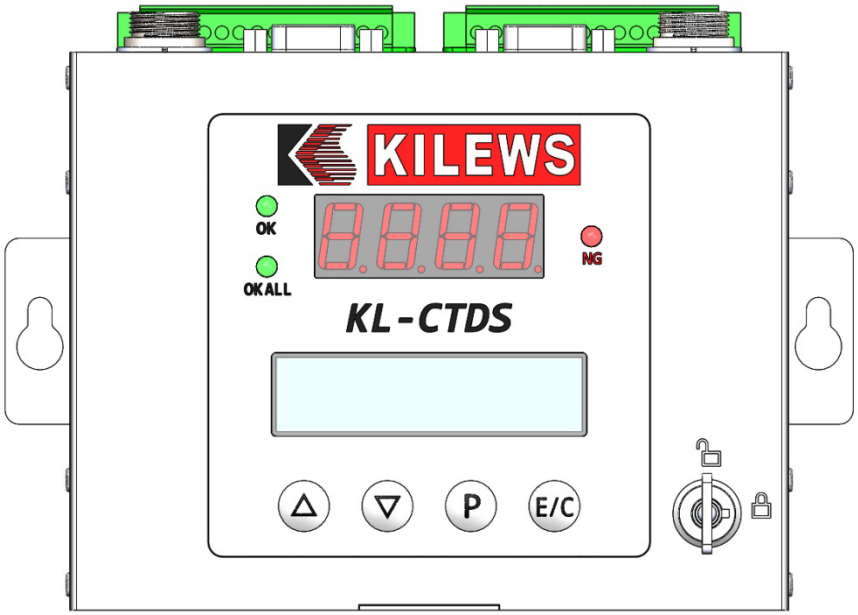
BNK 電動起子扭力顯示盒使用手冊

Torque Display User Manual



Model : KL - CTDS

(Ver 2.00)

奇力速工業股份有限公司

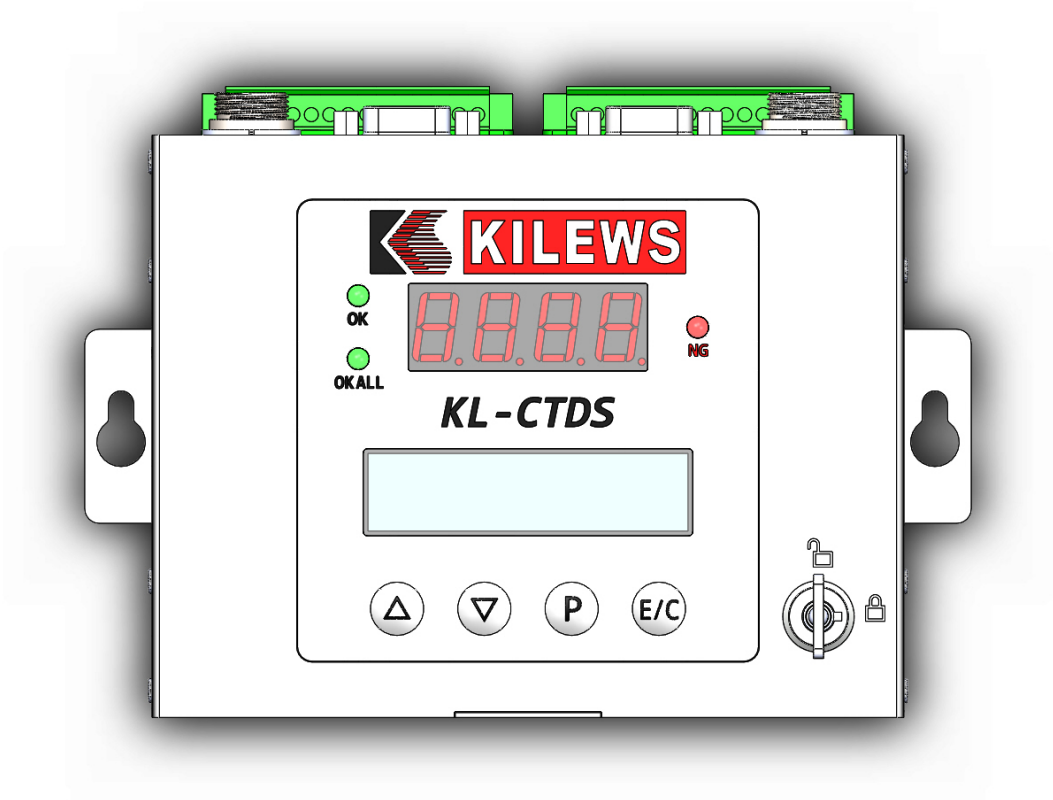
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Y2F167-2-019

20211201-V2129

一、外觀功能



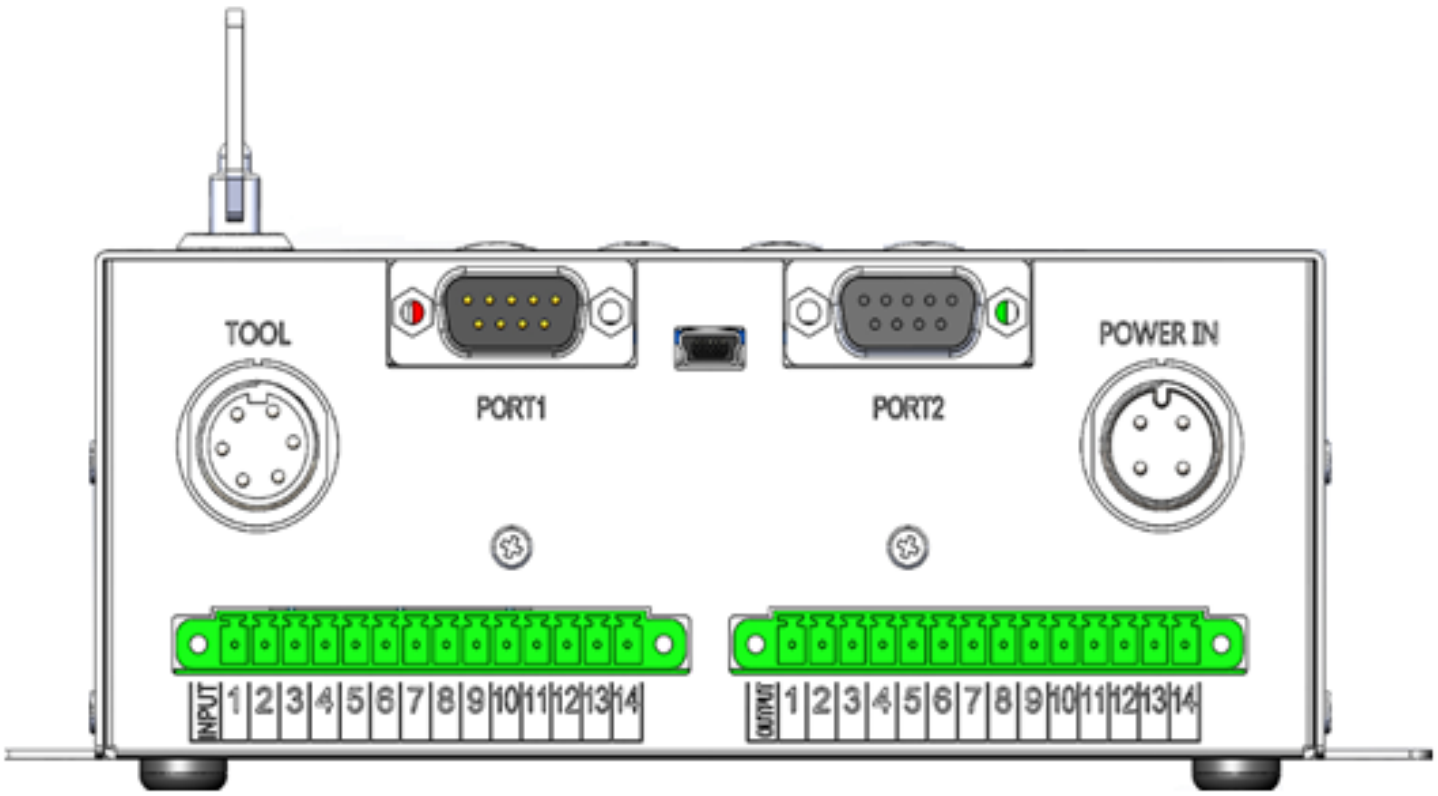
顯示屏：

1. 四位七段顯示扭力數值
2. 16X2 LCM 顯示設定功能。

C : 9 9 T : 9 . 9 9 9 9 9 . 9
Q : 5 5 0 . 0 0 K O K A L L

- C:顯示計數數值。
- T:顯示起子動作時間。
- 999.9 顯示圈數。
- Q:顯示扭力數值
- S:顯示狀態(OK,NGT,NGQ,NGC,OKALL....)

上鍵：設定模式上鍵切換功能。
下鍵：設定模式下鍵切換功能。
P 鍵：按壓三秒進/離開設定模式清除工序。
E/C：回復出廠設定功能/清除計數值/CONFIRM 鍵。
OK,NG,OKALL：顯示狀態燈。
鑰匙開關：鎖定按鍵使用功能



	電源端口(4PIN)	起子端口(6PIN)	RS232/PORT1	RS232/PORT2
BNK 系列 小扭力	SKP-BE32HL	BN 防干擾線材	連接 Barcode Scanner	連接 DAS
BNK 系列 大扭力	SKP-40B-HL-800 SKP-40B-HL(BNK800 系列)	BN 防干擾線材	連接 Barcode Scanner	連接 DAS
備註：電源設定請使用 HI 檔。				

二、設定功能選項及操作說明

電源開啟後，要進入功能選單時，主畫面按壓”P”鍵 3 秒進入後，必須輸入密碼才可進入。

名稱	設置時間及數值	功能解釋	原廠設定值
[1]PROGRAM	1-99	設定組別	1
BATCH COUNT	1-250	設定計數數值 計數次數範圍值為 1-250	5
TIME LIMIT	0.00-9.99 sec	設定 LT & HT 功能 LT: 設置時間及數值為 0.00-9.99，Lo time 起子啟動後停止時間早於 LT 設定時間，“NG”將顯示在狀態欄上，可檢測螺絲沒有正確鎖附。(起子啟動後在 LT 設定的時間，“NG”將顯示在狀態欄上，可用於螺絲浮鎖檢測) HT: 設置時間及數值為 0.00-9.99，Hi time 起子停止時間 (起子啟動後在 HT 設定的時間，“NG”將顯示在狀態欄上，可用於螺絲滑牙檢測)	LT:0.00 HT:9.99
TORQUE LIMIT	0.0-550.00 KGF.cm	設定 L & H 功能 L & H: 最小扭力和最大扭力選項允許用戶設定每個單獨的應用程序可接受的扭力範圍。當達到扭力在該範圍內，“OK”將顯示在狀態欄上，綠色的 LED 燈將亮起。如果達到扭力超出此範圍，“錯誤最小扭力”或“錯誤最大扭力”，“NG”將顯示在狀態欄上，並且紅色 LED 將亮起。扭力範圍值為 0-550KGF	L:0.0 H:550.00
THREAD LIMIT	0.0-999.9 圈	螺絲圈數 L & H:最小圈數和最大圈數選項允許用戶設定每個單獨的應用程序可接受的圈數範圍。實際測量圈數為馬達圈數/齒輪數比，當達到圈數在該範圍內，“OK”將顯示在狀態欄上，綠色“OK”的 LED 燈將亮起。如果達到圈數超出此範圍，“錯誤最小圈數”或“錯誤最大圈數”，“NG”將顯示在狀態欄上，並且紅色 LED 將亮起。	L:0.0 H:999.9
SLOW START TIME	L0-L9/ 0.0-9.9 sec	設定起子段速及作動時間。 S：設定行程轉速段數 L0（100%）、L1~L9（10%~90%）。 (L0/L1/L2/L3/L4/L5/L6/L7/L8/L9) T：持續作動時間，設定範圍為 0.0-9.9。	S:L0 T:0.0

