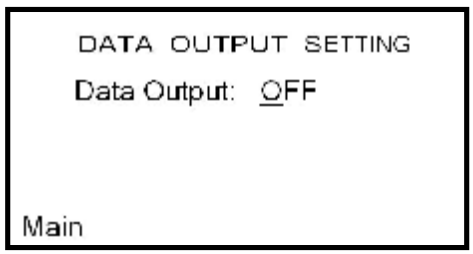
Data Output

This function allows a user to toggle data output to On or Off. Default setting is Off.
Use the Up / Down Scroll keys to toggle the setting from Off to On. Press enter to save the setting.

To Output Data via RS-232 to Microsoft HyperTerminal or similar Terminal Emulation packages, select **ON**

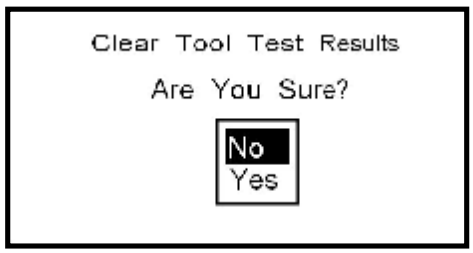
To synchronise data with the ET-cal Interface Software, select **OFF**

Note! The unit should never be plugged into the Interface Software with Data Output turned to “ON".



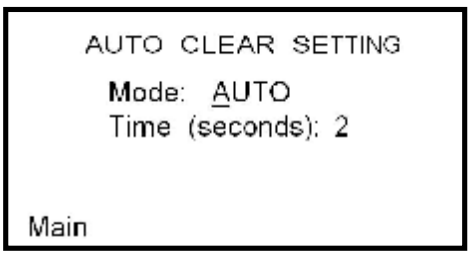
Clear Memory

This function clears ALL stored readings from Quick Tests. The user will be asked if they really want to perform this function. If they do they must choose "Yes". The stored readings can also be deleted from the Analyser using the Interface Program. Scroll to Yes, ONLY if you want to clear ALL readings, and press Enter.



Setup Selection

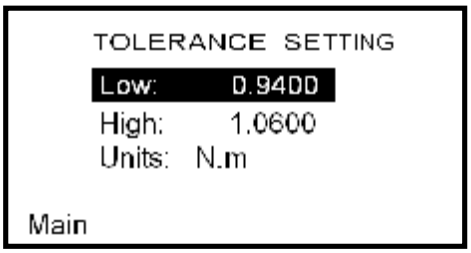
Auto Clear
This function controls the method of clearing the display of torque readings. When Auto Clear is selected, the torque values, during operation, will automatically be cleared from the display. The user can set the time threshold to control how long the values should be displayed before clearing. When Manual Clear is selected, the torque values during operation will indefinitely be display until the user presses the Enter key. The Auto Clear timer can be set from 1 to 5 seconds.



If a Quick Test is in operation, the readings will be stored when the Auto Clear timer expires or the user presses Enter if in Manual Clear mode.

Use the Up / Down scroll keys to change between Manual and Auto and press Scroll Left to move to the Time. Use the Up / Down scroll keys to select the Time. When finished, press Enter to end the process and store the setting.

Tolerance
The Tolerance parameters control the Go and No-Go multicolored Green / Red LED and In Tolerance and Out of Tolerance indication on the Analyser screen. The user sets a lower and upper torque threshold to get a visual warning signal when these limits are reached or breached during operation.

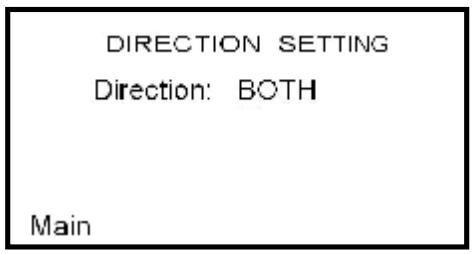


When you first enter the Tolerance Setting screen Low Tolerance will be in reverse video. When this is true you can scroll between Low and High tolerance using the Scroll Up / Down keys.

To set the Tolerance press Enter and the value will change to normal video and the cursor with be on the last digit. Use the Scroll Up / Down keys to increase or decrease digits and scroll left to move to the next digit. When done with Low Tolerance press Enter and the Low Tolerance will appear in reverse video. Use Scroll down to move to High Tolerance and then press enter to edit the value. After completion press the Menu key.

