EC-SERIES
OPERATING INSTRUCTIONS

Rev 1.2 (9/26/2022)

Heading	Page
Layout Overview	2
Controller System Start-up Process	3
Controller Operation Screen Overview	5
Parameter Menu Overview	7
Fastening Settings	7
Advanced Settings	11
Multi Sequence Settings	16
Model Settings	18
Presets or Model Selection	21
Screw Count Settings	23
Controller Settings	25
I/O settings	31
25P I/O Schematic	37
Network Settings	39
Monitoring Menu	40
Graphing	40
I/O Status Monitoring	41
Network Setting	41
Remote Menu	42
Auto Customizing Parameters	43
Speed Torque	44
Backup / Restore / Power Reset / Factory Reset	45
General Settings Menu	46
Date & Time	46
General Settings: Options	47
Barcode & Barcode Step	48
Storage (SD Card)	50
Firmware Upgrade	52
Maintenance	53
Torque Calibration and Compensation	54
Error Codes	57
Maintenance Intervals	59

ECD Controller

ECD-4000U and ECD-4000E controllers is compatible with EC-Series smart electric screwdrivers (40000 models)

ECD-5000U and ECD-5000E controllers is compatible with EC-Series smart electric screwdrivers (50000 models)

Input (Electric):

Input: AC120VC / AC230V, 50/60Hz 2.5A
Output (Electric): DC38V 3.5A
Fuse: 230V 25A
Operating Environment: 0 ~ 40℃ / 15 ~ 80% RH (without dew)
Front Panel: 4.3” Color LCD with touch screen
Communication: 1 x RS232C, 1 x Ethernet
Protocol: Modbus and Open Protocol
I/O: 8 Input & 8 Output flexible I/O (25P D-Sub)
No of Program Presets: 15
Error Display: Error code display (3 groups)
Dimension (W x L x H): 7 1/2” x 8” x 10 1/4”

Bottom View

EC-Series Smart Electric Screwdrivers

DC38V, 5A max
Swiss DC servo motor
Built-in torque transducer and angle encoder
Built-in angle encoder
Power tool cable

In-Line

Pistol Grip

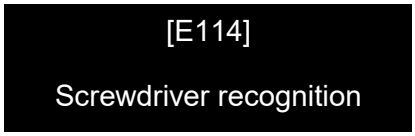
Right Angle

Robotic

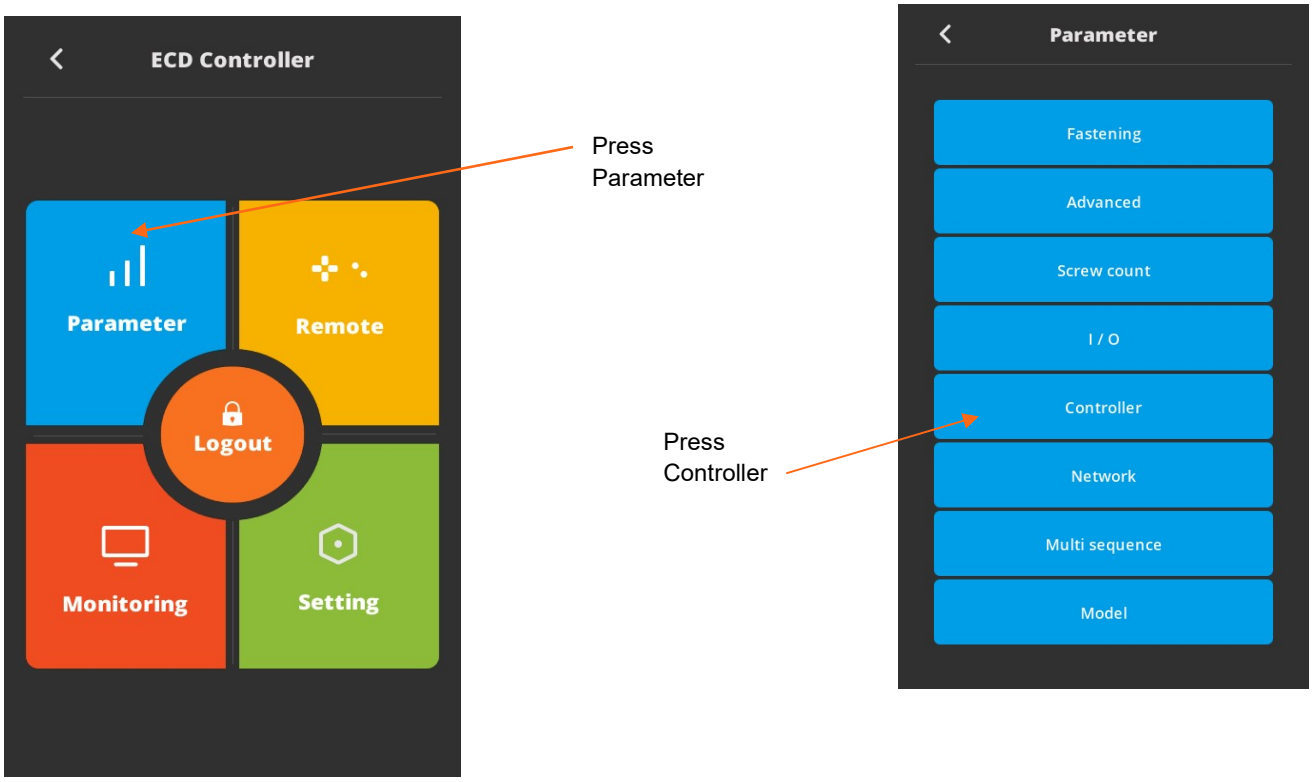
Controller System Start-up Process

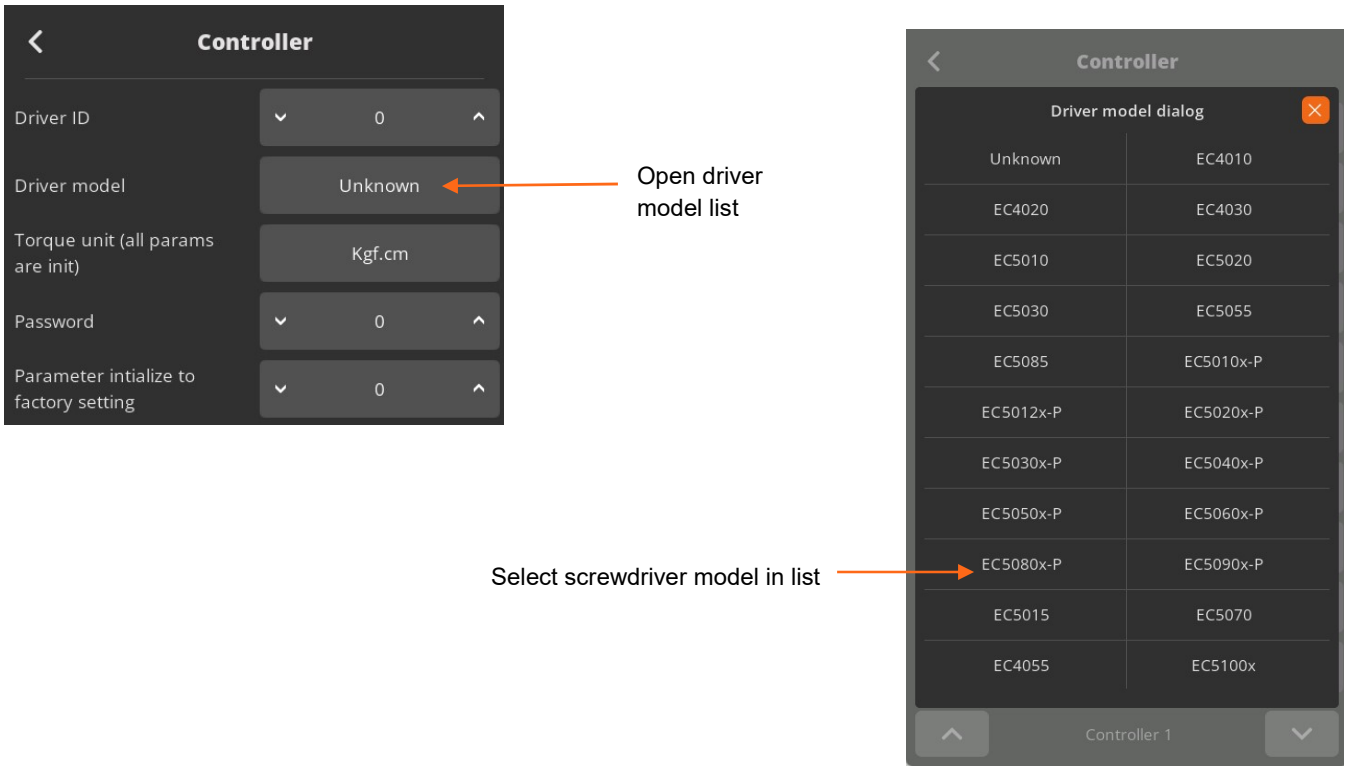
Before attempting to make any settings, it is essential to initialize the controller and electric screwdriver as a set, as the information stored within the controller during testing at the time of manufacture may not correlate with the screwdriver shipped with the system. This process should be used when turning on the unit or changing an electric screwdriver.

- Connect the screwdriver to the controller with the supplied cable
- Connect the controller power cable
- Power on the controller with a power switch
- The controller screen will display an error message as below, and the screwdriver is locked.



Note: Power off controller before disconnecting electric screwdriver

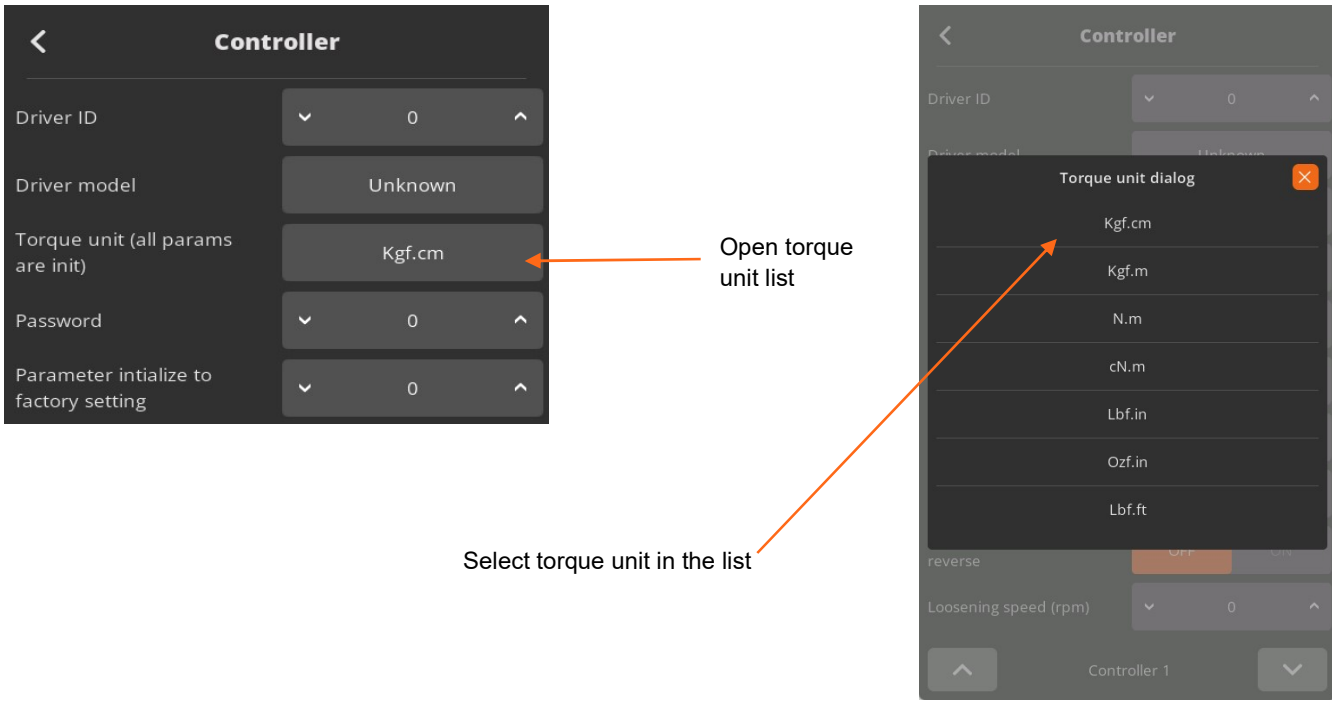




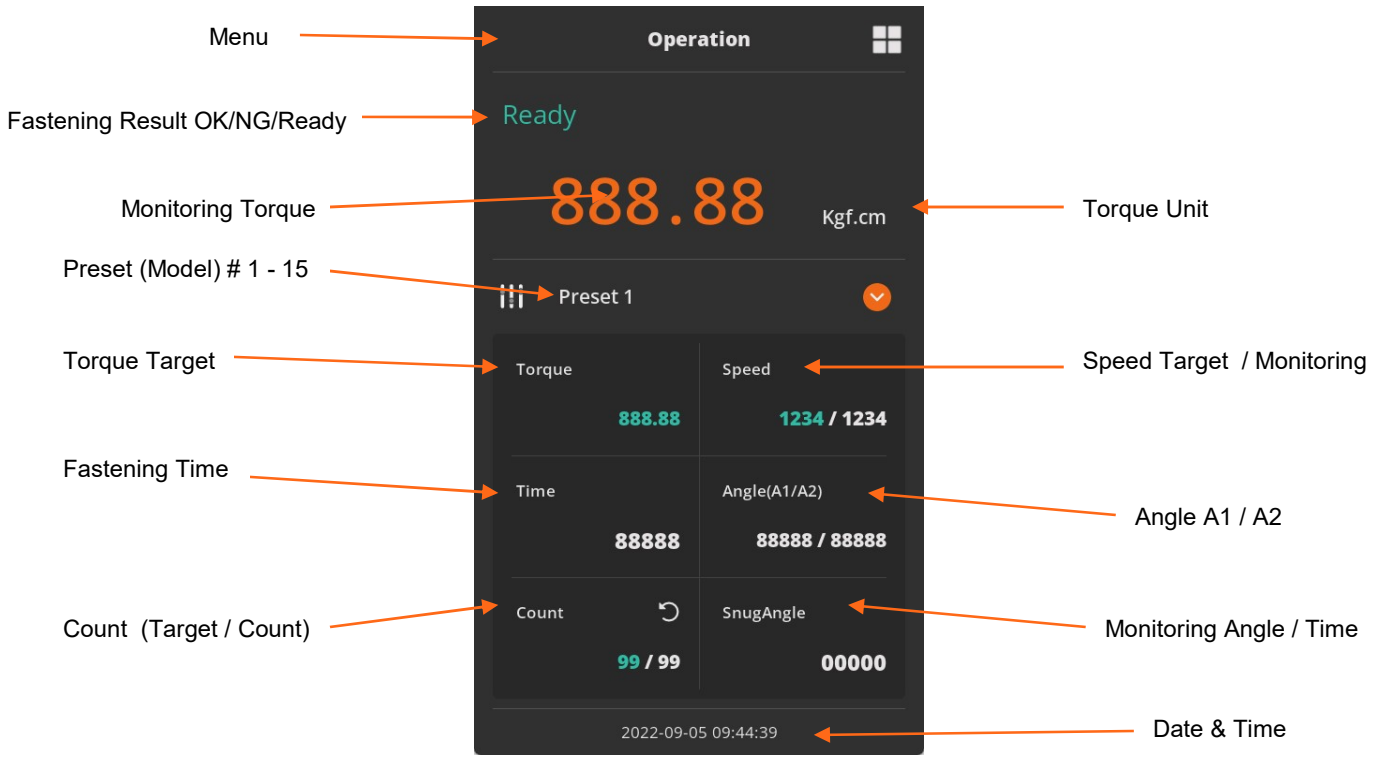
Power reset is done automatically and controller is initialized with selected screwdriver factory parameters.

Torque unit selection:

If necessary change torque unit (changing torque unit will reset all parameters) same procedure as above



Controller Operation Screen Overview

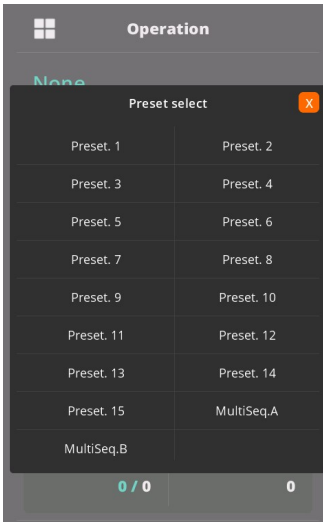


Operation screen is a default window when the controller power ON.

The real time monitoring data and target settings are displayed together.

To go other menu, click the menu icon on the top left side.