AUTO FORWARD	RR:0.00-9.99 sec RS:0.10-9.99 sec	設定起子啟動先反轉ＲＲ時間後，停頓ＲＳ時間再正轉直到跳脫。 RR：設定起子啟動先反轉時間。 RS：設定起子反轉後停頓時間。	RR:0.00 RS:0.10
AUTO REV. TIME	0.00-9.99 sec	自動反轉，設定正轉跳脫後，反轉運轉時間。	0.00
AUTO STOP TIME	0.0-9.9 sec	設定預鎖時間。	0.00
RECONFIRM TIME	0.00-9.99 sec	起子鎖附完成後再次確認時間	0.00
ALARM SG. TIME	0.00-9.99 sec	AT：OKALL 訊號輸出時間 OT：OK 訊號輸出時間	AT：1.00 OT：O.OO
NS STOP	ON/OFF	設定起子錯誤時選擇的處理方式。 設定 ON 時:錯誤訊號時，立刻停止起子動作。使用者需按”E/C”鍵確認才可解除正轉(若是 I/O 部分的話，為外部確認鍵輸入”CONFIRM”，但起子可反轉。 設定 OFF:錯誤訊號時，起子不會停止。也不會影響起子下次啟動，只會發出警告。	OFF
AS STOP	ON/OFF	設定計數數值完成動作時選擇的處理方式。 完成動作時，立刻停止起子動作。使用者需按”E/C”鍵確認才可解除正轉(若是 I/O 部分的話，為外部確認鍵輸入”CONFIRM”。 設定 OFF: 完成動作時，起子不會停止。也不會影響起子下次啟動。	OFF
TORQUE OFFSET	±0.0-400.00 KGF.cm	設定扭力補償值，扭力輸出顯示為補償後的值。	±0.0
COUNT THREAD	0-255	圈數設定 依照各電動起子型號設定該數值	10
[2] TOOL INFO	1(自動存取)	工具順序編號	1
GEAR RATIO	1-99	設定齒輪數比，依照各電動起子型號設定該數值。	14
SCREWDRIVER ID	工具產品序號	工具產品序號。 工具(電動起子)出廠前,由廠內自行編寫產品序號,當更換設備(KL-CTDS)時,可立即由設備端查詢工具序號。	工具產品序號
ALIGNMENT TIME	XXXX/00/00 00:00	紀錄校正時間	XXXX/00/00 00:00
TORQUE FILTER	0-250、UMLIMITED	扭力濾波功能 0：關閉濾波功能 1-250：開啟濾波次數 UMLIMITED：無限濾波	0

[3] DEVICE ID	1-255	設備編號	1
DEVICE SN	產品序號	顯示設備產品序號。	產品序號
DEVICE TIME	XXXX/00/00 00:00	控制器時間	2017/01/01 00:00
REVERSE MODE	ONCE/EACH	設定反轉扣數功能 ONCE:反轉只倒數一次 EACH:反轉每次啟動則會倒數一次	ONLY
BATCH MODE	INC/DEC	設定計數次數功能 INC:正數、DEC:倒數	INC
BRAKE SIGNAL	RELEASE/KEEP	煞車訊號顯示 設定 RELEASE 時，跳脫煞車時，煞車信號將持續輸出到啟動開關放開為止 設定 KEEP 時，煞車信號機持續到下一次啟動開關按下，起子重新啟動時才消失	RELEASE
THREAD FINDING	ON/OFF	ON：開啟功能，空轉時不會顯示 NG OFF：關閉功能，空轉時會顯示 NG	NO
GATE MODE	OFF/ONCE/TWICE/ONCE+CON/TWICE+CON	ONCE：一次性工件到位。 TWICE:二次性工件到位。 ONCE+CON: 一次性工件到位加 CONFIRM 確認。 TWICE+CON: 二次性工件到位加 CONFIRM 確認。	OFF
TORQUE UNIT	kgf.cm/N.m/lbf.in/kgf.m	設定扭力顯示單位	kgf.cm
OPERATION MODE	STD/ADV	連線模式 STD:單機模式。 ADV:KL-AMS 網路系統(WIFI/Ethernet)連線模式。	STD
TORQUE ALIGNMENT	ON/OFF	校正扭力開啟/關閉 按壓 E/C 鍵開啟選擇，利用上下鍵切換至 ON,再按壓 E/C 鍵確認	OFF
SEQUENCE SET	OFF/MULTI/SINGLE	OFF:關閉 MULTI:大循環 SINGLE:小循環	OFF
POO- POO-… *8	P01-99	組別順序	0
AUTO LEARNING	ON/OFF	自動學習 開啟自動學習功能，等自動學習完後(需要有煞車動作) ，螢幕將顯示起子作動時間、扭力值及螺絲圈數，並且會儲存該數據。(此三項數據,皆不能為 0,才能將自動學習完的參數儲存)。	OFF

BCODE LEARNING	ON/OFF	第一碼 G1-G5：設定條碼行程組別 第二碼 P1-P99：PROGRAM 組別 CL：清除顆數 DA：禁止起子 EA：解禁起子 AS：解除 OKALL 起子鎖定狀態 NS：解除起子錯誤時鎖定狀態	G1-P1 條碼輸入設定僅 16 字元
[4] PASSWORD	A0000	設定密碼鎖	A0000
CONTROL VER.	V2.XXX	主機版本	V2.XXX
SCREWDRIVER VER.	V2.XX	起子版本	V2.XX

動作限制				
	RR/RS	RT	PT	LL
AUTO FORWARD (RR/RS)	V	X	X	X
AUTO REV. TIME (RT)	X	V	X	X
AUTO STOP TIME (PT)	X	X	V	X
RECONFIRM TIME (LL)	X	X	X	V
備註：V-可設定、X-OFF				

三、設定功能選項及操作說明

1 . 電源開啟後，要進入回復出廠設定功能選單時，主畫面按壓”E/C”鍵 3 秒進入後，必須輸入密碼才可進入。

LOAD DEFAULT	NO/ DEFAULT	取消/回復原廠設定	NO

2. 按鍵鎖定狀態會顯示在七段顯示器。

Un：按鍵解鎖狀態	LC：按鍵鎖定狀態

3. 電源開啟後，要進入設定功能選單時，主畫面按壓”P”鍵 3 秒進入後，必須輸入密碼才可進入

4. 電源開啟後，可按壓上下鍵瀏覽設定參數。

四、外部輸入控制功能說明:

Connector No	定　義	功　能　說　明
CN 1	外部啟動訊號輸入 START_IN	1. (CN1+GND)短路(CLOSE) 時，起子開始啟動。 2. (CN1+GND)斷路(OPEN) 時，起子停止運轉。
CN 2	GND	輸出電源 GND。
CN 3	外部反轉訊號輸入 REVERSE	1. 外部啟動訊號(CN1)先與 GND 短路(CLOSE)，反轉訊號時(CN3+GND)短(CLOSE)，起子開始反轉啟動。 2. 外部啟動訊號(CN1)先與 GND 短路(CLOSE)，反轉訊號時(CN3+GND)斷(OPEN)，起子開始正轉啟動。
CN 4	GND	輸出電源 GND。
CN 5	外部禁止訊號輸入 DISABLE	1. (CN5+GND)短路(CLOSE)時，起子不可以啟動。 2. (CN5+GND)斷路(OPEN)時，起子可以啟動。
CN 6	GND	輸出電源 GND。
CN 7	外部確認鍵輸入 CONFIRM	1. 當系統要求按確認鍵時，可透過此 CN7 與 GND 短路來替代。 2. CONFIRM 執行後，NG 訊號也會清除。
CN 8	GND	輸出電源 GND。
CN 9	外部確認鍵輸入 CLEARED	當要清除計數值時，可透過此 CN9 與 GND 短路來啟動功能。
CN 10	GND	輸出電源 GND。
CN 11	外部感應開關 GATE	1.輸入一個確認信號，使機器判定被鎖物為有效值。 2.感應開關：作業上的外接開關，可以接上一個或兩個開關。 3.接任何開關時都必須與 GND (CN14) 銜接。
CN 12	GND	輸出電源 GND。
CN 13	外部確認鍵輸入 SEQUENCE CLEARED	當要清除工序時，可透過此 CN13 與 GND 短路來啟動功能。
CN 14	GND	輸出電源 GND。

五、外部輸出控制功能說明:

Connector No	功能說明	備　註
CN 1	START	RUN FWD:啟動起子時 CN1、2 導通 短路時，CN1-CN2 導通 斷路時，CN1-CN2 斷路
CN 2	COM	GND:此腳位是 RUN FWD 訊號連接負端
CN 3	BRAKE	Brake:起子禁止啟動 CN3、4 導通 短路時，CN3-CN4 導通 斷路時 CN3-CN4 斷路
CN 4	COM	GND:此腳位是 Brake 訊號連接負端
CN 5	REVERSE	RUN BWD:起子反轉時 CN5、6 導通 短路時，CN5-CN6 導通 斷路時 CN5-CN6 斷路
CN 6	COM	GND:此腳位是 RUN BWD 訊號連接負端
CN 7	OK	OK:鎖完一顆螺絲時 CN7、8 導通 短路時，CN7-CN8 導通 斷路時，CN7-CN8 斷路
CN 8	COM	GND:此腳位是 OK 訊號連接負端
CN 9	NG	NOK:當有錯誤操作時 CN9、10 導通 短路時，CN9-CN10 導通 斷路時，CN9-CN10 斷路
CN 10	COM	GND:此腳位是 NOK 訊號連接負端
CN 11	OKALL	OK BATCH:完成所設定的螺絲顆數,則 CN11、12 導通 短路時，CN11-CN12 導通 斷路時，CN11-CN12 斷路
CN 12	COM	GND:此腳位是 OK BATCH 訊號連接負端
CN 13	24/12Vdc	控制器內置輸出電壓 DC+12V/100mA 或+24V/50mA 預設：+24V/50mA(+12V/100mA 可客製)
CN 14	GND	輸出電源 GND。

※備註：

1. INPUT 接點，如果是使用非隔離(濕接點)控制方式，需在線上串聯一顆 10K 電阻。

2.自動化機台裝機時，建議先將機台端的訊號線安裝好後，再連接至 KL-CTDS 上。

搭配自動化控制時，須注意上列事項，預防設備損壞。

六、CONFIRM 模式：

代號	說明	備註
C1	為一個開關 SENSOR 確認方式	外部感應開關
C2	為二個開關 SENSOR 當發生錯誤時，SENSOR 需在感應，面板會顯示"Er"， 須再按面板"CONFIRM"或外部確認(CN7+CN8 短路)，將"Er"消除	外部感應開關
C3	面板上 CONFIRM 手動確認方式	面板 / 外部 CONFIRM
C4	為一個開關 SENSOR 長 ON 確認方式+面板上 CONFIRM 手動確認或外部確認(CN7+CN8 短路)方式。	外部感應開關 +面板/外部 CONFIRM
C5	為二個開關 SENSOR 確認方式 +面板上 CONFIRM 手動確認方式或外部確認(CN7+CN8 短路)。	外部感應開關+面板/外部 CONFIRM

七、ERROR CODE 模式狀態說明:

代號	符號定義	功能說明
E3	掉電保護	當電動起子的電壓瞬間降低時，會停止電動起子的動作並於 LED 顯示此符號，表示起子目前處於低電壓保護。
E4	過溫保護	當電動起子的內部溫度過高時，會停止電動起子的動作並於 LED 顯示此符號，表示起目前處於溫度過高保護。
E5	堵轉保護	當電動起子馬達啟動異常時，會停止電動起子的動作並於 LED 顯示此符號，表示起子目前處於馬達啟動異常保護。
E7	方向推板異常	當電動起子馬達啟動時切換方向推板，起子的馬達會立刻停止動作，並於 LED 顯示此符號。
E8	剎車訊號異常	當電動起子剎車訊號偵測異常，會停止電動起子的動作並於 LED 顯示此符號。
ES	起子端通訊異常	當電動起子通訊訊號偵測異常，會停止電動起子的動作並於 LED 顯示此符號。
ESC	起子端校正異常	當電動起子未校正時，LED 顯示此符號。
EPC	系統端通訊異常	ADV MODE 通訊偵測異常。

八、狀態說明:

