數位扭力計操作手冊

DIGITAL TORQUE METER INSTRUCTION MANUAL



KTM-1000

注意:
扭力計在長時間無使用狀態下，每個月至少需定期活化電池一次，
預防電池續航力衰退。
Note:
To prevent battery life decline, for a long period of time without use torque meter, needs to activate the battery at least once a month.

奇力速工業股份有限公司

KILEWS INDUSTRIAL CO., LTD.

Y2F144-2-013

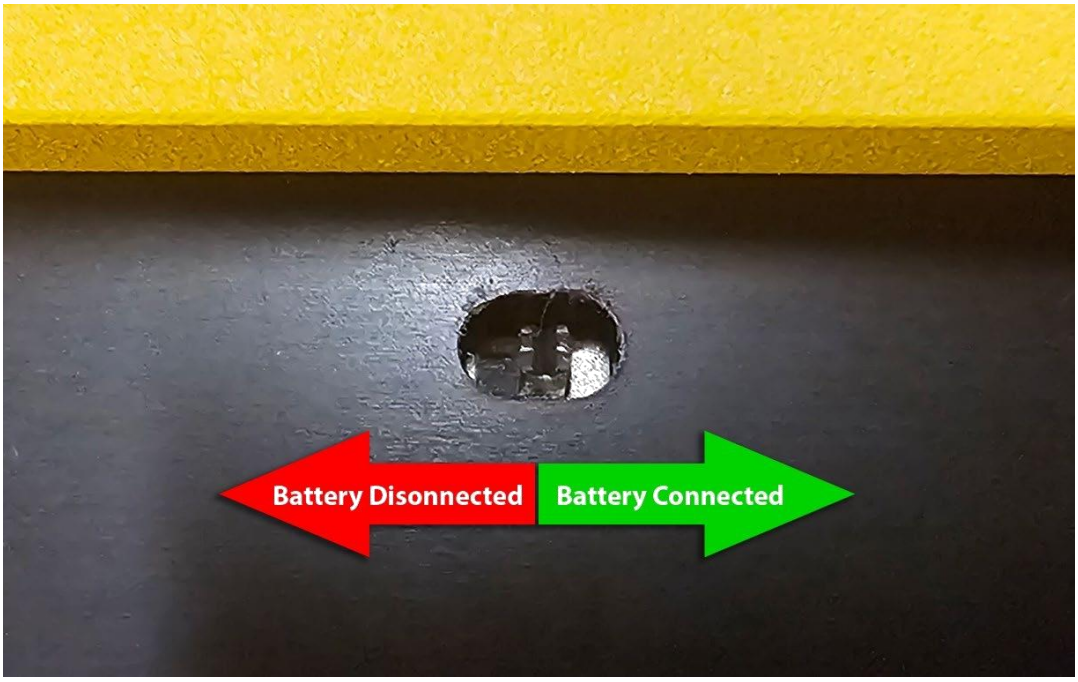
扭力測試機處於深度睡眠狀態以進行儲存和運輸。

KTM-1000 首次啟動說明

首次使用前，為了打開裝置電源，必須將滑動開關移至右側電池連接位置（請參閱附件），且扭力測試機必須透過 USB 充電器插入壁式轉接器，然後才能首次喚醒。
扭力測試機開機後，系統將提示使用者需要更新日期和時間(24 小時制)。扭力測試機包含首次啟動說明以概述此流程。

如果系統沒有提示或需要進一步更改，請進入「設定」選單，選擇「時鐘」進行調整。
請注意，隨附的校準證書上的日期是測試儀在工廠校準的日期。 首次投入使用的日期應作為下一個校準間隔的起點。

電池斷路開關



Battery Disconnect=電池斷開
Battery Connected=電池連接

目錄

一. 安全規範……3
安全資訊……3
安裝與測試……4
二. 外觀說明……4
三. 介面說明……5
開機界面……5
主選單界面……5
設定功能介面……6
四. 基本功能說明與操作……7
量測模式……7
快速模式……8
群組條件編輯……9
系統資訊……12
扭矩換算……12
自動歸零……12
自動關機……12
省電功能……13
語言設定……13
時間設定……13
螢幕亮度……13
快速引導……14
密碼鎖設定……14
五. 安裝……15
5-1-1 測試座……15
5-1-2 測試座組成……15
5-1-3 彈簧排列方向……15
5-2 固定底座……16
六. 故障排除……17
定期校準……17
恢復原廠設定……17
故障排除指南……17
七. 產品規格……18

一.安全規範

警告!

- 為了事前預防火災、觸電、受傷等等事故，請務必遵守下述「安全注意事項」。
- 使用前，請確實閱讀此「安全注意事項」後，依照指示正確使用。
- 在閱讀過所有安全資訊之前請勿擅自操作，沒有依照程序會導致產品損壞或者身體受傷。
- 閱讀後請保管在使用者可以隨時看到的地方。

安全資訊

- 使用此產品時，請勿穿戴任何項鍊等物品。
- 使用此產品時，請穿戴適當的服裝（例如：穿戴工作眼鏡、工作褲，鋼頭鞋）。
- 開始操作產品前，請先檢察周圍是否有電線以及其他鬆弛的線。
- 請將產品以及充電器遠離水，隨時放置在乾燥以及安全的環境。
- 請勿在易燃燒及爆炸的環境操作產品。
- 切勿對本機施加超過最大扭矩值的扭矩，否則可能導致設備損壞和操作員受傷。
- 未授權人士是不允許使用此產品。
- 請勿使用非本廠商提供的零件做更換與操作。
- 請在乾淨的環境操作此產品。
- 此產品需保持著乾淨及乾燥，並請遠離油污以及油脂。
- 請在進行清理，維修前，隨時將插頭拔除。
- 請務必依照維修流程指示進行維修，如果沒有按照指示做可能會導致產品損壞。
- 請勿拉扯電線。從插座上插拔接頭時請勿用力拉扯電線。
- 為了能夠安全且有效率的作業
  - 請定期檢查儀器本體、起子頭、測試座等等，請勿使用變形磨損的零部件。
  - 更換配件時請依操作手冊更換。
  - 請定期檢查電線及延長線，破損時請更換。
- 以下狀況時請關掉儀器本體的開關並拔掉插頭。
  - 不使用、或是不充電時。
  - 維修時。
  - 其他可能引起危險時。
- 維修請委託經銷商，請勿任意改裝機台。
- 請勿自行維修此產品，除非您有正式受訓過維修技術；需維修時請務必聯繫購買的經銷商。若是由非專業技術人員維修，除了無法充分發揮性能，也會引起事故或受傷。
- 本產品為精密儀器，請勿拆解或是強烈撞擊、震動。
  - 過強的撞擊或震動導致機器故障時，除了無法充分發揮性能，也會引起事故或受傷。
- 請正確充電。
  - 充電時請依照指示電壓進行充電。勿使用直流供電機或發電機充電，會產生高熱引發火災。
  - 請在通風良好的地方充電。充電時請勿用布等等覆蓋住。
- 請小心觸電。請勿以潮濕的手碰觸電源插頭以免觸電。
- 請勿將電池(裝於儀器本體內)丟入火中。可能會產生爆裂或是有毒物質。
- 連接外部機器時，請將全部機器的電源關掉後再連接，否則可能造成觸電或機器損壞。
- 發生操作手冊內容以外的狀況時，請馬上停止使用並連絡經銷商。

警告!

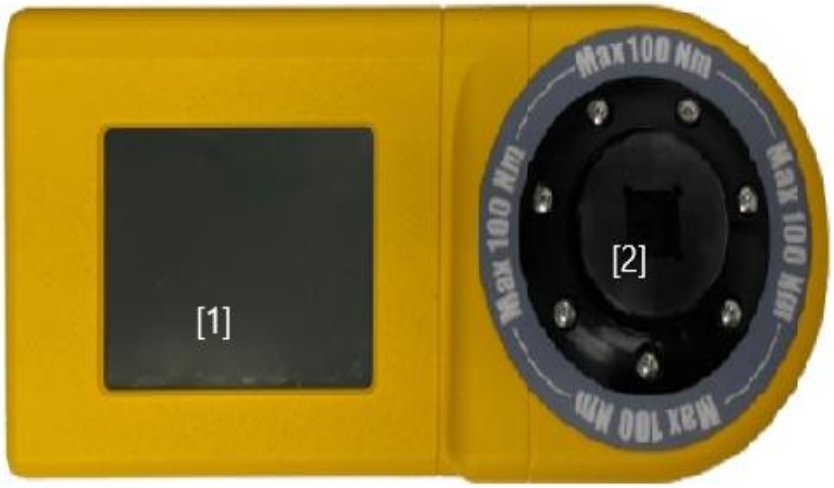
- 由於扭矩測試儀的高扭矩測試能力，與扭矩測試座的重複測試會導致測試座明顯的溫度累積。如果測試座變得燙手，再繼續測試之前請先冷卻測試座再進行測試。
- 如果沒有依照指示進行，可能會造成人身傷害或損傷。

安裝與測試

在測試儀底部有（4）個 M10 x 1.25 孔，用於適當的固定件安裝到工作台上。可以選購工作台安裝支架，作為測試儀固定方案。

KTM-1000 扭矩測試儀進行測試時，測試座必須安裝牢固避免產生反作用力及滑移，此外量測時滑移會影響最終的扭矩讀取值。

二.KTM-1000 外觀說明



1	LCD 觸碰式螢幕
2	傳感器測試座連接端
3	USB 2.0 插槽
4	電源開機
5	USB C 插槽
6	重置鈕





⚠ 注意!

