DOGA®
ASSEMBLY
TECHNOLOGY

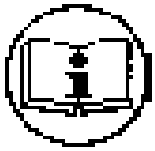
MDT series
MDTC38

INSTRUCTIONS MANUAL

IMPORTANT

The tool delivered with this manual may have been modified for specific needs.
In that case, please give us the tool code number written on our shipping note or the approximate tool delivery date when you place an order for a new similar tool or for spare parts.
In that way, you will be sure to get the required tool and/or spare part.

WARNING



This information has to be kept in a location known by all users.

Each operator has to read carefully this manual before installing, using, and mending the product.

Be sure that the operator has understood using recommendations and the meaning of signs put on the product.

Most accidents could be avoided respecting this Manual Instructions. As a matter of fact, they were created according to European laws and norms regarding products.

In each case, please respect and follow safety national norms. Do not take off nor damage the stickers or advise put on the product and above all the details imposed by the law.

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1. SAFETY RULES

ENGLISH

WARNING! Read and understand all instructions. Failure to follow all instructions listed below, may result in electric shock, fire and/or serious personal injury

SAVE THIS INSTRUCTIONS

1.1 Work Area

- **Keep your work area clean and well lit.** Cluttered benches and dark areas invite accidents.
- **Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust.** Power tools create sparks which may ignite the dust or fumes.
- **Keep bystanders, children, and visitors away while operating a power tool.** Distractions can cause you to lose control.

1.2 Electrical Safety

- **Grounded tools must be plugged into an outlet properly installed and grounded in accordance with all codes and ordinances. Never remove the grounding prong or modify the plug in any way. Do not use any plugs. Check with a qualified electrician if you are in doubt as to whether the outlet is properly grounded.** If the tools should electrically malfunction or break down, grounding provides a low resistance path to carry electricity away from the user.
- **Avoid body contact with grounded surface ad pipes, radiators, ranges and refrigerators.** There is an increased risk of electric shock if your body is grounded.
- **Don't expose power tools to rain or wet conditions.** Water entering a power tool will increase the risk of electric shock
- **Do not abuse the cord. Never use the cord to carry the tools or pull the plug from an outlet. Keep cord away from heat, oil, sharp edges or moving parts. Replace damaged cords immediately.** Damaged cords increase the risk of electric shock.
- **When operating a power tool outside, use an outdoor extension cord marked W-A or W.** These cords are rated for outdoor use and reduce the risk of electric shock.

1.3 Personal Safety

- **Stay alert, watch what you are doing and use common sense when operating a power tool. Do not use tool while tired or under the influence of drugs, alcohol, or medication.** A moment of inflation while operating power tools may result in serious personal injury.
- **Dress properly. Do not wear loose clothing or jewelry. Contain long hair. Keep your hair, clothing, and gloves away from moving parts.** Loose clothes, jewelry, or long hair can be caught in moving parts.
- **Avoid accidental starting. Be sure switch is off before plugging in.** Carrying tools with your finger on the switch or plugging in tools may result in personal injury.

- **Remove adjusting keys or switches before turning the tool on.** A wrench or a key that is left attached to a rotating part of the tool may result in personal injury.
- **Do not overreach. Keep proper footing and balance at all times.** Proper footing and balance enables better control of the tool in unexpected situations.
- **Use safety equipment. Always wear eye protection.** Dust mask, non-skid safety shoes, hard hat, or hearing protection must be used for appropriate conditions.

1.4 Tool use and Care

- **Use clamps or other practical way to secure and support the workplace to a stable platform.** Holding the work by hand or against your body is unstable and may lead to loss of control.
- **Do not force tool. Use the correct tool for your application.** The correct tool will do the job better and safer at the rate for which it is designed.
- **Do not use tool if switch does not turn it on or off.** Any tool that cannot be controlled with the switch is dangerous and must be repaired.
- **Disconnect the plug from the power source before making any adjustments, changing accessories, or storing the tool.** Such preventive safety
- **Store idle tools out of reach of children and other untrained persons.** Tools are dangerous in the hands of untrained users.
- **Maintain tools with care**. **Keep cutting tools sharp and clean.** Properly maintained tools, with sharp cutting edges are less likely to bind and are easier to control.
- **Check for misalignment or binding of moving parts, breakage of parts, and any other condition that may affect the tools operation. If damaged, have the tool serviced before using.** Many accidents are caused by poorly maintained tools.
- **Use only accessories that are recommended by the manufacturer for your model.** Accessories that may be suitable for one tool, may become hazardous when used on another tool.

1.5 Service

- **Tool service must be performed only by qualified personnel.** Service or maintenance performed by unqualified personnel could result in a risk of injury
- **When servicing a tool, use only identical replacement parts. Follow instructions in**
- **the Maintenance section of this manual.** Use of unauthorized parts or failure to follow Maintenance instructions may create a risk of electric shock or injury.

1.6 Specific safety rules

- **Hold tool by insulated gripping surfaces when performing an operation where the cutting tool may contact hidden wiring or its own cord.** Contact with a "live" wire will make exposed metal parts of the tool "live" and shock the operator.

- **Never lubricate aerosol oil on to the electrical part.**

2. PRODUCT

It consist of DC Servo screwdriver and controller as a complete system.

1) Screwdriver packing :

x1 screwdriver
x1 CE declaration of conformity
x1 calibration test certificate (original to be preserved)

2) Controller packing :

x1 MDTC38 controller
x1 power cable with type E and F electrical plug
x1 CE declaration of conformity

3) Cable packing :

x1 MDT cable with 14 pins connectors

3. MAIN FEATURES

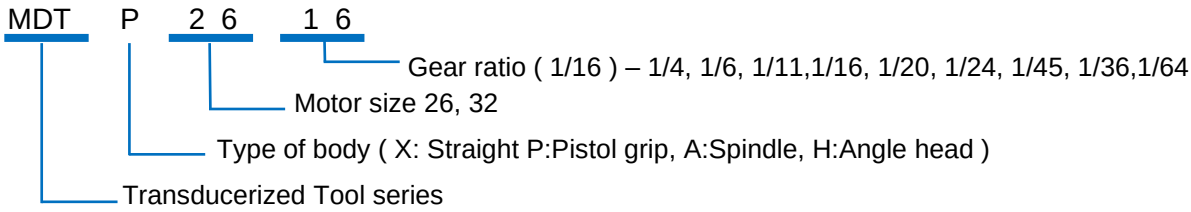
1) Digital torque and angle program in 15 preset numbers and 2 multi step sequence programs
2) 15 Models managing variable presets with counting no. and I/O in sequential 10 steps
3) Color LCD touch screen with easy control
4) Auto speed setting by torque
5) Monitoring fastening quality and count of screw numbers
6) Error information by code display
7) Easy parameter setting and monitoring by ParaMonMDTC (PC software)
8) Real time torque data and curve display
9) Real time fastening data output
10) Modbus protocol and OpenProtocol
11) RS232C, Ethernet communication port