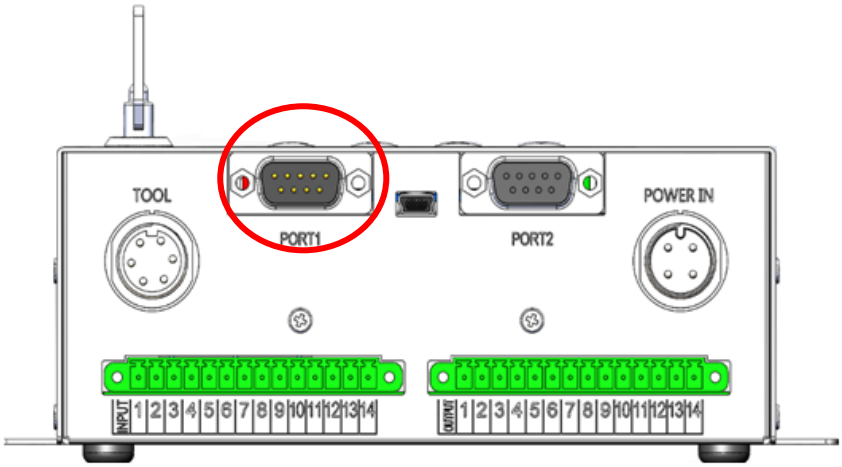
代號	說明
OK	每次鎖附到到位時，LCD 螢幕會顯示 OK
OKALL	每次鎖附一整組時，LCD 螢幕會顯示 OK ALL
NS	當發生操作失誤時 LCD 螢幕會顯示 NS 此時需要先經過 Confirm/Enter 鍵流程才能開始下一次動作
NG	NGT: 起子起動後停止時間早於 L/晚於 H。 NGQ: 起子起動後停止扭力早於 L/晚於 H。 NGC: 起子起動後停止圈數早於 L/晚於 H。 NG： THREAD FINDING 功能關閉時，空轉會顯示 NG
Dis	外部輸入 Disable、通訊協定 Disable、BCODELEARNING Disable，狀態時 LCD 螢幕會顯示 Dis

九、BARCODE 使用說明:

1.硬體架構說明

將 Barcode Reader 接至 CTDS 上 RS232 通訊端口(PORT1)





2. Barcode Reader Set function options

＜Serial interface＞

Record Suffix

===>CR

Baud Rate

===>9600 BPS

＜Data Frame＞

Data Bits

===>8

Parity

===>None

Stop Bits

===>1

3.操作功能說明

3.1. 先在 CTDS 上 Program 設定鎖付程序命令
能夠透過 Barcode Reader 切換該工件鎖付要用到的程式

使用奇力速條碼進行 Program 切換，可切換 1-99 組(CMD.P01-CMD.P99)







說明 ：

CTDS 上已經預設了 99 組程式，需預先在工件上貼上要使用的組別條碼
(如:CMD.P01~ CMD.P99)
當工件進來時，需先掃瞄貼在工件上或預先準備好的條碼，工具才能使用，
並切換到正確的組別

3.2. Barcode Reader 解除 AS 確認命令
當工件批次鎖付完成，有設定 AS 時，可以用 Barcode Reader 解除

使用奇力速條碼格式 ：CMD.C01 解除 AS (okAll Stop)



說明 ：

CTDS 上已啟用 AS 功能，當發生 AS 時，起子會鎖住不能再使用，
作業人員可用 Barcode Reader 掃瞄預先準備好的命令條碼來解除，方便操作。

3.3. Barcode Reader 解除 NS 確認命令

當工件鎖付條件錯誤，有設定 NS 時，可以用 Barcode Reader 解除

使用奇力速條碼格式 ：CMD.C02 解除 NS (Nok Stop)

CMD.C02

說明 ：

CTDS 上已啟用 NS 功能，當發生 NS 時，起子會鎖住不能再使用，

作業人員可用 Barcode Reader 掃瞄預先準備好的命令條碼來解除，方便操作。

警 告

1、扭力顯示盒請搭配整組的專用電動起子使用。

2、扭力顯示盒請配合 KILEWS 電源供應器、BNK 電動起子、配件使用，若搭配非 KILEWS 起子使用，以及使用非 KILEWS 原廠的零配件維修，而造成扭力顯示盒發生故障或品質不良，導致一切保證失效本廠恕不負責。

3、扭力顯示盒裝配，若搭配非 KILEWS 起子或電源使用及使用非 KILEWS 原廠的零配件維修，而造成扭力顯示盒發生故障或品質不良，導致一切保證失效本廠恕不負責。

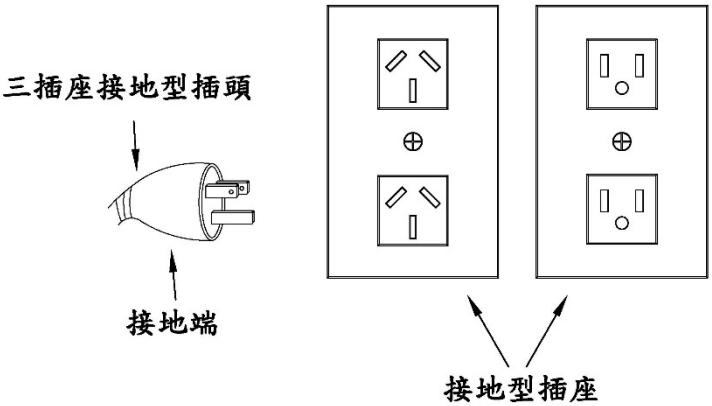
4、請勿任意修改接線端口與接點避免造成發生故障或品質不良，有需修改變更時請先與原廠確認後可以更改時才能更改，若擅自修改接線端口與接點，導致一切保證失效本廠恕不負責。
IO 端口的電氣規範承受值：INPUT：+48V，OUPUT：+48V/0.2A。

操 作 須 知

1、 當插入或拔開起子連接線和電源線之插頭時，需抓緊電纜線之插頭部分。
2、 請勿用力拉扯電纜線，或使其靠近油 、化學物質或熱的物體，同時也注意不要讓電纜線在工作中刮磨到銳利的物品。
3、 此型扭力顯示盒，只能專門供 KILEWS 電源供應器、BNK 電動起子、配件使用，勿將電動螺絲起子控制器使用於其他機械。
4、 假如控制器過熱，或負載使用電流超過保險絲最大額定電流時，快速型保險絲會自動熔斷，切斷電源，持續跳脫或開關動作不正常時，請立即停止操作，並將電動螺絲起子控制器送回修理。
5、 請勿任意拆卸電動螺絲起子扭力顯示盒嘗試自行修復。
6、 不使用時將主要電源開關 ”OFF”，並且拔掉電源插頭。

接 地 說 明

電動螺絲起子、扭力顯示盒、電源供應器使用時應接地以免操作者觸電。本控制器配有三條導線及三腳接地型插頭以適合接地型插座用，插座本身的接地線必須確實和電源設備地線相連接才有接地作用。電線黃綠色的導線是接地線。千萬不可將此黃綠色線接在通電的接頭上，此控制器內的接地線除了有漏電安全接地外，還可將起子工作時所產生的 ESD 靜電靠著接地線來接地消除。



CTDS V2.0 / MCTDS5 資料傳輸說明及流程控制建議

VER:2020060201

1.控制器開機及時間同步 :

控制器開機後，每隔一秒會主動送出 {REQ0,.....} 資料格式，通知外部連接的設備(電腦、PLC、AMS等)，此時需回覆{CMD0,....}控制器已經正常啟動及控制器目前時間，若控制器沒有收到回覆{CMD100,....},{REQ100,.....} 會隔 10 秒才會再度送出

2.控制器收到 Barcode 資料時，會將掃描資料以 {REQ1,....} 資料格式送出給外部設備做為控制判斷或儲存紀錄，此時需回覆{CMD0,....}

3.控制器開機後，當起子有跳脫信號產生時，會以{DATA0, ...} 資料格式，將跳脫資料送出，每跳脫一次會將第 6 個欄位(控制器總鎖附次數)加 1，此時需回覆{CMD0,....}若未回覆 CMD0 會重複送 DATA0 資料(只有更新時間)第 6 個欄位控制器總鎖附次數則不變

4.當下一次跳脫時，會傳送新的跳脫資料，可以第 6 個欄位(控制器總鎖附次數)來判斷是否為新的一次跳脫資料

5.當控制器接收到外接設備回覆 {CMD0,....} 資料格式時，確認已經收到資料時，控制器將回復到傳輸{REQ0,...}，並且可以設定控制器時間

6. 建議應用軟體端流程控制如下頁所示:

註: 流程中[CMD0] 的內容如下:

{CMD0,0,0,0,0,0,0,0,年,月,日,時,分,秒,0000,0000}

str8 0001~9999 年
str9 01~12 月
str10 01~31 日
str11 00~23 時
str12 00~59 分
str13 00~59 秒
str14 0000-9999 Check Sum(年月日時分秒 加總碼)
str15 0000-9999 Key Code(Check Sum + 5438)


循環通訊
控制器寫入至主機
REQ0(每秒傳送)
主機回覆時間
CMD0(每秒傳送)
控制器
CTDS/MCTDS5
(Master)
條碼輸入至主機
REQ1
主機
PC/AMS/PLC
(Slave)
主機回覆時間
CMD0
資料寫入至主機
DATA0(第 6 個欄位判斷是否為新資料)
主機回覆時間
CMD0

Kilews KL-CTDS-2.0&KL-MCTDS5 基本數據輸出協議說明

(Ver1.0_20210302_01)

COMPORT Setting:Baud rate : 115200/9600(CTDS 1.7X), Data bit : 8 , Stop bit : 1, Parity bit :NON

串行通訊模式 -ASCII (美國資訊交換標準碼)

通過設備上的內置 RS232端口，從設備（CTDS / MCTDS）向外部系統（DAS / AMS /其他系統）發送三種基本數據輸出格式:

1.命令{REQ0}：設備送出資料到主機 (設備啟動就緒後，每秒將設備狀態發送到主機)

2.命令 {REQ1}：設備送出資料到主機 (條碼掃描後立即將數據發送到主機)

3.命令 {DATA0}：設備送出資料到主機 (起子跳脫後將資料立即發送到主機)

4.命令 {CMD0}：主機送出資料到設備 (主機回覆系統時間給設備)

ps : 1.從外部系統讀取{CMD}後，設備將輸出數據從{DATA0}更改為{REQ0}

2.字串中的字元位置不含逗號位置

1. {REQ0} 資料格式/範例	{REQ0,01,00,001,5555566666_____,01_____,1,1,1,01,01,1,0000000001,2.123,2.15,1,0,0,001/005,2018,08,02,13,23,02,2066,7504}					
欄位	參數	數值	資料型態	長度	位置(不含逗號)	說明
1	Header+CMD	{REQ0	String	5 Byte	1-5	Header+命令碼
2	Sequence ID	01 ~ 20	String	2 Byte	7-8	工序 CTDS = 1 - 8, MCTDS = 1 - 20
3	Job ID	00~ 20	String	2 Byte	10-11	CTDS = 1, MCTDS = 1-20,預設值=0
4	Device ID	001 ~ 255	String	3 Byte	13-15	控制器代碼(CTDS:1-255 , MCTDS5:1-99)
5	Tool SN	20 Byte	String	20 Byte	17-36	起子序號,不足20 Bytes 後面補滿底線 "_"
6	Device SN	20 Byte	String	20 Byte	38-57	控制器序號,不足20 Bytes 後面補滿底線 "_"
7	Device Operation Mode	0~3	String	1 Byte	59	模式確認(0: ADV連線, 1: STD單機, 2: ALI校準, 3: SET設定模式)
8	Sequence Control Mode	0~1	String	1 Byte	61	控制器模式(0: 工序模式, 1: 不要工序模式)
9	Setting Status	0~1	String	1 Byte	63	設定狀態(0: 失敗 1: 成功)
10	Select Tool	01~09	String	2 Byte	65-66	選擇起子
11	Program Unit	01~99	String	2 Byte	68-69	組別
12	Device Type	0~3	String	1 Byte	71	設備種類(0: 1.7x CTDS 1: 2.0 CTDS 2: MCTDS 3: WSCBSN)
13	Tool Connect & Keylock	0000000000 (10 Byte)	String	10 Byte	73-82	接上起子狀態(0000000000 ; 0: 未接上, 1: 接上 由右開始第1把起子是否接上,第10個位置代表KEY LOCK)
14	Device Version	0.000~9.999	String	5 Byte	84-88	控制器韌體版本
15	Tool Version	0.00~9.99	String	4 Byte	90-93	起子韌體版本
16	Tool Enable/Disable Status	0~1	String	1 Byte	95	起子狀態(0: Disable(沒接時預設成 "0" Disable),1: Enable)
17	Tool Stop Status	0~9,A~J	String	1 Byte	97	起子停止狀態(0: None , 1:NS, 2:AS, 3:E3, 4:E4, 5:E5, 7:E7, 8:E8, 9:BS,A:EPC,B:ESC, C:ES, D:Er, E:C1, F:C2, G:C4, H:C5 I:ESD J:EA) EA在CTDS 1.7X版出現代表通訊異常(不會出現ES) EA在MCTDS5出現代表RS485通訊不良 出現C3代表AS所以會傳2 BS只會在MCTDS5出現
18	Device extend function	0~1	String	1 Byte	99	控制器執行功能(0: None, 1:Clear Batch)
19	Screw count	000~250/001~250	String	7 Byte	101-107	剩餘顆數/總顆數
20	Year	0001~9999	String	4 Byte	109-112	年
21	Month	01~12	String	2 Byte	114-115	月
22	Date	01~31	String	2 Byte	117-118	日
23	Hour	00~23	String	2 Byte	120-121	時(24小時)
24	Minute	00~59	String	2 Byte	123-124	分
25	Second	00~59	String	2 Byte	126-127	秒
26	Check Sum	0000~9999	String	4 Byte	129-132	
27	Key Code	0000~9999}	String	5 Byte	134-138	金鑰+Tail
28						換行位元(LF)
29						歸位位元(CR)
			{REQ0,... }Total:138 Byte,27個欄位			
備註	欄位1~27中間以"," (ASCII 0x2c)隔開					