KTM-1000 第一次開機說明

由於 KTM-1000 在運送過程的時間相當長，所以在第一次開機時，強烈要求使用者必須**先充電**再開啟 KTM-1000。

在第一次開啟 KTM-1000 時，會要求輸入時間值(日期,時間,24 小時制)。KTM-1000 在開機後會將時間資訊顯示出來。

若 KTM-1000 在第一次開機沒有要求設定時間值，請到 SETTINGS 設定選單 > CLOCK 時間選單，來設定時間值(日期,時間,24 小時制)。

請留意 KTM-1000 的校正時間&校正報告是由工廠進行校正，由於經過長時間運送以及放在庫存時間。建議使用者自行記錄第一次的使用日期，利於計算下次需要校正的時間。

備註：

在長時間不使用 KTM-1000，而導致無法開機，請參照以下流程

1. 插上充電線
2. 按下 KTM-1000 後方重置鍵(參照左圖)
3. 拔下電源線
4. 重新接上電源，並重新開機
5. 設定時間
6. 將 KTM-1000 充飽電

三.介面說明

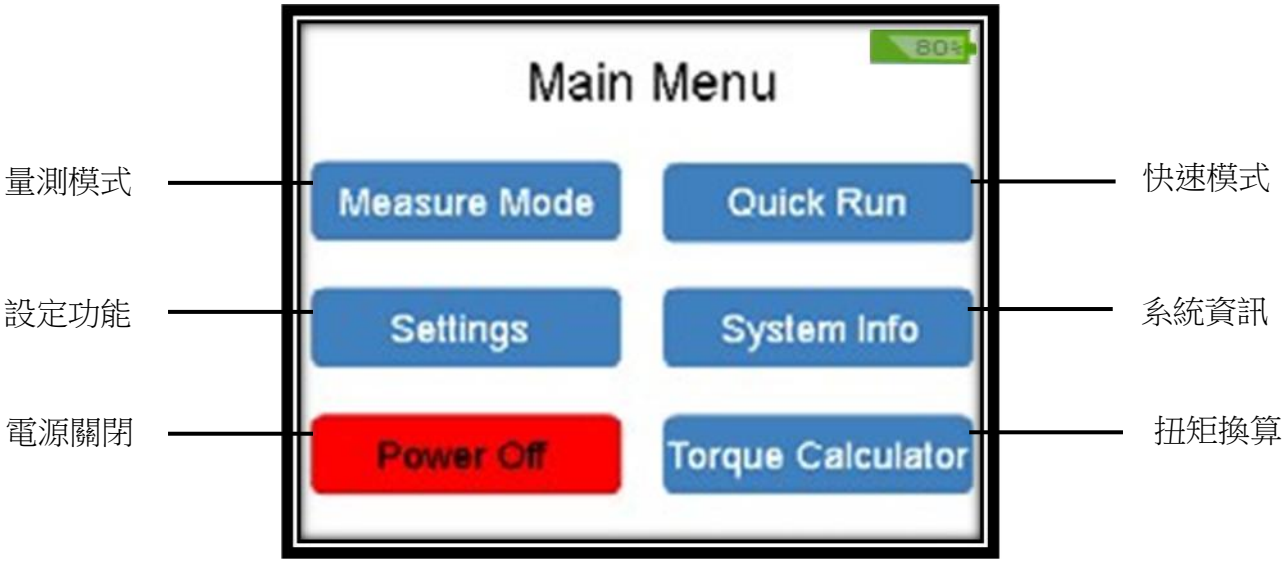
1. 開機界面

當操作員開機（按下儀器左側的開關打開扭矩測試儀）時，將顯示此屏幕。觸摸顯示屏的任何部分可進入主選單。



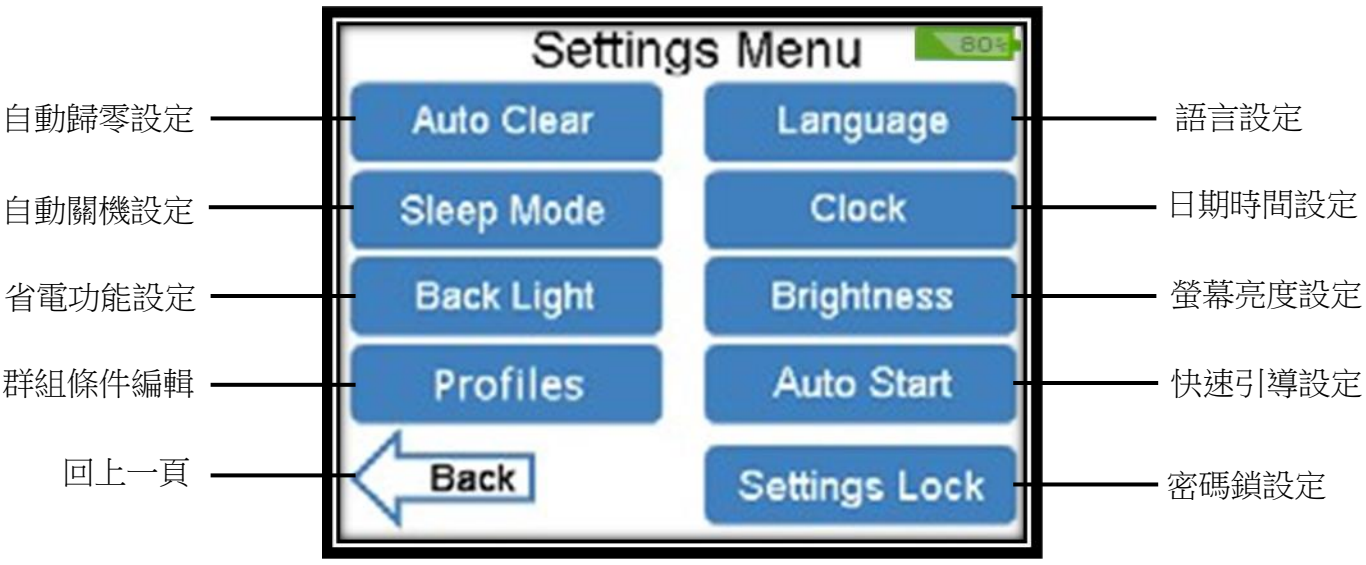
2. 主選單界面

KTM-1000 扭矩測試儀的主選單，可以在完成一個功能並想要移動到另一個功能時，或關閉儀器電源時返回此屏幕。



3. 設定功能界面

用戶可設定或建立特定需求之測試條件與功能。



主選單界面備註:

選項/設定	註解
量測模式(Measure Mode)	進入後可進行扭矩量測(Peak)與校驗模式(Track)。
快速模式(Quick Run)	即可進行量測，不用選擇群組條件。
設定功能(Settings)	多種設定功能，如自動歸零、日期設定、休眠時間等等。
系統資訊(System Info)	本系統資訊目錄允許用戶取得各種資訊，包含軟體版本、序號、電池訊息和校準數據。它還包含設備的校準功能。校準螢幕和電池螢幕的某些功能受密碼保護。請聯繫工廠以獲取更多信息。即使密碼輸入錯誤或未輸入密碼，電池螢幕仍會顯示可用的電池訊息。
扭矩換算(Torque Calculator)	內建扭矩換算計算器。

設定功能界面備註:

選項/設定	註解
自動歸零設定(Auto Clear)	在實測扭矩時可自動歸零上一次顯示的扭矩讀數，可設置一到九秒的歸零時間。
自動關機設定(Sleep Mode)	當無使用扭矩測試儀時，儀器會自動關機，可設置一到四十分鐘。
省電功能設定(Back Light)	當無使用扭矩測試儀時，會進入省電模式，可設置三十秒至八分鐘。
群組條件編輯(Profiles)	可記錄最多八個群組，每個群組可設定測試時所需要的測試條件。
語言設定(Language)	設定需要的語言。
日期時間設定(Clock)	設定時間 日/月/年
螢幕亮度設定(Brightness)	調整螢幕亮度使用[+]和[-]按鈕可以提高或降低，調節到所需要的亮度。
快速引導設定(Auto Start)	開機後可自動進入快速模式或量測模式。
密碼鎖設定(Settings Lock)	設定密碼鎖必須輸入四位數 PIN 才能更改密碼(默認 PIN 密碼為 1234)。

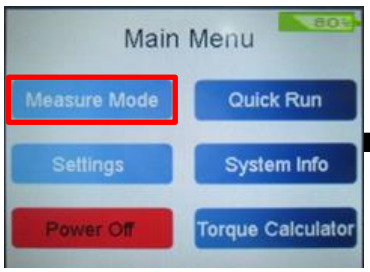
四.基本功能說明與操作

1. 量測模式

量測模式可讓使用者獲取並儲存相關的起子扭矩資料，從主要選單中選擇量測模式後，使用者可以選擇峰值 (Peak) 和校正模式(Track)。按壓  測試數據資訊，在屏幕右下角落處圖示，就可以顯示資料測試的統計資料。按  壓儲存測試數據圖示即可輸出峰值資料，詳閱【1.2 其他操作(數據儲存)】。

1.1 操作方式

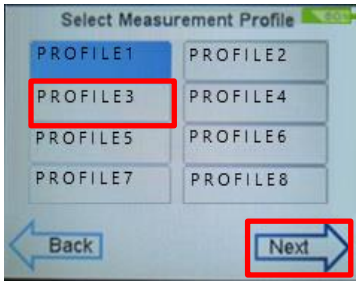
▲建議先設定群組建立需要的測試條件在進入量測模式，詳閱【3.群組條件編輯】。



1. 進入主選單點選 Measure Mode 量測模式

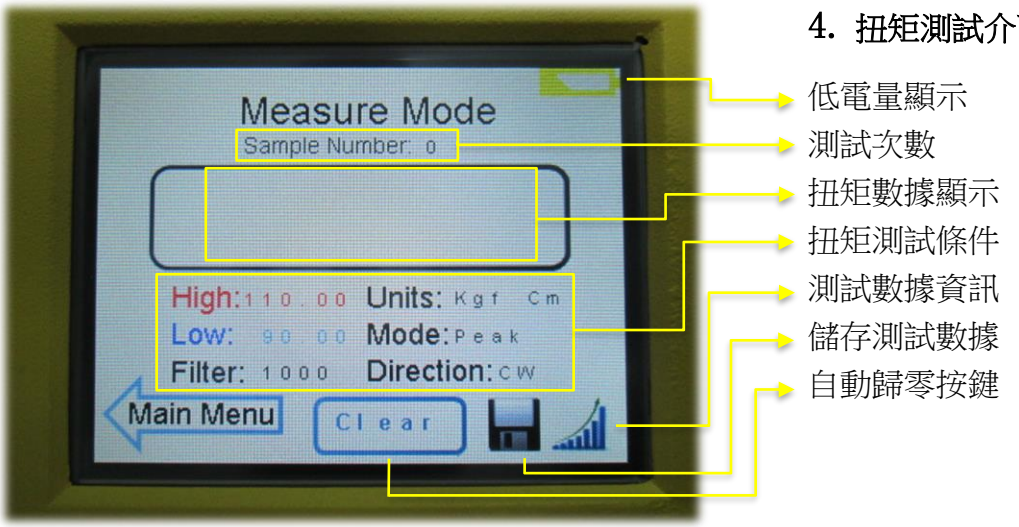


2. 手指點選 Peak 峰值，再點選 Next



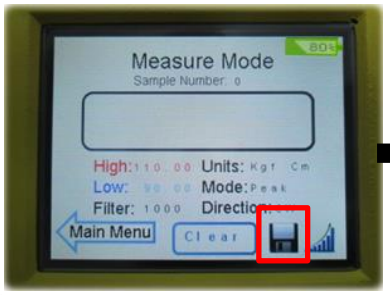
3. 選擇其中一個群組，再點選 Next

4. 扭矩測試介面



備註: 1.低電量顯示，只有在低電量時才會顯示，電量足夠時不會顯示。
2.可存取測試數據或透過 USB 傳送數據至電腦。
3.群組設定請詳閱【3.群組條件編輯】。
4.點選測試數據資訊可以觀看測試扭矩資訊。