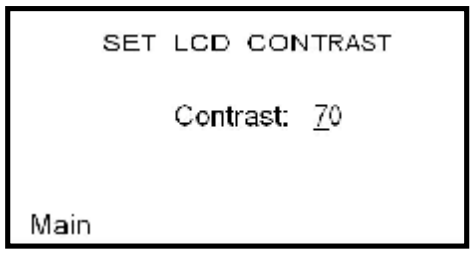
Mode Selection

Direction
Allows an operator to set the direction for capturing the torque readings: (Clockwise, Counter Clockwise and Both directions).
Use the Up / Down scroll keys to change between BOTH, CW and CCW. When finished, press Enter to end the process and store the setting.



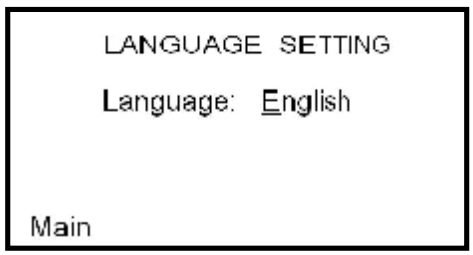
Contrast
This function sets the contrast of the Display.

Use the Up scroll key to increase the contrast and the Down scroll key to decrease the contrast. When finished, press Enter to end the process and store the setting.



Language
The function allows the user to change the language of the Analyser. Only two languages are available in the Analyser at one time

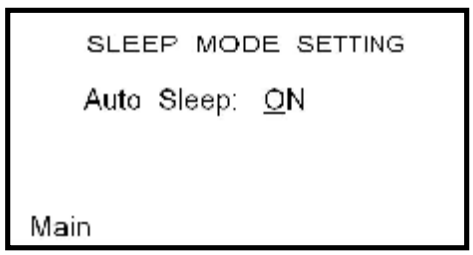
Use the Up / Down scroll keys to change between languages. When finished, press Enter to end the process and store the setting.



Sleep
The ET-cal will automatically turn off after 10 minutes of non use (no torque readings or no presses of the key pad buttons).

This function is used to turn off the sleep mode for users that do not want the ET-cal to go to sleep.
Use the Up / Down scroll keys to change between sleep mode On / Off. When finished, press Enter to end the process and store the setting.

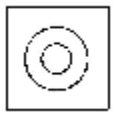
Caution: The ET-cal will have significantly less operational life if Sleep Mode is turned off.



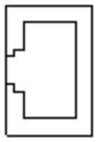
External Connections

On the left side, there are three slots for external connections.

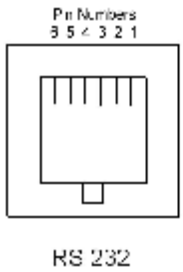
External Power Supply
Plug the provided transformer to charge the internal batteries in the unit.



RS 232 Connection:
The RS 232 can be used for printing or downloading torque values into a computer or used with an external PC to calibrate the unit.
Rate: 19,200 BPS
Output Format: 8 bits fixed, 1 stop bit, no parity.



Pin-Out
The following diagram and Table define the pins of the I/O connectors for the ET-cal Torque Tester.



RS 232 Connector

Pin	Signal
1	Not Used
2	RXD
3	TXD
4	Not Used
5	Ground
6	Not Used

Analog Output
Connector provided for those that wish to monitor the amplified analog signal before the analog to digital conversion.

Power Tool Testing

The ET-cal includes a 1/4 Female Hex Square Drive Adapter which is used for testing hand tools. It also includes a Run Down Adapter

The run down adapter is designed to provide consistent and reliable torque readings for use with power driven torque control tools. The RDA's reduce the impact and irregular peaks that cause poor

Always use a quality joint rate simulator (run down adapter) when testing power tools in a simulated application. Use the peak mode. The Peak mode is designed to meet the demanding frequency requirements for testing dynamic torque applications.