2. {REQ1} 條碼格式/範例	{REQ1,69100660016096,2018,08,02,16,33,33,2110,7548}					
欄位	參數	數值	資料型態	長度	位置(不含逗號)	說明
1	Header+CMD	{REQ1	String	5 Byte	1-5	Header+命令碼
2	Barcode	1~30 Byte	String	30 Byte	7-36	條碼
3	Year	0001~9999	String	4 Byte	38-41	年
4	Month	01~12	String	2 Byte	43-44	月
5	Date	01~31	String	2 Byte	46-47	日
6	Hour	00~23	String	2 Byte	49-50	時(24小時)
7	Minute	00~59	String	2 Byte	52-53	分
8	Second	00~59	String	2 Byte	55-56	秒
9	Check Sum	0000-9999	String	4 Byte	58-61	
10	Key Code	0000-9999}	String	5 Byte	63-67	金鑰+Tail
11						換行位元(LF)
12						歸位位元(CR)
			{REQ1, ... }Total: 67Byte,10個欄位			
備註	欄位1~10中間以"," (ASCII 0x2c)隔開					

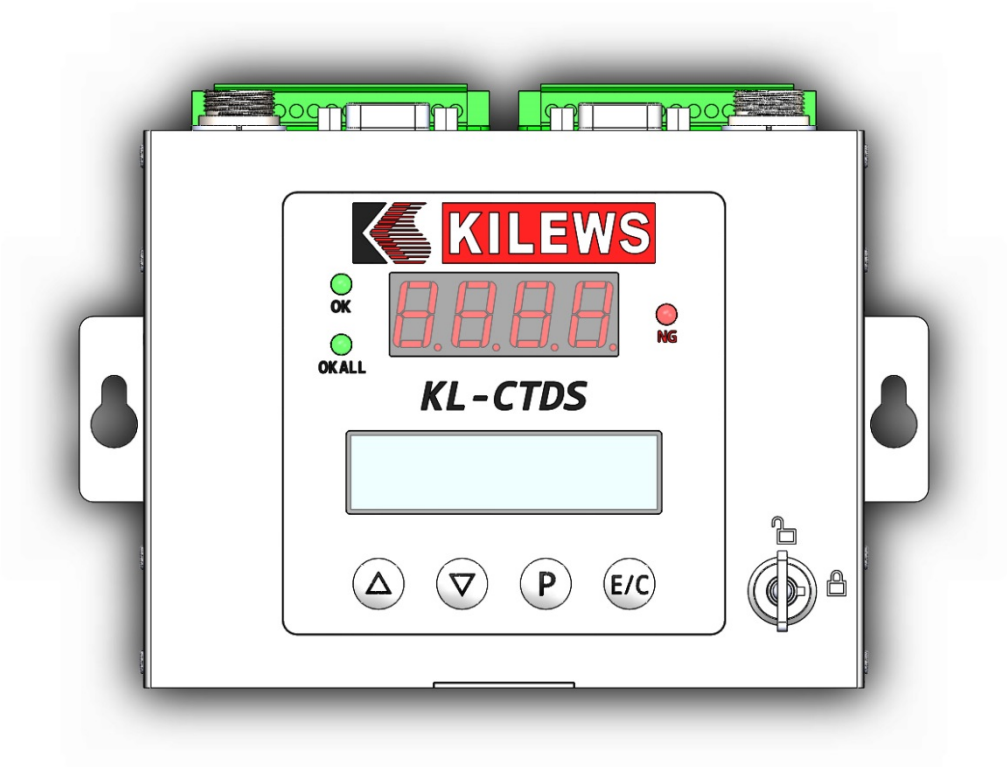
3. {DATA0} 資料格式/範例	{DATA0,1,001,2344_____,1y_____,0000000002,01,01,0002.4800,kgf.cm,0000.2100,0002.4000,003/005,INC,OK___,1,0,0,0002.4800,00339,2019,02,22,11,51,51,2156,7594}					
欄位	參數	數值	資料型態	長度	位置(不含逗號)	說明
1	Header+CMD	{DATA0	String	6 Byte	1-6	Header+命令碼
2	Device Type	0~3	String	1 Byte	8	設備種類(0: 1.7x CTDS 1: 2.0 CTDS 2: MCTDS 3: WSCBSN)
3	Device ID	001~255	String	3 Byte	10-12	控制器代碼(CTDS:1-255 , MCTDS5:1-99)
4	Tool SN	20 Byte	String	20 Byte	14-33	起子辨識碼,不足20 Bytes 後面補滿底線 "_"
5	Device SN	20 Byte	String	20 Byte	35-54	控制器辨識碼,不足20 Bytes 後面補滿底線 "_"
6	Device Count	0000000001~9999999999	String	10 Byte	56-65	控制器總鎖附次數
7	Program unit	01~99	String	2 Byte	67-68	組別
8	Select Tool	01~09	String	2 Byte	70-71	選擇起子
9	Torque	0000.0000~0550.0000	String	9 Byte	73-81	扭力值
10	Torque unit	kgf.cm, N.m, lbf.in, kgf.m	String	6 Byte	83-88	扭力單位,不足6Bytes 後面補滿底線 "_"
11	Fastening time	0000.0000~0009.9990	String	9 Byte	90-98	鎖附時間
12	Fastening thread	0000.0000~0999.9000	String	9 Byte	100-108	鎖附圈數
13	Screw count	000~250/001~250	String	7 Byte	110-116	剩餘顆數/總顆數
14	INC/DEC	INC,DEC	String	3 Byte	118-120	正數 / 倒數
15	Status	OK,NGT,NGQ,NGC,OKALL,REV	String	5 Byte	122-126	鎖附狀態(OK:鎖附到位顯示OK, NGT:起子停止時間早於 L/晚於 H NGQ:起子停止扭力小於 L/大於 H NGC:起子停止圈數低於 L/高於 H OKALL:鎖附一整組時顯示OKALL REV:起子反轉。) 不足5 Bytes 後面補滿底線 "_"
16	Device Operation Mode	0~3	String	1 Byte	128	模式確認(0: ADV連線, 1: STD單機, 2: ALI校準, 3: SET設定模式)
17	Tool Stop Status	0~9,A~J	String	1 Byte	130	NS / AS 狀態(0: None , 1:NS, 2:AS, 3:E3, 4:E4, 5:E5, 7:E7, 8:E8, 9:BS,A:EPC,B:ESC, C:ES, D:Er, E:C1, F:C2, G:C4, H:C5 I:ESD J:EA) EA在CTDS 1.7X版出現代表通訊異常(不會出現ES) EA在MCTDS5出現代表RS485通訊不良 出現C3代表AS所以會傳2 BS只會在MCTDS出現

18	Torque Filter	0~250,255	String	3 Byte	132-134	濾波次數(0:不濾波(預設值),1-250:濾波次數, 255:無限濾波) CTDS 2.124 與 MCTDS5 2.005版增加無限濾波以及修改次數由原本20次增加到250次
19	Pre-filtering torque	0000.0000~0550.0000	String	9 Byte	136-144	濾波前扭力值 CTDS 2.124 與MCTDS5 2.006版開始才有此欄位
20	Current value	00000-65535	String	5 Byte	146-150	電流值 CTDS 2.124與MCTDS5 2.006版開始才有此欄位
21	Year	0001~9999	String	4 Byte	152-155	年
22	Month	01~12	String	2 Byte	157-158	月
23	Date	01~31	String	2 Byte	160-161	日
24	Hour	00~23	String	2 Byte	163-164	時
25	Minute	00~59	String	2 Byte	166-167	分
26	Second	00~59	String	2 Byte	169-170	秒
27	Check Sum	0000-9999	String	4 Byte	172-175	
28	Key Code	0000-9999}	String	5 Byte	177-181	金鑰+Tail
29						換行位元(LF)
30						歸位位元(CR)
			{DATA0, ... }Total:181 Byte,28個欄位			
備註	欄位1~28中間以"," (ASCII 0x2c)隔開					

4. {CMD0} 資料格式/範例	{CMD0,0,0,0,0,0,0,2018,09,03,18,45,19,2112,7550}					
欄位	參數	數值	資料型態	長度	位置(不含逗號)	說明
1	Header+CMD	{CMD0	String	5 Byte	1-5	Header+命令碼
2	Device Name	0~1	String	1 Byte	7	設備名稱(0: AMS, 1: DAS)
3	unused	0	String	1 Byte	9	未使用
4	unused	0	String	1 Byte	11	未使用
5	unused	0	String	1 Byte	13	未使用
6	unused	0	String	1 Byte	15	未使用
7	unused	0	String	1 Byte	17	未使用
8	Year	0001~9999	String	4 Byte	19-22	年
9	Month	01~12	String	2 Byte	24-25	月
10	Date	01~31	String	2 Byte	27-28	日
11	Hour	00~23	String	2 Byte	30-31	時(24小時)
12	Minute	00~59	String	2 Byte	33-34	分
13	Second	00~59	String	2 Byte	36-37	秒
14	Check Sum	0000-9999	String	4 Byte	39-42	
15	Key Code	0000-9999}	String	5 Byte	44-48	金鑰+Tail
16						換行位元(LF)
17						歸位位元(CR)
			{CMD0, ... }Total: 48Byte,15個欄位			
備註	1.欄位1~15中間以"," (ASCII 0x2c)隔開 2.當時間不一致或是重複送{DATA0}則回覆CMD 0					
通訊界面 :	**標準 RS-232C 9 Pin Female (DCE) to PC or PLC (DTE)**					
連接 RS232 :	**1.Barcode scanner**		**連接方式:KL-CTDS**			**連接方式:KL-MCTDS5**
PORT1						
	2.WIFI模組		**連接方式:KL-CTDS**			**連接方式:KL-MCTDS5**
PORT2						
備註 :	※當跳脫資訊(DATA0)連續傳輸時，可用欄位6判斷。					

我司保留對技術參數更新的權利

1. Panel Function



Display screen:

1. Four-digit seven-segment display of torque value
2. 16X2 LCM display setting function

C	:	9	9		T	:	9	.	9	9	9	9	9	.	9
Q	:	5	5	0	.	0	0	K			O	K	A	L	L

- C: Display count value
- T: Display screwdriver action time
- 999.9 display number of turns
- Q: Display torque value
- S: Display status (OK, NGT, NGQ, NGC, OKALL....)

Up Key: Setting mode Up key switch function.