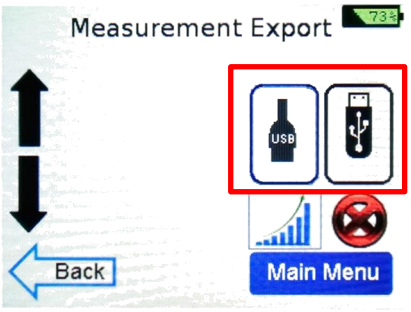
1.2 其他操作(數據儲存)



1. 點選儲存測試數據



2. 編輯儲存名稱。



3. 點選儲存方式。



備註:

按 USB 裝置圖示將數據導出到可移動 USB 隨身碟。 也可以按下 USB C 圖示由 USB 連接導出數據（注意：這需要使用终端軟件或他資料擷取軟體）。

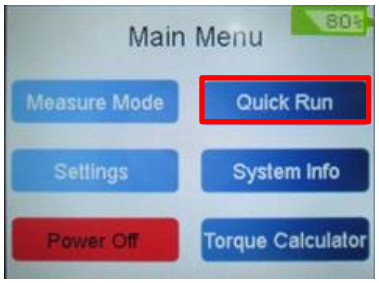
在測量模式螢幕上，按壓 圖示將顯示有關收集數據的統計信息。 按下红色的“X”圖示將清除本機記錄的數據。

2. 快速模式

此模式為快速且簡易的扭矩量測，左右選項提供使用者選擇量測單位和**Peak/Track模式**。查看扭矩收集資料可以按下**[Graph]**按鈕即可顯示扭矩曲線圖，(須在峰值模式下，**[Clear]**視窗內尚未歸清除數據時才可顯示曲線圖)，**校驗模式(Track)**為校驗扭矩時所用。

2.1 操作方式

▲建議先選擇群組，在進入快速模式進行量測，詳閱**【3.群組條件編輯】**。



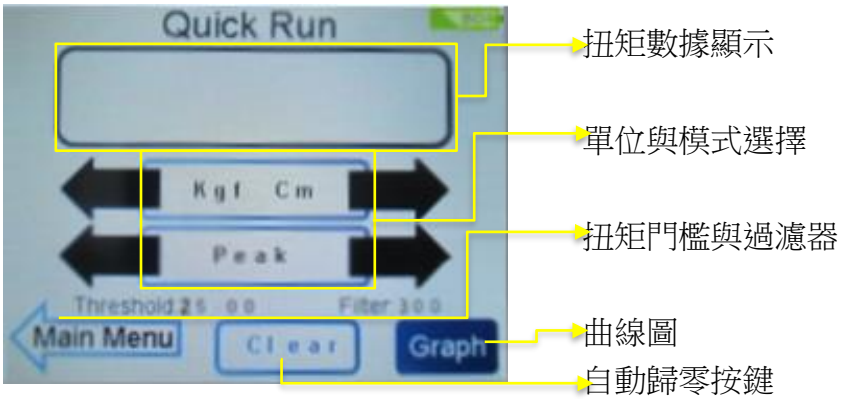
1. 進入主選單，手指點選 Quick Run 快速模式



2. 進入快速模式介面(可按左右箭頭選擇需要的單位與模式)。



3. 裝上測試座即可測試



備註:

1. 在快速模式介面可按左右箭頭選擇需要的單位與模式。
2. 扭矩收集的資料可以按右下角[Graph]按鈕即可用圖表來顯示。
3. 當視窗內有數值時，才會顯示曲線圖，[Clear]按鈕可用來清除資料

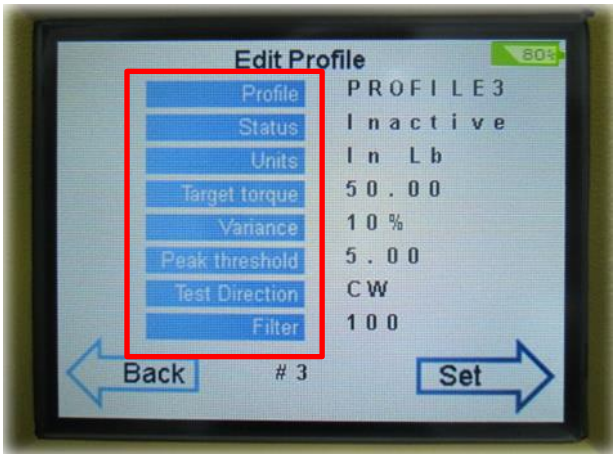
3. 群組條件編輯

群組條件編輯選單可以記錄最多 8 種不同的測試條件並存儲在存儲器中。群組的所有功能都可以針對每個測試條件進行定制。

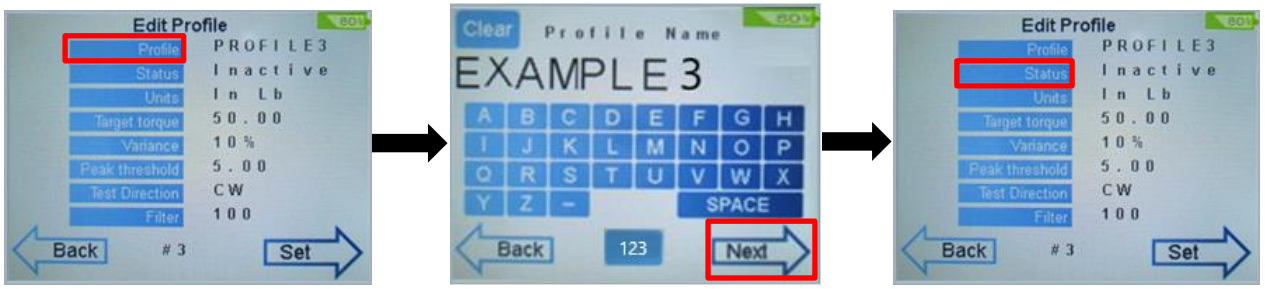
3.1 操作方式



1. 進入主選單點選 Settings 設定功能
2. 手指點選 Profiles 群組條件編輯
3. 手指點選其中一個未編輯群組



4. 進入群組編輯 (詳閱備註)
(Profile)群組名稱
(Status)狀態設定
(Units)扭矩單位
(Target torque)目標扭矩值
(Variance)扭矩差異值
(Peak threshold)最低扭矩顯示
(Test Direction)測試方向
(Filter)過濾器



5. 進入群組編輯選取
Profiles 群組名稱

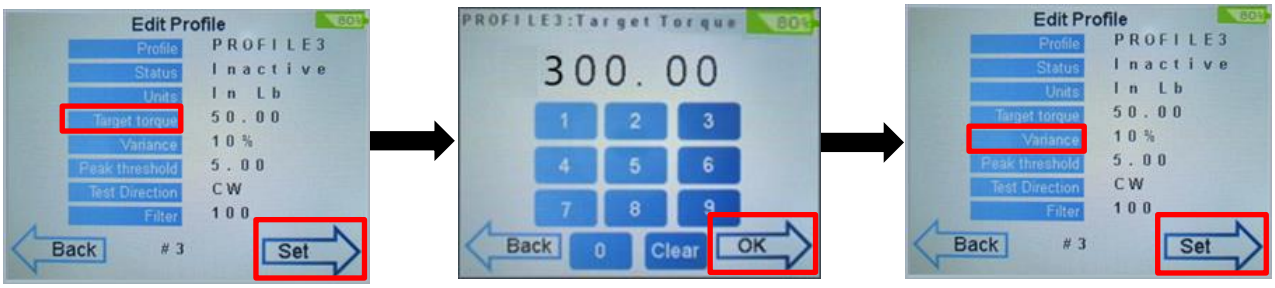
6. 編輯
群組名稱，編輯完按 Next

7. 選取
Status 狀態設定



8. 選擇
ACTIVE 狀態在按 OK

9. 選取
需要的扭矩單位，在按 OK



10. 選取
Target torque 目標扭矩值

11. 設定需要的目標扭矩值
，設定完按 OK

12. 選取
Variance 扭矩差異值



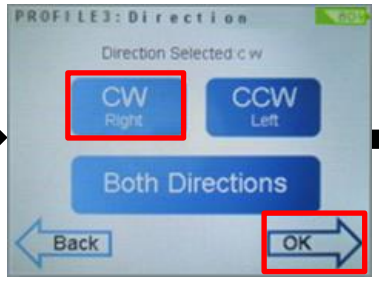
13. 設定
需要的差異值。(默認 10%)

14. 選取
Peak threshold 最低扭矩顯示

15. 設定
最低扭矩顯示，設定完按 OK



16. 選取
Test Direction 測試方向



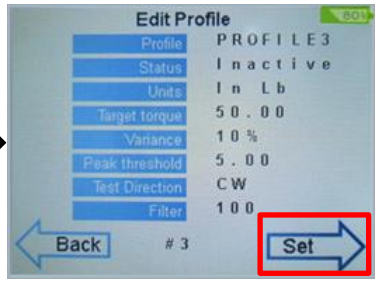
17. 設定需要的測試方向，設定完按 OK。 (詳閱備註)



18. 選取
Filter 過濾器

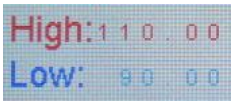


19. 設定過濾器(默認值100)，
設定完按 OK



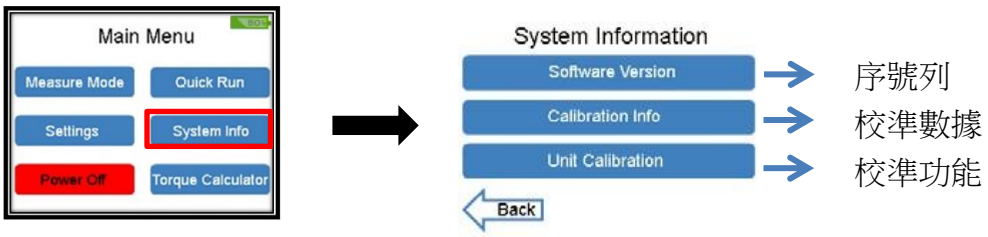
20. 按下 Set 儲存，設定完畢。

群組條件編輯備註:

群組名稱	配置文件名稱
狀態設定	狀態為“有效”或“無效”，必須選取{ACTIVE}才能使用。
扭矩單位	可使用不同單位的扭矩。 選項是Ft Lbs、In Lbs、In Oz、Nm、Kgf Cm、Kgf m、Gf Cm、cNm。
目標扭矩值	使用此配置測試所需的扭矩值。
扭矩差異值	目標扭矩值可接受的偏差（±%）。假如目標扭矩設定100kg，差異值設定10%，量測模式界面會顯示 
最低扭矩顯示	此配置辨識最低扭矩值，小於該值的任何測量結果將被忽略。
測試方向	使用此測試儀測量的扭矩方向。這可以設置為CW順時針、CCW逆時針或Both Directions雙方向。
過濾器	過濾潛在峰值到較大峰值的最大分配時間段（以毫秒為單位）。

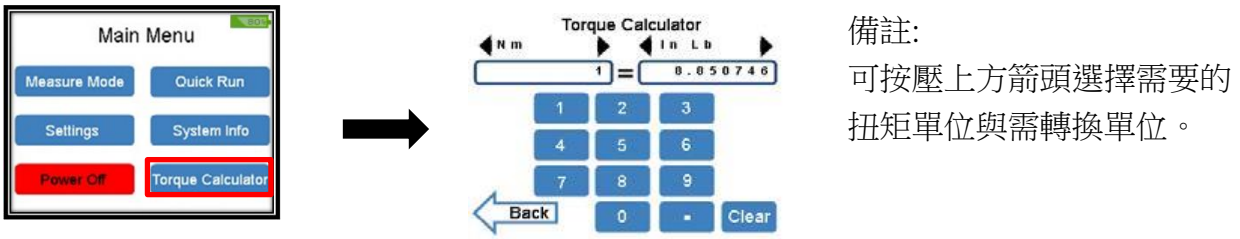
4. 系統資訊(System Info)

系統信息選單允許用戶查看軟件版本，序號列和校準數據。還包含本機的校準功能。(校準模式受到密碼保護，須詢問原廠)。



5. 扭矩換算(Torque Calculator)

提供扭矩計算器讓用戶方便在不同的扭矩單位之間換算。



備註:
可按壓上方箭頭選擇需要的扭矩單位與需轉換單位。

6. 自動歸零(Auto Clear)

自動清除上一次顯示的扭矩讀數。可設定 1 到 9 秒設置，或者按[Off]禁用此功能。如果關閉功能，用戶將手動清除顯示屏上的扭矩讀數。



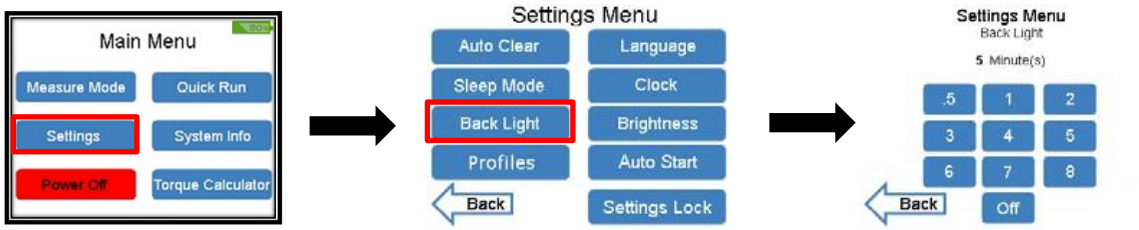
7. 自動關機(Sleep Mode)

自動關機功能會自動關閉扭矩測試儀以節省電池。 自動關機前的時間可以使用鍵盤上的數字設置為 1 到 40 分鐘，或按[Off]關閉此功能。



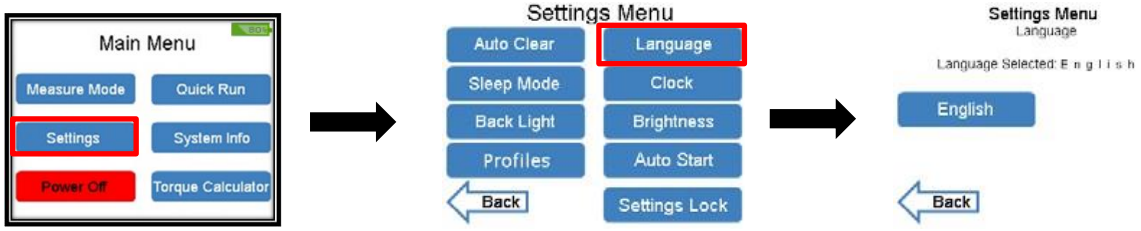
8. 省電功能(Back Light)

扭矩測試儀在不使用時，屏幕關閉時間可設置為 30 秒至 8 分鐘，或按[Off]關閉此功能。如果屏幕關閉，則可點擊屏幕來重新開啟。



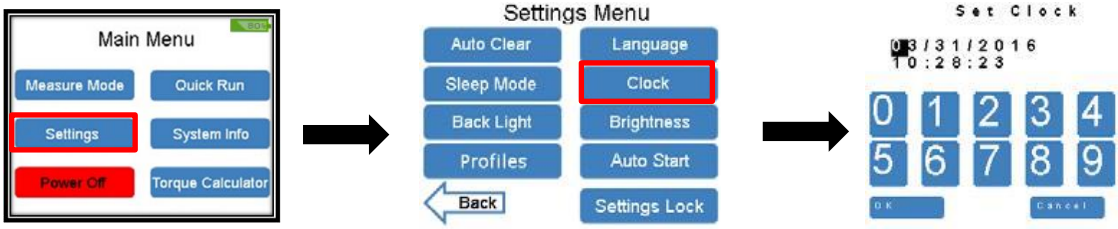
9. 語言設定(Language)

扭矩測試儀僅支援英語。 將來會添加其他語言，並且可以通過按下此屏幕上的對應按鈕來選擇任何可用的語言。



10. 日期時間(Clock)

日期時間設定為用戶在扭矩測試儀上可設置時間和日期。可以使用鍵盤上的數字進行調整。



11. 螢幕亮度(Brightness)

用戶調節屏幕的亮度。使用[+]和[-]按鈕提高或降低調節所需要的屏幕亮度。



12. 快速引導(Auto Start)

開機後可自動進入快速量測模式或量測模式，可繞過主選單，或選擇 None 不使用此功能。

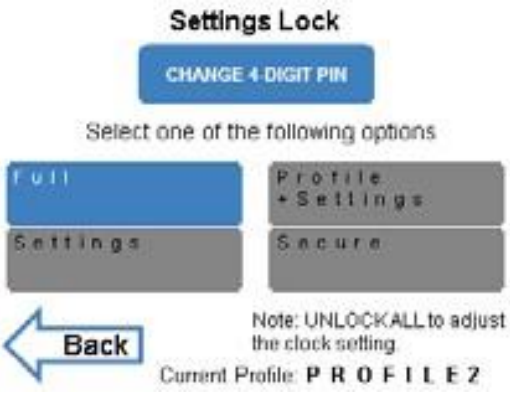


13. 密碼鎖設定(Settings Lock)

可以使用設置鎖定，以防止用戶進入扭矩測試儀的某些功能。 必須輸入四位數 PIN 才能更改鎖定。 默認 PIN 密碼為 1234。

13.1 操作方式





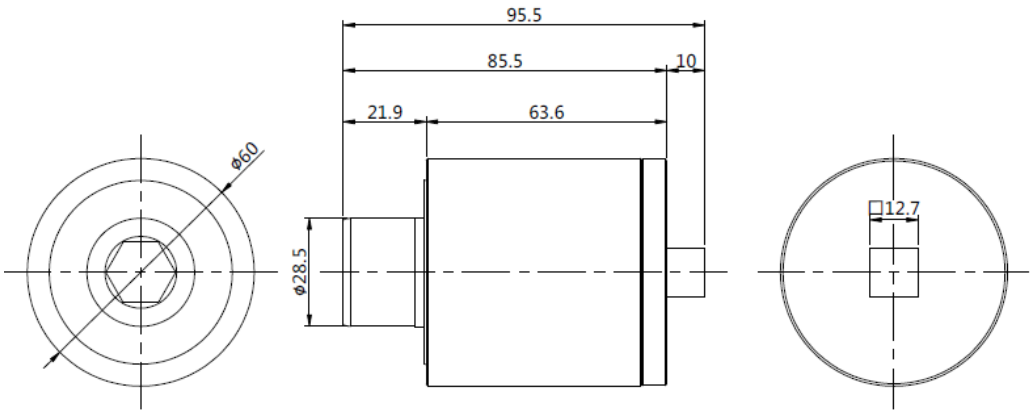
鎖定設置	權限
全功能設定	所有設置和功能都解鎖。
群組 + 設定	鎖定時鐘設置與群組編輯，無法編輯群組條件，但可以選擇群組與其他設置。
設置	無法選擇群組，鎖定時鐘設置，但其他設定功能可以調整。
安全	設定功能界面都被鎖定，只剩主選單界面可以用。

五.安裝

5-1-1. 測試座

KTM-1000測試儀會附上檢測動力工具時使用的測試座，測試座透過工具在鎖緊和跳脫之前，以不限速度的狀況來模擬螺絲鎖附的動作，在每次測試過程中，請正確使用工具，使工具的驅動端與緊固件正確對齊。

彈簧測試座
外觀尺寸圖



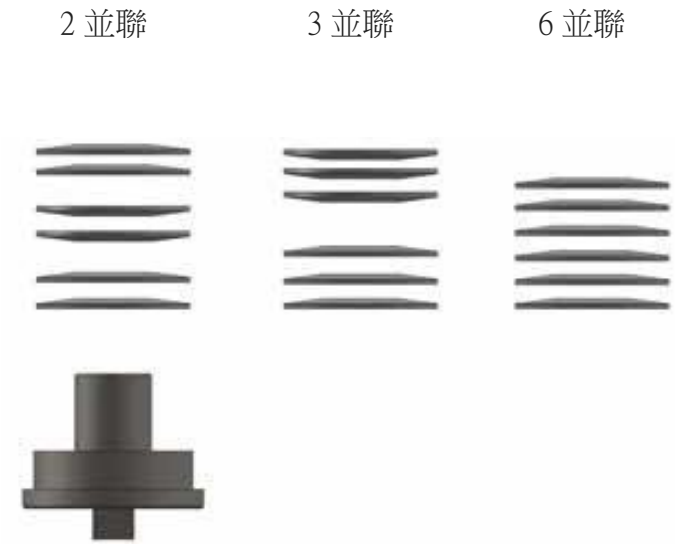
5-1-2. 測試座組成

主體帶有方形驅動端(內部有螺紋)，用於連接安裝到扭矩測試儀的凹槽中，測試座內部有 Belleville（盤型彈簧）墊圈疊層，用於模擬緊固件鎖附動作。間隔器、滾輪軸承和導向襯套、用於將緊固件旋轉緊固傳遞到貝氏墊圈(盤型彈簧)和主體。內六角螺絲與被測工具頭連接。它用於在測試期間擰緊/鬆開模擬動作。外部保護蓋，用於封閉測試接頭的運動部件。如要拆卸測試座外蓋，須鬆開蓋子底部的兩個固定螺釘並將其向上提起。拆卸完畢須將測試座底部的兩個固定螺釘鎖緊固定。