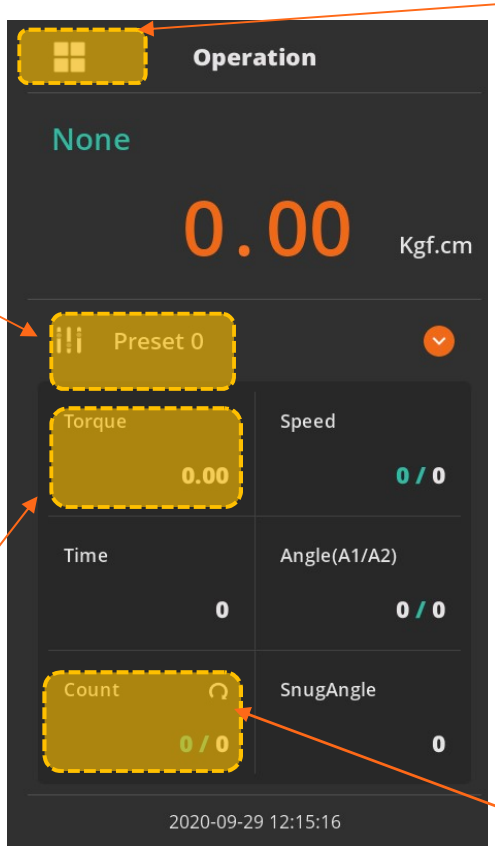
There are 4 menus the main menu and a Logout option



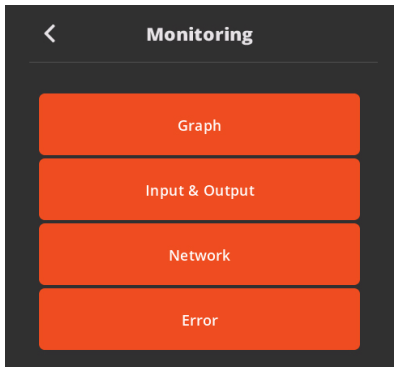
Preset # or Model select

Touch Screen field to move

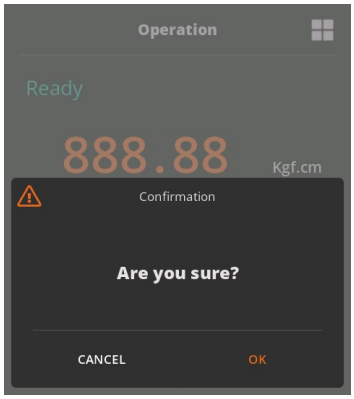
Main Menu



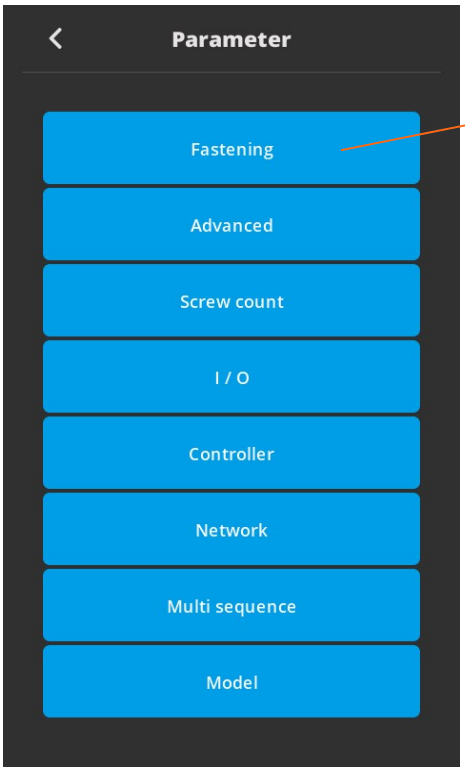
Real time monitoring

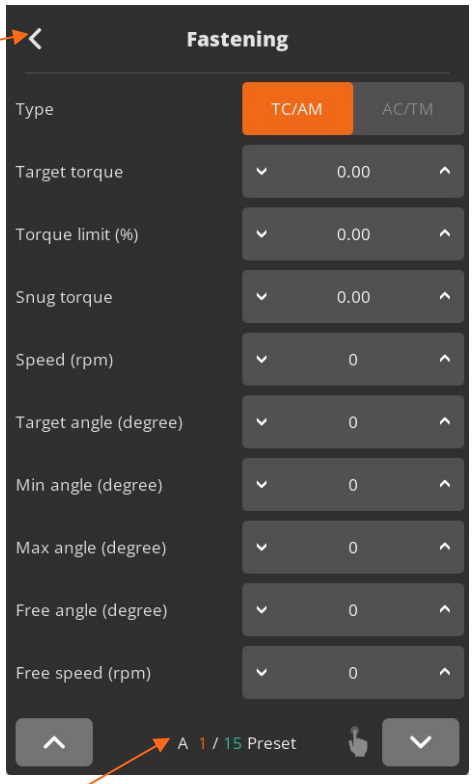


Last count cancel

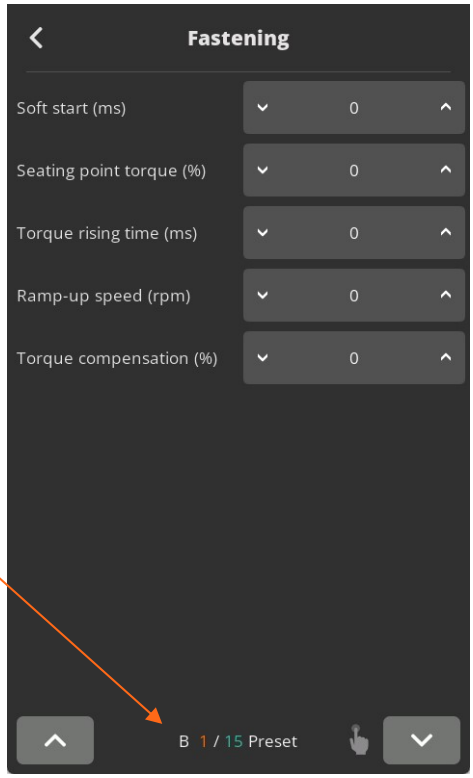


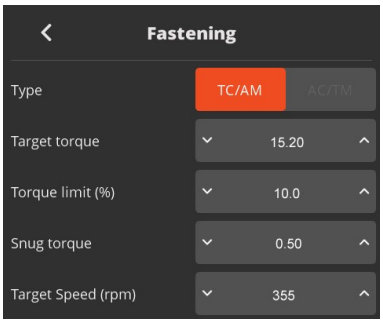
Parameter Menu Overview
Fastening Settings





Parameters listed on A and B pages for each Preset from 1 to 15





Preset Selection

Type

	Unit	Range	Initial
Description	Control type TC/AM: torque control / angle monitoring AC/TM: angle control / torque monitoring		

Target Torque

	Unit	Range	Initial
	set up in controller	Tool range	
Description	TC/AM: Target torque AC/TM: Max torque		

Torque Limit

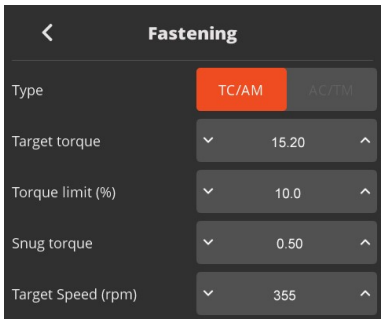
	Unit	Range	Initial
Torque limit (TC) % Min torque (AC)	% Set up in controller	0 ~ 100 Tool range	0
Description	TC/AM: torque monitoring tolerance +/- % of target for fastening Ok AC/TM: Min torque		

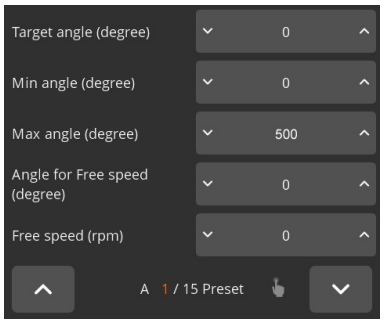
Snug Torque

	Unit	Range	Initial
	Set up in controller	Tool range	0
Description	In TC/AM: Point to start angle monitoring In AC/TM: Point to control angle		

Target Speed

	Unit	Range	Initial
	rpm	Tool range	Auto
Description	Target speed: Speed is changed by torque setting automatically. To change manually, Auto Speed must be Disabled in Controller		





Target Angle

	Unit	Range	Initial
	degree	0 ~ 9999	0
Description	Target angle in AC/TM mode		

Min Angle

	Unit	Range	Initial
	degree	0 ~ 9999	0
Description	Minimum angle to be OK in TC/AM mode		

Max Angle

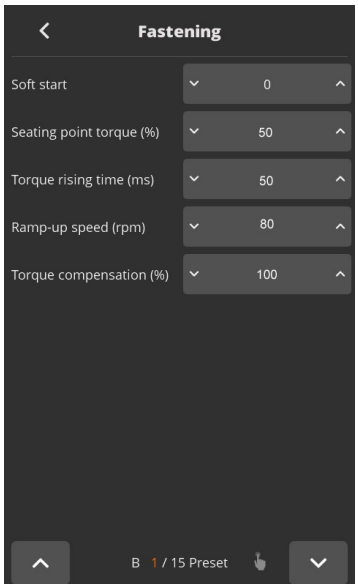
	Unit	Range	Initial
	degree	0 ~ 9999	0
Description	Maximum angle to be OK in TC/AM mode		

Angle for Free Speed

	Unit	Range	Initial
	degree	0 ~ 9999	0
Description	Angle for Free speed		

Free Speed

	Unit	Range	Initial
	rpm	Tool range	0
Description	Manual setting speed. Shift back to the auto speed after the free angle running		



Soft Start

	Unit	Range	Initial
	msec	0 ~ 300	0
Description	Speed reach to the target in the setting time, Preset complement to acceleration controller parameter		

Seating Point Torque %

	Unit	Range	Initial
	%	10 ~ 95	50
Description	In TC/AM: % of Target torque Auto speed slow down to ramp-up speed for torque control In AC/TM: to be set with same torque value as Snug torque, in % of Max torque		

Torque Rising Time

	Unit	Range	Initial
	msec	50 ~ 200	50
Description	Time setting from seating point to the target		

Ramp-up Speed

	Unit	Range	Initial
	rpm	Tool range	Auto
Description	Speed after seating to the end of tightening		

Torque Compensation

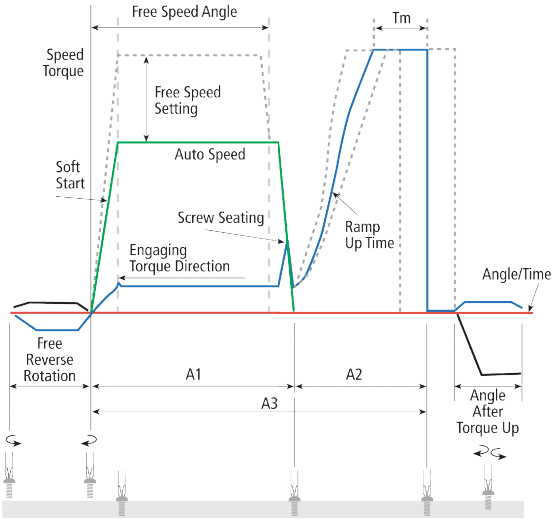
	Unit	Range	Initial
	%	80 ~ 120	100
Description	Individual torque tuning on each preset, saved in the controller The torque output can be adjusted in the selected preset ONLY, it does not influence other presets. For details, please refer to page 55		

Advanced Settings

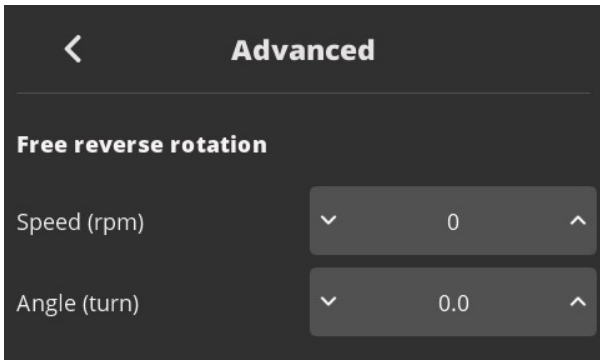
Parameters listed on A and B pages for each Preset from 1 to 15

Advanced Functions:
In this mode there are 4 extra functions can be set independently for each Preset.

1. Free Reverse Rotation
2. Engaging Torque Detection
3. Angle After Torque Up
4. Thread Tapping



Free Reverse Rotation (Before fastening)
The free reverse rotation guides the screw into the screw hole smoothly with low speed.



Speed (rpm)

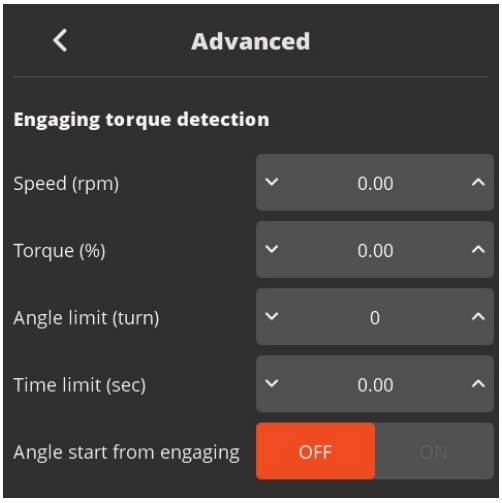
	Unit	Range	Initial
	rpm	Tool range	0
Description	Tool reverse rotation speed		

Angle (turn)

	Unit	Range	Initial
	0.1 turn	0 ~ 20	0
Description	Reverse rotation angle in rev		

Engaging Torque Detection

This setting is only possible when the screw engaging provides significantly higher torque than the previous free run.



Speed

	Unit	Range	Initial
	rpm	Tool range	0
Description	Tool rotation speed		

Torque (%)

	Unit	Range	Initial
	%	0 ~ 50	0
Description	Engaging torque setting by percentage of target torque – detection will be active from this value		

Angle Limit (turn)

	Unit	Range	Initial
	0.1 turn	0 ~ 20	0
Description	Max engaging rotation in rev		

Time Limit (sec)

	Unit	Range	Initial
	sec	0 ~ 10	0
Description	Max engaging time lap		

Angle Start from Engaging

	Unit	Range	Initial
		YES - NO	NO
Description	If select, the monitoring angle count is reset and start again from engaging torque detection point.		

Angle After Torque Up

After tightening by torque control, it manages extra angle control in both forward and reverse directions.

Speed

	Unit	Range	Initial
	rpm	Tool range	0
Description	Driver rotation speed		

Angle

	Unit	Range	Initial
	degree	0 ~ 15000	0
Description	Rotation angle		

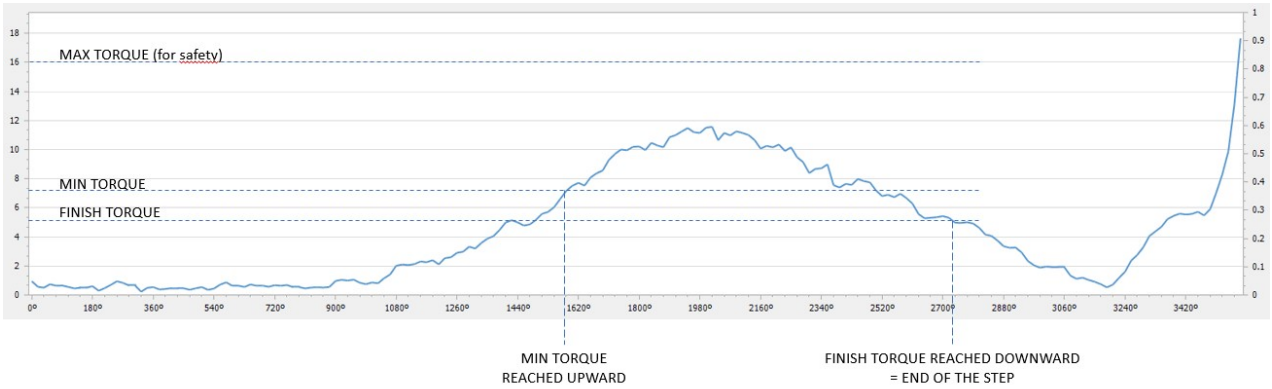
Direction

	Unit	Range	Default
		Forward - Reverse	Forward
Description	Angle rotation direction		

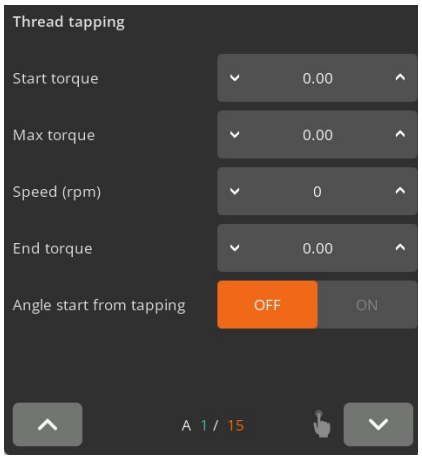
Thread Tapping

This function is dedicated to through hole tapping with a torque pic during thread tapping.
TC/AM program will start once the tapping is done.

Typical thread tapping graph



It is not the case in the chart (on prior page), but the tapping torque can be higher than the target torque (tapping in metal sheets, for example)



Min Thread Torque

	Unit	Range	Initial
	set up in controller	Tool range	0
Description	Torque level to start tapping monitoring Reach upward and higher than end torque parameter		

Max Thread Torque

	Unit	Range	Initial
	set up in controller	Tool range	0
Description	Safety torque level - end preset with a specific alarm		

Speed

	Unit	Range	Initial
	rpm	Tool range	0
Description	Driver rotation speed		

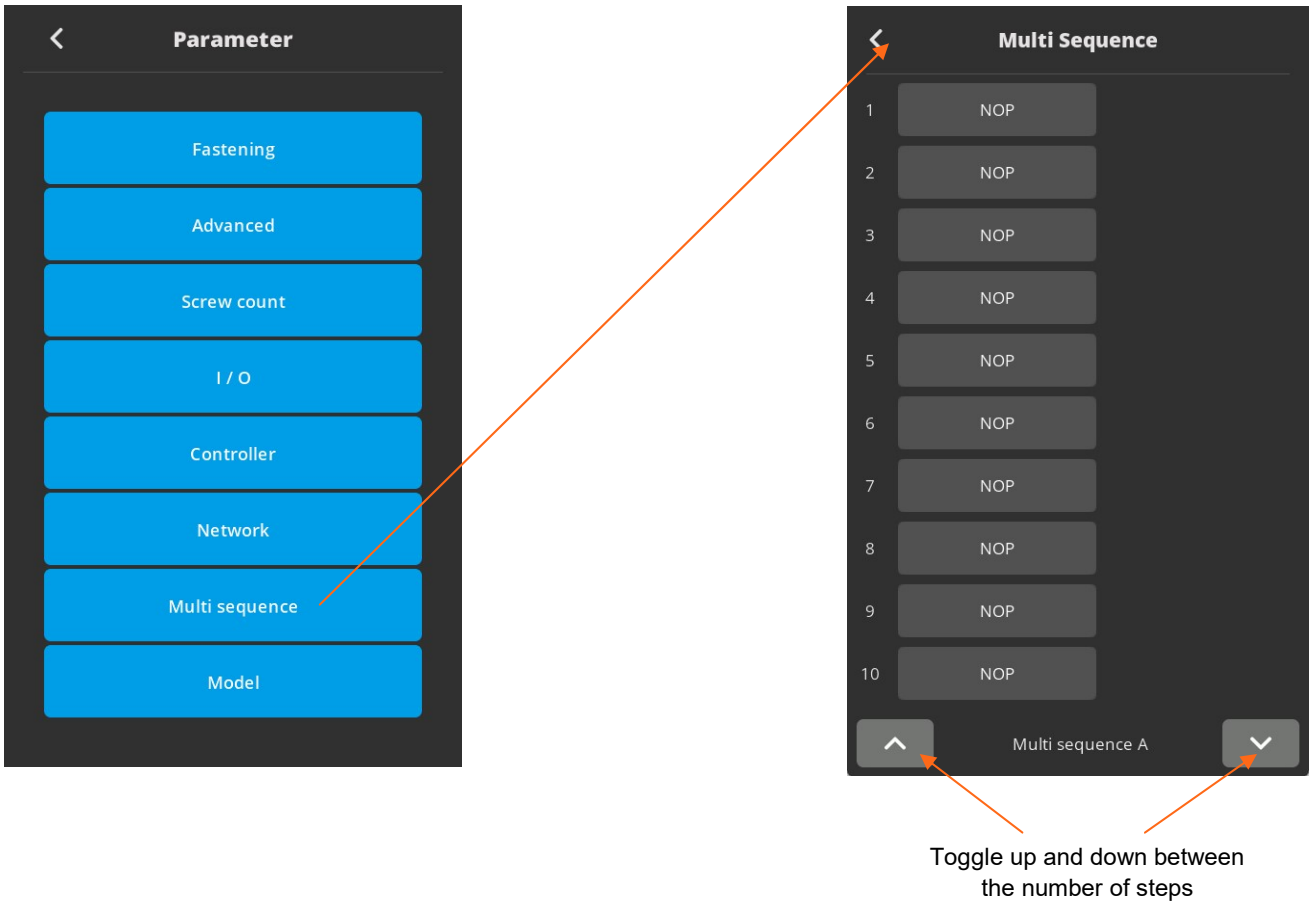
Thread Tapping End Torque

	Unit	Range	Initial
	set up in controller	Tool range	0
Description	Torque level to end the thread tapping advance function Reach downward and lower than min thread torque parameter		

Angle Start from Engaging

	Unit	Range	Initial
		YES - NO	NO
Description	If select, the monitoring angle count is reset and start again from engaging torque detection point.		