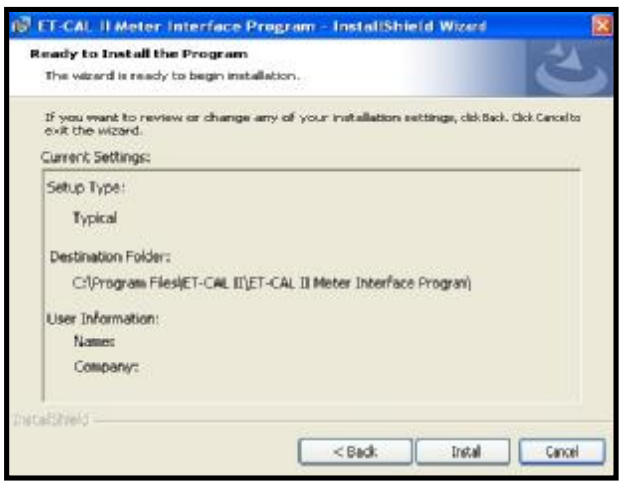
Operation
1. The run down adapter is placed in-line between the tool drive and transducer of the torque tester.
2. The torque tester should be properly secured on a solid surface or a test bench.
3. Before each test run, the Input drive run down adapter (RDA) should be completely backed-up.
4. The RDA is designed to run in clockwise direction only.
5. Apply torque until RDA is run down completely. Then note or save reading with the torque tester.

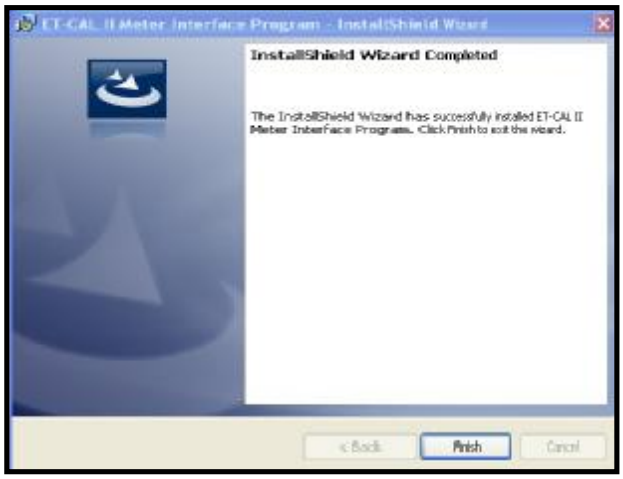
Installation of the “Interface Software”

The interface program allows the operator to conduct Tool Tests, Data logging and Transducer Calibration.

1) Insert the CD into the PC and the Interface Program splash screen will appear. Click on the “Install ET-cal II Program”

2) Click Install.

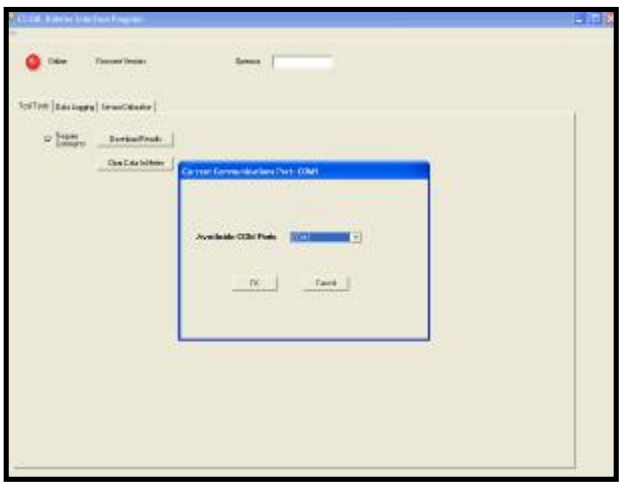




3) After the installation is successful click Finish.
4) After installation of the ET-cal Interface Program, turn on the ET-cal and connect it to a PC through the RS-232 port.
5) A green light will show on the Interface Program indicating that the software was installed and the unit is connected properly.

COM Port Selection

The ET-cal Interface Program contains a com port selection tab which allows for selection of a specific com port. The default setting is Com 1. Go to File Menu, select Com Port.



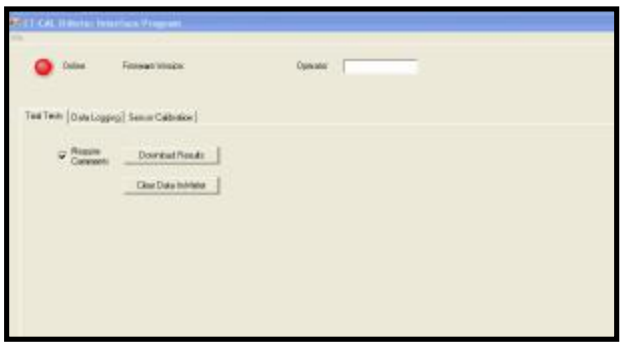
If using a USB connection, Toggle through the com port selections and click ok on the available selections until the On-Line indicator turns Green. The ET-cal must be turned on to establish a connection. The COM port setting can also be verified by checking port assignments via device manager.