5-1-3.彈簧排列方向

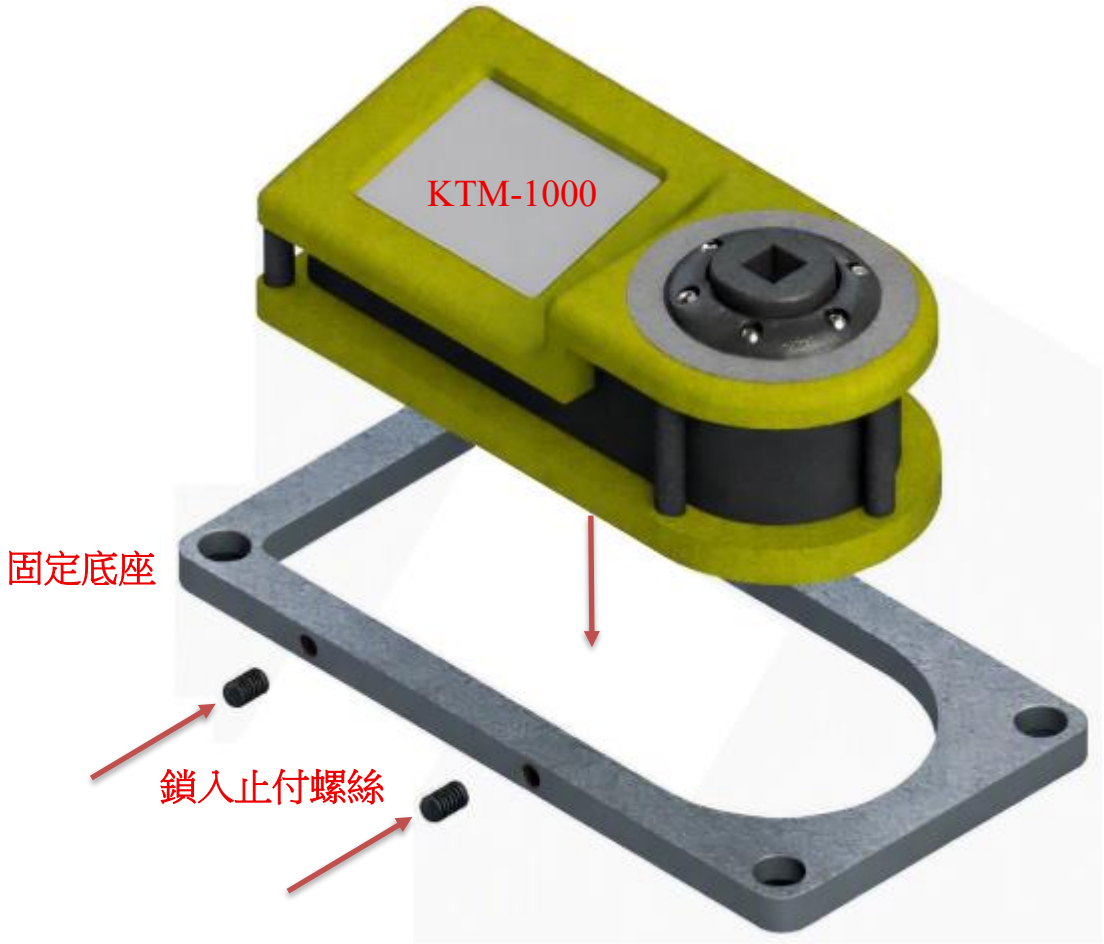
鬆開螺絲後貝氏墊圈(盤型彈簧)堆疊可以重新配置，以模擬各種類型的接頭。6 個墊圈可以一個向上/向下堆疊成一個軟接合(串聯)，或上下組成 2 並聯、3 並聯或 6 並聯，如圖所示的接頭配置。請確保使用原廠提供的零件，以防止在使用過程中測試座異常。螺絲的螺紋在組裝時須塗抹一層潤滑油。請根據需要重新塗抹一層輕油，以保持螺絲的平穩旋轉。如果扭矩測試座接頭旋轉有約束力或扭矩動作不順暢則停止使用。





5-2 固定底座

1. 取出 KTM-1000
2. 將機身往下對準底座固定位
3. 將機身與底座螺絲孔位要對齊，並鎖上螺絲。



六.故障排除

1. 定期校準

定期校準機體可以維持測試的高精準度. 通常校準時期為 6-12 個月，如果快到應校準時期請與代理商聯繫。

2. 恢復原廠設定

執行恢復原廠設定時需要先確保已先將電源拔掉, 並按下機體後方的一個恢復原廠設定的按鈕，按下恢復原廠設定按鈕之後，將電源插入充電端，測試儀會自動開機(不須再重新按開機按鈕)，在開機之後，校正狀態與編輯資訊將會不變，不過設定功能等...時間與其它設置將重置為原廠設定值。

3. 故障排除指南

問題	原因	解決方案
扭矩數值不一致	錯誤濾波設定	調整峰值濾波設定
	沒有使用扭矩測試座	測試電動起子時一定要使用扭矩測試座
	不斷更改使用電動起子的姿勢	確定電動起子使用姿勢正確
	扭矩測試儀沒有固定妥當	確認扭矩測試儀有正確固定
	測試電動起子無法維持穩定扭矩值	將電動起子送回檢測
	扭矩測試儀需校準	將扭矩測試儀送回校準
機體會自動關機	低電量	將機體充電
	休眠模式設定太短	調整休眠模式的設定
機體無法開機	低電量	將機體充電
	顯示記憶體錯誤	執行恢復原廠設定

七.產品規格

KTM-1000 特性

KTM-1000 扭矩測試測試儀透過簡單的觸控式屏幕提供許多，多元化特性以及直觀選項，KTM-1000 提供了無與倫比的精度測試扭矩，電動螺絲起子和其他扭矩控制的電動工具。提供快速審核或計量水平校準的能力，使其成為一個令人難以置信的多用途儀器能為鎖付工具提供質量保證。

- 20~100N.m扭矩範圍精準度為±0.5%，10~20N.m扭矩範圍精準度為±1%
- 全彩色螢幕觸控
- 螢幕顯示扭矩計算
- 北美製造
- 透過USB C線充電
- 提供1年保固
- Cp, Cpk, Sigma 製程能力指標統計
- 螢幕圖像式分析
- 將資料匯出至可移動USB記憶棒或 USB C Cable
- 螢幕可依水平方向自動調整反轉
- 快速測試模式可以方便快速的審計及校正工具
- 計量水準"差異值"允許使用者建立可接受的公差
- 提供8種計算單位: In Oz, In Lb, Ft Lb, Nm, cNm, KgCm, gfCm, Kgm
- 鋰電池:(工作的情況下可持續長達8小時，不工作的情況下可維持12小時)
  KTM-1000在長時間不使用的情況下，每個月至少需充飽電一次，以延長電池壽命。
- 可編輯8種不同型號之起子測試條件

扭矩測試範圍	5.0 - 100.0 Nm
精準度	±0.5% (20-100 Nm) ±1.0% (10-20 Nm) ±2.0%(5-10 Nm)
資訊儲存與輸出	USB Memory & USB C
電池	3.7V, 4400 mAh Lithium Ion
充電時間	8 hours
使用時間	8 hours
充電器	Output 5V 1.0A Max
重量	2.7Kg

我司保留對技術參數更新的權利

KTM-1000 FIRST LAUNCH INSTRUCTIONS

This tester has been placed in a deep sleep state for storage and transport. Before first use slide the Battery Disconnect switch on the back of the unit to the **Right** position (See image below). Once switched the unit must be plugged in before it will wake up for the first time. On first launch, the clock (date and time) will need to be set (24-hour time). The system will prompt for this information when it boots up.

If the system does not prompt or further changes need to be made, please go to the 'SETTINGS' menu and select 'CLOCK' to make adjustments.

Please note that the date on the included calibration certificate is the date that the tester was calibrated at the factory. The first in-service date should be used as the starting point for the next calibration interval.

Battery Disconnect Switch

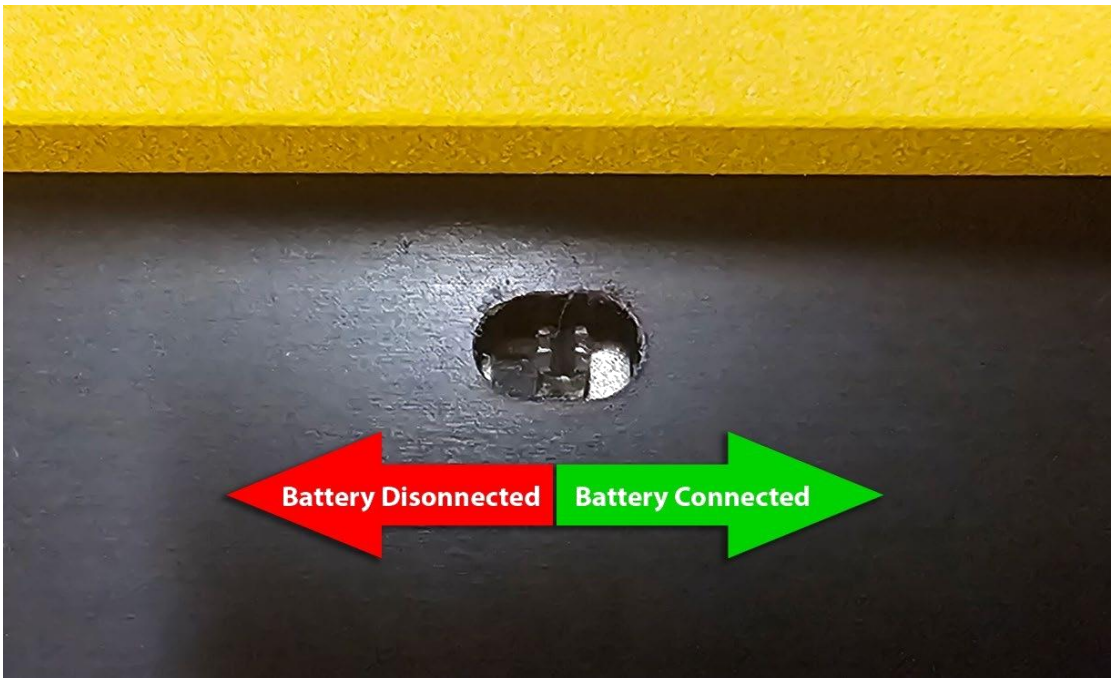


Table of Contents

Safety **20**

Specifications **21**

Component Identification **22**

Glossary of Terms **23**

Display Features and Settings **23-28**

Display Screen 23
Main Menu 23

Settings 25-26

Editing Profiles 27

Settings Lock 28

Measuring Torque **29-31**

Collecting Torque Data 29

Using Quick Run 29

Using Measuring Mode 29

Exporting Data from Measure Mode 29

Rundown Joints 31

Troubleshooting Guide **32**

Safety

WARNING !