4. MDT SCREWDRIVERS

4.1 General specification

no	Item	Specification
1	Electric power	DC38V, 5A max
2	Motor	Swiss DC servo motor
3	Torque tranducer	Built-in
4	Angle encoder	Built in
5	Speed	Autospeed by torque setting or manual

4.2 Model specification



- Straight hand-held (Lever start)

Model	Torque (N.m)	Speed (rpm)	Weight (g)	Bit Socket	Controller
MDT2604	0.2~1.4	150~1500	535	Hex 1/4”	MDTC-38
MDT2611	0.4~3.4	100~900	555	Hex 1/4”	
MDT2616	0.5~5.0	100~620	555	Hex 1/4”	
MDT3204	0.4~4.0	100~1800	830	Hex 1/4”	
MDT3206/L	0.6~6.5	100~1250	915	Hex 1/4”	MDTC-38
MDT3211/L	1.5~11.5	50~690	990	Hex 1/4”	
MDT3216/L	2 ~16	50~470	1000	Hex 1/4”	
MDT3220/L	3 ~20	50~375	995	SQ 3/8”	
MDT3224/L	4 ~24	50~310	1000	SQ 3/8”	
MDT3236/L	5 ~33	50~200	1005	SQ 3/8”	
MDT3245/L	6 ~40	50~160	1080	SQ 3/8”	
MDT3264/L	8 ~57	50~115	1085	SQ 3/8”	

● Pistol grip hand held (Trigger start)

Model	Torque (N.m)	Speed (rpm)	Weight (g)	Bit Socket	Controller
MDTP3204	0.4~4.5	100~1800	990	Hex 1/4”	MDTC-38
MDTP3206	0.6~6.5	100~1250	985	Hex 1/4”	
MDTP3211	1.5~11.5	50~690	1060	Hex 1/4”	
MDTP3216	2~16	50~470	1070	Hex 1/4”	
MDTP3224	4~24	50~310	1070	SQ 3/8”	
MDTP3236	5~33	50~200	1075	SQ 3/8”	
MDTP3245	6~40	50~160	1150	SQ 3/8”	
MDTP3264	8~57	50~115	1155	SQ 3/8”	

● Angle head hand-held (Lever start)

Model	Torque (N.m)	Speed (rpm)	Weight (g)	Bit Socket	Controller
MDTH2604	0.2~1.4	150~1500	895	Hex 1/4”	MDTC-38
MDTH2611	0.4~3.4	100~900	915	Hex 1/4”	
MDTH2616	0.5~5.0	100~620	915	Hex 1/4”	
MDTH2628	1.8~8.0	50~300	920	Hex 1/4”	
MDTH3204	0.4~4.5	100~1800	1270	Hex 1/4”	
MDTH3206/L	0.6~6.5	100~1250	1335	Hex 1/4” or SQ 3/8”	
MDTH3211/L	1.5~11.5	50~690	1440	Hex 1/4” or SQ 3/8”	
MDTH3216/L	2 ~16	50~470	1445	Hex 1/4” or SQ 3/8”	
MDTH3220/L	3 ~20	50~375	1460	Hex 1/4” or SQ 3/8”	
MDTH3224/L	4 ~24	50~310	1465	Hex 1/4” or SQ 3/8”	
MDTH3236/L	5 ~33	50~200	1470	SQ 3/8”	
MDTH3245/L	6 ~40	50~160	1545	SQ 3/8”	
MDTH3264/L	8 ~57	50~115	1550	SQ 3/8”	

● Spindle for automation (Remote start by I/O)

Model	Torque (N.m)	Speed (rpm)	Weight (g)	Bit Socket	Controller
MDTA3204	0.4~4.5	100~1800	1070	Hex 1/4”	MDTC-38
MDTA3206	0.6~6.5	100~1250	1065	Hex 1/4”	
MDTA3211	1.5~11.5	50~690	1170	Hex 1/4”	
MDTA3216	2~16	50~470	1180	Hex 1/4”	
MDTA3220	3~20	50~375	1200	SQ 3/8”	
MDTA3224	4~24	50~310	1205	SQ 3/8	
MDTA3236	5~33	50~200	1210	SQ 3/8”	
MDTA3245	6~40	50~160	185	SQ 3/8”	
MDTA3264	8~57	50~115	1290	SQ 3/8”	