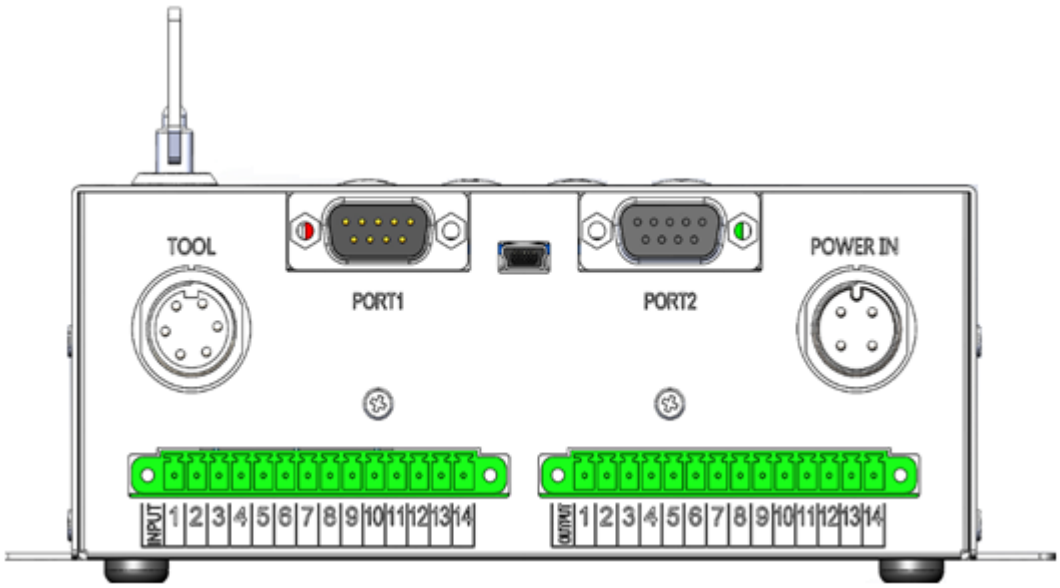
Down Key: Setting mode Down key switch function.

P key: Press three seconds to enter/leave the setting mode/ Clear Sequence.

E/C: Restore initial defaults/ Clear count value /CONFIRM.

OK, NG, OKALL: Display status indicator.

Key switch: Lock the key usage functions.



	Power port (4PIN)	Screwdriver port (6PIN)	RS232/PORT1	RS232/PORT2
BNK series small torque	SKP-BE32HL	BN Anti-interference cable	Connect Barcode Scanner	Connect DAS
BNK series power torque	SKP-40B-HL-800 SKP-40B-HL (BNK800 series)	BN Anti-interference cable	Connect Barcode Scanner	Connect DAS
Remark: Please switch the power controller HI/LO switch to "HI" position.				

2. Set Function Options and Operating Instructions

After switching on the power, to enter into the function menu, press the “P” key on the panel for 3 seconds, following which password input is required to enter the menu.

Name	Set Up Time and Value	Function Interpretation	Factory Setting Value
[1]PROGRAM	1-99	Select program	1
BATCH COUNT	1-250	Set up count value Count number range is 0~250	5
TIME LIMIT	0.00-9.99 sec	Set up LT & HT functions LT: Setting time and value is 0.00-9.99, Screwdriver stops or shut off before Lo time setting, NG will be displayed on the status bar. It can check whether the screw is properly fastened or not. (Lo time setting can be used to detect cross threading or unfinished rundowns) HT: Setting time and value is 0.00-9.99, Screwdriver stops or shut off exceeded Hi time setting, NG will be displayed on the status bar. (Hi time setting can be used to detect stripped or oversize screw)	LT:0.00 HT:9.99
TORQUE LIMIT	0.0-550.00 KGF.cm	Set up L & H functions L & H: The options of Minimum Torque and Maximum Torque allow the user to set up the acceptable torque range for each independent application program. When the reaching torque is in the range, “OK” will be displayed on the status bar, and the green LED light is lit up. If the reaching torque exceeds such range, “Error in Minimum Torque” or “Error in Maximum Torque”, “NG” will be displayed in the status bar, and the red LED is lit up. The torque range value is 0-550KGF.	L:0.0 H:550.00

Name	Set Up Time and Value	Function Interpretation	Factory Setting Value
THREAD LIMIT	0.0-999.9 Turns	Number of screw turns L & H: The options of Minimum number of turns and Maximum number of turns allow the user to set up the acceptable number of turns range for each rundown. The actual number of turns measured refers to the motor turns/gear ratio; when the number turns reached the range, “OK” is displayed in the status bar, and green LED light of OK” is lit up. If the reaching number of turns exceeds such range, “Error in Minimum number of turns” or “Error in Maximum number of turns”, “NG” will be displayed in the status bar, and the red LED is lit up.	L:0.0 H:999.9
SLOW START TIME	L0-L9/ 0.0-9.9 sec	Set up screwdriver slow start time and speed. S: Set up slow start speed level, L0 (100%), L1~L9 (10%~90%). (L0/L1/L2/L3/L4/L5/L6/L7/L8/L9) T: Set up slow start time, slow start time is 0.0-9.9 sec..	S:L0 T:0.0
AUTO FORWARD	RR:0.00-9.99 sec RS:0.10-9.99 sec	Set up screwdriver reverse start time, then pause RS time, followed by forward rotation until screwdriver shuts off. RR: Set up the screwdriver reverse start time RS: Set up the screwdriver pause time after reverse.	RR:0.00 RS:0.10
AUTO REV. TIME	0.00-9.99 sec	Automatic reverse. Set up auto reverse time after screwdriver shut off.	0.00
AUTO STOP TIME	0.0-9.9 sec	Set up pre-fastening time.	0.00
RECONFIRM TIME	0.00-9.99 sec	Set up re hit time after rundown complete.	0.00
ALARM SG. TIME	0.00-9.99 sec	AT: OKALL signal output time OT: OK signal output time	AT: 1.00 OT: 0.00
NS STOP	ON/OFF	Set up the handling method selected during errors of the screwdriver. Set up for ON: when there is error signal, display NS stops the action of the screwdriver immediately. The user is required to press the “E/C” key for confirmation in order to unlock the forward rotation (For I/O control, input “CONFIRM” from the external confirm key; however, the screwdriver can perform reverse rotation). Set up for OFF: when there is error signal, the screwdriver will not be locked, and it will not affect the switch-on of the screwdriver next time, but only a warning is sounded.	OFF
AS STOP	ON/OFF	Set up handling method selected during the action completion of count value. When the action is complete, the user is required to press the “E/C” key for confirmation in order to unlock the forward rotation (for I/O control, input “CONFIRM” from the external confirm key). Set up for OFF: when the action is complete, the screwdriver is not locked, and it will not affect the next switch-on of the screwdriver.	OFF
TORQUE OFFSET	±0.0-400.00 KGF.cm	Set up the torque compensation value, the torque output displays the value after compensation.	±0.0
COUNT THREAD	0-255	Thread Setting Set the thread value according to each electric screwdriver model	10
[2] TOOL INFO	1 (Automatic access and saving)	Tool sequential number.	1
GEAR RATIO	1-99	Set up the gear ratio and set up such value according to each electric screwdriver model.	14
SCREWDRIVER ID	Tool product serial number	Tool product serial number. Before the tool exit the factory (electric screwdriver), the factory provides the tool a serial number. When equipment (KL-CTDS) needs to be replaced, the tool serial number can be searched from the equipment end.	Tool product serial number

Name	Set Up Time and Value	Function Interpretation	Factory Setting Value
ALIGNMENT TIME	XXXX/00/00 00:00	Record calibration date and time.	XXXX/00/00 00:00
TORQUE FILTER	0-250、UMLIMITED	Torque Filter Function : 0 : Disable Filter 1 - 250: Enable Filter Counter UMLIMITED：Infinite filtering	0
[3]DEVICE ID	1-255	Equipment No.	1
DEVICE SN	Product serial number	Display serial number of product	Product serial number
DEVICE TIME	XXXX/00/00 00:00	Device time	2017/01/01 00:00
REVERSE MODE	ONCE /EACH	Set up reverse rotation deduction function. ONCE : reverse rotation only counts down once only. EACH: count down each reverse rotation	ONLY
BATCH MODE	INC/DEC	Set up count number function. INC: count up, DEC: count down	INC
BRAKE SIGNAL	RELEASE/KEEP	Brake signal method. When it is RELEASE . After screwdriver triggered and shut off, brake signal will last until trigger released. When it is KEEP . After screwdriver triggered and shut off, brake signal will last until next time screwdriver triggered.	RELEASE
THREAD FINDING	ON/OFF	ON: NG will not display when no load rotation OFF： NG will display when no load rotation	ON
GATE MODE	OFF/ONCE/TWICE/ ONCE+CON/TWICE +CON	ONCE: workpiece in position at once TWICE: workpiece in position at two times ONCE+CON: workpiece at position at once plus CONFIRM for confirmation TWICE+CON: workpiece at position at two times plus CONFIRM for confirmation	OFF
TORQUE UNIT	kgf.cm/N.m/ lbf.in/kgf.m	Set up torque display unit.	kgf.cm
OPERATION MODE	STD/ADV	Connection mode. STD: Standalone mode. ADV: KL-AMS network system (WIFI/Ethernet) connection mode.	STD
TORQUE ALIGNMENT	ON/OFF	Calibration torque switch on/off Press E/C key to start selection, use Up and Down key to change to ON, and then press E/C key to confirm.	OFF
SEQUENCE SET	OFF/MULTI/SINGLE	OFF: Disable MULTI : A Job cycle SINGLE : Sequence cycle	OFF
POO- POO-… *8	P01-99	Sequence order	0
AUTO LEARNING	ON/OFF	Automatic learning. Turn on auto-learning function; wait for the auto-learning to complete (need to perform brake function), monitor will then display the screw driving time, torque value, number of screw turns, and such data will be saved. Above data cannot be 0 in order to save the parameters after the auto-learning.	OFF
BCODE LEARNING	ON/OFF	First Code G1-G5：Set Barcode group Second Code P1-P99：Set PROGRAM Group CL：Clear DA：Disable Screwdriver Functions EA：Disable Relieve AS：Release Screwdriver lock status by OKALL NS：Release Screwdriver lock status by NG	G1-P1 The maximum length of Barcode data is 16 characters

Name	Set Up Time and Value	Function Interpretation	Factory Setting Value
[4]PASSWORD	A0000	Set up password lock.	A0000
CONTROL VER.	V2.XXX	Mainboard version.	V2.XXX
SCREWDRIVER VER.	V2.XX	Screwdriver version.	V2.XX

Action Limitation				
	RR/RS	RT	PT	LL
AUTO FORWARD (RR/RS)	V	X	X	X
AUTO REV. TIME (RT)	X	V	X	X
AUTO STOP TIME (PT)	X	X	V	X
RECONFIRM TIME (LL)	X	X	X	V
Remarks: V - setting available, X - OFF				

3. Set function options and operating instructions

3-1. After the power is turned on, press the "E / C" button for 3 seconds to enter the menu of initial default, which must entry the password to enter.

LOAD DEFAULT	NO/DEFAULT	Cancel/restore to factory setting	NO

3-2. The status “LC” is displayed on the 7-segment display when key lock has been used.

Un: Key of unlock state	LC: Key of lock state

3-3. After the power is turned on, press the "P" button for 3 seconds to enter the Function menu page, which must entry the password to enter.

3-4. After enter the function menu page, parameter can be browsed and setting by press up and down button.