Multi Sequence Settings



Fastening Automation Workflows
When there is a repetitive series of tightening tasks, manufacturers should implement a fastening automation workflow process. By creating a fastening automation workflow, the manufacturing process becomes streamlined and reduces human error risk.

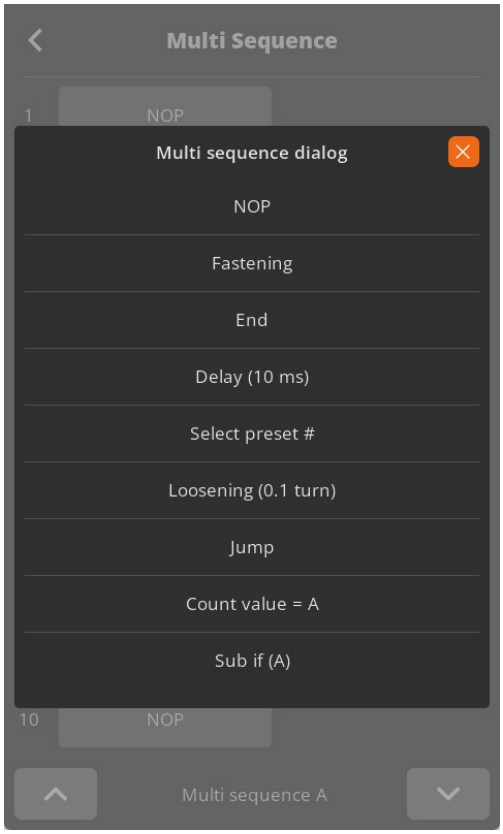
Group similar processes and assign a set of standardized tasks: program fastening sequences and torque tolerances for each fastener in a sequence for sensitive and complex assembly joints. Workflow automation is the best method to achieve tightening tasks efficiently. It produces reliable and accurate torque control results.

Workflow automation provides visibility of the various fastening tasks and improves production efficiency, consistency, and quality.

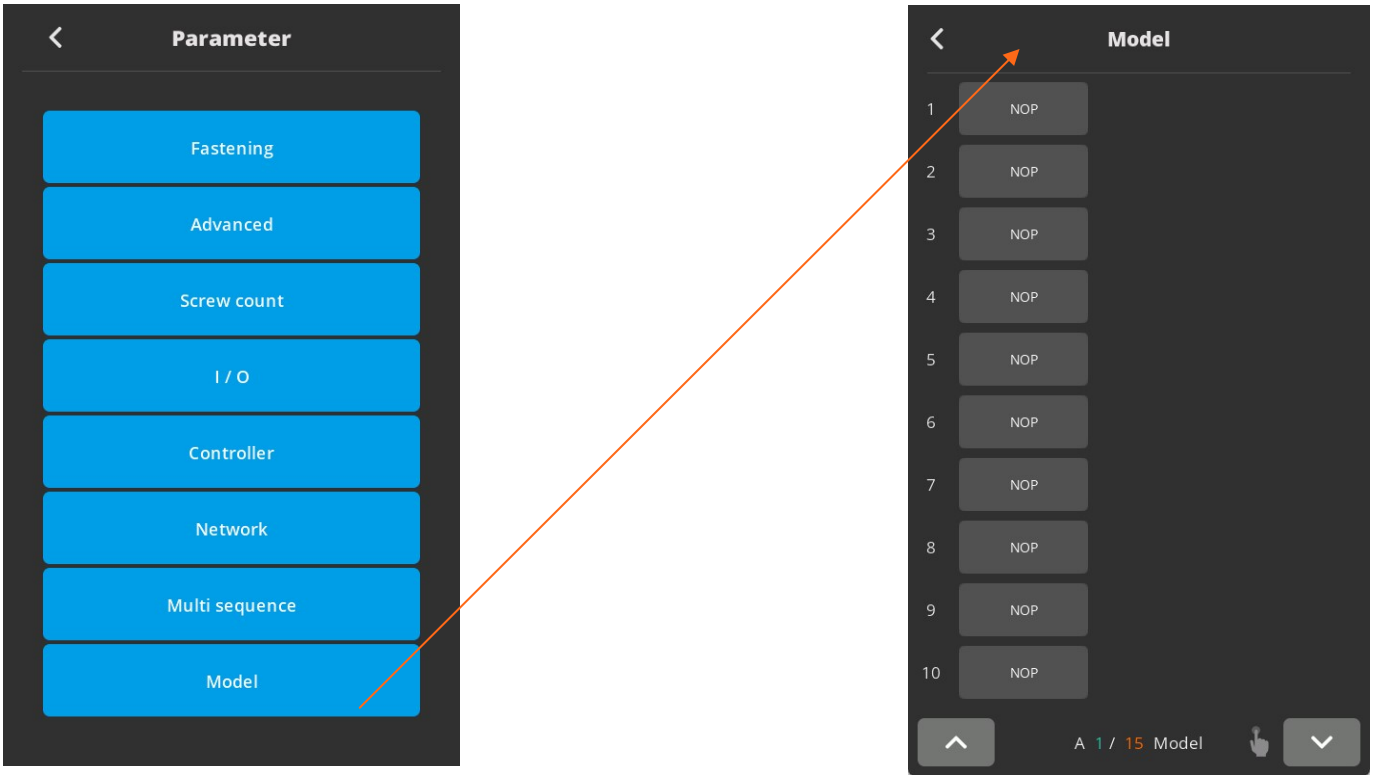
- Multi sequence provides a cycle of fastening by a start signal.
- Program maximum of 2 multi sequences.
- Up to 20 steps per multi sequence program.
- To program, select the command and required parameter on each step.
- To finish the multi-sequence programming, last step command should be “END”.
- For screw counting and I/O’s connections, please use the Models function.

Command	Description	Data (range)
NOP	No operation	No use
Fastening	Tool start fastening process in forward rotation - Selected Preset is fill in Data field	Preset selection 1 to 15
Loosening	Tool start loosening process in reverse rotation	Angle in 0.1 turn up to 999
Select preset#	Select preset # (not mandatory) Preset can be selected in data of Fastening command.	Preset selection 1 to 15
Delay	Time delay for setting time	1 to 999
Jump	Move to the setting step	2 to 9
Count value = A	Total number “A” to count	1 to 999
Sub if (A)	Subtract 1 from “A” and save the value replacing “A” . If the value “ A” is not “0”, then move to the next lower step. If the value “ A” is “0”, then move to 2nd lower step	No use
End	Finish multi-sequence process (mandatory)	No use

Be careful: Data can be set from 0 to 999. Please set correct value in fields.



Model Settings



They are 15 sequencing models of 20 steps with assignable tightening program batch counting and logical IO management.

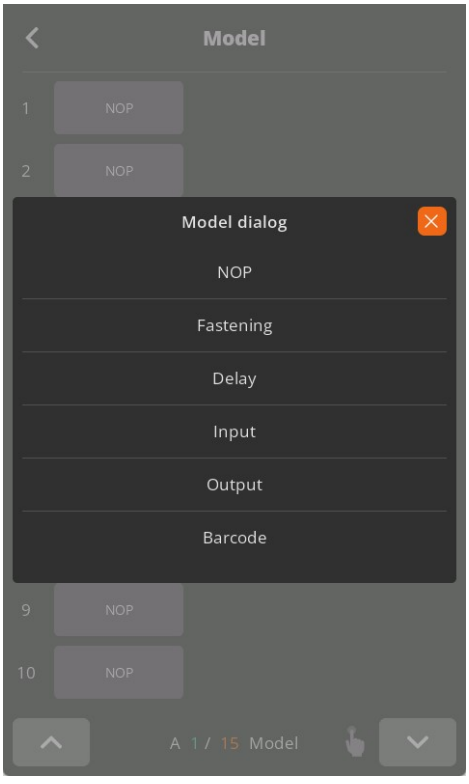
Model should be activated in controller parameters.

The digital inputs for preset # select becomes model # select automatically.

Each step can have one of the above commands with related setting value.

There are 5 different type of command:

1. Input
2. Output
3. Fastening
4. Time Delay
5. Barcode Scan



Fastening setting: The fastening with counting number follows all settings and features in Screw Count menu except the number of screw.

The spindle can be locked automatically in all steps except Fastening step, by selecting Enable on the menu Controller 'Auto lock' (model).

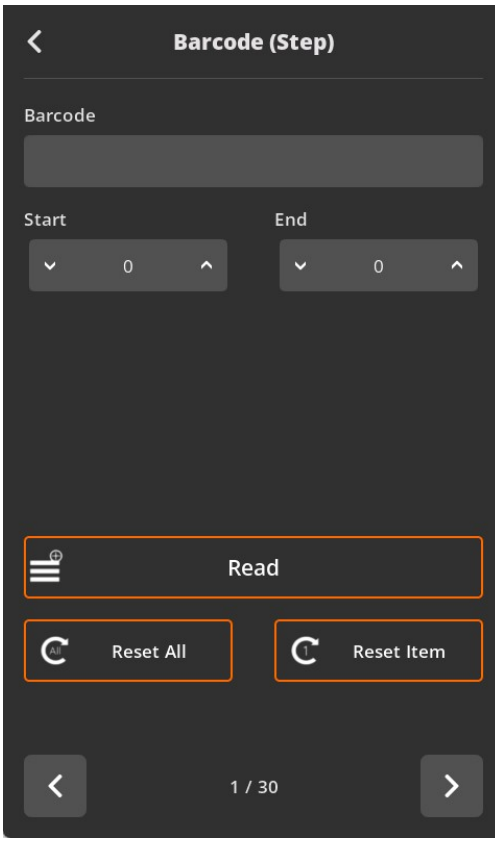
Input/Output setting: IO port used in models should be unassigned (None) in IO settings
Inputs port 9 to 15 are unassigned and dedicated to models

Command details

Command	Description	Data 1	Data 2
Input	Mapping digital Input	Input # select from 1 - 8	0: No output → NG 1: Active High 2: Active Low 3: High status 4: Low status
Output	Mapping digital Output	Output # select from 1 - 8	0: No Output → NG 1: On 2: Off 3: On for 0.5s and Off 4: On for 1.0s and Off
Fastening	Start fastening	**Preset # from 1 – 13** **14 : MA*** **15 : MB***	Count number from 1 - 250
Delay	Delay time	-	1 to 250 (unit: 0.1s) 0.1 - 25 sec.
Bar code	Require bar code scan	None	Barcode step data: '1 to 30' registered barcode(step) '0' any barcode scan

* To select preset 14 and 15, please program preset 14 and 15 in a one step multi-sequence.

Bar code: receiving a barcode to go to next step



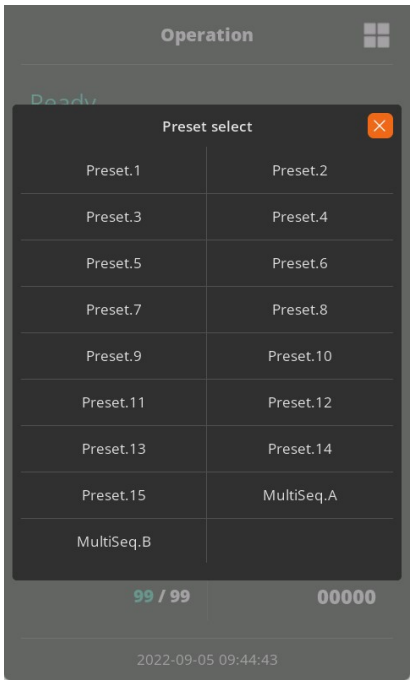
- If model barcode step data is set between 1 to 30:
  It can go next step by receiving only barcode data scanned in setting menu Barcode (step)

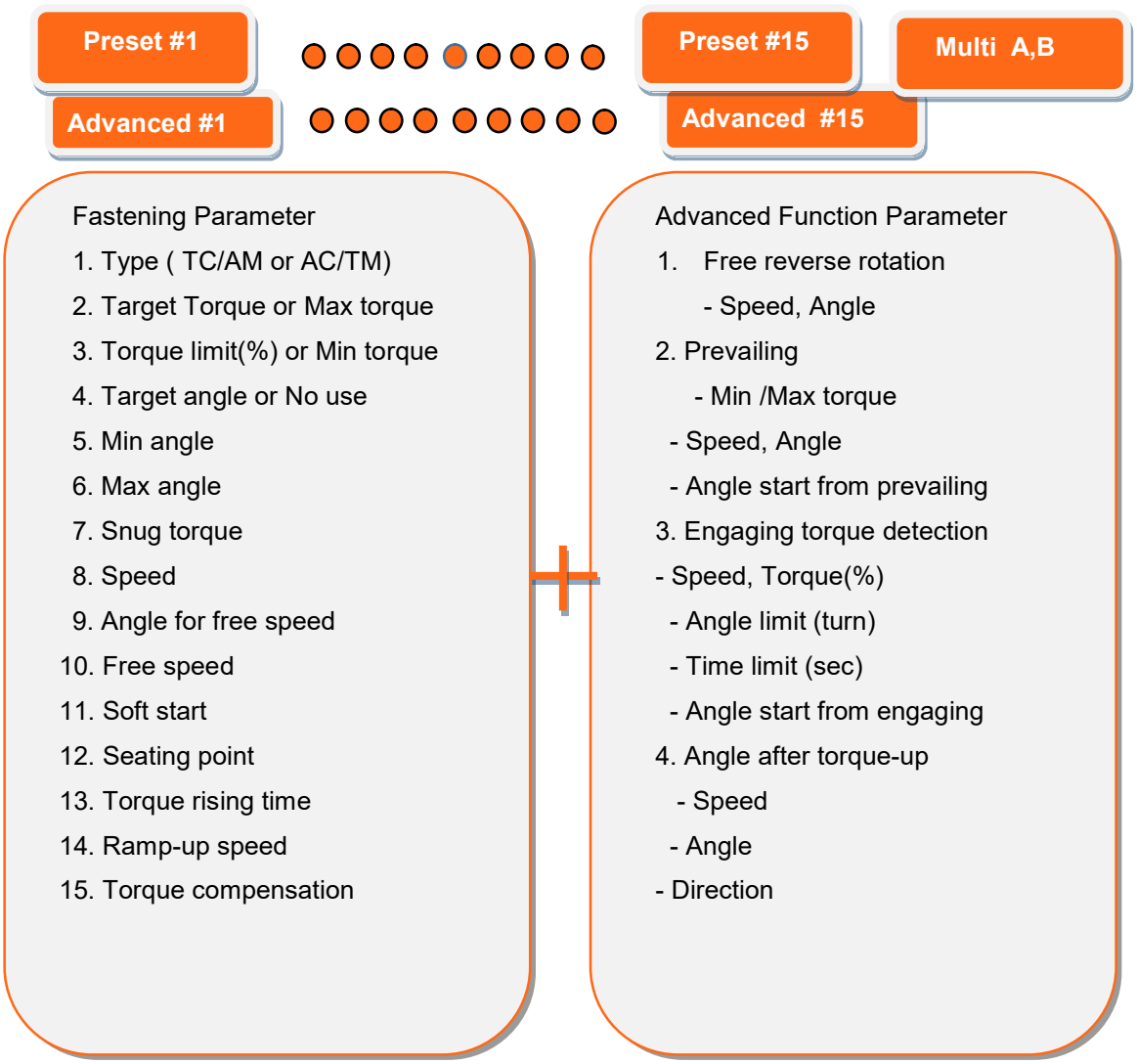
- If model barcode step data is set 0:
  It can go next step by receiving any barcode data
  Can be used to merged a part barcode with tightening results

Presets or Model Selection

To use Model mode must select the ON setting for it. There are 15 presets of program. Each preset contains the following parameters

- Torque
- Speed
- verifying angles
- soft start duration time
- free speed tightening.

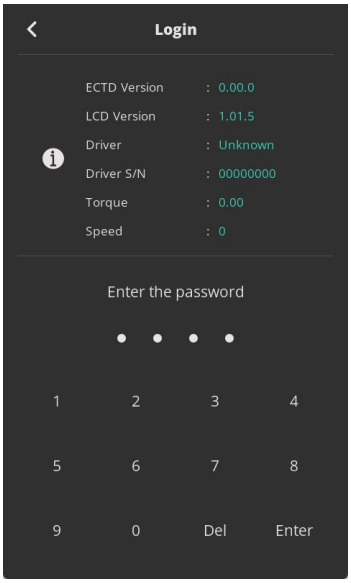




Parameter for Preset

To program each presets, click Menu icon and select Parameter icon.