4.3 Max allowed axial force

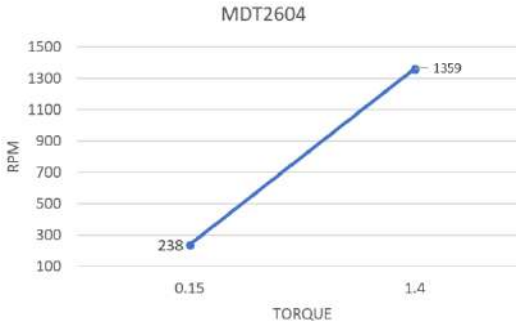
Identical for MDT, MDTP, MDTA

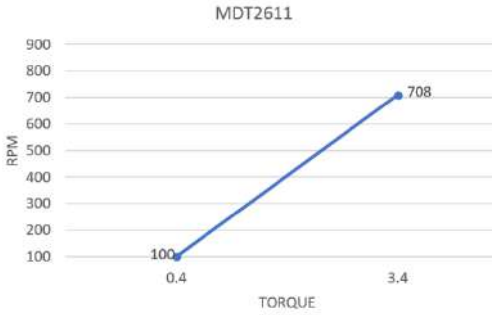
- MDT2604~16 : 50N max

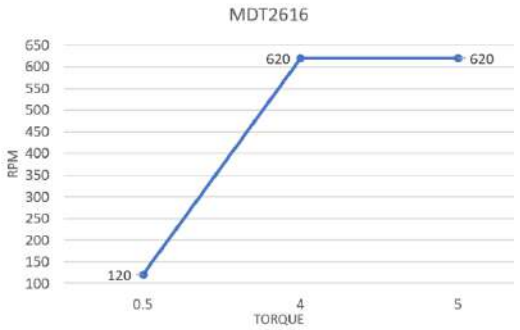
- MDT3204 ~ MD3264 : 100N max

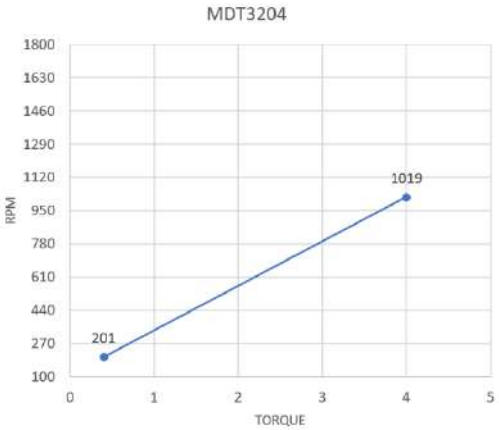
4.4 Auto Speed by torque setting under the each test condition

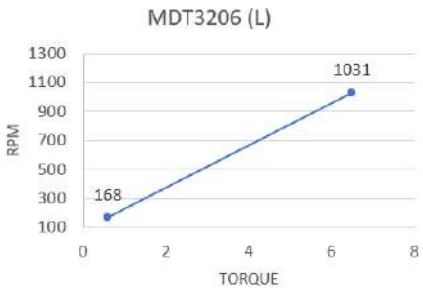
- Speed range : Available setting range by manual
- **Auto speed by torque setting** : Safe speed not exceeding over torque by rotation inertia under the testing conditions described on the chart