4. External Input Control Function Description

Connector No.	Definition	Function Description
CN 1	External start signal input START_IN	1. When (CN1+GND) is in close circuit (CLOSE), the screwdriver then Starts. 2. When (CN1+GND) is in open circuit (OPEN), the screwdriver then Stops.
CN 2	GND	Output GND.
CN 3	External reverse rotation signal input REVERSE	1. External switch-on (CN1) is in close circuit with GND (CLOSE); during the reverse rotation signal (CN3+GND) Close (CLOSE), the screwdriver then starts the activation of Reverse rotation. 2. External switch-on (CN1) is in close circuit with GND (CLOSE); during the reverse rotation signal (CN3+GND) Open (OPEN), the screwdriver then starts the activation of Forward rotation.
CN 4	GND	Output GND.
CN 5	External disable signal input DISABLE	1. When (CN5+GND) is in close circuit (CLOSE), the screwdriver cannot be activated. 2. When (CN5+GND) is in open circuit (OPEN), the screwdriver can be activated.
CN 6	GND	Output GND.
CN 7	External confirm key input CONFIRM	1. When the system requires the press of confirmation key, the CN7 in close circuit with GND can be used instead. 2. After executing the CONFIRM, the NG signal is also cleared.
CN 8	GND	Output GND.
CN 9	External confirm key input CLEARED	To clear the count value, the CN9 in close circuit with GND can be used to clear count value.
CN 10	GND	Output power GND.
CN 11	External sensor switch	1. Input a confirmation signal to allow the controller to determine that the

	GATE	workpiece is in position. 2. Sensor switch: external switch in operation can be connected to one or two switches. 3. Connection to any switch shall be connected to GND (CN14).
CN 12	GND	Output GND.
CN 13	SEQUENCE CLEARED	When the sequence is to be cleared, this function can be triggered by CN13 to GND connected. (CN13+GND)
CN 14	GND	Output GND.

5. External Output Control Function Description

Connector No.	Function Description	Remarks
CN 1	START	RUN FWD: During the switch-on of screwdriver, CN1, 2 are conducted During close circuit, CN1-CN2 are conducted During open circuit, CN1-CN2 are disconnected
CN 2	COM	GND: This pin refers to the RUN FWD signal connection negative end
CN 3	BRAKE	Brake: When the brake of the screwdriver is actuated, CN3, 4 are conducted During close circuit, CN3-CN4 are conducted During open circuit, CN3-CN4 are disconnected
CN 4	COM	GND: This pin refers to the Brake signal connection negative end
CN 5	REVERSE	RUN BWD: Reverse triggered by conducting CN5 and 6 During close circuit, CN5-CN6 are conducted During open circuit, CN5-CN6 are disconnected
CN 6	COM	GND: This pin refers to the RUN BWD signal connection negative end
CN 7	OK	OK: After completion of fastening a screw, CN7 and 8 are conducted During close circuit, CN7-CN8 are conducted During open circuit, CN7-CN8 are disconnected
CN 8	COM	GND: This pin refers to the OK signal connection negative end
CN 9	NG	NOK: When there is an error operation, CN9 and 10 are conducted During close circuit, CN9-CN10 are conducted During open circuit, CN9-CN10 are disconnected
CN 10	COM	GND: This pin refers to the NOK signal connection negative end
CN 11	OKALL	OK BATCH: When the batch completed, CN11 and 12 are conducted During close circuit, CN11-CN12 are conducted During open circuit, CN11-CN12 are disconnected
CN 12	COM	GND: This pin refers to the OK BATCH signal connection negative end
CN 13	24/12Vdc	Controller output voltage: DC+12V/100mA or +24V/50mA Default value: +24V/50mA (+12V/100mA can be customized).
CN 14	GND	Output GND.

※Notification：

1. INPUT Contact，If a non-isolated (wet contact) control method is used, a 10K resistor must be connected in series on the circuit.

2. When installing an automated machine, it is recommended to first install the signal cable at the machine end and then connect it to the KL-CTDS.

When collaborating with automated controls, please notes to the above items to prevent equipment damage.

6. CONFIRM Mode

Code	Description	Remarks
C1	Refers to a switch SENSOR confirmation method	External sensor switch
C2	Refers to two switch SENSORS In case of errors, SENSOR needs to be in detection, and the panel displays "Er"; the "CONIRM" on the panel needs to be pressed again or the external confirmation (CN7+CN8 close circuit) in order to clear the "Er"	External sensor switch
C3	Manual confirmation method for CONFIRM on panel	Panel/external CONFIRM
C4	Refers to switch SENSOR long ON confirmation method + manual confirmation of CONFIRM on the panel or external confirmation (CN7+CN8 in close circuit) method.	External sensor switch + external CONFIRM
C5	Refers to two switch SENSOR confirmation method + manual confirmation method of CONFIRM on the panel or external confirmation (CN7+CN8 in close circuit).	External sensor switch + external CONFIRM

7. ERROR CODE Mode Status Description

Code	Symbol Definition	Function Description
E3	Voltage-drop protection	When the voltage of the electric screwdriver drops instantly, the action of the electric screwdriver is stopped, and the LED displays this symbol, representing that the screwdriver is currently under low-voltage protection.
E4	Over-temperature protection	When the internal temperature of the electric screwdriver is too high, the action of the electric screwdriver is stopped, and the LED displays this symbol, representing that the screwdriver is currently under over-temperature protection.
E5	Rotation-jamming protection	When the startup of the electric screwdriver motor is abnormal, the action of the electric screwdriver is stopped, and the LED displays this symbol, representing that the screwdriver is currently under motor startup abnormality protection.
E7	Direction push board abnormal	When the electric screwdriver motor is switched on, as the direction push board is changed, the motor of the screwdriver then stops action immediately, and LED displays this symbol.
E8	Brake signal abnormal	When the electric screwdriver brake signal detection is abnormal, the action of the electric screwdriver is stopped, and the LED displays this symbol.
ES	Screwdriver end communication abnormal	When the power screwdriver communication signal detection is abnormal, the action of the electric screwdriver is stopped, and the LED displays this symbol.
ESC	Screwdriver end calibration abnormal	When the electric screwdriver is not calibrated, the LED displays this symbol.
EPC	System end communication abnormal	ADV MODE communication detection abnormal.

8. Status Description

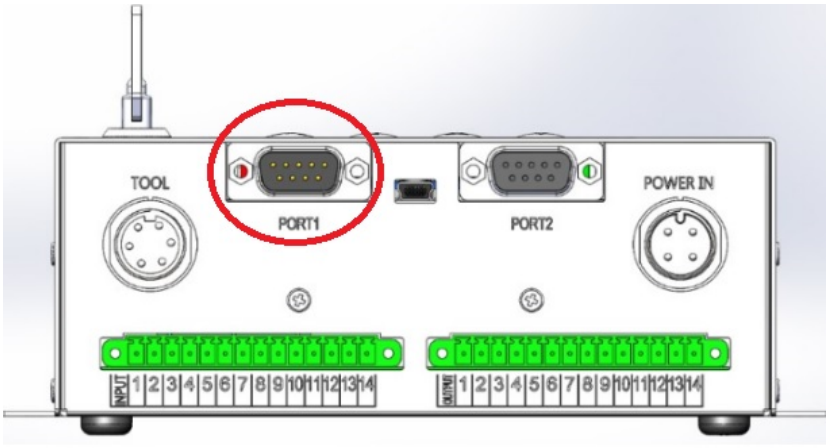
Code	Description
OK	Each time when the fastening is complete, LCD monitor displays OK.
OKALL	Each time when a batch is complete, LCD monitor displays OK ALL.
NS	When there is an error in the operation, LCD monitor displays NS. At this time, it needs to go through the Confirm/Enter key process in order to start next action.
NG	NGT: After the start of the screwdriver, the stop time is earlier than L/later than H. NGQ: After the start of the screwdriver, the stop torque is earlier than L/later than H. NGC: After the start of the screwdriver, the stop number of turns is earlier than L/later than H. NG： When the THREAD FINDING function is off, it will show NG if rotate with no load has been detected.
Dis	The LED screen displays Dis when the External input, Communication protocol, and BCODELEARNING are disabled.

9. BARCODE instructions:

9-1. Hardware description

Connect Bar code Reader to port 1 on CTDS through RS232





9-2. Barcode Reader Set function options

＜Serial interface＞

Record Suffix

===>CR

Baud Rate

===>9600 BPS

＜Data Frame＞

Data Bits

===>8

Parity

===>None

Stop Bits

===>1

3.Operation function description

9-3.1. Set fasten program command on CTDS first

The program that can be used to switch the fasten program through Barcode Reader

Use KILEWS barcode for Program switching, 1-99 groups can be switched (CMD.P01-CMD.P99)







Instructions:

99 sets of programs have been preset on the CTDS. The barcode of the group to be used must be pasted on the workpiece in advance. (eg: CMD.P01~CMD.P99)

When the workpiece comes in for fastening purpose, you need to scan the workpiece or pre-prepared barcode before the tool can be used and switch to the correct group.

9-3.2. Barcode Reader can be used for cancels the AS confirmation command. When the workpiece fasten batch is completed and AS is set, Barcode Reader can be used for cancels AS confirmation.

Use KILEWS bar code format : CMD.C01 release AS (OkAll Stop)



Description:

The AS function has been enabled on the CTDS. When an AS occurs, the screwdriver locks out and cannot be used.

The operator can use Barcode Reader to scan the prepared command bar code to release it for easy operation.

9-3.3. Barcode Reader cancels the NS confirmation command. When the workpiece fastening condition is wrong and NS is set, you can use Barcode Reader to release it.

Use KILEWS bar code format : CMD.C02 release NS (Nok Stop)



Description:
The NS function has been enabled on the CTDS. When an NS occurs, the screwdriver locks out and cannot be used.
The operator can use Barcode Reader to scan the prepared command bar code to release it for easy operation.

Warning

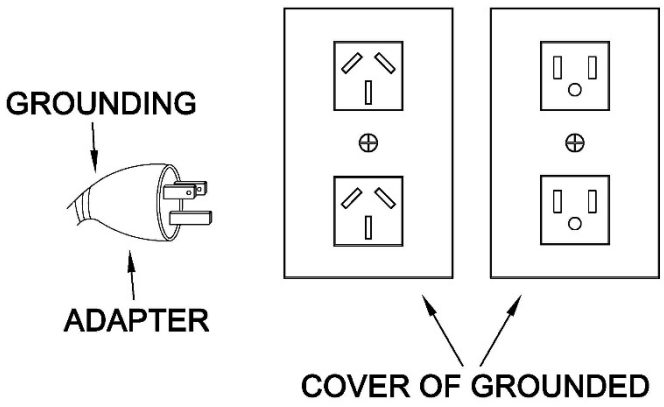
1、Please use entire set of special BNK series electric screwdriver with KL-CTDS
2、The KL-CTDS should be used with KILEWS's power supply, BNK electric screwdriver and accessories. KILEWS would not responsible for if it used with a non-KILEWS screwdriver or spare parts for repair purpose, caused malfunction or poor quality resulting in failure of all guarantees.
3、KILEWS shall not be responsible for if used with non-KILEWS screwdriver or power supply on KL-CTDS and use non-KILEWS original spare parts repair, resulting in KL-CTDS failure or poor quality resulting in all guarantees of failure.
4、Please do not modify the connection ports and contacts to avoid malfunctions or poor quality and confirm with the KILEWS before you try to change or modify any of them. Please be noted that all the guarantees will be invalid if you change the ports and contacts without authorization. KILEWS will not responsible for it.
Electrical specifications of the IO port: INPUT: +48V, OUPUT: +48V/0.2A.

Operation Instruction

1、Please grasp the plug portion of the cable tightly when inserting or unplugging the power code connector of the screwdriver.
2、Do not pull the cable tightly, place it close to oil, chemicals, or hot objects. Also, be careful not to scratch the cable to sharp objects during operation.
3、The KL-CTDS can only be used exclusively for KILEWS power supply, BNK electric screwdriver and accessories. Do not use the electric screwdriver driver for other machines.
4、If the KL-CTDS overheats occurred or the load current exceeds the maximum rated current of the fuse, the quick type fuse will blow automatically cut off the power supply; please immediately stop operation as abnormal condition occurred such as continue fasten shut-off or the switching power, and the KL-CTDS and electric screwdriver is required return for repair service.
5、Do not disassemble the screwdriver of the electric screwdriver to try to fix it.
6、When not in use, please turn the main power switch to “OFF” position and unplug the power plug.

Grounding instructions

The electric screwdriver, KL-CTDS and power supply should be grounded to prevent the operator from getting an electric shock. The controller is equipped with three wires and three-pin grounding plugs for grounding sockets. The grounding wire of the socket itself must be connected to the ground wire of the power supply device. The yellow-green wire of the wire is the ground wire. Do not connect this yellow-green wire to an energized connector. The grounding wire in the controller is not only grounded for safety leakage, but also the ESD static as electricity generated when the driver works can be grounded by grounding.