Do not operate unit until you read and understand ALL safety information. Failure to do so may result in damage to the product and/or bodily injury.

Safety Information

- Do not wear any loose articles of clothing or jewelry when operating unit.
- Always wear appropriate attire when using these products (i.e. protective eye wear, pants, closed-toed shoes)
- Always check for loose wires and cables on and around unit before beginning operation
- Keep unit and charger away from water, always store in a dry and safe environment.
- Do not operate unit in a flammable or explosive environment.
- Never apply torque to this unit that exceeds the maximum torque value. Doing so may result in damage to the unit and injury to the operator.
- Unauthorized personnel should never be permitted to operate this unit.
- Never use additional accessories with this unit that were not included and are not from this manufacturer. Doing so could result in damage to the unit.
- Always operate unit in a clean and organized workplace
- This unit should always be kept clean, dry, and free from oil and grease.
- Do not perform repairs on this unit, unless you are an authorized service technician.
- Always unplug unit before inspecting, cleaning, or performing maintenance on the unit
- Never perform maintenance on unit that is not in accordance with the maintenance procedures listed in the service and maintenance portion of this manual. Failure to comply with these instructions may result in damage to the unit.

CAUTION !

Due to the high torque capabilities of the torque tester, repeated cycling of the rundown joint can cause significant heat build-up in the joint. If the joint becomes hot to the touch, allow time for the rundown joint to cool before continuing with testing.

Mounting

The KTM-1000 Torque Tester is capable of measuring high torque values. The tester must be mounted firmly to a solid surface so that its base can react the torque that is applied to the input shaft of the tester without movement. Any movement of the tester while taking readings will affect the displayed torque value.

CAUTION !

Failure to properly secure the tester could result in damage and/or personal injury.

There are (4) M10 x 1.25 holes provided in the underside of the tester for mounting directly to a bench using appropriate fasteners (not included). An optional bench mount bracket can be purchased as an alternative solution for securing the tester in position.

Specifications

KTM-1000 Features

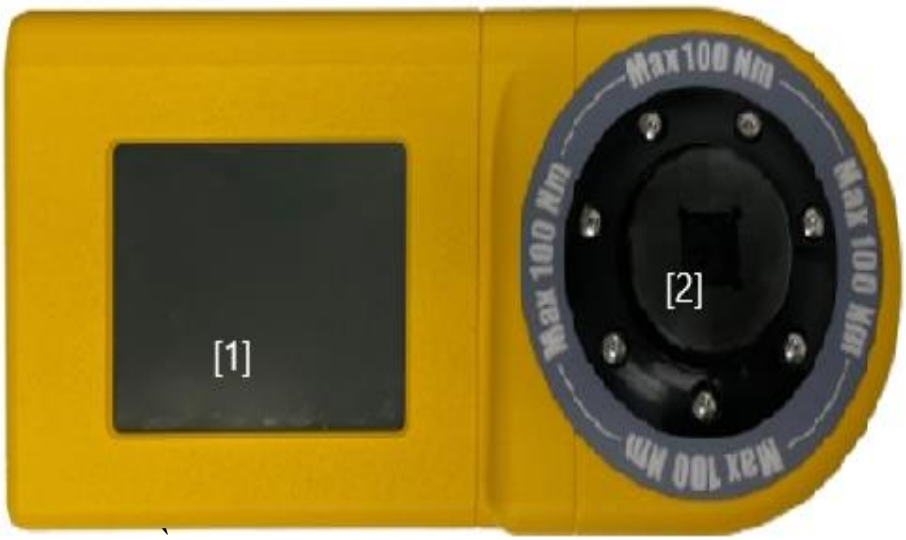
The KTM-1000 torque tester offers an unparalleled number of features and provides intuitive menu selection through the use of an easy to operate touch screen interface.

The KTM-1000 provides unsurpassed accuracy for testing torque wrenches, screwdrivers and other torque-controlled power tools. The unit provides the ability to do a quick audit or metrology level calibration making it an incredibly versatile and priceless instrument for any QA department.

- ±0.5%precision from 20%to 100%of full scale,±1%precision between 10%and 20%
- Full color LCD touch screen
- On-screen torque calculator
- Made in North America
- Charging via USB C cable
- 1-year warranty
- Processes statistical calculations: Cp, Cpk, Sigma
- On-Screen graphing capability for tool performance analysis
- Export data to USB Removable Memory Stick or USB C Cable
- Automatic screen rotation (level sensor flips screen to keep it properly oriented)
- "Quick Run" mode provides the ability to quickly audit and verify a tool.
- Metrology level "Measure Mode" allows users to establish acceptable tolerances.
- Eight available engineering units: In Oz, In Lb, Ft Lb, Nm, cNm, KgCm, gfCm, Kgm
- Li-Ion technology provides extended battery life (up to 8 hours of continuous use or 12 hours idle)
- Advanced user programmable options

Torque Range	5.0 - 100.0 Nm
Precision / Accuracy	±0.5% (20-100 NM) ±1.0% (10-20 NM) ±2.0% (5-10 NM)
Data Output Port	USB Memory & USB C
Battery	3.7V, 4400 mAh Lithium Ion
Charge Time	8 hours
Battery Life	8 hours
Charger	Output 5V 1.0A Max
Weight	2.7Kg

Component Identification



1	LCD Touch Screen
2	Transducer Input
3	USB 2.0 Memory Card
4	Wake-Up Switch
5	USB C Port
6	Battery Disconnect





⚠ WARNING !

First launch instructions

This tester has been placed in a deep sleep state for storage and transport. It MUST be plugged in before it will wake up for the first time. On first launch, the clock (date and time) will need to be set (24-hour time). The system will prompt for this information when it boots up.

If the system does not prompt or further changes need to be made, please go to the 'SETTINGS' menu and select 'CLOCK' adjustments.

Please note that the date on the included calibration certificate is the date that the tester was calibrated at the factory. The first in-service date should be used as the starting point for the next calibration interval.

If KTM-1000 was not used for a long time, it could not be turn on. Please follow below step for re-charge KTM-1000 again.

1. Plug KTM-1000 charging cable.
2. Press Reset bottom (picture show as left)
3. Unplug KTM-1000 charging cable.
4. Plug KTM-1000 charging cable and turn it on.
5. Set date and time.
6. Keep charging until battery show 100%

Glossary of Terms

Profile: A profile allows the user to quickly select a predetermined testing strategy. The KTM-1000 torque tester allows for up to 8 different profiles to be preset.

Quick Run: The mode for gaining quick access to the torque tester's measuring capability.

Measure Mode: The mode for saving or exporting data related to a tool's performance.

Rundown Joint: An accessory for simulating the tightening of a fastener. Common types of joints are hard, medium, and soft. A rundown joint is required for testing power tools such as screwdrivers and nutrunners.

Peak: Peak mode is used to measure the maximum torque that a tool experiences.

Track: Track mode is used to measure the amount of force that is applied to the transducer in real time.

Peak Filter: The expected period of time needed to capture a peak (milliseconds).

Torque Threshold: The minimum reading that the unit will display. This feature is designed to help avoid picking up a reading due to operation setup.

Torque High Limit: The Torque High Limit is used to notify an operator when the reading falls above the maximum torque value. Maximum acceptable reading.

Torque Low Limit: The Torque Low Limit is used to notify an operator when the reading falls below the minimum torque value. Minimum acceptable reading.

Cpk: The Cpk value, also known as the process capability index, is a statistical value that is used to indicate how closely a series of test samples are grouped around the target value.

Display Features & Settings

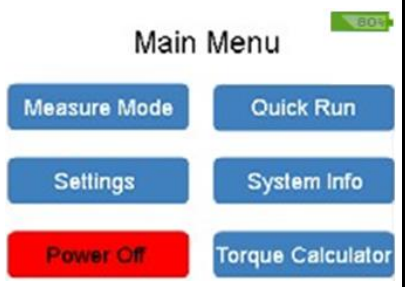
Power-up & Display Screen

When the operator switches on the unit (press the switch on the left-hand side of the unit to power on the torque tester) this screen will appear. Touch any part of the display to continue to the main menu.



Main Menu

The main menu allows users to navigate through the KTM-1000 torque tester's features. Users may return to this screen when they are finished with one function and would like to move on to another, or when they want to power down the unit.



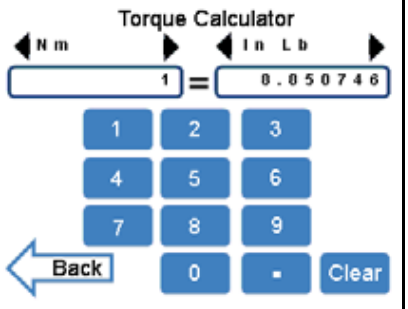
System Info

The system information menu allows the user to access various information about the unit, including the software version, the serial number, battery information, and calibration data. It also contains the calibration functions for the unit. The calibration screen and certain functions of the battery screen are password protected. Please contact the factory for further information. The battery screen will still display available battery information even if an incorrect password or no password is entered.