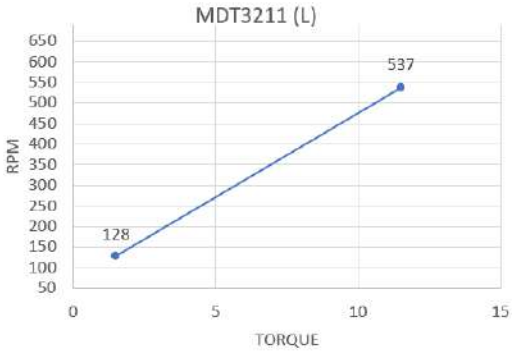


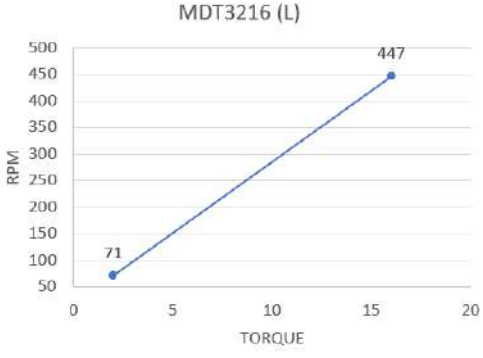


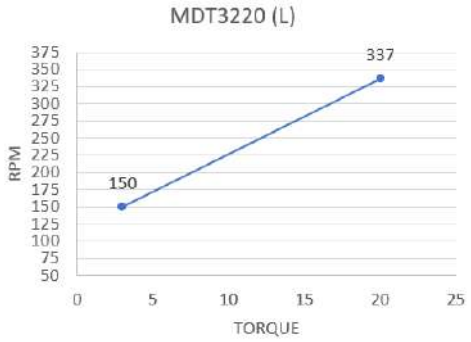


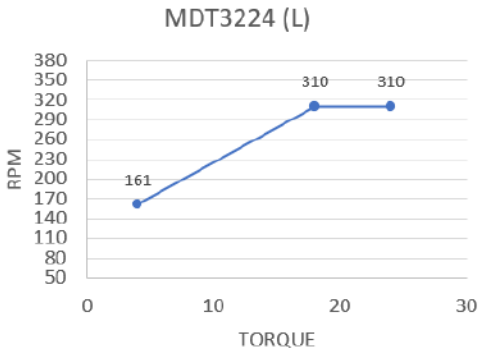


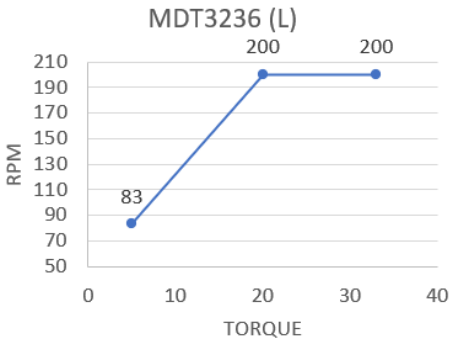


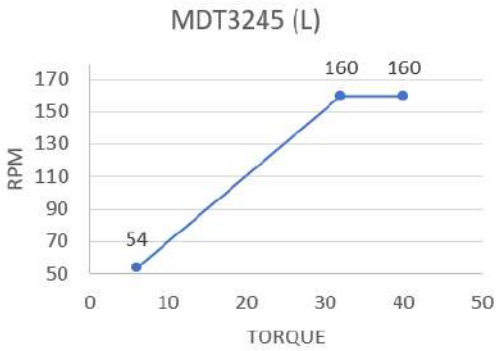


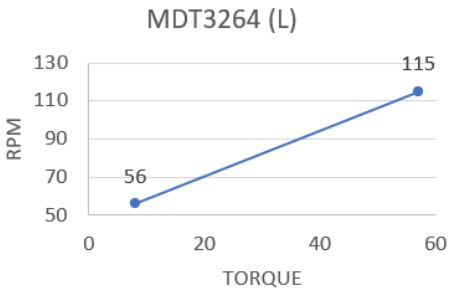



MDT3220 (L)
RPM
TORQUE