Parameter menu require password to log in.
The initial factory setting is " 0 " for password
The password can be changed once log in.
There are .875 address for each parameters. Parameters are grouped for each settings as below



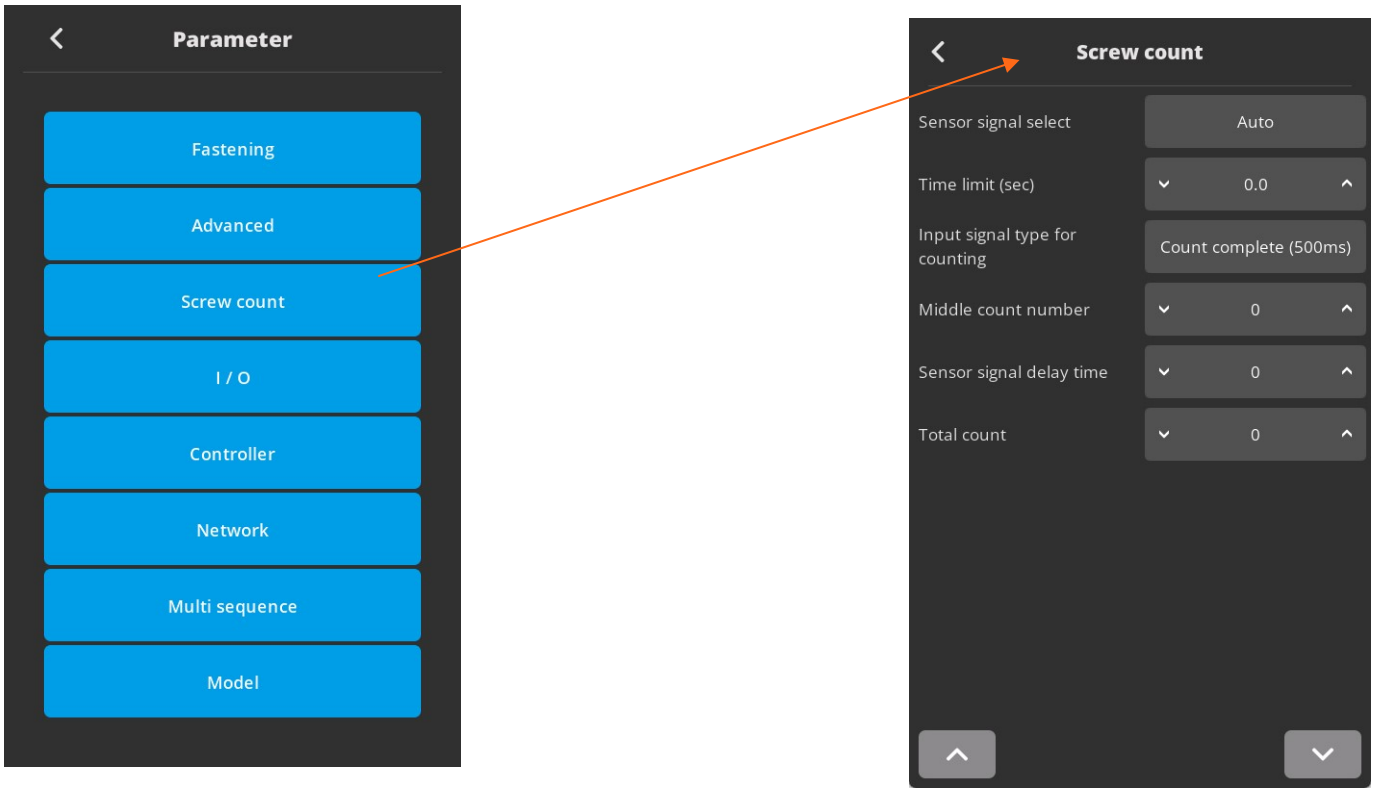
On the log in window, there are tool information about controller firmware version, LCD firmware version and, screwdriver model, serial no., torque & speed ranges of the electric screwdriver

Parameter group:

Please refer to the operation manual of MountzCom PC software for details of parameter settings.

Group	Parameter	Address
1. Fastening	Preset #1 to #15	A001 – A225
2. I/O	Input	A226 – A233
	Output	A234 – A241
3. Screw count	Number & cycle start	A242 – A247
4. Crow foot option		A265 – A269
5. Controller		A270 – A306
6. Network	IP address	A307– 320
7. Multi sequence	Multi-A, Multi-B	A321 – 340
8. Error	8 error history	A341 – 348
	Controller model	A349
9. Model	Model #1 to 15	A350 – 649
10. Advanced Function	Advanced #1 to #15	A650 – 874
11. Firmware version		A875

Screw Count Settings



Screw count parameters are set for presets and models.

Cycle Starts Signal select : Count start (IN) / end (OUT)

1. No signal, auto start (Auto) - auto reset to total number after “0”
2. Sensor or switch with one trigger pulse - Count starts with only trigger pulse. Counting is valid until complete or reset. Reset calls count NG
3. One trigger pulse with timer for counting - Counting should be completed within the time of timer from the trigger pulse, otherwise count NG
4. One trigger pulse to start counting, another trigger pulse to stop counting and evaluate OK or NG. Any remaining number calls count NG

Time Limit: Only set if sensor signal is ‘start pulse+ time limit’
The fastening time limit from Count START for NG judgment.
The fastening work should be finished within the set time.
Otherwise, the work piece leave the working area

Total Count: This parameter is only used with Presets (not used for Model) – set value 0 to 99.

Counting is set in Model with different values for each fastening step.

Middle Count number: When the count number is reaches to the middle count number, count complete signal out become ON till the total count is completed.

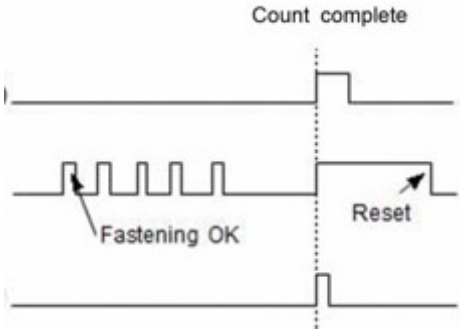
'Port count signal type' setting is ignored on this features.
'0' : no use.

Count Port Signal Type (OUT): Count complete signal can be set with 4 different type of signals.

Count complete (500ms)

Torque up + Count complete

Count complete (100ms)
Screw missing alarm



Count Complete (500ms): It provides 500ms of pulse type count complete signal after fasten all set numbers.

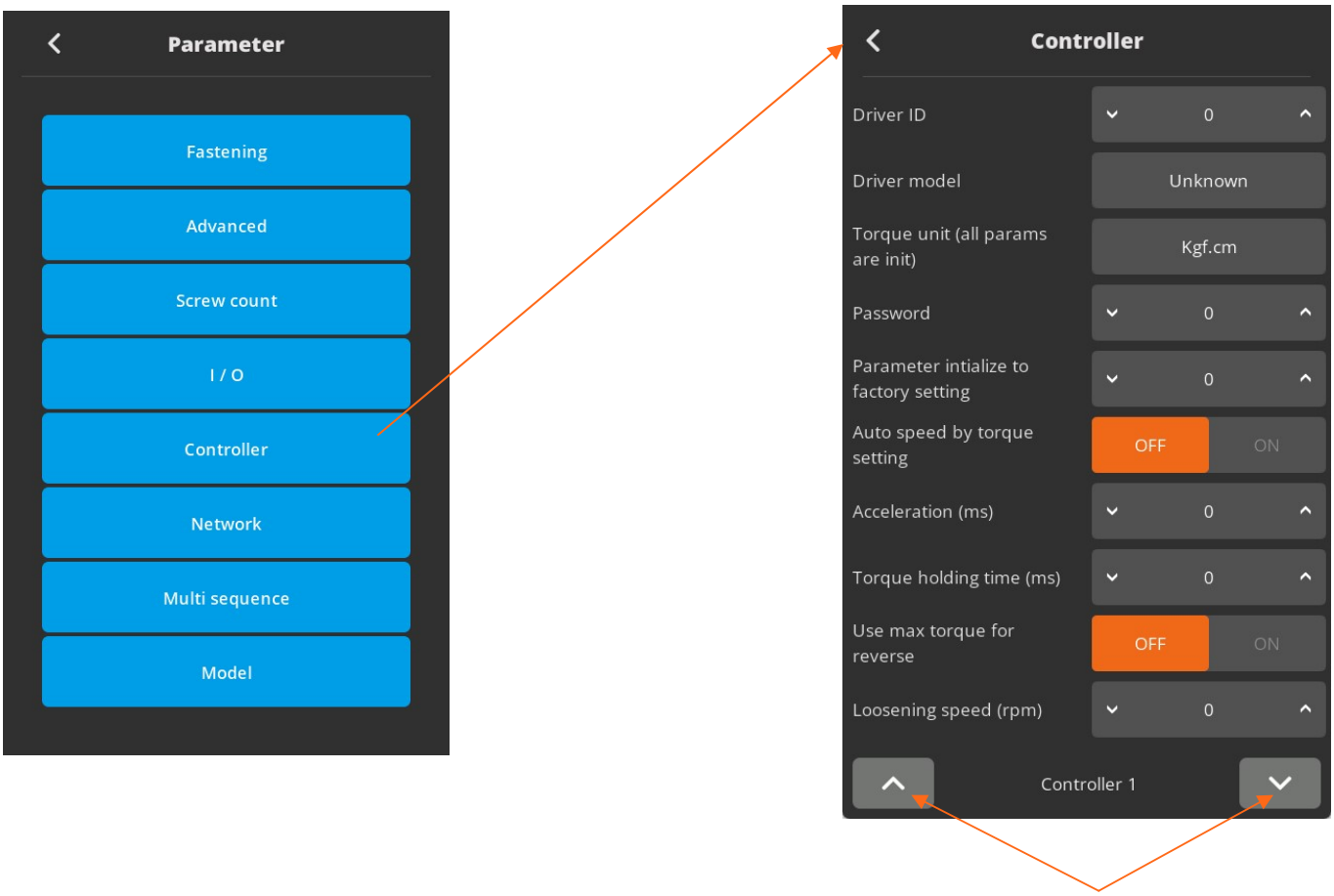
Torque up + Count Complete: It provides every pulse (0.5sec) signal of torque OK and count complete signal after fasten all set numbers.

The count complete signal will be off after reset of count number when first screw of the new work piece is tightened.

Count complete (100ms): It provide a 100ms of pulse type count complete signal after fasten all set numbers.

Screw missing alarm: It provide a 100ms of pulse type alarm signal when screw missed in a cycle.

Controller Settings



Driver ID

	Unit	Range	Initial
		1 ~ 99	1
Description	EC ID used to identify Ethernet data communication.		

Driver model

	Unit	Range	Initial
		Screwdriver list	Unknown
Description	Screwdriver model selection: controller will auto soft boot itself when driver model is changed		

Torque unit

	Unit	Range	Initial
		Kgf.cm ~ Lbf.ft	N.m
Description	Kgf.cm / Kgf.m / cNm / Nm / ozf.in / lbf.in / lbf.ft Whenever the unit is changed, all parameters are initialized and controller will auto soft boot itself.		

Password

	Unit	Range	Initial
		0 ~ 9999	0
Description	Password to access controller menu Factory setting password is ‘0’ at the initial.		

Controller parameter initialize

	Unit	Range	Initial
		0 to 9999	0
Description	Key in ‘77’ and press enter button. Resets the parameters back to factory settings - screwdriver is paired to controller.		

Auto speed

	Unit	Range	Initial
		OFF- ON	YES
Description	Provide the safe speed on the torque setting (P1 ~ P15). The speed is automatically calculated		

Acceleration

	Unit	Range	Initial
	ms	10 ~ 1000	150
Description	Slow start of motor to the target speed		

Torque holding time

	Unit	Range	Initial
	ms	1 ~ 20	2
Description	Time lap torque is maintained after torque		

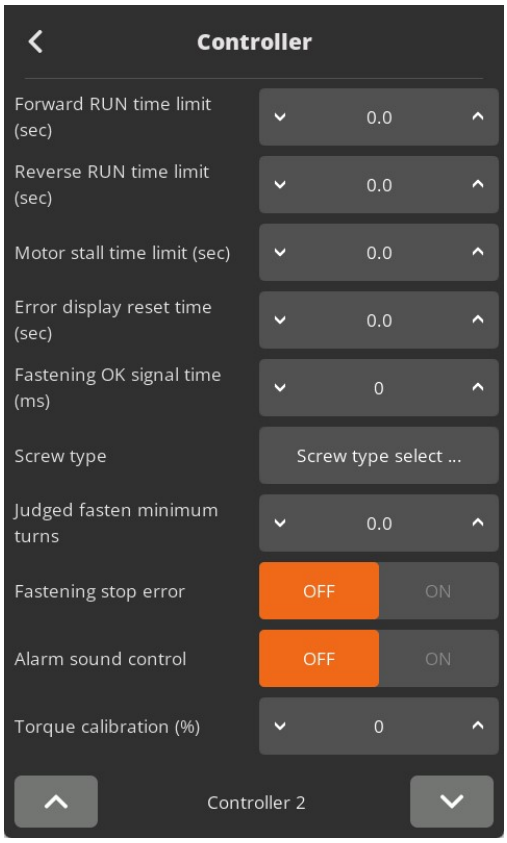
Use max torque for reverse

	Unit	Range	Initial
		OFF- ON	OFF
Description	OFF: max loosening torque +20% selected preset torque target ON: full power loosening.		

Loosening speed

	Unit	Range	Initial
	rpm	Tool range	Max tool speed
Description	Tool reverse rotation speed		

Controller Settings (continued)



Forward run time

	Unit	Range	Initial
	Sec	0 - 60	10
Description	Run limit to forward rotation – It prevents the continuous running over the preset time. The driver stops automatically at the preset time and provides the pattern NG with error code		

Reverse run time limit

	Unit	Range	Initial
	Sec	0 - 60	10
Description	Run limit to reverse rotation – It prevents the continuous running over the preset time. The driver stops automatically at the preset time and provides the pattern NG with error code		

Motor stall limit

	Unit	Range	Initial
	Sec	0.1 – 0.5	0.2
Description	Immediate stop when motor is stalled. It prevents the continuous time going against the motor stall for over heat protection		

Error display reset time

	Unit	Range	Initial
	sec	0 ~ 10	1,0
Description	Error display and reset after the below set time Value 0: manual reset with RESET button		

Fastening OK signal time

	Unit	Range	Initial
	ms	0 ~ 500	200
Description	Signal output time setting longer than 150ms which is factory setting. Shorter time than factory setting doesn't work.		

Screw type

	Unit	Range	Initial
		CW - CCW	CW
Description	Set tightening rotation direction for each preset		

Judged fasten minimum turn

	Unit	Range	Initial
	turn	0 ~ 5	0
Description	Turns out of judgement		

Fastening stop error

	Unit	Range	Initial
		OFF- ON	OFF
Description	NO: does not create any NG when the tool stops without fully tightening by torque up.		

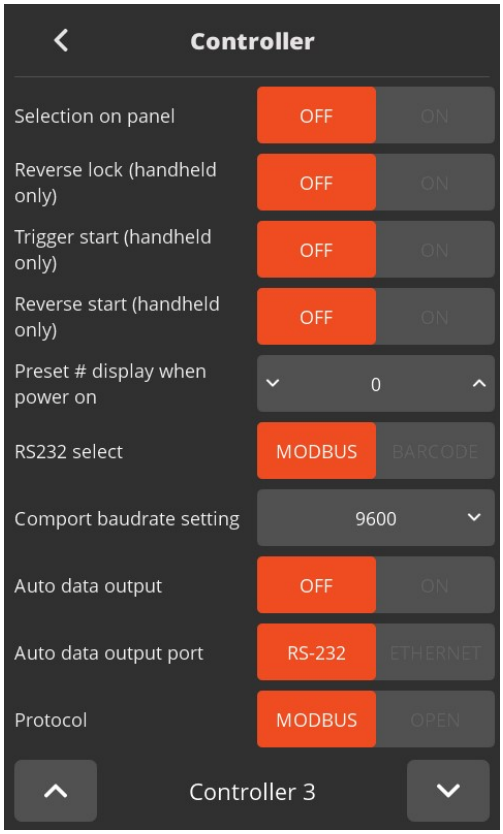
Alarm sound control

	Unit	Range	Initial
		OFF- ON	ON
Description	Activation of noise alarm – stops when reset (timer or manual)		

Torque calibration

	Unit	Range	Initial
	%	90 ~ 110	100
Description	It is the master calibration for whole range of tool. Saved in the tool memory and effective on another controller. The F/R switch should be at Reverse position before writing the new value. For details, please refer to page 55.		

Controller Settings (continued)



Selection on panel

	Unit	Range	Initial
		OFF - ON	ON
Description	OFF: disable touch screen ON : allow touch screen use		

Reverse lock (hand held only)

	Unit	Range	Initial
		OFF- ON	OFF
Description	YES will disable the reverse rotation switch on screwdriver.		

Trigger start (hand held only)

	Unit	Range	Initial
		OFF- ON	OFF
Description	Trigger (⎍) start Enable/Disable with start lever		

Reverse start (hand held only)

	Unit	Range	Initial
		OFF- ON	OFF
Description	Reverse rotation switch can start the screwdriver in reverse by pushing it and stops by moving it back		

Preset # display when power on

	Unit	Range	Initial
		1 ~ 15	1
Description	Choice of initial preset selection on display when power on.		

RS232 select

	Unit	Range	Initial
		MODBUS - Barcode	MODBUS
Description	RS232 Port use: for data report or barcode reader Please ensure that baud rate is set to correct value		

Comport baud rate setting

	Unit	Range	Initial
	bauds	9600 ~ 230400	115200
Description	RS232 communication speed To be set as computer com port:115200 bauds for MountzCom PC or barcode reader setting : 9600 bauds		

Auto data output

	Unit	Range	Initial
		OFF - ON	OFF
Description	Fastening data output automatically on every events as like run, For/Rev change, torque up, preset change, etc. Monitoring data come out through RS232 or Ethernet without data request command		

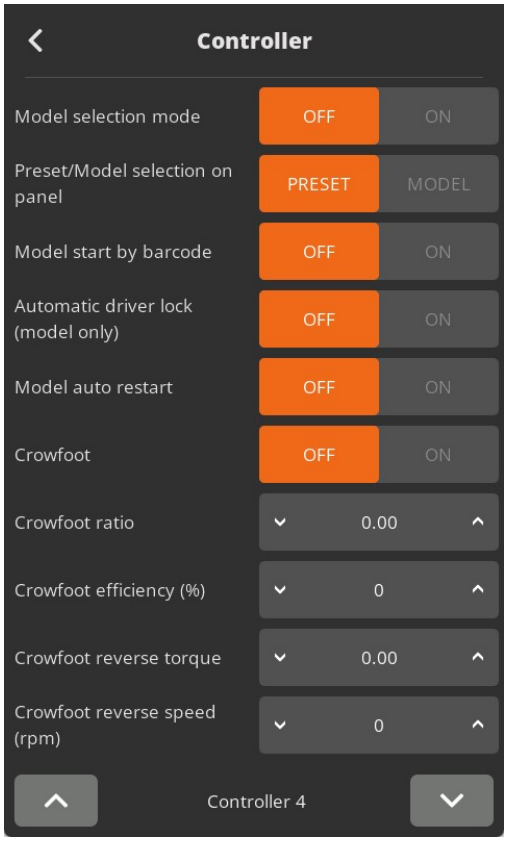
Auto data output port

	Unit	Range	Initial
		RS232 - Ethernet	RS232
Description	Data output port selection for automatic report Auto data should be also set on		

Protocol

	Unit	Range	Initial
		MODBUS - OPEN	MODBUS
Description	MODBUS OPENL Refer to Protocol manual		

Controller Settings (continued)



Model selection mode

	Unit	Range	Initial
		OFF - ON	OFF
Description	ON: model selection on operation screen OFF: Preset and MA/MB selection on operation screen		

Preset/Model selection on panel

	Unit	Range	Initial
		Preset - Model	Preset
Description	Allow Model or Preset selection on operation screen		

Model start by bar code (model)

	Unit	Range	Initial
		OFF- ON	OFF
Description	ON: model start only after barcode scan OFF :model can start without bar code scan		

Automatic driver lock (model)

	Unit	Range	Initial
		OFF- ON	OFF
Description	Driver can be locked in out of the process when the model mode is selected		

Model auto restart

	Unit	Range	Initial
		OFF - ON	ON
Description	ON: model restart automatically after previous one is completed OFF: model must be manually restarted when a model is completed		