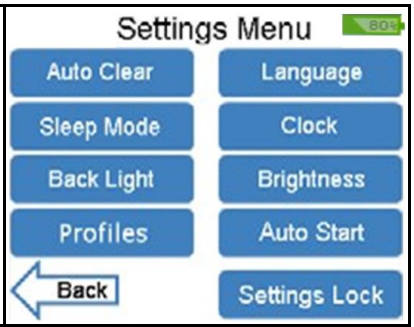
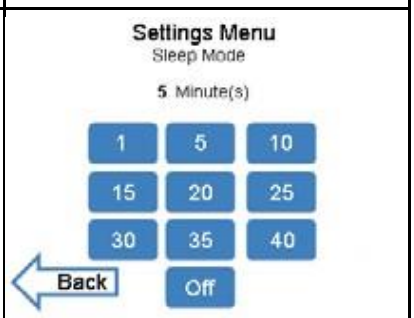
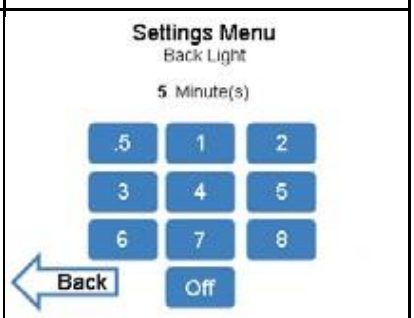
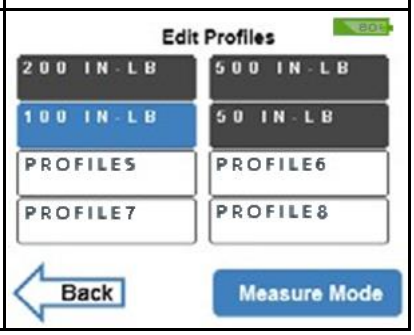


Torque Calculator

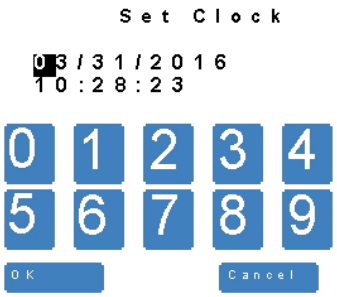
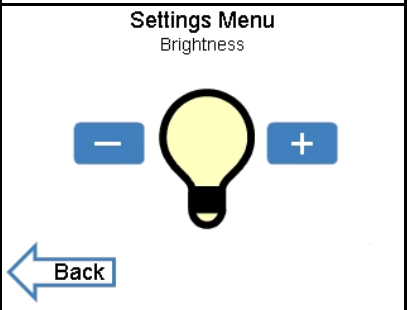
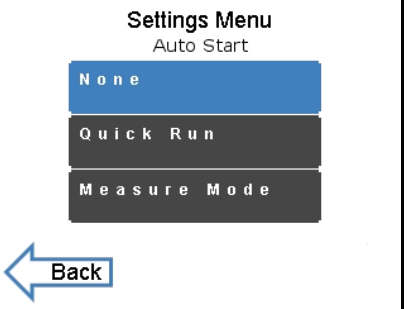
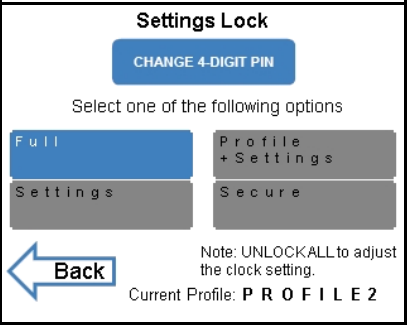
The torque calculator is provided to allow the user to conveniently convert between different units of torque.



Display Features & Settings

Settings The settings menu gives the user access to all of the functions for configuring the unit to their specific needs.		
Auto Clear	The auto clear function allows users to set a desired amount of time (in seconds) for a torque reading to be displayed before it is automatically cleared from the screen. This time can be set from **1** to **9 seconds** using the numbers on the keypad, or the feature can be disabled by pressing **[Off]**. If turned off, the user will need to manually clear the torque reading from the display.	
Sleep Mode	The sleep mode feature automatically shuts down the torque tester when it is not in use in order to conserve battery life. The time before automatic shutdown can be set from **1** to **40 minutes** using the numbers on the keypad, or the feature can be disabled by pressing **[Off]**.	
Back Light	The back light keeps the screen lit on the torque tester for a specified amount of time while the torque tester is not in use. The time can be set from **30 seconds** to **8 minutes** using the numbers on the keypad, or the power saving feature can be disabled by pressing **[Off]**. If the back light has turned off, it can be turned back on by simply tapping the screen.	
Profiles	The profiles menu allows for up to 8 different testing strategies to be preset and stored in the memory. All functions of these profiles can be customized to each testing strategy.	

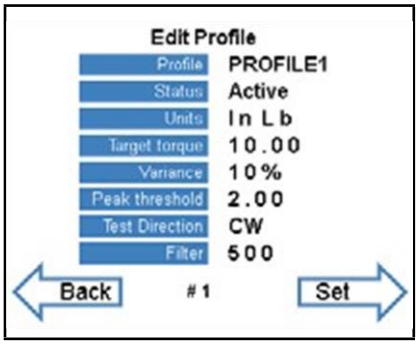
Display Features & Settings

Language	At the time of printing, the torque tester supports the English language. Other languages may be added in the future, and any available language can be selected by pressing the corresponding button on this screen.	
Clock	The clock settings allow users to set the time and date on the torque tester. These may be adjusted using the numbers on the keypad.	
Brightness	The brightness setting allows users to adjust the touch screen's level of brightness. The brightness can be increased or decreased to the desired level by using the **[+]** and **[-]** buttons.	
Auto Start	The auto start feature allows the torque tester to be configured to boot automatically into Quick Run or Measure Mode, bypassing the main menu.	
Settings Lock	The settings lock can be configured to prevent users from accessing certain functions of the torque tester. A four-digit PIN must be entered to change the lock. **The default PIN is 1234**.	

Display Features & Settings

Editing Profiles

Tapping on a profile on the profile's menu allows the user to view and edit its attributes. To edit an attribute, the user must press the blue label for that attribute. Once a profile has been edited, the **[Set]** arrow must be pressed in order to confirm the changes.

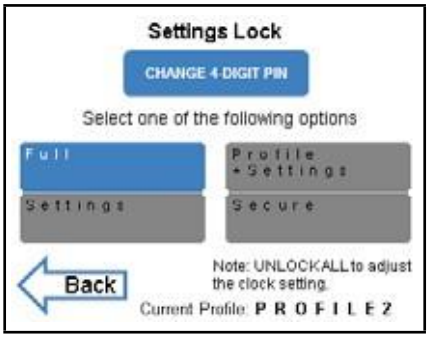


On the profile editing screen, a profile will show the following customizable attributes:

Profile	The name of the profile.
Status	The profile's status as either 'Active' or 'Inactive'. Inactive profiles are locked and must be made active before they can be used.
Units	The units in which torque will be measured when this profile is active. Options are Ft Lbs, In Lbs, In Oz, Nm, Kgf Cm, Kgf m, Gf Cm, and cNm.
Target Torque	The desired torque value for the tool being tested with this profile.
Variance	Acceptable deviation (± %) from the target torque value.
Peak Threshold	The lowest torque value that will be recognized and logged by this profile in peak mode. Any torque measurement smaller than this value will be ignored.
Test Direction	The direction of torque that will be measured with this profile. This can be set to CW (clockwise), CCW (counterclockwise) or both directions.
Filter	The maximum allotted period of time, in milliseconds, to find a greater peak value after a potential peak is identified.

Display Features & Settings

Settings Lock



The settings lock can be configured to prevent users from accessing certain functions of the torque tester. A four-digit PIN must be entered to change the lock. Once the PIN has been entered, the user is granted access to a screen from which the settings lock or PIN can be changed.

The different lock settings are as follows:

Lock Setting	Permissions
Full	All settings and functions are unlocked
Profiles + Settings	Profiles cannot be edited but active profiles can be selected, clock settings are locked but other settings can be adjusted
Settings	User is locked into a single profile; clock settings are locked but other settings can be adjusted
Secure	User is locked into a single profile and all settings are locked

Resetting the PIN: If the PIN is lost, it can be recovered by hitting the **[Forgot PIN?]** button. Pressing this button will bring up a screen with a hexadecimal keypad and a five-digit code in the upper-left corner. The user may contact the manufacturer's customer service department during regular business hours and give them the code displayed in the corner to receive the code required to reset the PIN.

Measuring Torque

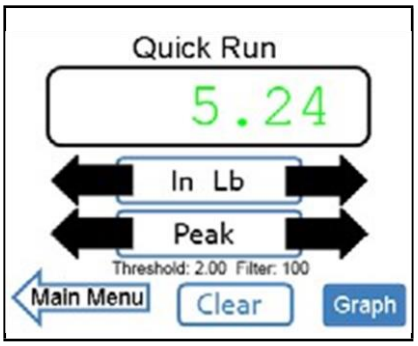
Collecting Torque Data

The KTM-1000 torque tester provides two modes for collecting torque data: **Quick Run** and **Measure Mode**. Both are accessible from the main menu, and each may be run in either Peak or Track mode, depending on the requirements of the user.

Peak is used to measure and display the maximum torque that a tool experiences. It is most commonly used for calibrating pulse tools, electric/pneumatic clutch tools, clicker style torque wrenches and hand torque drivers.

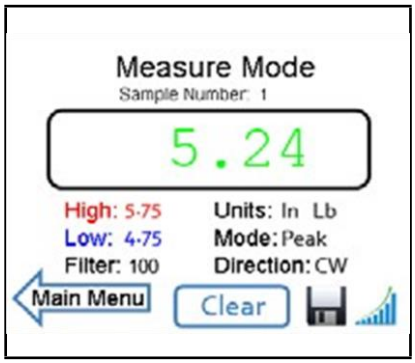
Track measures the amount of force that is applied to the transducer in real time. This is used to verify the calibration of dial indicating and beam style torque wrenches. Track mode may also be used for bottle cap fastening.

Using Quick Run



Quick run provides quick and simple access to the torque tester's measuring capability. The arrows beneath the readout allow the user to select units of measurement and to toggle between peak and track modes. Collected data can be viewed as a graph by tapping the **[Graph]** button. In peak mode, the graph is only present as long as there is a number in the display window. The **[Clear]** button can be used to clear the data from the display.

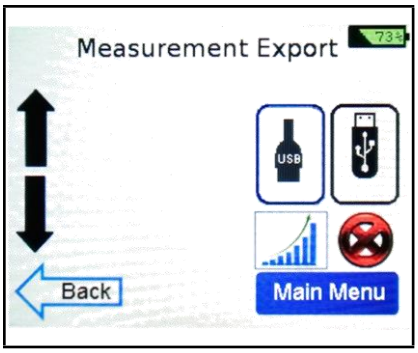
Using Measure Mode



Measure mode allows the user to acquire and save data related to tool performance. After selecting **[Measure Mode]** from the main menu, the user will be prompted to choose between peak and track modes and to select a measurement profile before being taken to the data collection screen. Tapping the graph icon in the corner of the screen will show statistics about the collected data set. Peak data can be exported by tapping the disk icon.