150
337


MDT3224 (L)
RPM
TORQUE
161
310
310


MDT3236 (L)
RPM
TORQUE
83
200
200

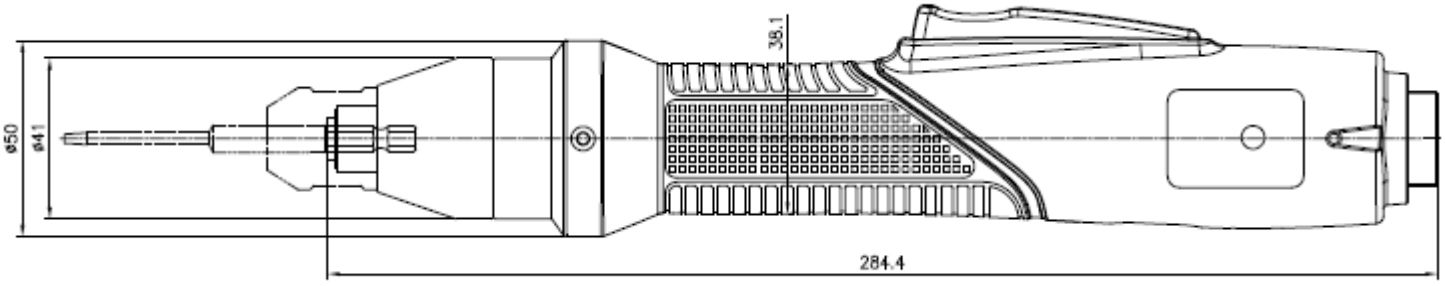

MDT3245 (L)
RPM
TORQUE
54
160
160


MDT3264 (L)
RPM
TORQUE
56
115

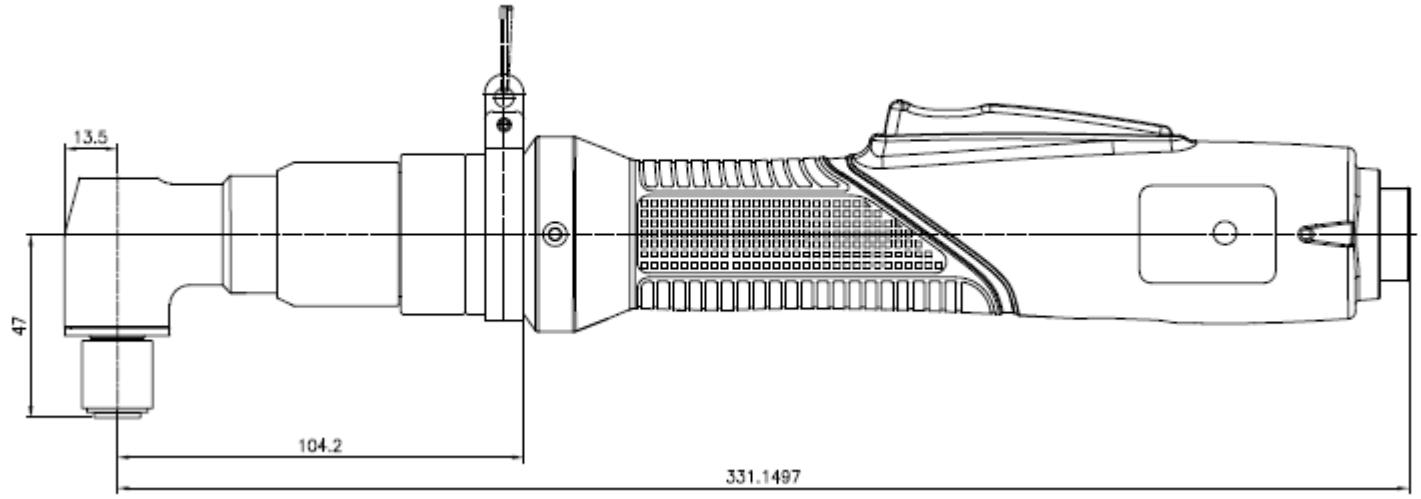
4.5 Screwdrivers overall dimensions

4.5.1 Straight MDT and angle head MDTH