Quick Test Downloading

The interface software can be used to download the results of the Quick test data stored in the ET-cal. The test data stored in the Analyser can be deleted using this program or deleted using the menu.
If you desire to add comments to the download, check the "Require Comments" check box and you will be provided with a window to add comments to the downloaded results.

1) **Download Results**
   Retrieves the results of a QuickTest after it has been run. It will offer a chance to add further notes to the test at this point.
   The results will save in the PC in a location of your choice in a folder under the name entered in the "Operator" field in the upper portion of Interface software.
   The results are stored in a .csv file which can be opened in Excel or using a text editor program, such as Notepad.
   The file name will be the QuickTest number followed by the date and the time at which the test was started.

2) **Clear Data in Meter**
   Clears the test data for the QuickTest in the ET-cal Analyser.
   The operator will be asked for confirmation before the action takes place.

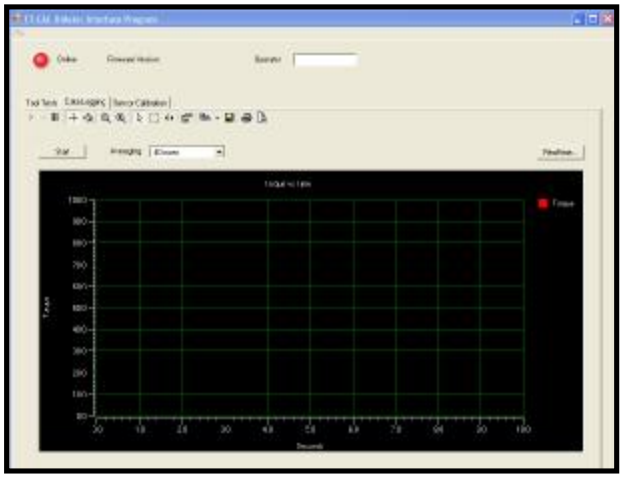


Data Logging

The Data Logging tab of the Interface software provides a feature to graph torque vs time in real time. The Data Logging tab also provides a "Real-time" feature that allows the capture of torque readings into an Excel Spreadsheet.

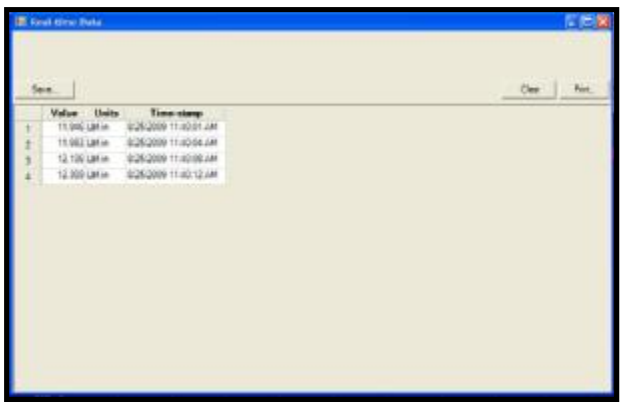
1) Graph:

The real time torque vs time graph can be accessed by clicking on the Data logging tab, and then clicking on the Start button on the top left side of the screen.
After torque has been applied and the desired graph has been obtained, click the Stop button to stop the collection of readings.
There are different features available at the top of the Start button that can be utilized for the graph.



2) Real-time:

The Real-Time button on the upper right side of the Data Logging screen allows a user to connect the ET-cal to a PC and get readings sent to the PC, in Real-Time, which can be printed to a printer or saved as an Excel Spread Sheet.
The screen reading is sent from the Analyser when Auto clear takes place or when Enter is pressed if the ET-cal is in Manual Clear mode.