Crowfoot

	Unit	Range	Initial
		OFF - ON	OFF
Description	ON: activate crowfoot setting		

Crowfoot ratio

	Unit	Range	Initial
		0 to 10	1
Description	Crowfoot gear ratio including angle head		

Crowfoot efficency (%)

	Unit	Range	Initial
	%	0 to 150	100
Description	Crowfoot gear ratio including angle head		

Crowfoot reverse torque

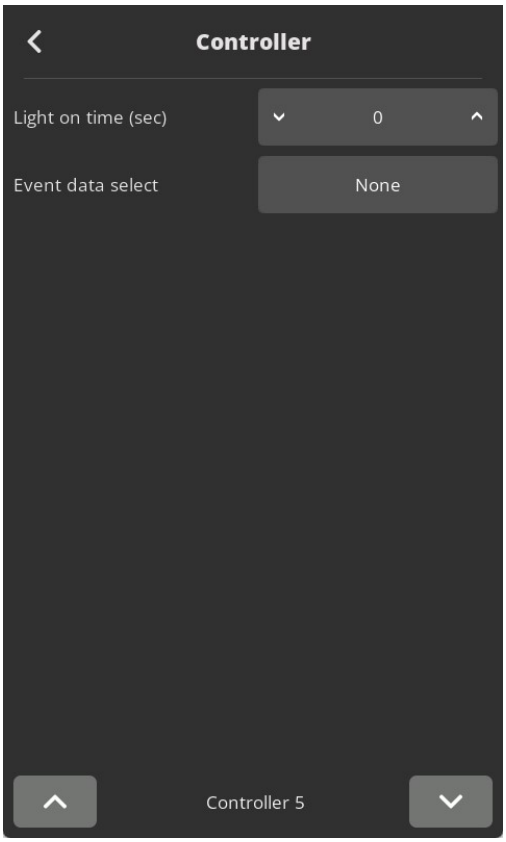
	Unit	Range	Initial
	Set up in controller	Tool range	0
Description	For open crowfoot: max torque for return to open position detection		

Crowfoot reverse speed

	Unit	Range	Initial
	rpm	Tool range	*
Description	For open crowfoot: speed for return to open position		

* Speed may based on the tool model

Controller Settings (continued)



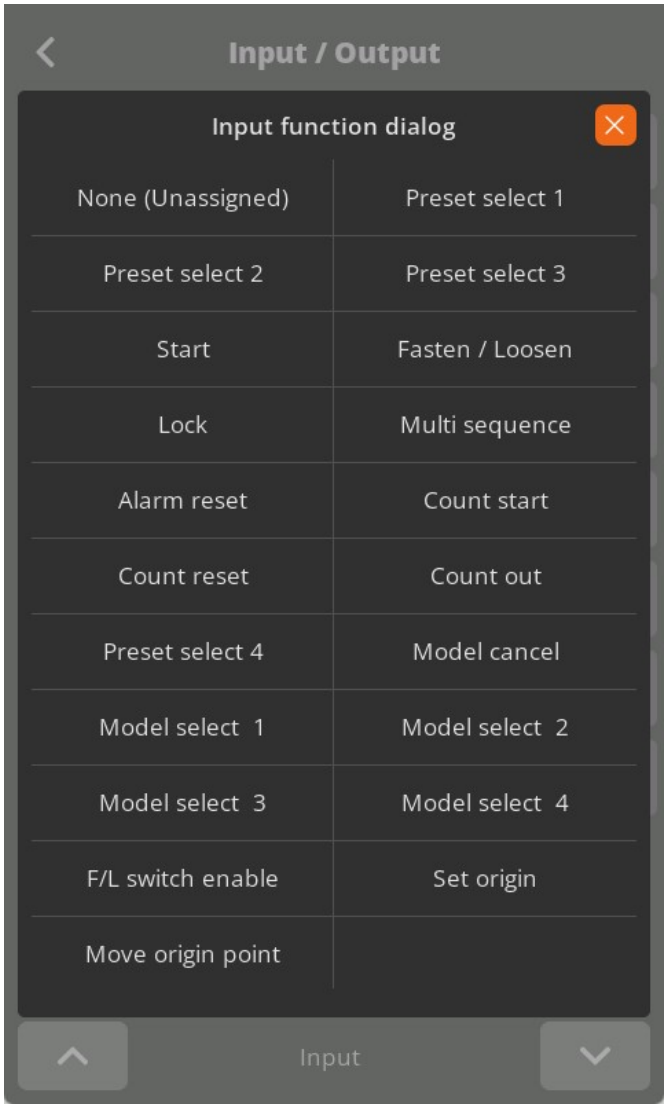
Led/light on time

	Unit	Range	Initial
	sec	0 ~ 30	0
Description	Screwdriver LED lamp off timer (used only with pistol grip models) 0 = lamp off timer disable.		

I/O settings

Parameter
Fastening
Advanced
Screw count
I / O
Controller
Network
Multi sequence
Model
Input / Output
1
None (Unassigned)
2
None (Unassigned)
3
None (Unassigned)
4
None (Unassigned)
5
None (Unassigned)
6
None (Unassigned)
7
None (Unassigned)
8
None (Unassigned)
Input

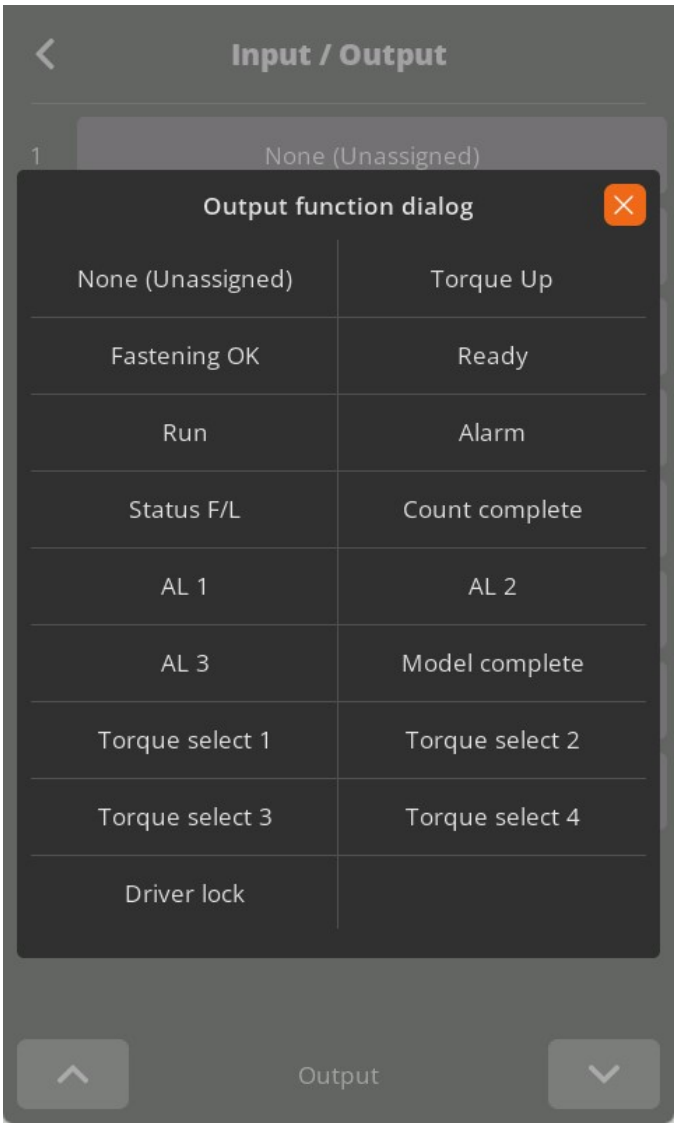
Input Function Dialog



F/L switch enable: Allow reverse by external input when F/L switch is locked by controller setting

Absolute home bit/socket position
Set origin: Create the absolute home position monitored by motor angle encoder.
Move origin point: Bit socket position goes back to the home position

Output Function Dialog

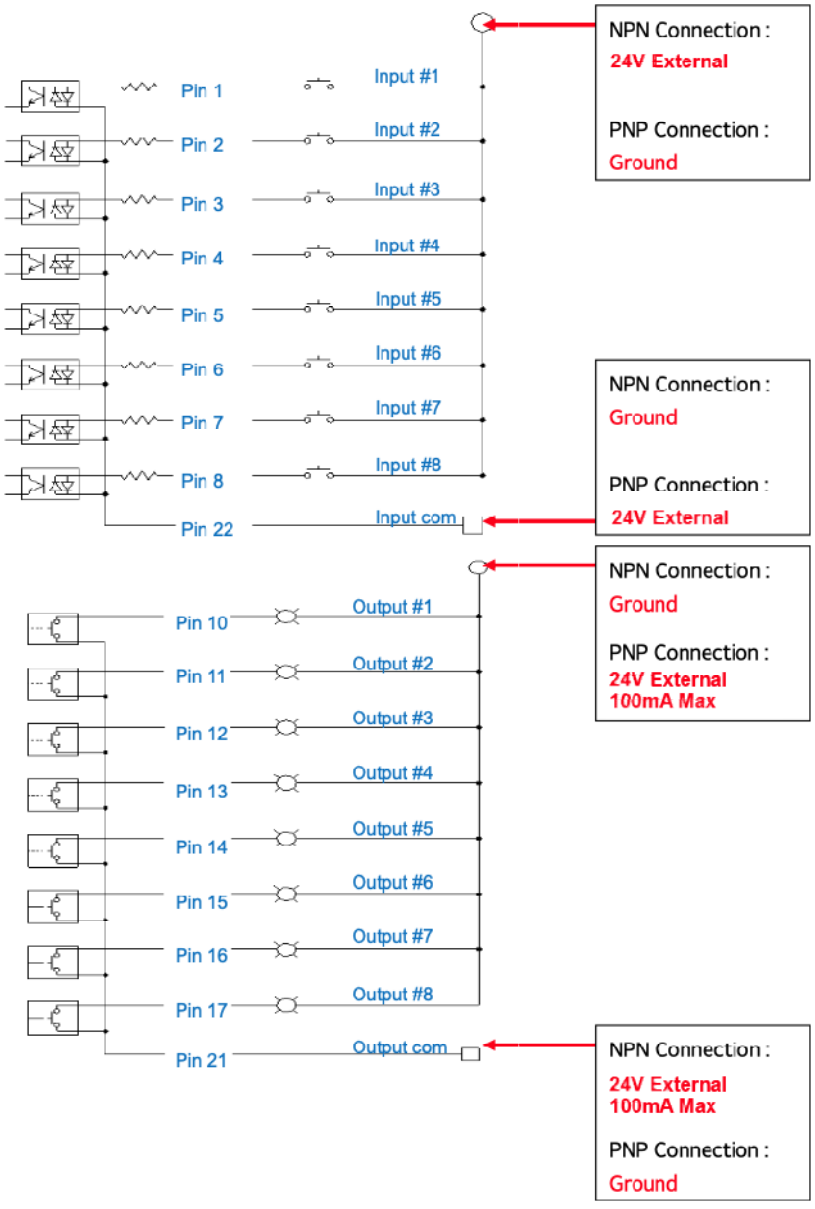


25P I/O Schematic

The digital I/O provide the free assignment feature for 8 Inputs and 8 Outputs.
Factory setting of I/O assignments are as following.

To validate changing I/O, turn the power OFF and ON again

I/O connections



Factory settings

Pin No	Description	Factory setting
1	IN 1	Preset select 1
2	IN 2	Preset select 2
3	IN 3	Preset select 3
4	IN 4	Start
5	IN 5	Forward / Reverse
6	IN 6	Driver Lock
7	IN 7	Multi-sequence
8	IN 8	Alarm Reset
9	*IN 9*	*Non assignable only Model*
10	OUT 1	Torque UP
11	OUT 2	Fastening OK
12	OUT 3	Ready
13	OUT 4	Motor RUN
14	OUT 5	Alarm
15	OUT 6	Status F/L
16	OUT 7	Count complete
17	OUT 8	Alarm 1
18	*IN 10*	*Non assignable only Model*
19	*IN 11*	*Non assignable only Model*
20	*IN 12*	*Non assignable only Model*
21	Out COM	
22	In COM	
23	*IN 13*	*Non assignable only Model*
24	*IN 14*	*Non assignable only Model*
25	*IN 15*	*Non assignable only Model*

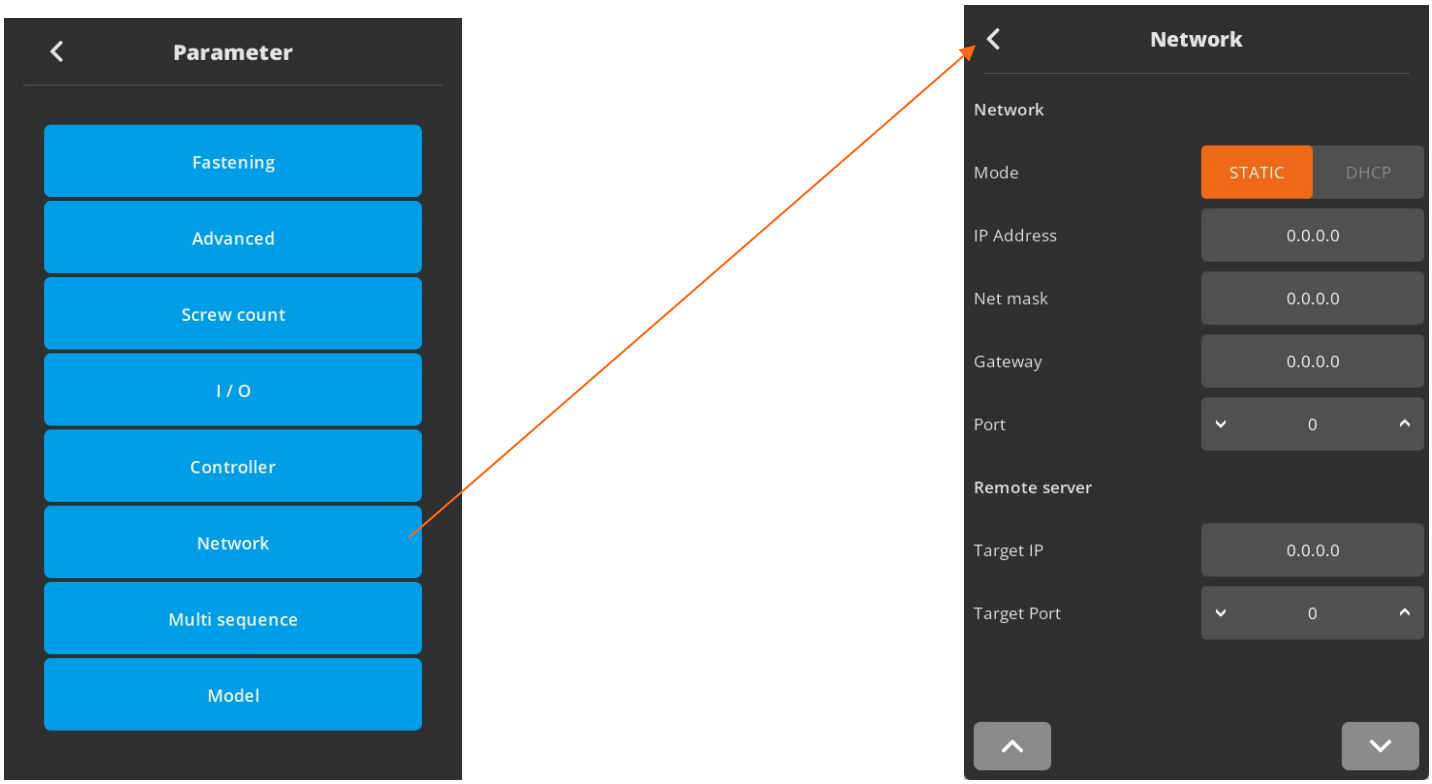
Binary coding with 5 inputs to select preset # and Mode (identical for Model)

Preset #	Input				
	Torque select 4	Torque select 3	Torque select 2	Torque select 1	Multi sequence
1	0	0	0	1	
2	0	0	1	0	
3	0	0	1	1	
4	0	1	0	0	
5	0	1	0	1	
6	0	1	1	0	
7	0	1	1	1	
8	1	0	0	0	
9	1	0	0	1	
10	1	0	1	0	
11	1	0	1	1	
12	1	1	0	0	
13	1	1	0	1	
14	1	1	1	0	
15	1	1	1	1	
Multi A	0	0	0	0	1
Multi B	0	0	0	1	1

Binary coding with 3 outputs for error codes in 7 groups

Error code	Alarm 3	Alarm 2	Alarm 1
110,111,112,113,114,115,116,118,200,201,220	0	0	1
300,301,302,303,304,309	0	1	0
310,311	0	1	1
330,331	1	0	0
332	1	0	1
333,334,335,336, 337	1	1	0
400,401,500	1	1	1

Network Settings



Mode

	Unit	Range	Initial
		STATIC - DHCP	STATIC
Description	STATIC: IP address should be set manually on controller DHCP: if controller is connected to a LAN with a DHCP router IP address will automatically given by LAN router		

IP address

	Unit	Range	Initial
	IPv4 address		192.168.1.100
Description	Used with Static mode to set manually IP address		

Net mask

	Unit	Range	Initial
			255.255.255.0
Description			

Gateway

	Unit	Range	Initial
			192.168.1.1
Description	Set LAN Router address		

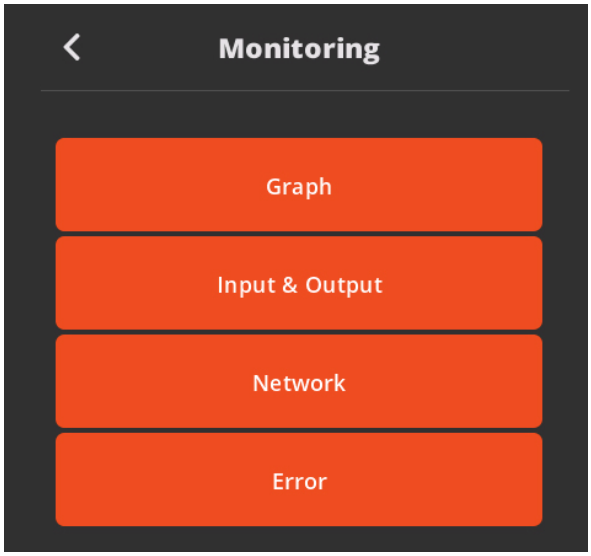
Port

	Unit	Range	Initial
		0 to 9999	5000
Description	To be set for communication ParaMon software standard setting is port 5000		

Monitoring Menu

To monitor fastening data and I/O status, click menu icon and select Monitoring icon.

There are three(3) real-time monitoring menu and one error history.