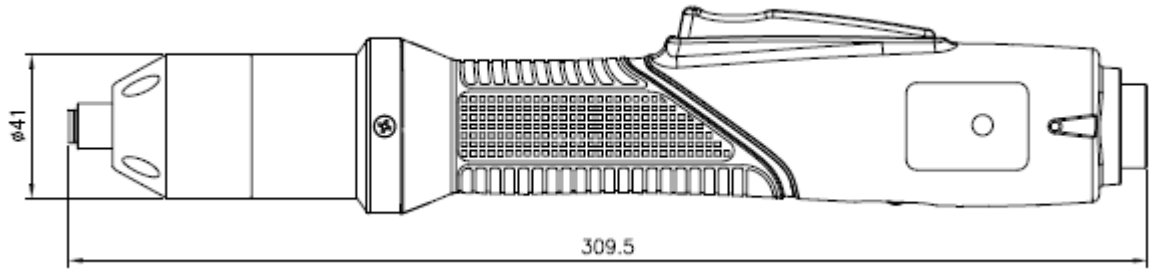
MDT3204-A



MDTH3204-A

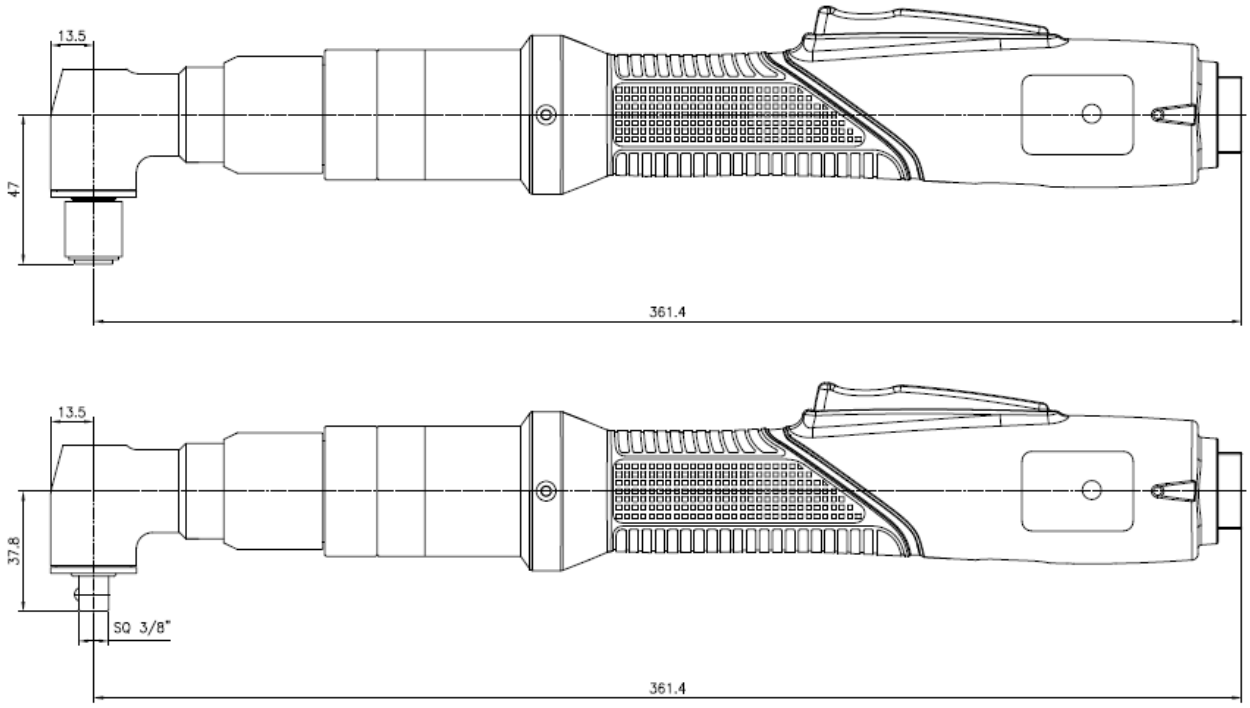


MTD3206-A/L

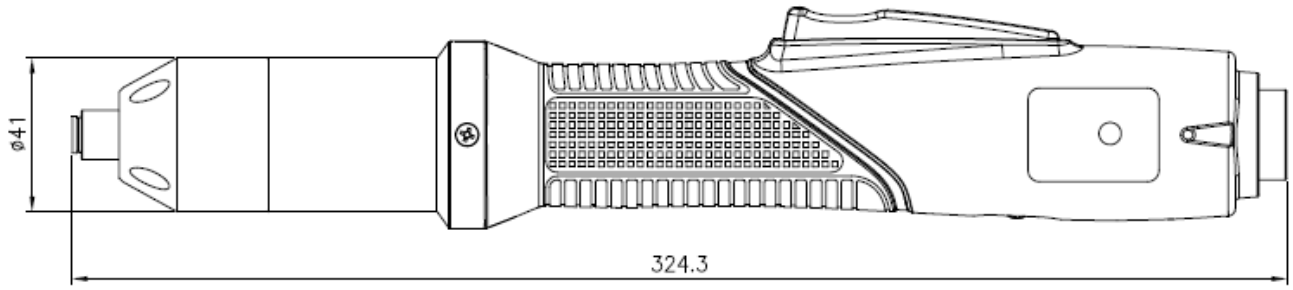


MDTH3206-A/L

MDTH3206-Q/L



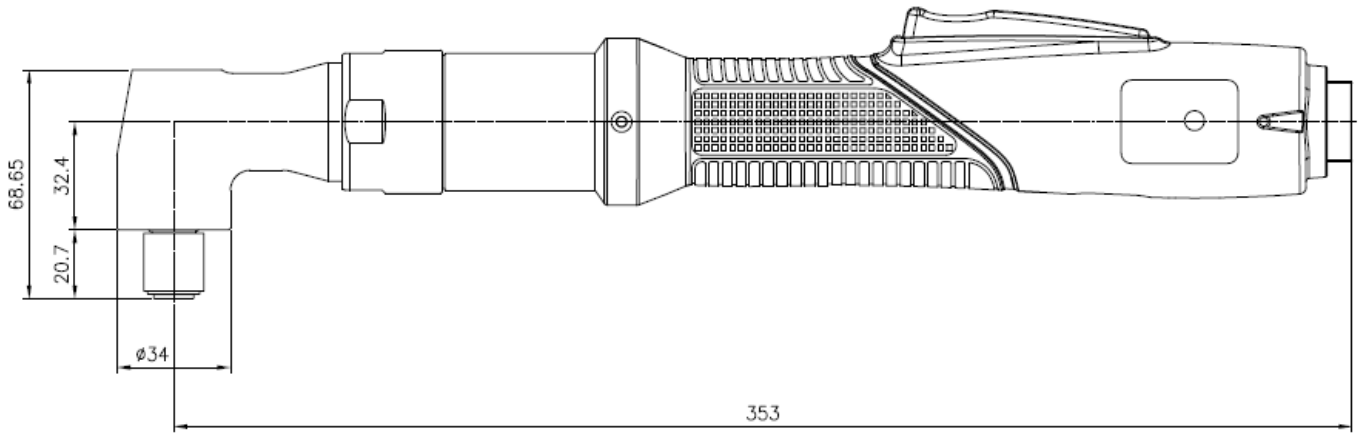
MDT3211, 3216, 3220, 3224-A/L



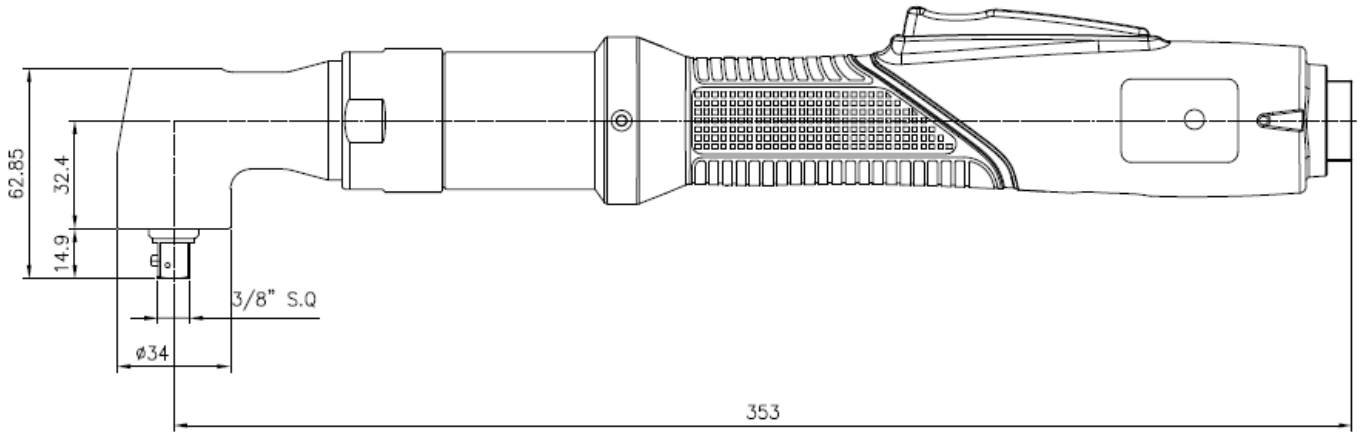
MDTH3211, 3216, 3220, 3224-A/L