CTDS V2.0/MCTDS5 Data transmission description and flow control suggestion

VER:2020060201

1. Controller power on and time synchronization
   After controller is power on, it will send data {REQ0...} each second to inform external device such as computer、PLC、AMS. It needs to reply {CMD0,....} that controller function normally and controller time.
   If the controller does not receive {CMD100,....},{REQ100,...}will be sent again after 10 seconds.

2. When controller received barcode information, it will send scanned data and data format as {REQ1....} to external device for control judgement or record saving. External device needs to reply {CMD0....}

3. After controller is power on and screwdriver shut off, brake signal format as {DATA0, ...} will be send. Every shut off will cause column 6 (no. of total tightening on controller) to increase by 1. External device needs to reply {CMD0,....}, if not, CMD0 will keep on sending DATA0(only update date time) and column 6 (no. of total tightening on controller) value will remain unchanged.

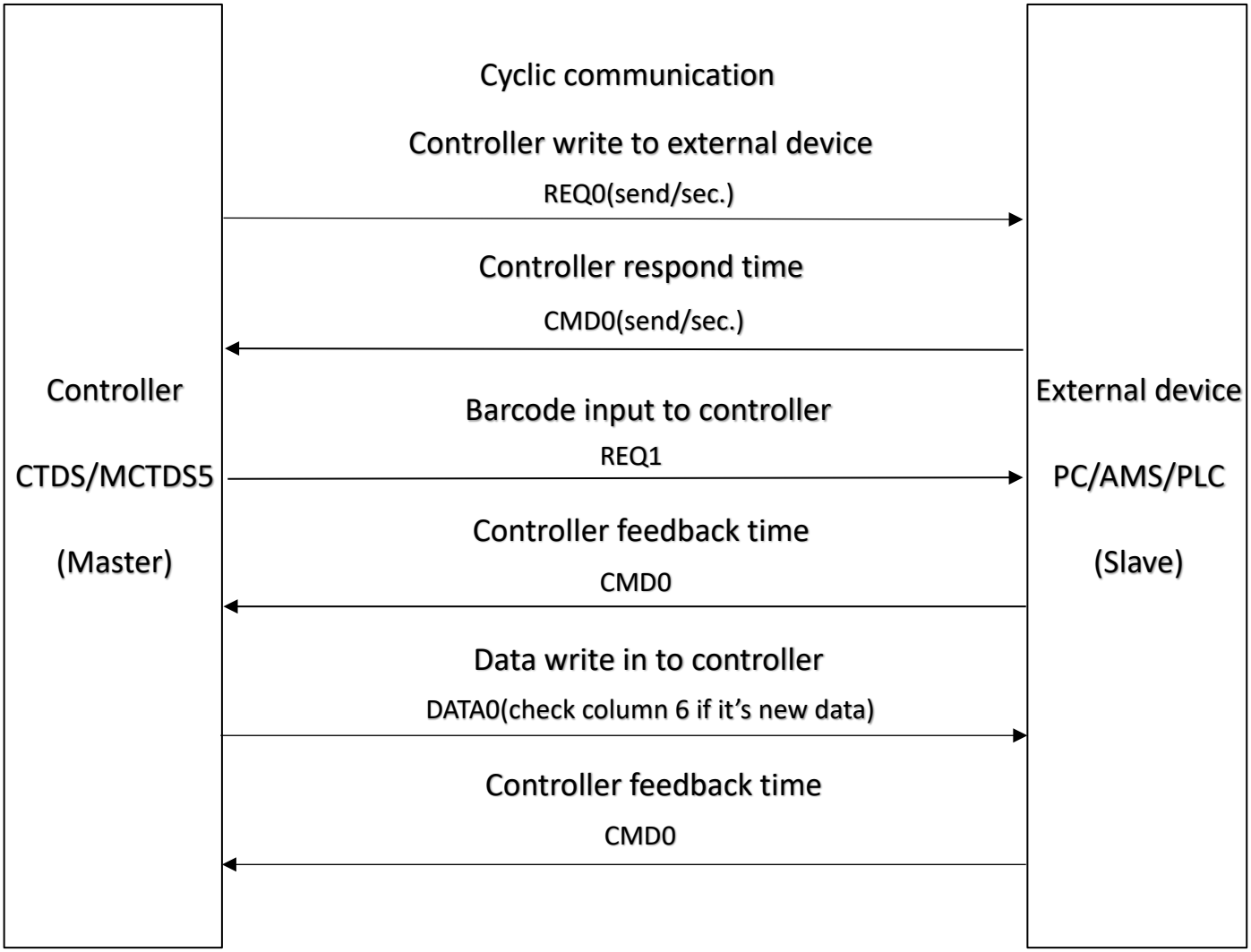
4. Shut off data will be sent after each shut off. Use the column 6 (no. of tightening on controller) to judge if there it is a new shut off data or not.

5.When controller receive feedback and format as {CMD0,....} from external device, controller will resume to automatically send {REQ0,...} and be able to configure controller time.

6. Recommended software control flow as below:
   P.S: The content of [CMD0] in flow as the below:

{CMD0,0,0,0,0,0,0,YEAR,MONTH,DAY,HOUR,MINUTE,SECOND,0000,0000}

str8 0001~9999 YEAR
str9 01~12 MONTH
str10 01~31 DAY
str11 00~23 HOUR
str12 00~59 MINUTE
str13 00~59 SECOND
str14 0000-9999 Check Sum(year, month, day, hour, mimute, and second plus sum)
str15 0000-9999 Key Code(Check Sum + 5438)


Cyclic communication
Controller write to external device
REQ0(send/sec.)
Controller respond time
CMD0(send/sec.)
Controller
CTDS/MCTDS5
(Master)
Barcode input to controller
REQ1
External device
PC/AMS/PLC
(Slave)
Controller feedback time
CMD0
Data write in to controller
DATA0(check column 6 if it's new data)
Controller feedback time
CMD0

Kilews KL-CTDS-2.0&KL-MCTDS5 Basic Data Output Protocol Description

(Ver1.0_20210302_01)

COMPORT Setting:Baud rate : 115200/9600(CTDS 1.7X), Data bit : 8 , Stop bit : 1, Parity bit :NON

Serial communication Mode -ASCII (American Standard Code for Information Interchange)

There are three basic data output formats send from device (CTDS/MCTDS) to external system (DAS/AMS/Other System) via the buildin RS232 port on the device :

1.Command {REQ0} : Send from Device to Host (Send device status to host per second after device startup ready)

2.Command {REQ1} : Send from Device to Host (Send barcode data to host immediately after barcode scaned a data)

3.Command {DATA0} : Send from Device to Host (Send last shutoff data to host immediately and repeat per second after screwdriver shutoff)

4.Command {CMD0} : Send from Host to Device (Host respond system time to device)

ps : 1.Device will change output data from {DATA0} to {REQ0} after read {CMD} from external system

2.The character position in the string does not contain a comma

1. {REQ0} Data format/example {REQ0,01,00,001,5555566666_____,01_____,1,1,1,01,01,1,0000000001,2.123,2.15,1,0,0,001/005,2018,08,02,13,23,02,2066,7504}

Field	Parameter	Value	Data Type	String Length	Position	Description
1	Header+CMD	{REQ0	String	5 Byte	1-5	Header+Command code
2	Sequence ID	01 ~ 20	String	2 Byte	7-8	CTDS = 1 - 8, MCTDS = 1 - 20
3	Job ID	00~ 20	String	2 Byte	10-11	CTDS = 1, MCTDS = 1-20,Default=0
4	Device ID	001 ~ 255	String	3 Byte	13-15	Device index number arranged in the same assembly line (or workstation) (CTDS:1-255 , MCTDS5:1-99)
5	Tool SN	20 Byte	String	20 Byte	17-36	Screwdriver serial no. Less than 20 Bytes ,fill the underline"_".
6	Device SN	20 Byte	String	20 Byte	38-57	Device serial no. Less than 20 Bytes ,fill the underline"_".
7	Device Operation Mode	0~3	String	1 Byte	59	Mode : 0 : ADV (Connection mode), 1 : STD (Standalone Mode), 2 : ALI (Alignment mode) , 3 : SET(Setting mode)
8	Sequence Control Mode	0~1	String	1 Byte	61	0 : Sequence control mode 1 : Skip sequence mode
9	Setting Status	0~1	String	1 Byte	63	Setting status (Received command executed status) 0 : fales, 1 : success
10	Select Tool	01~09	String	2 Byte	65-66	Selected Tool (Current activated screwdriver)
11	Program Unit	01~99	String	2 Byte	68-69	Selected Unit Program
12	Device Type	0~3	String	1 Byte	71	Device type (0: 1.7x CTDS,1: 2.0 CTDS, 2: MCTDS, 3: WSCBSN)
13	Tool Connect & Keylock	0000000000(10 Byte)	String	10 Byte	73-82	Screwdriver connection status and Keylock state (1: Connect, 0: Not connect) (Byte 1-9 indicate screwdriver connected or disconnected to controller from right to left order, byte 10th is keylock state)
14	Device Version	0.000~9.999	String	5 Byte	84-88	Device firmware version
15	Tool Version	0.00~9.99	String	4 Byte	90-93	Screwdriver firmware version
16	Tool Enable/Disable Status	0~1	String	1 Byte	95	Screwdriver status (0: Disable, 1: Enable)
17	Tool Stop Status	0~9,A~J	String	1 Byte	97	Tool Stop Status (0: None , 1:NS, 2:AS, 3:E3, 4:E4, 5:E5, 7:E7, 8:E8, 9:BS, A:EPC, B:ESC, C:ES, D:Er, E:C1, F:C2, G:C4, H:C5 I:ESD J:EA) EA has an abnormal communication in CTDS 1.7X version. The appearance of EA in MCTDS5 means bad RS485 communication. C3 appears for AS so it will send 2. BS only appear on the MCTDS5.
18	Device extend function	0~1	String	1 Byte	99	Device extend function code (0: None, 1:Clear Batch)
19	Screw count	000~250/001~250	String	7 Byte	101-107	Remaining screws/Total screws
20	Year	0001~9999	String	4 Byte	109-112	Year
21	Month	01~12	String	2 Byte	114-115	Month
22	Date	01~31	String	2 Byte	117-118	Date
23	Hour	00~23	String	2 Byte	120-121	Hour(24 hours)
24	Minute	00~59	String	2 Byte	123-124	Minute
25	Second	00~59	String	2 Byte	126-127	Second
26	Check Sum	0000~9999	String	4 Byte	129-132	
27	Key Code	0000~9999}	String	5 Byte	134-138	Key Code+Tail
28						ASCII code LF
29						ASCII code CR
			{REQ0,... }Total:138 Byte,27 Field			
Remark	Item 1 to 27 are separated by "," (ASCII 0x2c)					

2. {REQ1} Barcode format/example {REQ1,6910066016096,2018,08,02,16,33,33,2110,7548}

Field	Parameter	Value	Data Type	String Length	Position	Description
1	Header+CMD	{REQ1	String	5 Byte	1-5	Header+Command code
2	Barcode	1~30 Byte	String	30 Byte	7-36	Barcode data
3	Year	0001~9999	String	4 Byte	38-41	Year
4	Month	01~12	String	2 Byte	43-44	Month
5	Date	01~31	String	2 Byte	46-47	Date
6	Hour	00~23	String	2 Byte	49-50	Hour(24 hours)
7	Minute	00~59	String	2 Byte	52-53	Minute
8	Second	00~59	String	2 Byte	55-56	Second
9	Check Sum	0000-9999	String	4 Byte	58-61	
10	Key Code	0000-9999}	String	5 Byte	63-67	Key Code+Tail
11						ASCII code LF
12						ASCII code CR
			{REQ1, ... }Total: 67Byte,10 Field			
Remark	Item 1 to 10 are separated by "," (ASCII 0x2c)					

3. {DATA0} Data format/example {DATA0,1,001,2344_____,1y_____,0000000002,01,01,0002.4800,kgf.cm,0000.2100,0002.4000,003/005,INC,OK__,1,0,0,0002.4800,00339,2019,02,22,11,51,51,2156,7594}