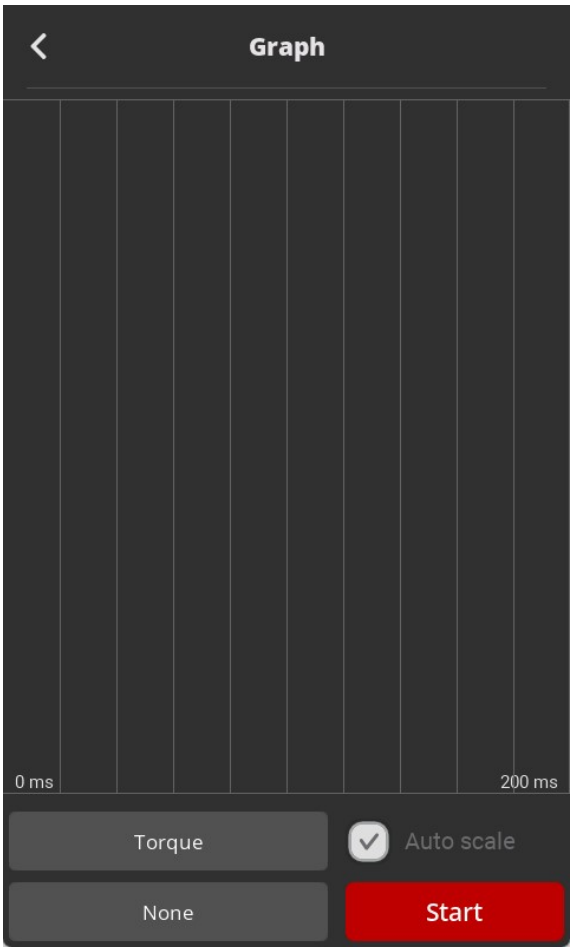


- Graph: torque, Angle, Speed and current
- I/O: Input & output status
- Network: RS-232 & Ethernet settings
- Error: latest 8 error history

Graph (Torque curve) monitoring

Two channel data curve for Current, Torque, Angle, Speed

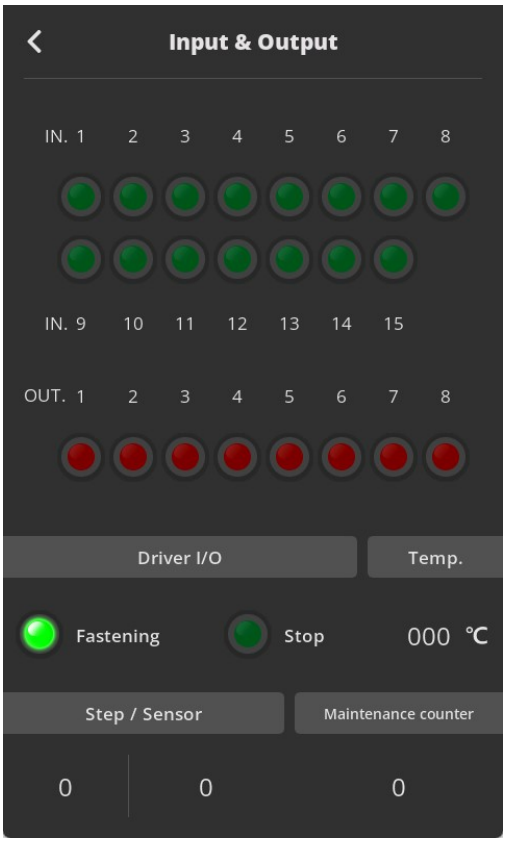
The sampling rate is 1ms (0.001 second) for maximum 400 data display. The latest 400 data display will be refreshed by moving left from right. Auto scale will display all data on one single screen by changing real-time sampling rate automatically.



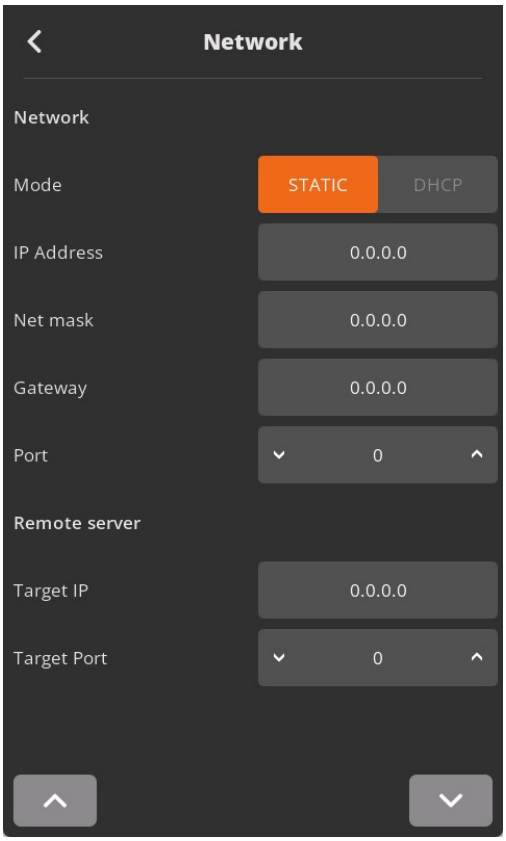
I/O Status Monitoring

The I/O & tool operation signals are displayed when they are activated.

The temperature of the motor is also displayed.

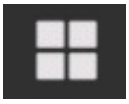


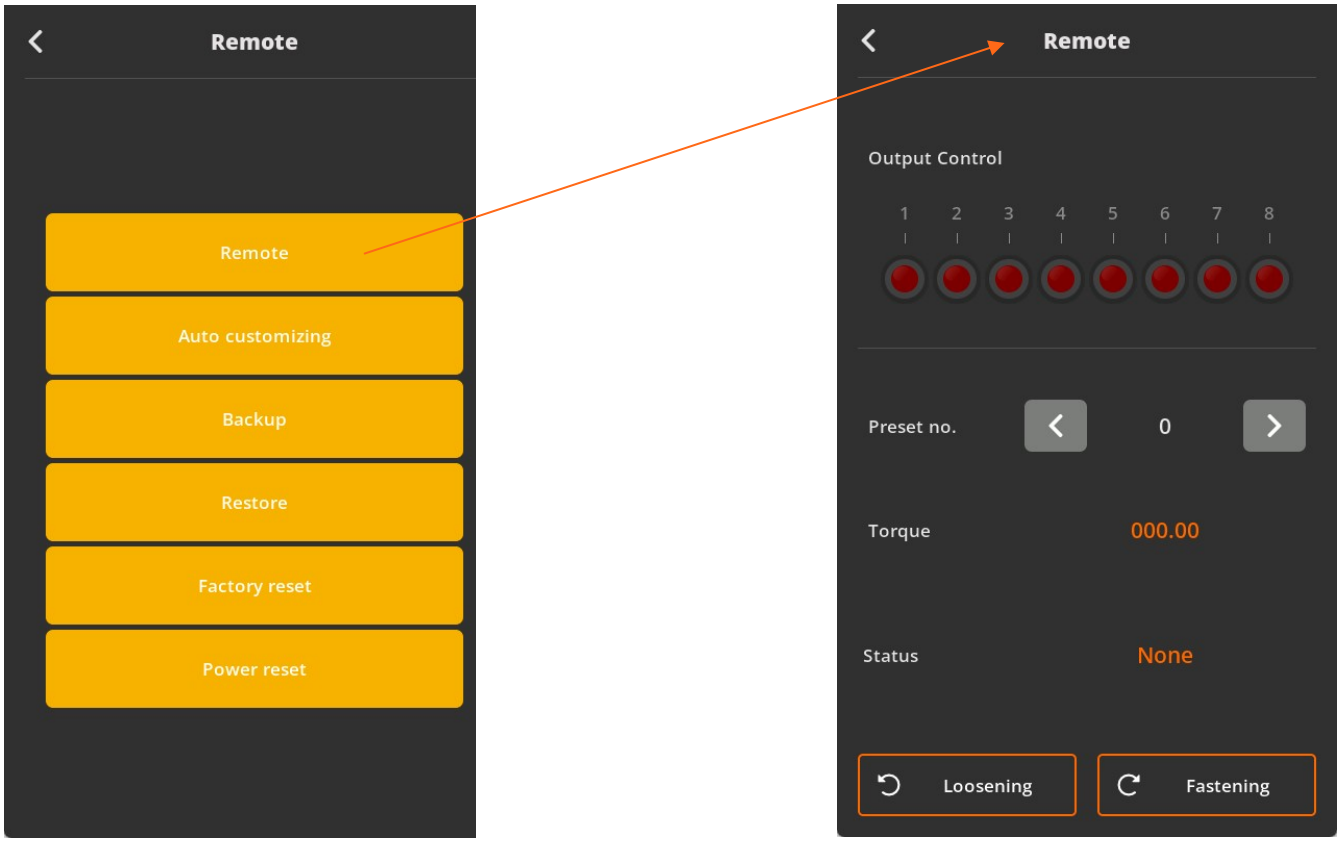
Network Setting



Remote Menu

Remote menu provides remote tool operation, auto customizing parameters to have highest cycle time and resets. Click menu icon and select Remote icon.





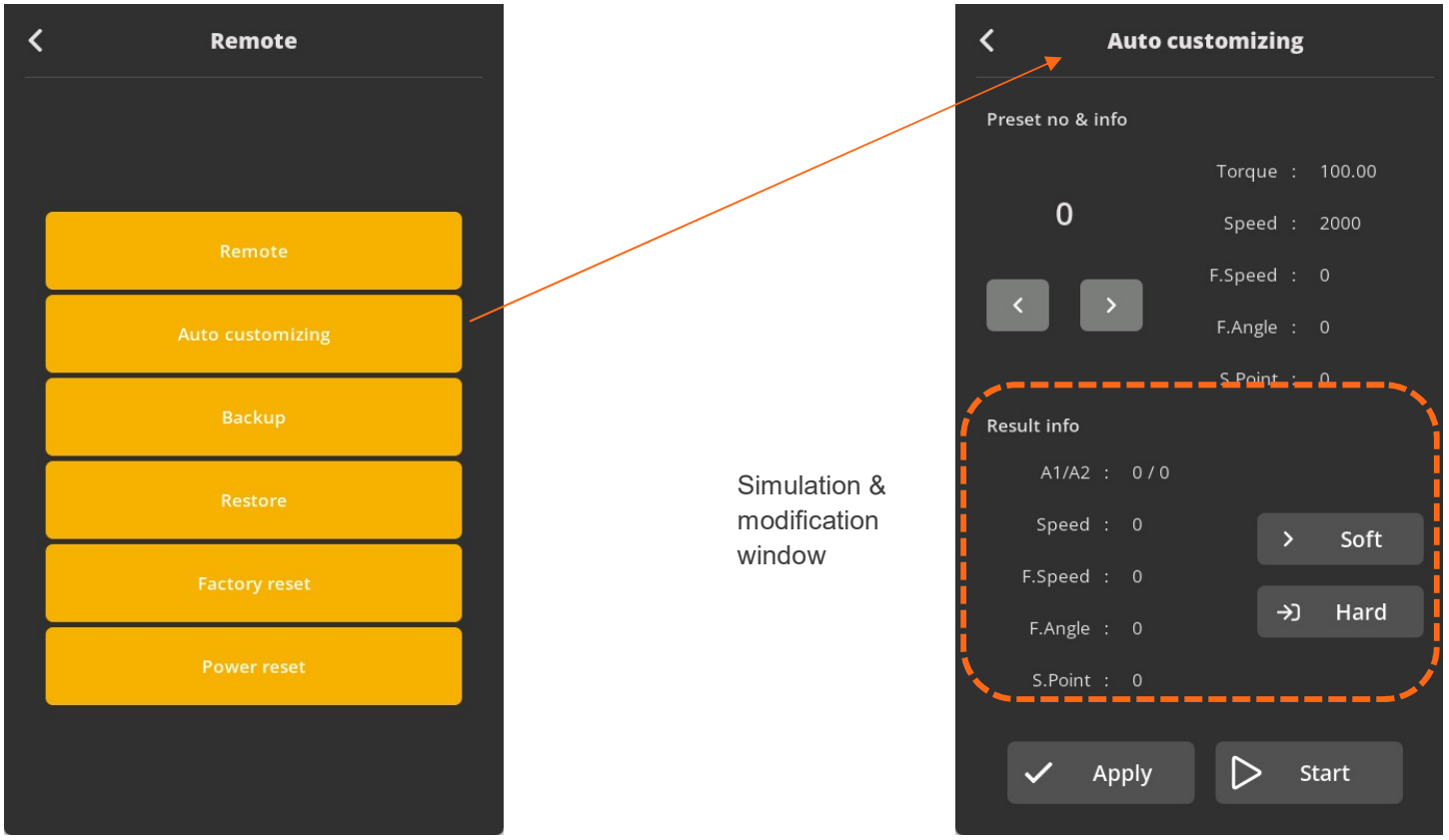
Remote

The tool and output signal can be operated remotely by clicking on "Loosening" or "Fastening" buttons.

It is a useful feature to simulate the tools in automation integration. Useful in validating the output wiring and tool test without PLC.

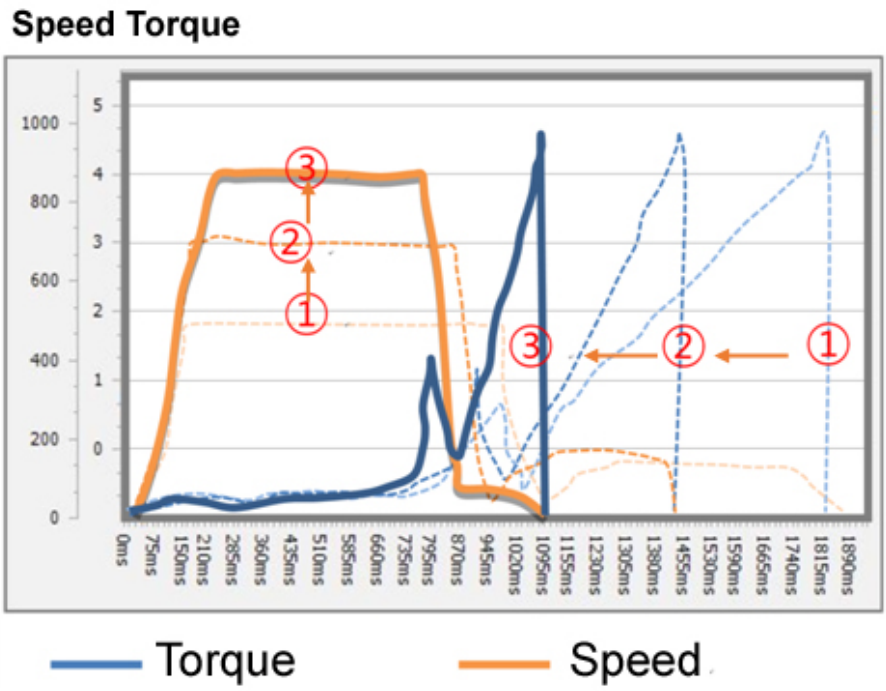
- Preset selection
- Remote start tool in Fastening or Loosening direction
- Providing Output signals

Auto Customizing Parameters



EC and ECT tool has the auto speed setting feature against torque setting to minimize over torque by speed shock. This auto speed is safe speed on the hard joint condition. On the real application, this setting can be changed manually. Auto customizing feature provides optimized parameter settings for saving cycle time on the real application.

Speed Torque



① Select Preset # to modify parameter settings

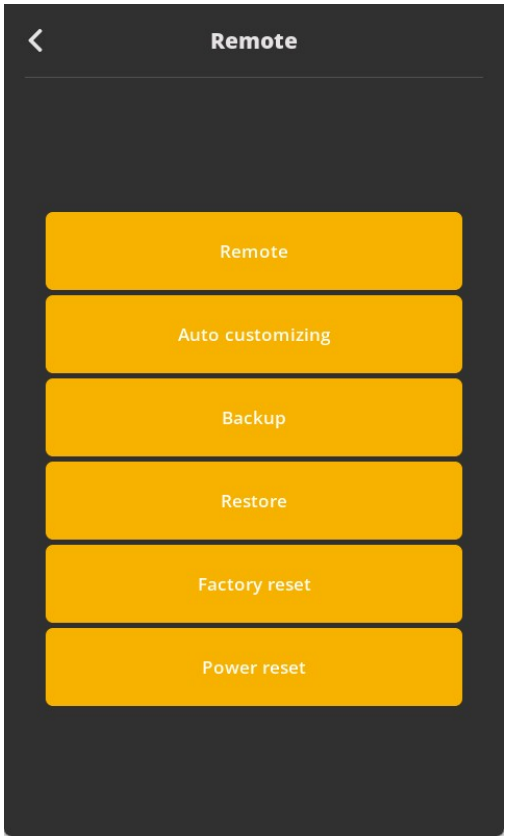
② Select one of Soft & Hard joint condition when it is obviously clear or both together when it is not clear to be clarified, then click START

③ Apply screw tightening several times until there is no more parameter changing on the simulation & modification window. Be sure that the fastening condition should be same during the process. The system changes parameter values by the previous fastening data.

④ Once there is no more changes on the simulation & modification window, click STOP to finish testing.

⑤ Click APPLY to apply the settings on the simulation & modification window. The setting can be modified by manually before applying them.

Remote: Backup / Restore / Power Reset / Factory Reset



Backup

Parameter save to SD-Card.

Backup is saved on the SD-Card - PARAM folder.

Back up file name: yyyymmdd.csv

Only one file per day (latest backup erase previous one)

Restore

Restore backup file from SD-Card.

Power reset

Power reset provide the equal effect of system rebooting by power OFF and ON of the controller.It refresh the booting by the software without real power off.