Bootloader

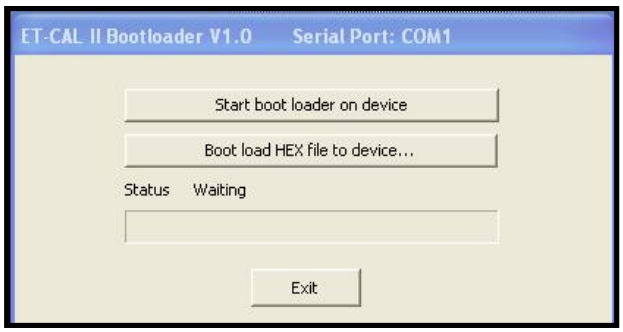
This program is used to update the code in the ET-cal unit. This program does not automatically install as the Interface program does when CD is inserted into the PC. Insert the CD into the PC.
Locate the Bootloader.exe file and click on it, a small window will pop up as shown below.

The ET-cal is supplied with RS-232 cable adapter and USB serial converter adapter.
Connect the RS-232 cable to the torque tester and the computer.
Turn on the ET-cal unit. Click the button "Start boot loader on device" and the ET-Cal screen will indicate the ET-cal is in bootloader mode.

To update the firmware click the "Boot load HEX file to device" button, and locate the hex file on the computer. The process will take about 6 minutes. The status will be shown in the Bootloader window as the process takes place.

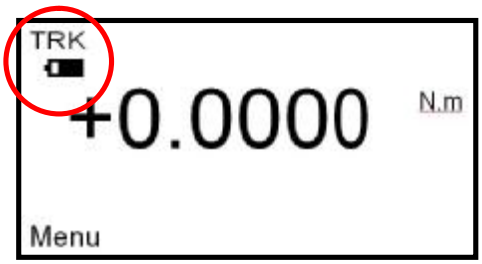
In some cases when a computer does not have an RS-232 connector and the USB serial converter adapter is used, the serial port where the connection is received might come in at a port different than COM1. In this situation if the user wants to update the firmware through the Bootloader program, the user needs to perform the following procedure:

1) Right-Click the ET-CAL II Bootloader Program shortcut on the desktop.
2) Click on Properties
3) Under the "Shortcut" tab locate the Target address box.
4) In the Target address box the user will see the address of the shortcut file as shown in the example below:
   "C:\Program Files\ET-CAL II\ET-CAL II Meter Interface Program\BootLoader.exe".
5) Right after the Bootloader.exe" add a space and forward slash followed by the ComPort the connection comes in at as shown in the example below:
   "C:\.....exe" /com6



Note: Only use Bootloader when instructed by Torqueleader and when there is a firmware update to install. Unnecessary use may cause corruption of the existing firmware.