Field	Parameter	Value	Data Type	String Length	Position	Description
1	Header+CMD	{DATA0	String	6 Byte	1-6	Header+Command code
2	Device Type	0~3	String	1 Byte	8	Devic type (0: 1.7x CTDS 1: 2.0 CTDS 2: MCTDS 3: WSCBSN)
3	Device ID	001~255	String	3 Byte	10-12	Device index(Exclusive in the same AMS system) (CTDS:1-255 , MCTDS5:1-99)
4	Tool SN	20 Byte	String	20 Byte	14-33	Screwdriver serial no. Less than 20 Bytes ,fill the underline"_".
5	Device SN	20 Byte	String	20 Byte	35-54	Devicer serial no. Less than 20 Bytes ,fill the underline"_".
6	Device Count	0000000001~9999999999	String	10 Byte	56-65	Device accumulated shutoff count after poweron
7	Program unit	01~99	String	2 Byte	67-68	Selected Program unit
8	Select Tool	01~09	String	2 Byte	70-71	Selected Tool (Activated screwdriver)
9	Torque	0000.0000~0550.0000	String	9 Byte	73-81	Shutoff troque
10	Torque unit	kgf.cm, N.m, lbf.in, kgf.m	String	6 Byte	83-88	Troque unit Less than 6 Bytes ,fill the bottom line"_".
11	Fastening time	0000.0000~0009.9990	String	9 Byte	90-98	Fastening time(ms)
12	Fastening thread	0000.0000~0999.9000	String	9 Byte	100-108	Fastening thread
13	Screw count	000~250/001~250	String	7 Byte	110-116	Remaining screws/Total screws
14	INC/DEC	INC,DEC	String	3 Byte	118-120	Batch Mode:Increase , Decrease
15	Status	OK,NGT,NGQ,NGC,OKALL,REV	String	5 Byte	122-126	Fastening status OK:Each time when the fastening is complete. NGT: stop time is earlier than L/later than H. NGQ: stop torque is less than L/more than H. NGC: stop number of turns is less than L/more than H. OKALL:Each time when a batch is complete. REV:Reverse Less than 5 Bytes ,fill the underline"_".

16	Device Operation Mode	0~3	String	1 Byte	128	Mode: 0 : ADV (Connection mode), 1 : STD (Standalone Mode), 2 : ALI (Alignment mode) , 3 : SET(Setting mode)
17	Tool Stop Status	0~9,A~J	String	1 Byte	130	Tool Stop Status (0: None , 1:NS, 2:AS, 3:E3, 4:E4, 5:E5, 7:E7, 8:E8, 9:BS, A:EPC, B:ESC, C:ES, D:Er, E:C1, F:C2, G:C4, H:C5 I:ESD J:EA) EA has an abnormal communication in CTDS 1.7X version. The appearance of EA in MCTDS5 means bad RS485 communication. C3 appears for AS so it will send 2. BS only appear on the MCTDS5.
18	Torque Filter	0~250,255	String	3 Byte	132-134	Torque filter (0:No filter,1-250 : Filter count,255:Unlimited Filter) CTDS 2.124 and MCTDS5 2.005 version add infinite filtering and modify 20 times to 250 times
19	Pre-filtering torque	0000.0000~0550.0000	String	9 Byte	136-144	Pre-filtering torque This field is only available for CTDS 2.124 and MCTDS5 2.006.
20	Current value	00000-65535	String	5 Byte	146-150	Current value This field is only available for CTDS 2.124 and MCTDS5 2.006.
21	Year	0001~9999	String	4 Byte	152-155	Year
22	Month	01~12	String	2 Byte	157-158	Month
23	Date	01~31	String	2 Byte	160-161	Date
24	Hour	00~23	String	2 Byte	163-164	Hour(24 hours)
25	Minute	00~59	String	2 Byte	166-167	Minute
26	Second	00~59	String	2 Byte	169-170	Second
27	Check Sum	0000-9999	String	4 Byte	172-175	
28	Key Code	0000-9999}	String	5 Byte	177-181	Key Code+Tail
29						ASCII code LF
30						ASCII code CR
			{DATA0, ... }Total:181 Byte,28 Field			
Remark	Item 1 to 28 are separated by "," (ASCII 0x2c)					

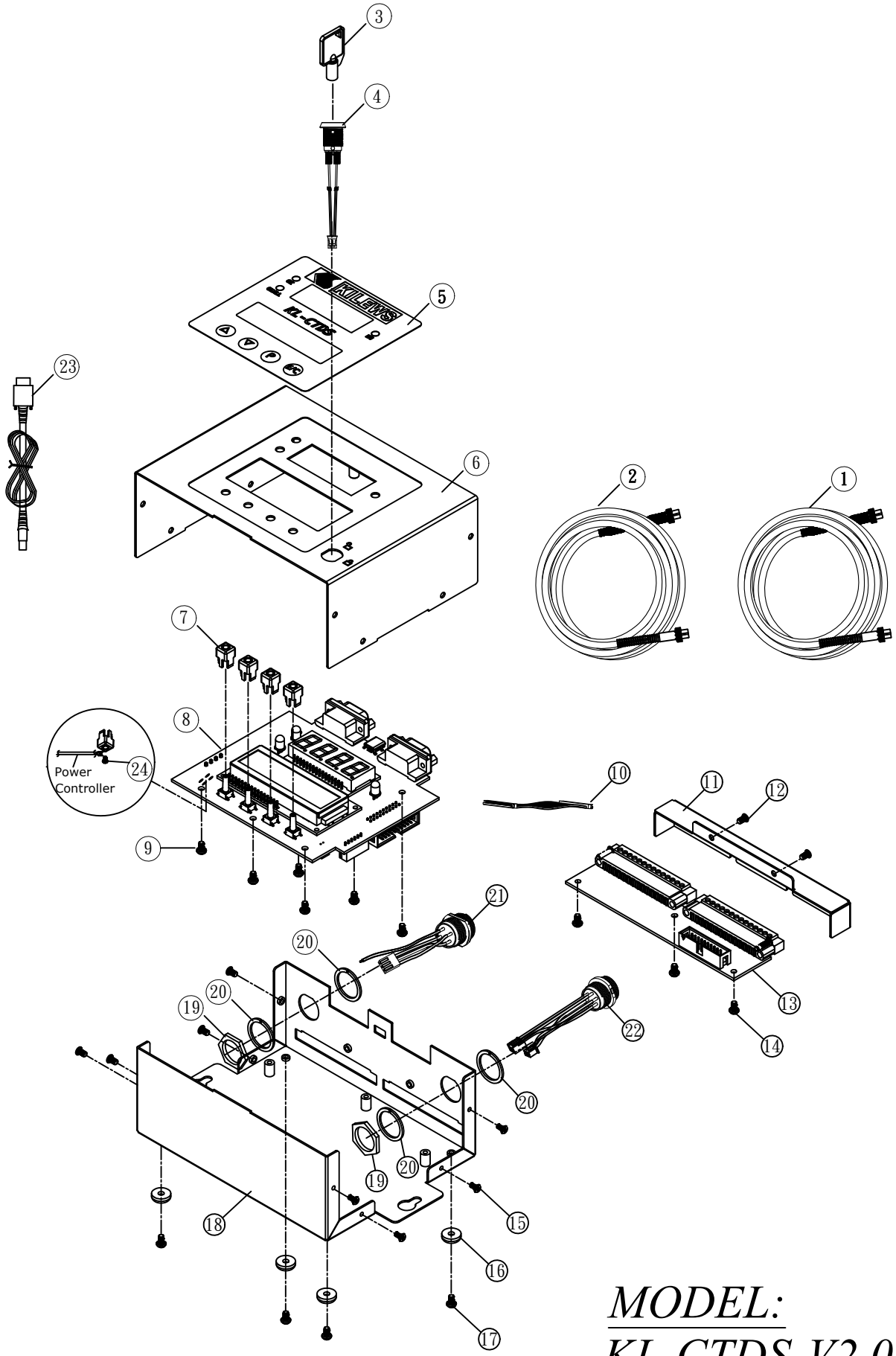
4. {CMD0} Data format/example	{CMD0,0,0,0,0,0,0,2018,09,03,18,45,19,2112,7550}					
Field	Parameter	Value	Data Type	String Length	Position	Description
1	Header+CMD	{CMD0	String	5 Byte	1-5	Header+Command code
2	Device Name	0~1	String	1 Byte	7	Device Name(0: AMS, 1: DAS)
3	unused	0	String	1 Byte	9	unused
4	unused	0	String	1 Byte	11	unused
5	unused	0	String	1 Byte	13	unused
6	unused	0	String	1 Byte	15	unused
7	unused	0	String	1 Byte	17	unused
8	Year	0001~9999	String	4 Byte	19-22	Year
9	Month	01~12	String	2 Byte	24-25	Month
10	Date	01~31	String	2 Byte	27-28	Date
11	Hour	00~23	String	2 Byte	30-31	Hour(24 hours)
12	Minute	00~59	String	2 Byte	33-34	Minute
13	Second	00~59	String	2 Byte	36-37	Second
14	Check Sum	0000-9999	String	4 Byte	39-42	
15	Key Code	0000-9999}	String	5 Byte	44-48	Key Code+Tail
16						ASCII code LF
17						ASCII code CR
			{CMD0, ... }Total: 48Byte,15 Filed			
Remark	1.Item 1 to 15 are separated by "," (ASCII 0x2c) 2.Reply to CMD0 when the time is inconsistent or repeat {DATA0}					

Communication interface : RS-232C 9 Pin Female (DCE) to PC or PLC (DTE)

Connection RS232 :

	1.Barcode scanner	Connection method:KL-CTDS	Connection method:KL-MCTDS5
PORT1			
	2.WIFI module	Connection method:KL-CTDS	Connection method:KL-MCTDS5
PORT2			
Remark	※When the trip information (DATA0) is continuously transmitted, it can be judged by the field six。		

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



MODEL:

KL-CTDS-V2.0

CUSTOMER		DWG NAME			PRODUCTION NO.	
ITEM NO:		DWG NO:				
TITLE:		MATERIAL		SHRINK		
		DES. BY		DATE	THIRD ANGLE PROJECTION.	
		CHKD. BY		DATE	UNIT / SCALE	SHT NO.
		APPD. BY		DATE		OF SHTS.

No.	PARTS NO.	PARTS NAME-E	PARTS NAME-C	Q'ty
1	AA50001-139N	CORD ASSEMBLY (BC6Pin) 3M	連接線 BC6PIN 3M隔離線灰色	1
2	AA50005-B6P-7-2	CORD ASSEMBLY (BC6Pin＆4Pin) 2M	連接線 BC6P轉4P 2M	1
3	P11404-6	Key (1506)	鑰匙 (1506)	1
4	P11404-8	Key Switch ASS'Y	鑰匙開關半成品	1
5	YTM0173	Sticker-Model	面板貼紙	1
6	CAA10003-1	Housung-Upside	外殼上蓋	1
7	C50226-1	Button	按鍵開關蓋	4
8	EG31541-1	PCB	機板成品 電流偵測扭力顯示	1
9	CH20505-6	Srew M3*5mm	螺絲 圓頭 M3*5mm	6
10	E31726-1	20Pin Plug	20P 雙排插頭含線	1
11	C50217-2	Terminal Cover	端子保護蓋	1
12	CH30222-1	Srew M3*0.5P*5L I	螺絲 M3*0.5P*5L I	2
13	EG31538-3	PCB-IO	機板成品-IO	1
14	CH20505-6	Srew M3*5mm	螺絲 圓頭 M3*5mm	3
15	CH30222-1	Srew M3*0.5P*5L I	螺絲 M3*0.5P*5L I	8
16	CH20110	Rubber Shim	腳墊	4
17	CH20504-0	Srew M3*5mm NI	螺絲 傘頭 3*5mm NI	4
18	CBA10003-1	Housing-Underside	外殼下蓋	1
19	X10068	Bolt	螺帽	2
20	X10067	Washer	墊片	4
21	PZ50180-5	Connector (4Pin)	插座半成品-4Pin	1
22	PZ50165-23	Connector (BC6Pin)	插座半成品-BC6Pin	1
23	P11307	USB Converter	USB 轉換器	1
24	CH80506C	Srew-Power Controller Grounding Means	螺絲-電源接地線用	1