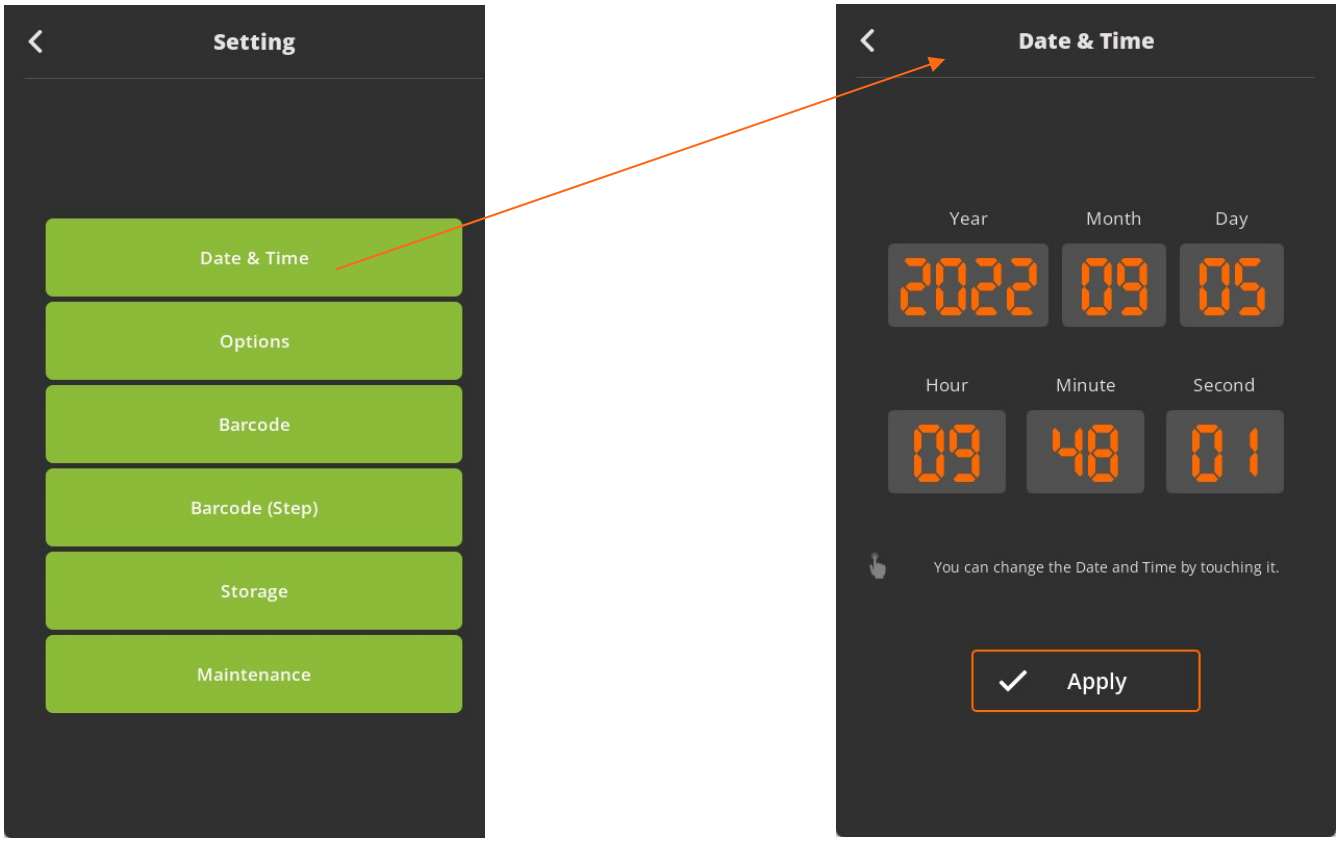
Factory reset

All parameters are reset to the factory setting.

General Settings Menu

Date & Time

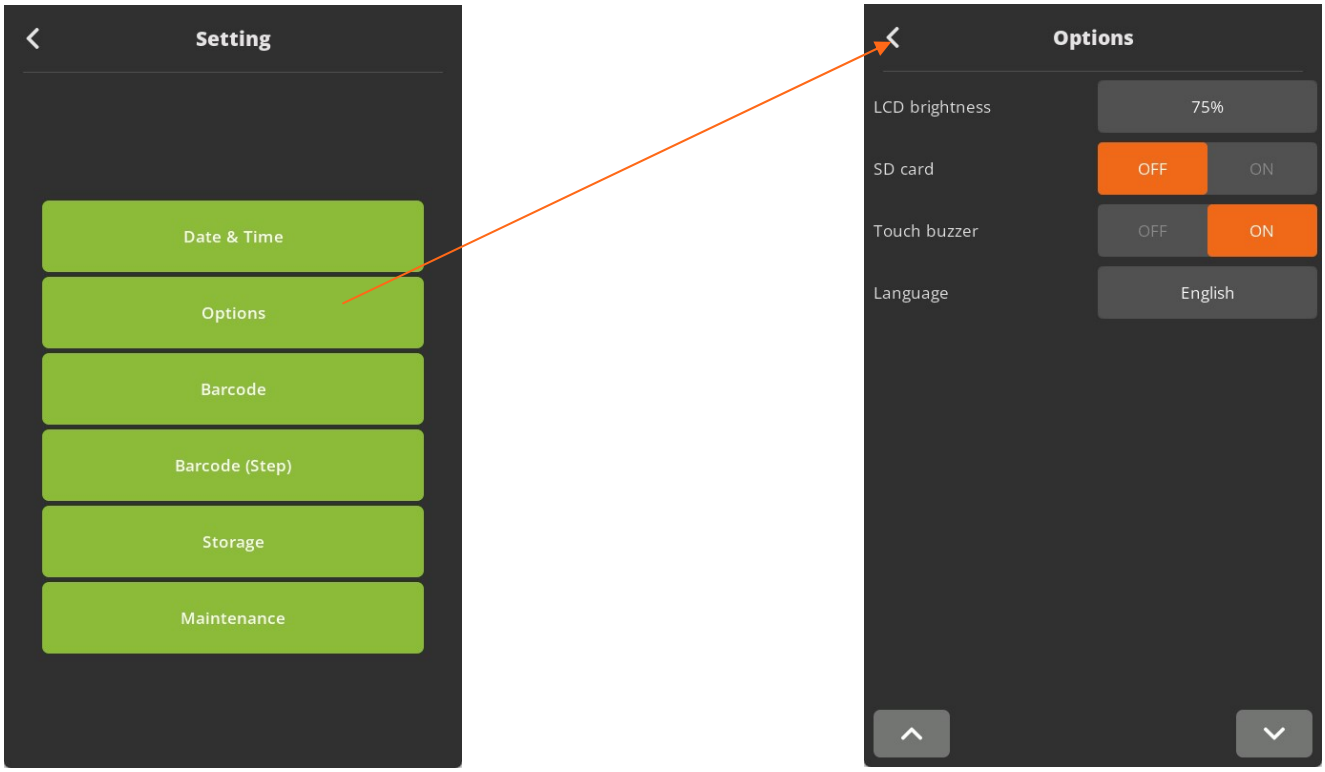
To modify date, time and backlight brightness , click menu icon and select setting icon.



Date and time

System date and time can be modified. yyyy-mm-dd hh:mm:ss

General Settings: Options



LCD Brightness

	Unit	Range	Initial
		1-100	100
Description	Manual LCD backlight brightness adjustment		

Touch buzzer

	Unit	Range	Initial
		OFF - ON	ON
Description	Touch screen sound deactivated or activated		

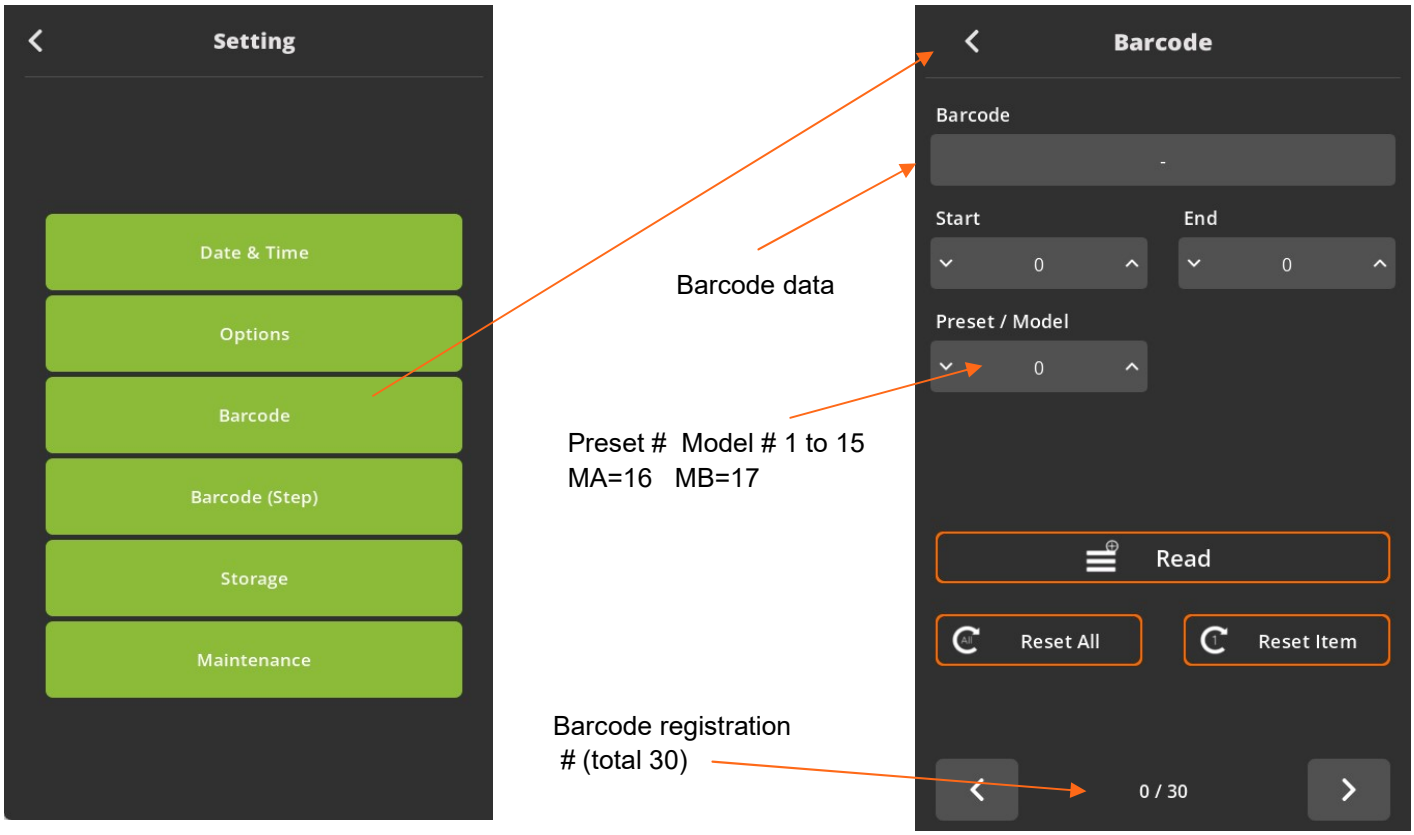
Language

	Unit	Range	Initial
		List	English
Description	Choose in a list of 5 languages: English, German, French, Spanish and Czech – change is applied in the menu		

SD card

	Unit	Range	Initial
		OFF - ON	ON
Description	In order to save the fastening data, Select ON of SD card and select the items to be saved on the SD card:		

Barcode & Barcode Step



The barcode information can select the Preset or Model by the setting.

In order to use barcode scanner, there are some parameters to be selected prior to the barcode setting.

(Controller menu) R2232 Select: Modbus / Barcode
RS232 baud rate: Select right one for the scanner - usually 9600

- Total number of barcode registration: up to 30
- Max number of barcode data length: 32 characters (including CR data)
- Registering process

1) Click “READ” and scan the barcode
2) Select the first and ending digit number from the scan data for registration
3) Select Preset/Model # to be linked with the registered scan data
4) Click bottom right button to move the next registration and repeat the same process

** Preset #16 and 17 in P.M# window works for Multi A and B

When Muti A or B is used, the operation window display contains the followings according to the sequence MA or MB > Step no. > Preset # (current preset #)

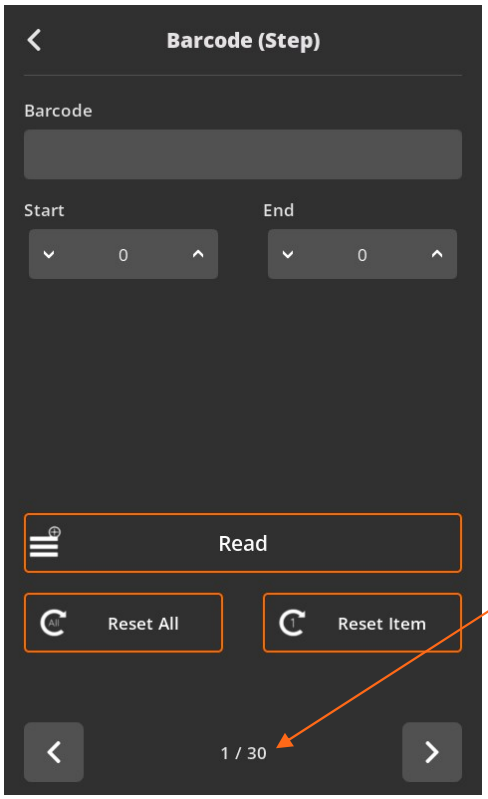
“Reset all" button is used to clear all registration

"Reset Item" button is used to clear the current scan data.

Barcode Step setting

Only for barcode reading used in model barcode step.

Dialog menu Identical to Barcode (refer previous page).



Barcode registration # (total 30)
Max 32 characters each

Barcode registration: barcode model step for setting up value.

Ex: Model barcode step value set 1.
If read barcode registration 1 data then model change next step.

Note for barcode reader connection:

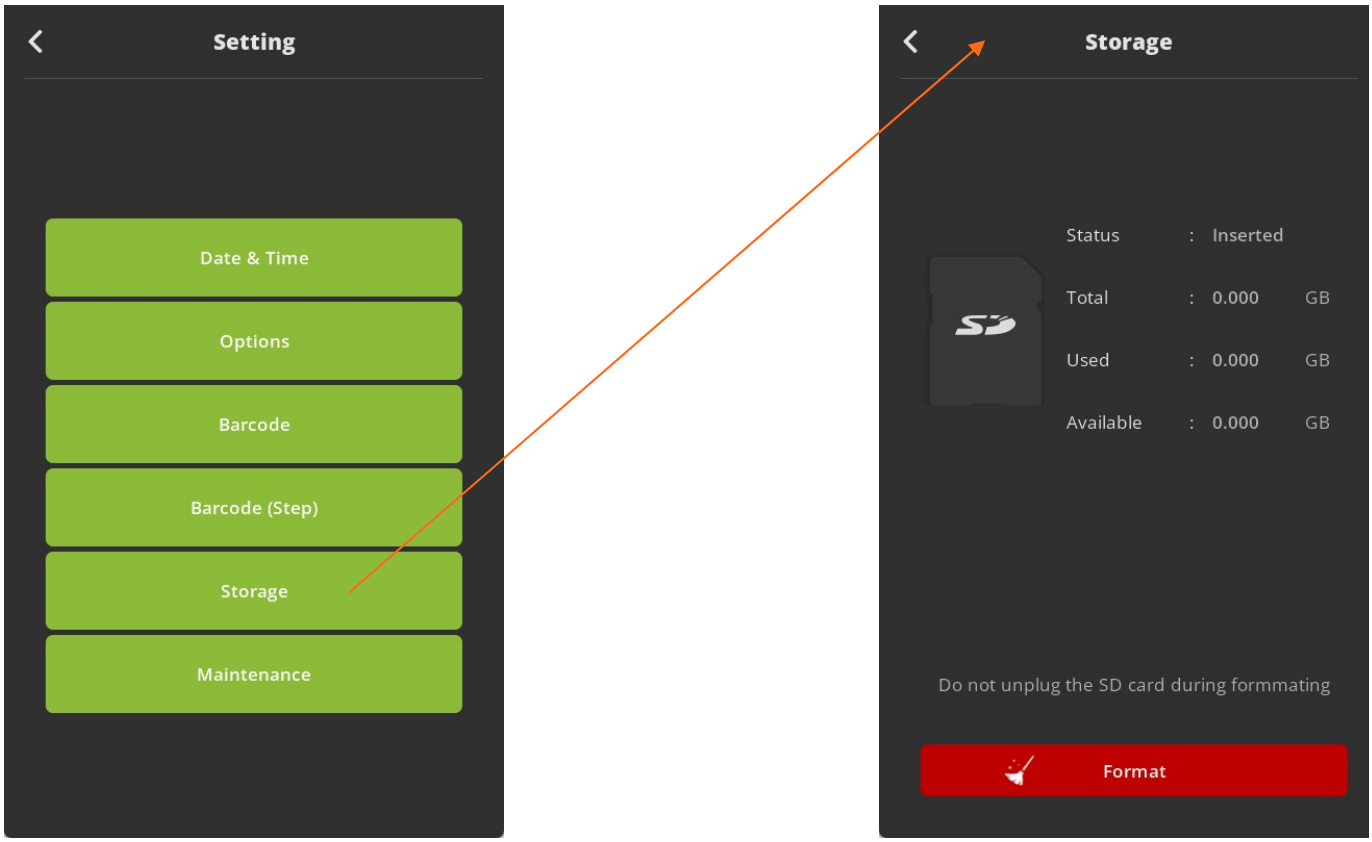
Hardware connection on RS232 port:

Serial connection RS232 use only 2, 3 , 5 pins.
Pins 2 and 3 should be switched
External voltage supply is needed for RS232 barcode = reader

Barcode reader setting:
See default standard parameters

Parameter	Standard (Default)
Transmit Code ID	No
Data Transmission Format	Data as is
Suffix	CR/LF (7013)
Baud Rate	9600
Parity	None
Hardware Handshaking	None
Software Handshaking	None
Serial Response Time-out	2 Sec.
Stop Bit Select	One
ASCII Format	8-Bit

Storage



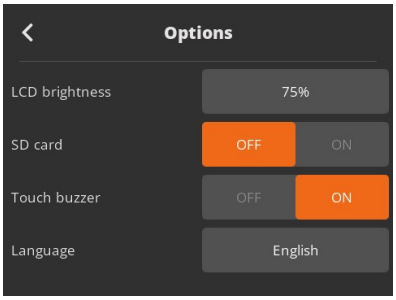
Check SD card information and available memory.

Important:

Format will delete all data saved on memory card. To avoid losing data please make a copy on a PC before.

SD memory card specification

SD card type	Size	Format
Industrial grade Class 10	Max 32GB	FAT32

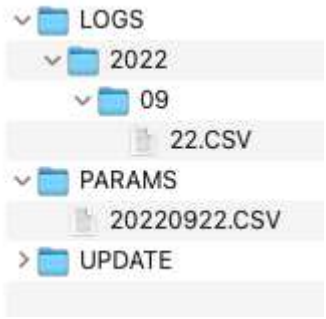


System creates the folders of YEAR, MONTH automatically. And it creates one file in CSV format with the file name of DATE.

LOGS: *(This folder contains data from all fastening events, if the SD Card Option is enabled and a SD Card is present)*
PARAMS: *(This folder contains back-ups if using the back-up feature from the remote menu on the controller)*
UPDATE: *(This folder is utilized for updating the Controller firmware and LCD firmware).*

Following is a example of the SD Card folder hierarchy on for MDC v2, ECD and ECTD systems.