Battery Operation



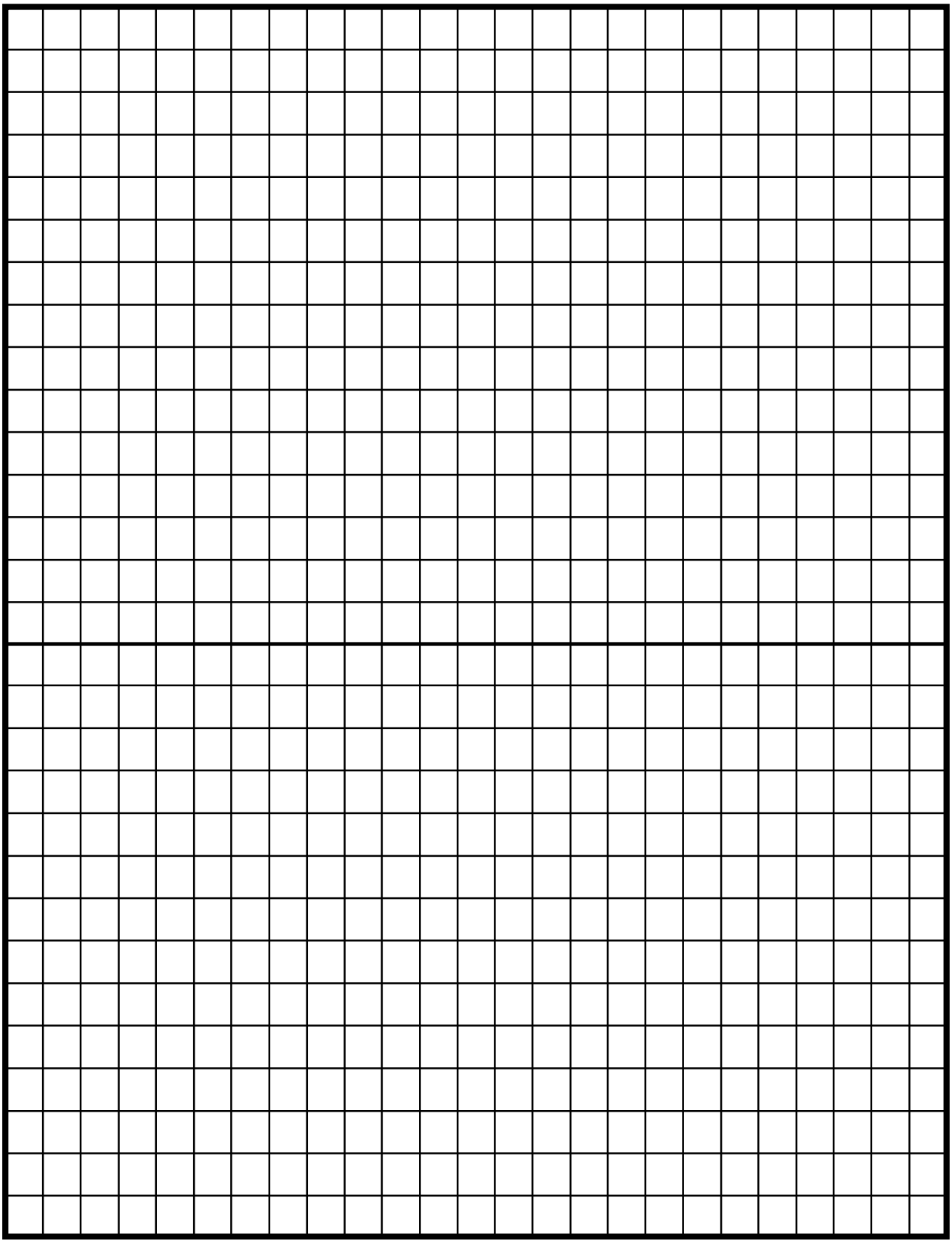
The ET-cal Analyser is powered using Li-Ion batteries for long battery life. The battery pack should last up to 40 hours with normal use and maximum charge. The battery icon is always on the display. It is filled in completely when fully charged and shows white space as the battery depletes.

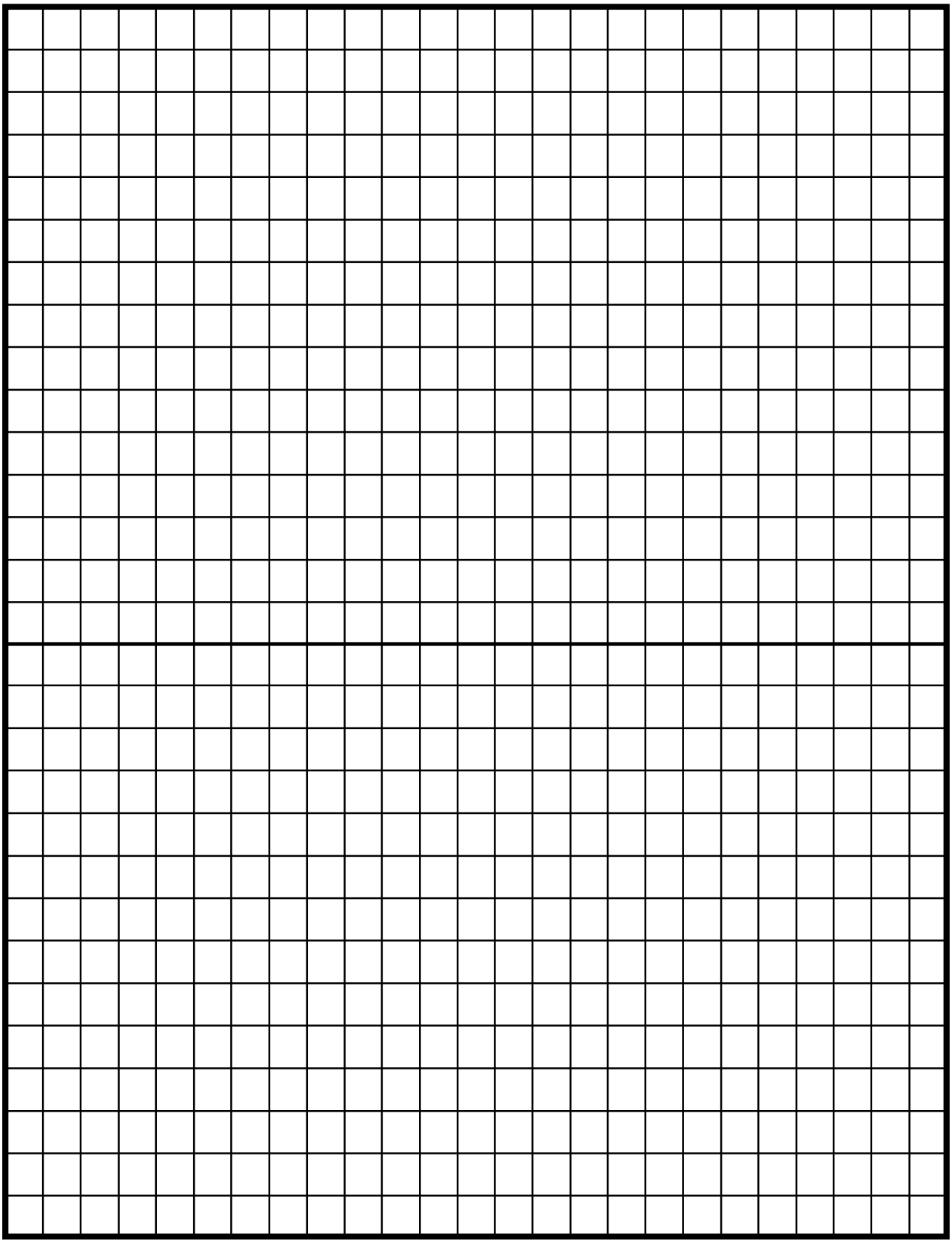
When the battery strength appears low, the unit should be connected to the external AC adapter to charge the batteries. The torque readings may become inaccurate when the unit is used with a low battery. Charging time is 4 hours minimum, but the unit may be used with charging.