MDTH3211, 3216, 3220, 3224-Q/L

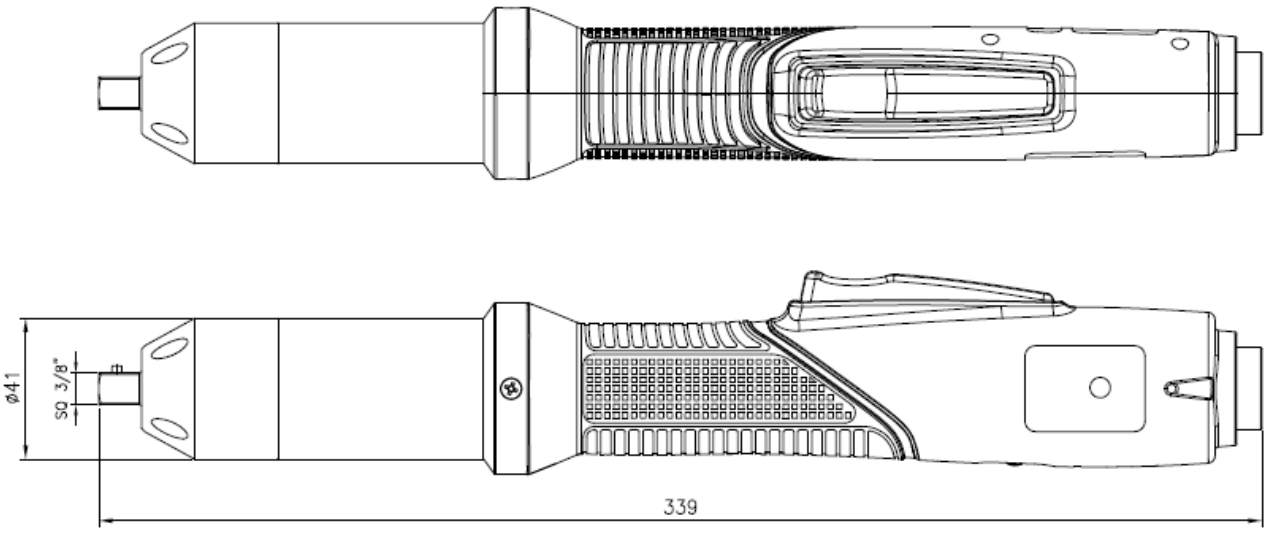
MDT3211,3216,3220,3224–A/L



MDT3211,3216,3220,3224–Q/L



MDT3245, 3264-Q/L



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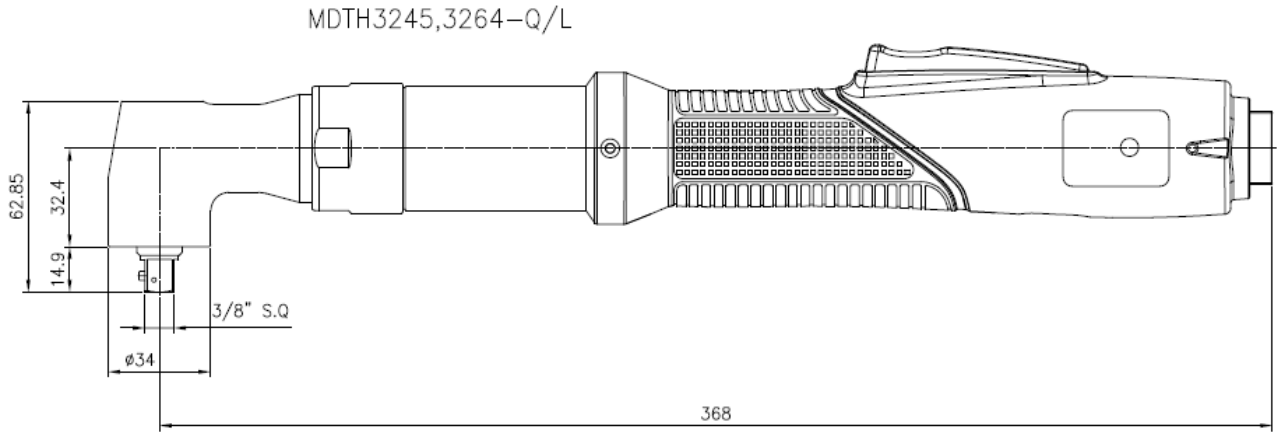
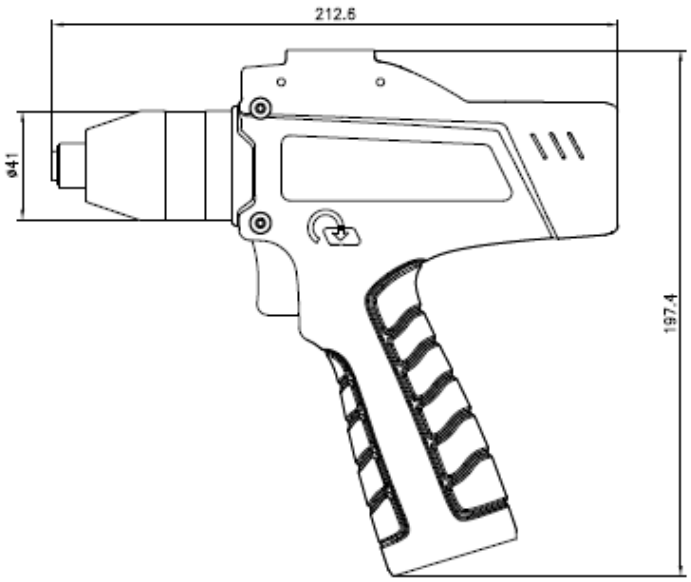
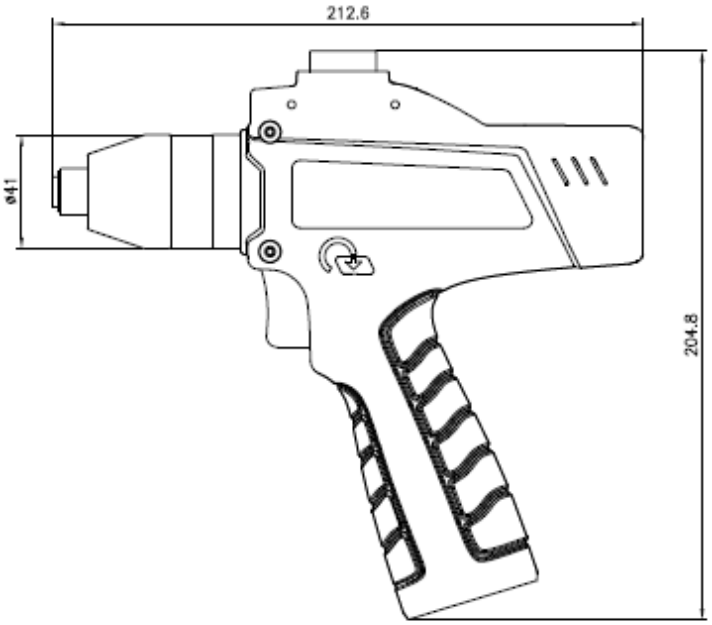