Clock time, Fastening time, Preset #, Target torque, Converted torque, Speed, A1, A2, A3 angles, Count no. Error code, Forward/Reverse, Status (OK), Snug angle



Date.csv monitoring data file / one file per one day (new excel from John)

Time	Barcode	FTime	Preset	Target Torque	Converted Torque	Speed	Angle1	Angle2	Screw	Snug	Error	FL	Result
12:15:41	0232119-1295	725	1	2	2	306	1090	13	2	0	0	0	1
12:15:47	0232119-1295	745	1	2	2	306	1090	12	1	0	0	0	1
12:16:10	0232119-1295	514	2	4	4	509	1115	19	2	0	0	0	1
12:16:14	0232119-1295	534	2	4	4	509	1085	19	1	0	0	0	1
12:16:28	0232119-1295	443	3	6	6	711	1111	27	2	0	0	0	1
12:16:33	0232119-1295	438	3	6	6	711	1078	27	1	0	0	0	1
12:16:52	0232119-1295	399	4	8	8.01	914	1101	37	2	0	0	0	1
12:16:56	0232119-1295	405	4	8	8.01	914	1070	38	1	0	0	0	1
12:17:51	0232119-1295	395	5	9	9.01	1015	1068	42	2	0	0	0	1
12:17:55	0232119-1295	379	5	9	9.01	1015	1064	42	1	0	0	0	1
This example represents 5 fastening operations on a single assembly, 2 screws each.													
The bar code value represents the serial number for the part													

The last scanning data is recorded together with every fastening data.

Firmware Upgrade

1. Power off cotroller

   Remove the SD card for data saving and use the new SD card for firmware update only.

2. Create the folder “ Update" if not present.

3. Copy the firmware files to the Update folder.

4. Insert the SD card, and power ON the controller, then it is updated automatically.

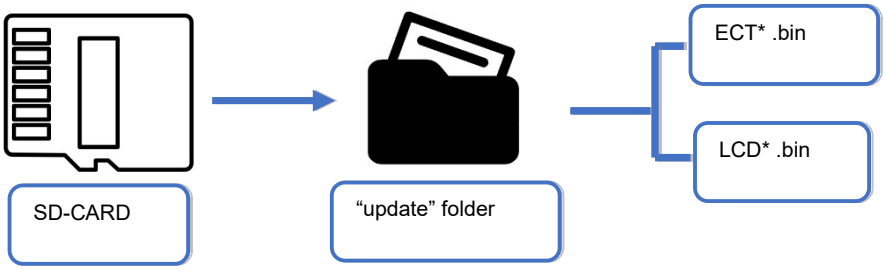
Power off, remove card and remove the bin files fro the update folder.

SD Memory card

update

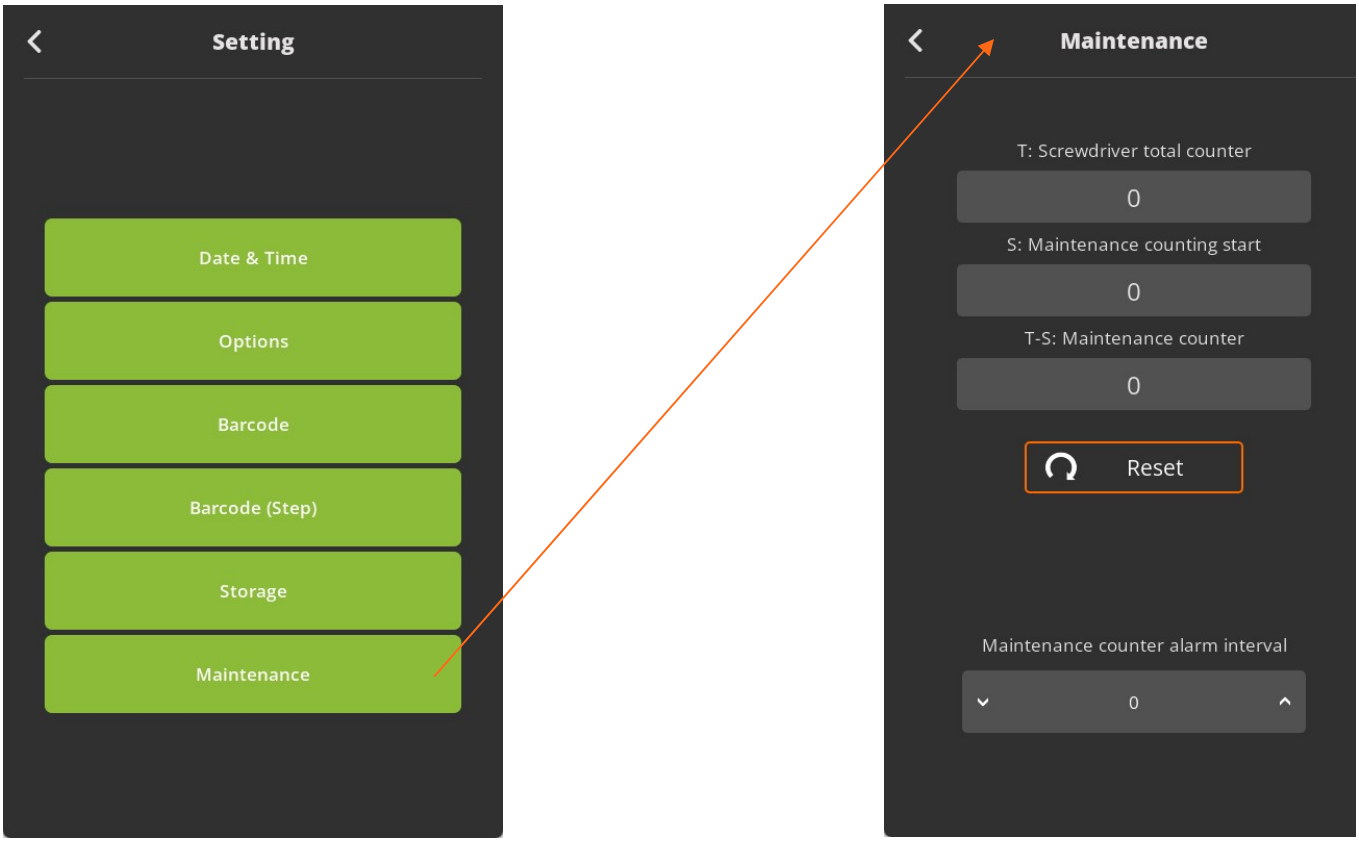
ECT*.bin (ECT firmware file)

LCD*.bin (LCD firmware file)



Note: If controller is on and you remove SD card, the controller generates alarm sound.

General Settings: Maintenance

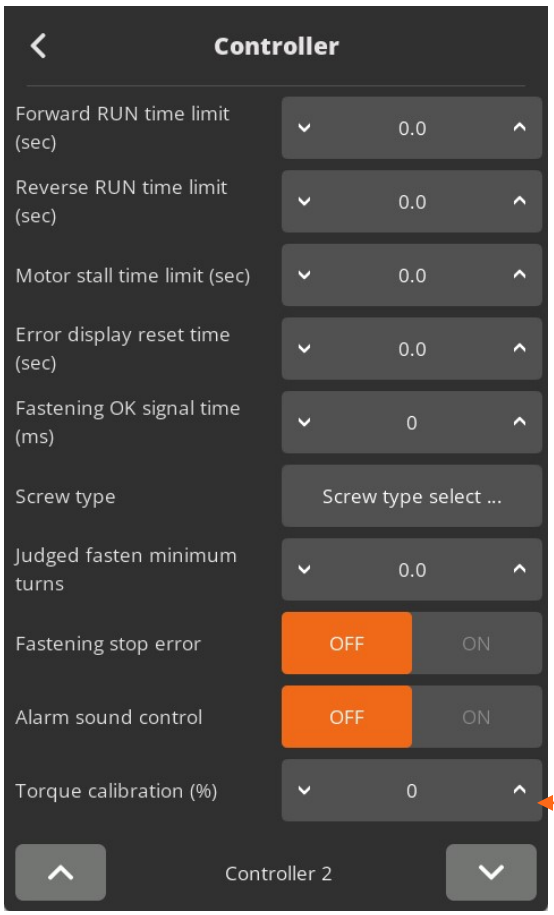


Torque Calibration and Compensation

Torque calibration: It is the master calibration for whole torque range of the tool, saved in the tool memory. The F/R switch should be at Reverse position before writing the new value.

The torque calibration could be utilized to change the electric screwdriver calibration. The screwdriver should be recalibrated if replacing the motor or gear mechanism.

Torque calibration on the controller panel



Torque calibration (%).
The default value is 100%

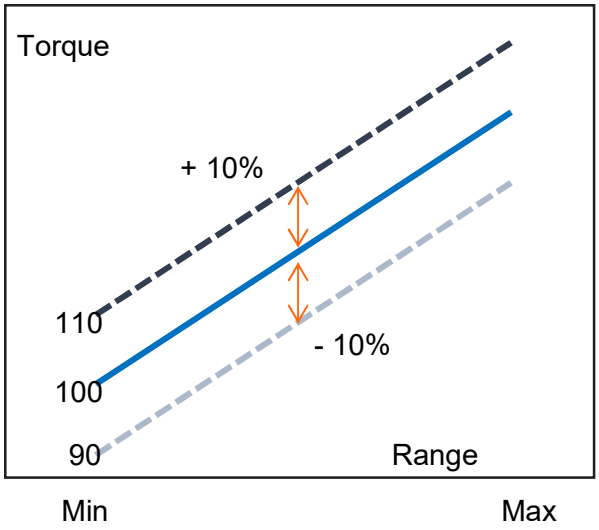
Total adjustable range is +/- 10% (90% to 110%)

Example to increase the output torque 5%, key in 105(%). The changes to the torque calibration percent will effect the entire range of the tool. The torque calibration percent is stored in the memory chip in the tool. So it can be still effective on other controller.

The results can vary based on test conditions:

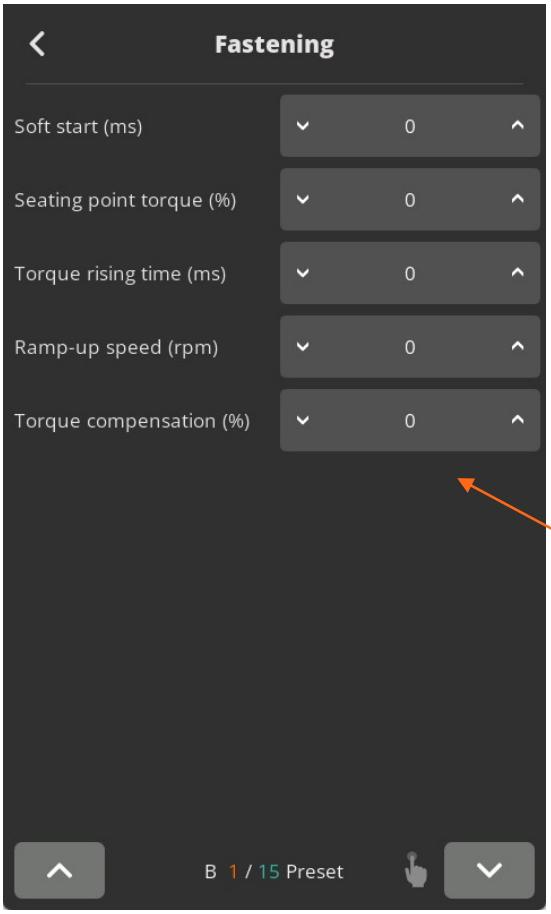
- Type of the rundown simulation (Hard joint, semi-elastic or Soft joint)
- Rundown screw diameter
- Pressing pressure of the tool
- Washer, lubricant and run down screw material

- Tool speed
- Low pass filter of the torque meter



A periodical torque calibration is required to keep the accuracy of fastening quality.

Torque compensation: Individual torque tuning on each preset. Saved in the controller.



Torque compensation can be used when:

The reading on the torque meter is variable according to the fastening condition on each preset, and it should be decreased or increased together on other presets, the torque compensation is useful in parameter setting of each preset. The torque output can be adjusted in the selected preset ONLY. It does not influence to another presets.

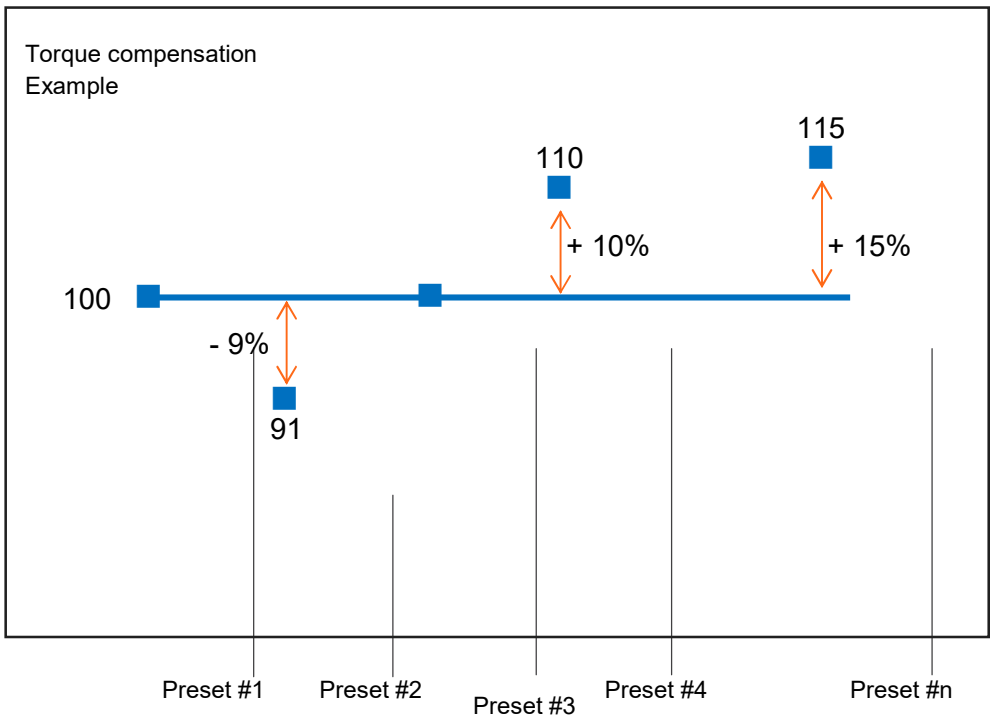
Torque compensation on the controller panel.

Torque compensation (%)

Total adjustable range is +/- 20% (80% to 120%) for 15 presets.

Torque compensation value is stored in the controller memory, not the tool memory.

Torque compensation can be utilized to characterize a tool to an application (fastening joint).



Error Codes

System Errors

Code	Error message	Description	How to reset
110	AD offset error	When the power of controller is ON, the current offset is out of range.	Reset and retry booting. If failed, repair is required
111	Under voltage	Under voltage protection on SMPS power supply circuit.	
112	Over speed	Over rotation speed than the set value.	Check the cable connection.
113	Driver data read	Screwdriver parameter data read error	Reset and retry booting.
114	Screwdriver recognition error	The screwdriver is not compatible with the controller	A251 – Select driver
115	Controller recognition error	Program itself cannot recognize the controller information.	A251 – Select driver
116	Com error related with I/O data	System failed to read the data from I/O port by communication issue	Reset and retry booting
118	No motor rotation error	When motor rotation is not monitored	Reset and retry booting
120	No SD card	SD memory card option setting is enabled, but No SD card detected	
121	SD card writing	Writing on the memory is not available.	
122	SD card failure	SD card board is damaged	
200	Parameter reading failure	It failed to read parameter at all. Check the EEP-ROM damage or communication failure	
201	Parameter Check sum error	The read parameter is wrong by the check sum routine	
220	Multi-sequence program error	Multi-sequence program is wrong	Multi-sequence program is wrong

Fastening errors

Code	Error message	Description	How to reset
300	Run time limit (Forward)	Over time limit on A260	Resetting A260 value
301	Run time limit (Reverse)	Over time limit on A261	Resetting A261 value
302	Model setting error	Failure in Model programming	Resetting Model
303	Model cancel	The Model process is canceled	
304	Motor stall by loosening failure	Motor stall by loosening failure within time limit on A262	Resetting A262 value
309	Bit socket tray	Bit socket tray application error	
310	Time over in screw counting	Over the time limit of screw counting on A243	Resetting A243 value
311	Screw missing	When the work-piece moves out of the working area without complete number of fastening	
330	Min Angle error	Target torque reached before the Min angle	
331	Target angle setting error	Target torque reached over the Max angle	Resetting target angle
332	Angle over	Target torque reached over the Max angle	Resetting max angle
333	No torque complete	Operation stops before complete cycle of torque up by releasing lever trigger	
334	Engaging torque detection fail	The engaging torque is not detected in time or angle limit	
335	Converted torque error	Converted torque is out of torque limit (%)	Check min, max torque range
336	Over torque error	[AC/TM] Torque reached to the high limit of torque capacity	Resetting max torque
337	Torque up at free speed	Torque up occur at Free speed	
338	Thread tap max torque error	Over max torque at Thread tap	Resetting thread tap max torque
339	Thread tap min & max range error	Thread tap setting min, max torque range invalid	
400	Ethernet port fail	Ethernet device IC initializing fail	
401	Ethernet socket error	Ethernet communication error related with socket	
500	Over temperature	Overtemperature over 70°C	

Maintenance Intervals

For Service Engineer

No	Item	Recommended Maintenance Interval		Check Point	Service	Notes
		Fastening Cycle	Years			
1	Motor Ass'y	1,000,000	2	Low rotation speed Noise & shakiness Overheat	Inspect motor or PCB	After replacement, calibration is required.
2	Gear	1,000,000	2	Wear	Replace Gear	After replacement,
3	Grease	1,000,000	2	Grease shortage	Supplement grease	Grease: SAPPHIRE PREMIER (Rocol)
4	Torque Accuracy	500,000	1	Inaccurate torque value	Calibration	If after calibration, still problem exists, inspect no.1, 2, and 3
5	Cable	600,000	1	Damaged sheath, wire disconnection, damaged & corroded connector	Replace cable	

For User

No	Item	Check Point	Service
1	Motor Ass'y Gear and Grease	Low rotation speed Noise and shakiness	One year
2	Torque Accuracy	Inaccurate torque value	One year
3	Cable	Damaged sheath, disconnection Damaged & corroded connector	One year

Mountz Calibration and Repair Services

Mountz Inc. features an experienced calibration and repair staff. Our trained technicians can calibrate and repair most any tool. Mountz provides rapid service with quality that you can trust as we offer three state-of-the-art calibration lab and repair facilities.

About Mountz

Mountz, The Torque Tool Specialists®, has been a leader in the torque tool industry for more than 55 years. Engineered in the Silicon Valley and serving the globe, Mountz focuses on delivering high-quality torque products, services, and solutions to ensure customers can always proceed with confidence. We are committed to forging a safer world through precision and accuracy and by innovating every day.

Mountz Service Locations

Eastern Service Center
19051 Underwood Rd.
Foley, AL 36535
Phone: (251) 943-4125
Fax: (251) 943-4979

Western Service Center
1080 N.11th Street
San Jose, CA 95112
Phone: (408) 292-2214
Fax: (408) 292-2733

UK Service Center
Pier Copse Courtyard, Milland Lane,
Liphook, Hampshire, GU30 7JN, UK
Phone: 00 44 1428 741756

www.mountztorque.com