Universal Charger/ Adapter
The unit is supplied with a Universal Charger/ Adapter with auto volt feature 100-240 V, and the user does not have to physically change the voltage setting.

Accessories

Accessories Included:
- 1/4 F/Hex Sq. Dr. Adapter - 17mm Hex (for ET-cal)
- Square Dr. Adapter (1/4 Sq. Dr x 1/4 Hex x 2" Oal)
- 2 x 17mm Hex Blank Adaptors (soft)
- Run Down Adapter
- 3 Interchangeable Rundown Springs
- Socket Head Power Bit 5mm x 49mm
- RS232 Cable Adapter (6P6C)
- Serial to USB Adapter
- Universal Charger (100-240 VAC & 10 VDC)
- Case





Torqueleader – TAKING THE RISK OUT OF TIGHTENING

Measure

- Torque measuring tools are used in Research, Development, Inspection and Quality Control where there is a need to check torque settings. This type of tool can also be used in a Servicing or Production Environment to apply torque.
- Measuring Torque Tools feature a Dial or Digital readout and are available in Screwdriver or Wrench formats, covering torque values up to 2000 N.m.

Apply

- Torque applying tools are used to apply a set torque to a fastener. The tool will **Click**, **Break** or **Slip** to signal to the operator when the set torque has been achieved.
- **Preset** tools are ideal for Production areas where the same torque is applied repeatedly.
- **Calibrated Scale** tools are operator adjustable and are ideal for servicing applications where ease of adjustment is essential.

Calibrate

Torqueleader offer two types of Torque Analyser:

- **Mechanical** Analysers offer a low cost robust and easy to use device, designed to set and calibrate low range torque tools.
- **Digital** Analysers allow the user to download test results, test powered Torque Tools and reach higher torque values than are possible using Mechanical Analysers.

Torqueleader's Calibration Service

Professional, Quality and Competitive

- Regular calibration to International Standards is vital to ensure that your torque equipment is operating at its peak performance.
- We have a UKAS Calibration Laboratory, accredited to ISO/IEC 17025:2005 on site, capable of recalibrating most Hand Torque Tools, Analysers and Transducers in accordance with the International Standards.

Torqueleader, Tannery Lane, Gosden Common, Bramley, Guildford, Surrey, GU5 0AJ

Sales Hotline: +44 (0) 1483 894476
Switchboard: +44 (0) 1483 892772
Facsimile: +44 (0) 1483 898536
Email: salesandrepairs@torqueleader.co.uk

Torqueleader

Leading The World in Torque Technology

Torqueleader is a partner in the GEDORE Group

www.torqueleader.com