Measuring Torque

Exporting Data From Measure Mode



Peak data collected in measure mode can be exported by tapping on the disk icon near the lower-right corner of the screen. When this icon is tapped, the user will first be prompted to provide a name for the data set being exported. Once a name has been entered, the screen will show a scrollable list containing the data, as well as a number of buttons on the left side of the screen.

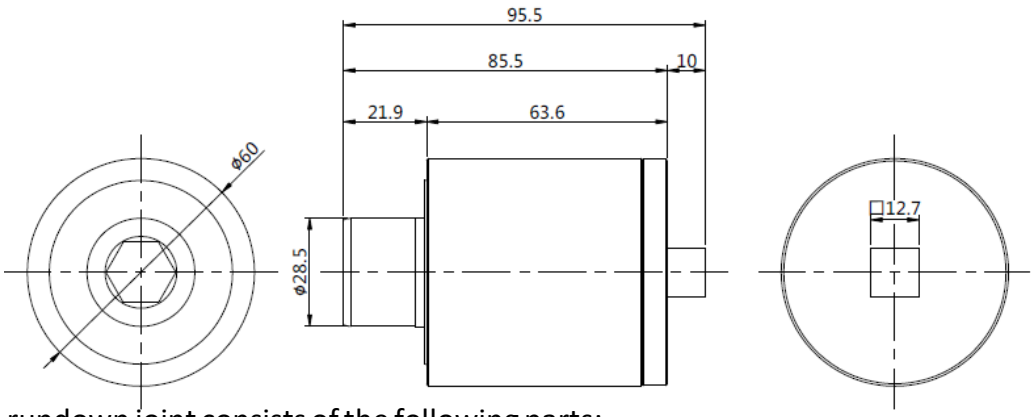
Pressing the USB Device icon will export the data to an USB Memory Stick inserted into the unit. Data may also be exported via USB C connection by pressing the USB C icon (Note: this requires the use of terminal software or other data acquisition software). As on the main measure mode screen, pressing the graph icon will display statistics about the collected data set. Pressing the red 'X' icon will clear the data logged by the unit.

```
Date:03/31/2016    Time:12:31:5    Unit S/N:KW1234    Transducer: 100 In
Job:CAL36 #1
Measurement direction:    CW
Maximum Torque Limit: 27.50 In Lb
Minimum Torque Limit: 22.50 In Lb
Threshold Torque Limit:  5.00 In Lb
Peak Time:   0.100 Seconds
Maximum recorded:        In Lb
Minimum 24.31            In Lb
Sigma:  recorded:
Cp:  4.509 75
Cpk:  2.655
Readings above maximum:  0
Readings below minimum:  0
Percentage     OK:    0.000
Reading #      Peak
    1         24.04
    2         24.02
    3         23.75
    4         23.79
    5         23.96
    6         24.27
    7         24.31
    8         23.85
    9         23.92
   10         24.31
   11         23.90
   12         23.85
   13         23.83
   14         23.88
   15         23.90
```

Troubleshooting Guide

RundownJoint

A rundown joint is offered with the KTM-1000 torque tester for testing power tools. The rundown joint simulates the tightening of a threaded fastener by allowing the tool to run at free speed before fastening and shutting-off. Before starting each rundown, reverse (back out) the fastener until it is loose, but not completely backed out of the thread. Hold the tool firmly, keeping the drive of the tool properly aligned with the fastener during each rundown.

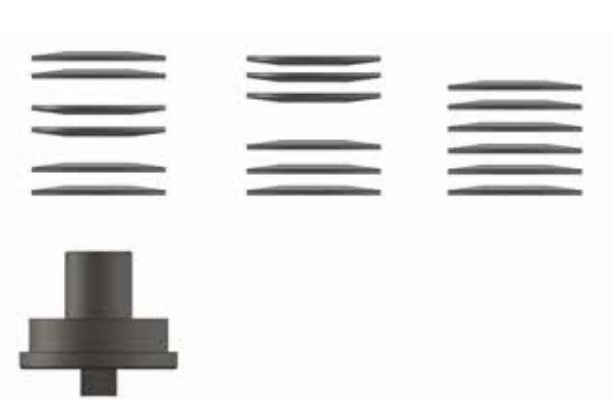






The rundown joint consists of the following parts:

- Main body with male square drive and internal thread to accept the rundown fastener. The square drive installs into the matching female square drive socket of the torque tester.
- Belleville (spring) washer stack to simulate the action of a joint being fastened.
- Spacer, roller bearing, and guide bushing to transfer the rotational tightening of the fastener to the belleville washer stack and main body.
- Socket head cap screw and corresponding driver bit. The driver bit is installed into the tool being tested. It is used to tighten/loosen the cap screw during testing.
- Outer protective cover to enclose the moving parts of the test joint when being used. Remove the cover to reconfigure the washer stack by loosening the two set screws at the base of the cover and lifting it straight up. Replace the cover and secure the set screws before placing the rundown joint into service.



The belleville washer stack in the rundown joint may be removed and reconfigured to simulate various types of joints. The 6 washers can be stacked one up/one down for a soft joint, or nested in groups of 2, 3, or 6 as shown for harder joint configurations. Please make sure to use all of the supplied washers to prevent the cap screw from bottoming out during rundowns. The threads of the cap screw are lightly greased at assembly. Please re-apply a light coat of grease as required to maintain smooth rotation of the cap screw. Discontinue use if the rundown joint appears to be binding or acting inconsistently.

Note: A torque tester used in conjunction with a rundown joint provides a good indication of the repeatability (capability) of a mechanical clutch power screwdriver. Since the torque output of mechanical clutch power tools is joint and operator dependent, the actual torque value displayed on the tester may vary from the final torque of the installed fastener in the workpiece. It is strongly advised that the user audits the final torque of an installed fastener(s) to ensure that the power tool is set properly to meet their requirements.

Problem	Possible Cause	Solution
Inconsistent torque readings	Wrong filter set	Adjust peak time filter
	Rundown joint not being used	Always use a rundown joint when testing power tools
	Tool is not being held consistently	Ensure that driver is held securely and in the same plane for every rundown
	Torque tester is not properly secured	Ensure that tester base is anchored securely
	Tool being tested is unable to hold consistent torque value	Send tool in for evaluation
	Torque tester needs calibration	Send torque tester in for calibration
Unit turns off by itself	Low battery	Recharge the unit
	Sleep mode time set too short	Adjust sleep mode time
Unit will not turn on	Low battery	Recharge the unit
	Flash memory error	Perform hard reset

Calibration of Unit

Periodic calibrations are required in order to maintain a high standard of accuracy. In most applications a 6-12month calibration interval is acceptable. Please contact your local distributor or the manufacturer when your unit is due for calibration.

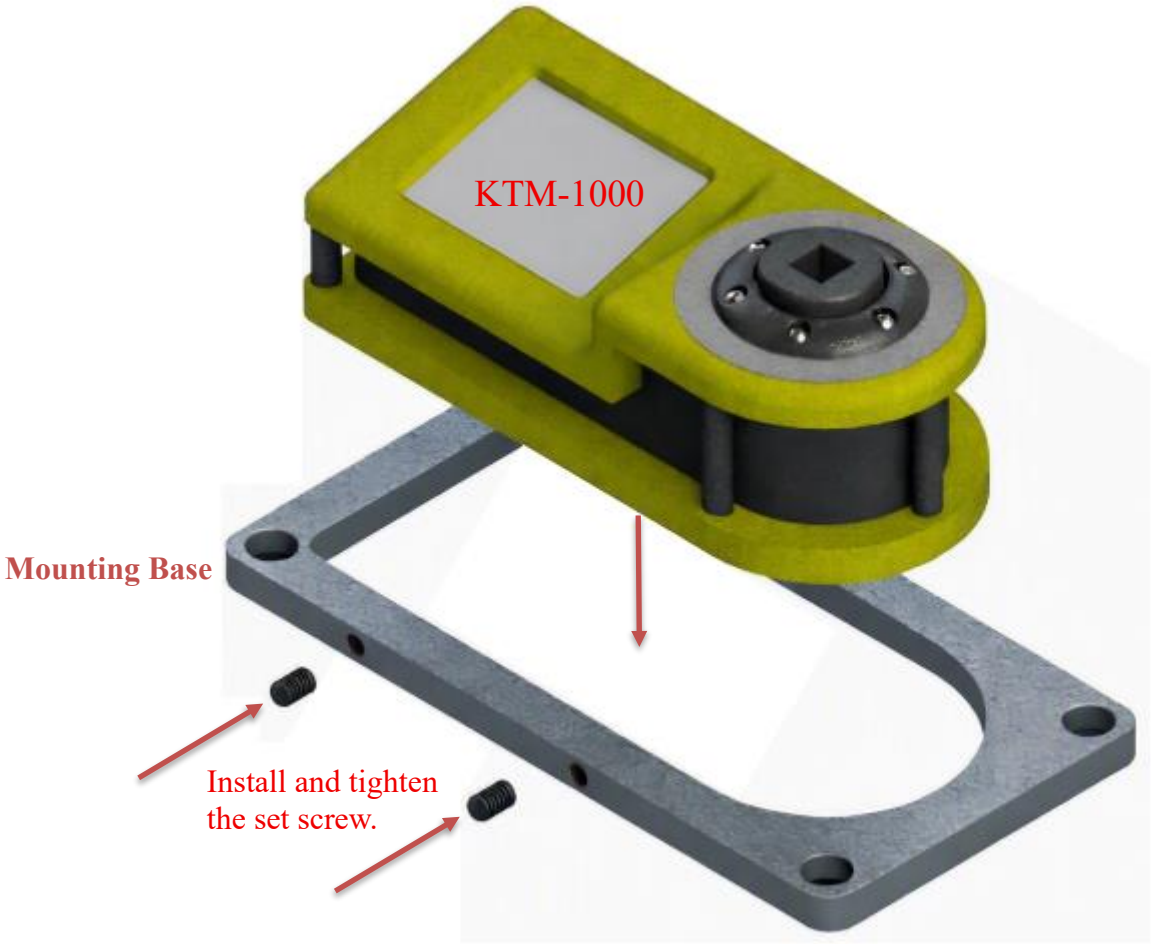
Performing a Hard Reset

A hard reset can be performed by completing the following steps:

1) Unplug KTM-1000
2) Slide battery disconnect switch to the Left position and wait 60 seconds
3) Slide battery disconnect switch to the Right position
4) Plug in KTM-1000 and reset the Date/Time once prompted

Mounting Base

1. **Remove the KTM-1000 from its packaging.**
2. **Align the main unit downward with the mounting base.**
3. **Ensure the screw holes on the main unit and the base are properly aligned, then fasten the screws.**



Our company reserves the right to modify the product without prior notice.