4.5.2 Pistol MDTP

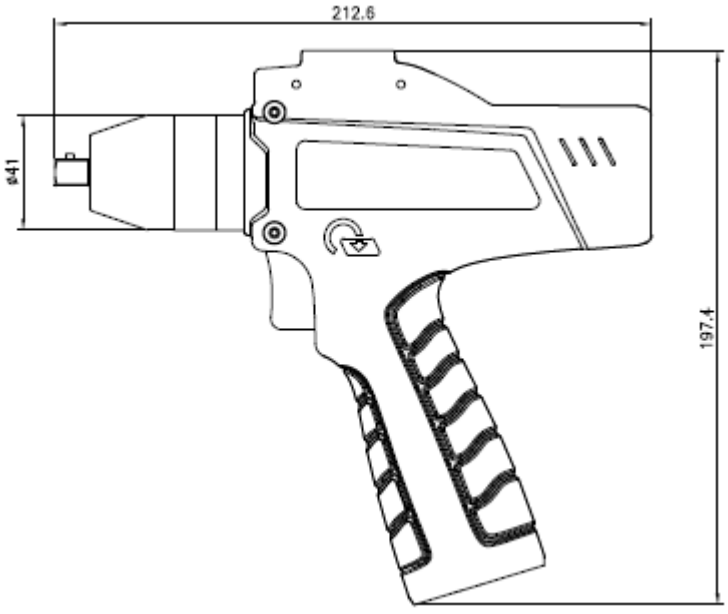
MDTP3204, 3206-A/D



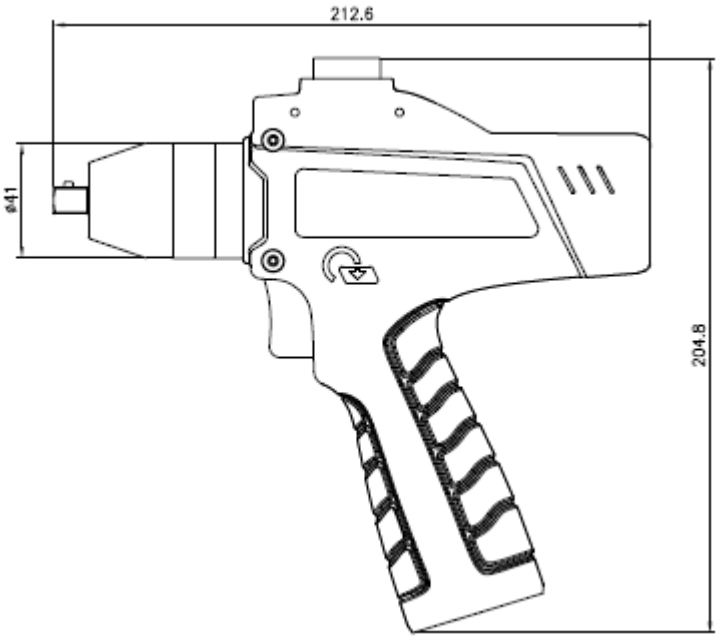
MDTP3204, 3206-A/U



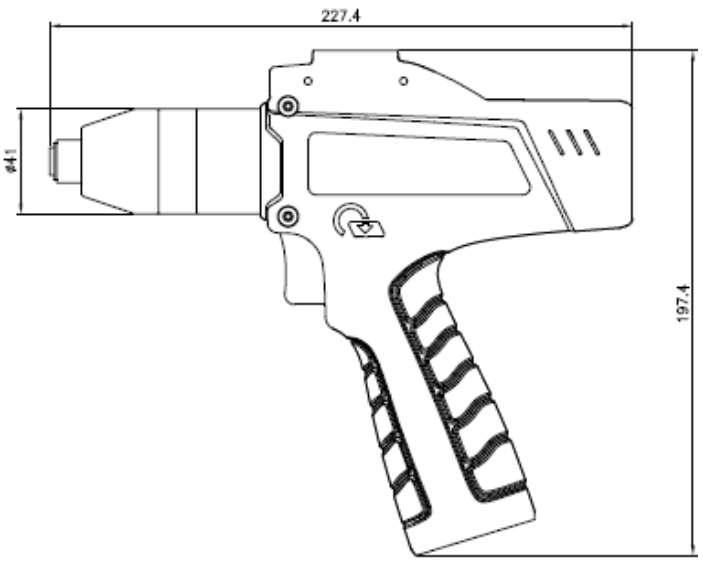
MDTP3204, 3206-Q/D



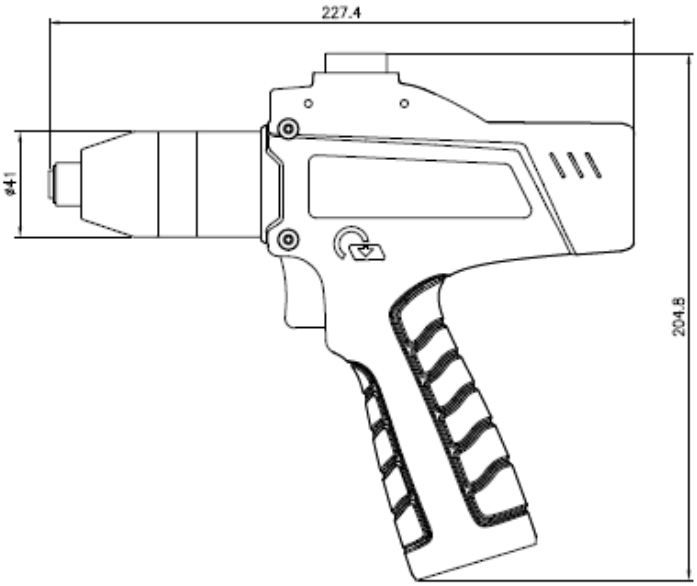
MDTP3204, 3206-Q/U



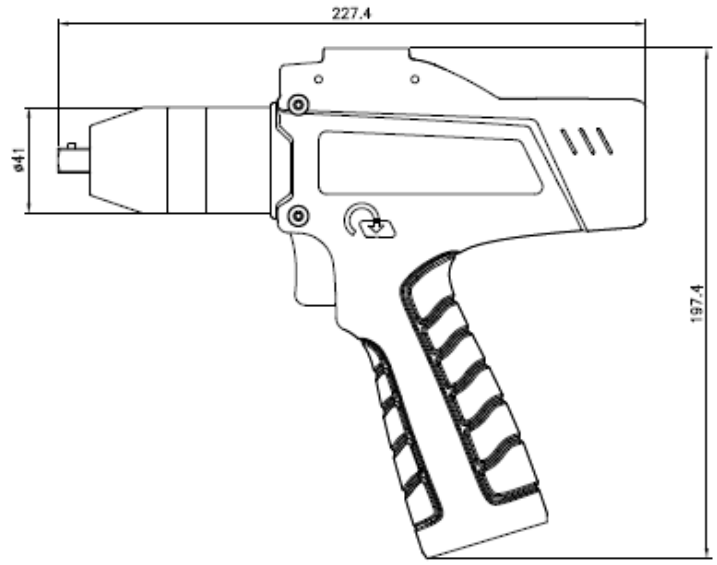
MDTP3211, 3216, 3220, 3224-A/D



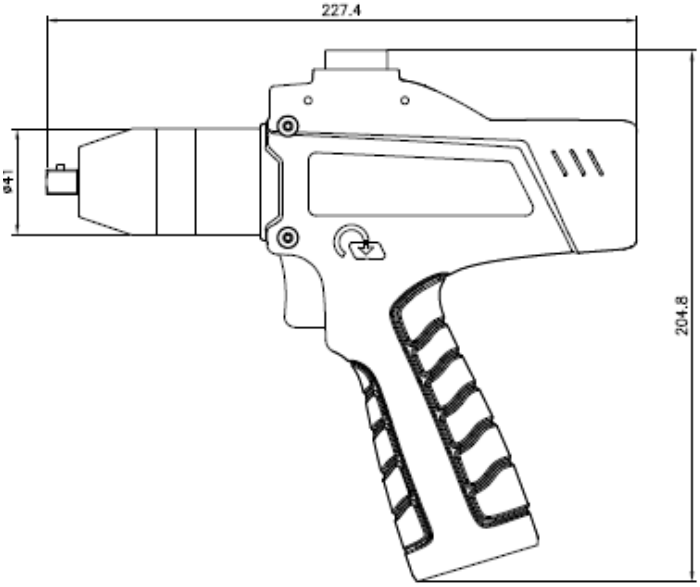
MDTP3211, 3216, 3220, 3224-A/U



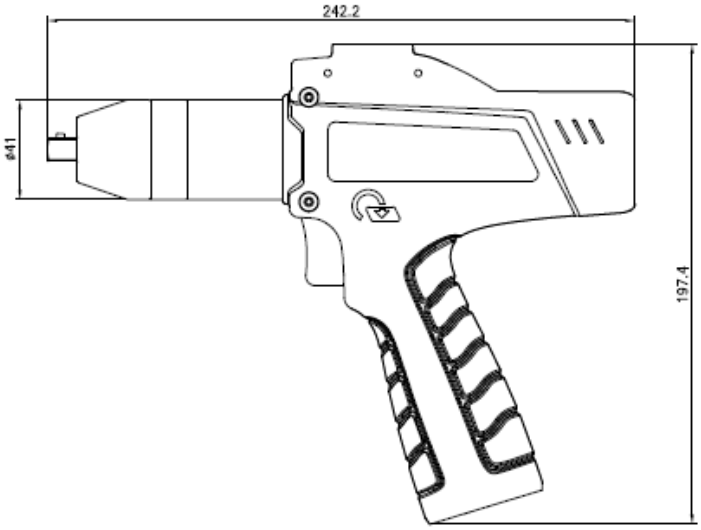
MDTP3211, 3216, 3220, 3224, 3236-Q/D



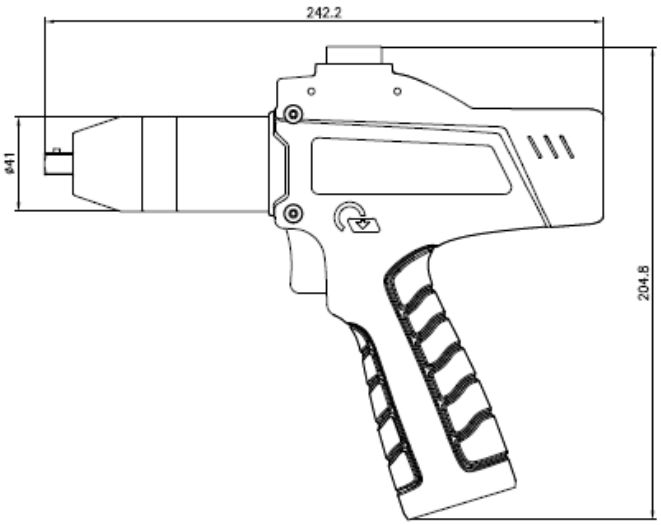
MDTP3211, 3216, 3220, 3224,3236-Q/U



MDTP3245, 3264-Q/D



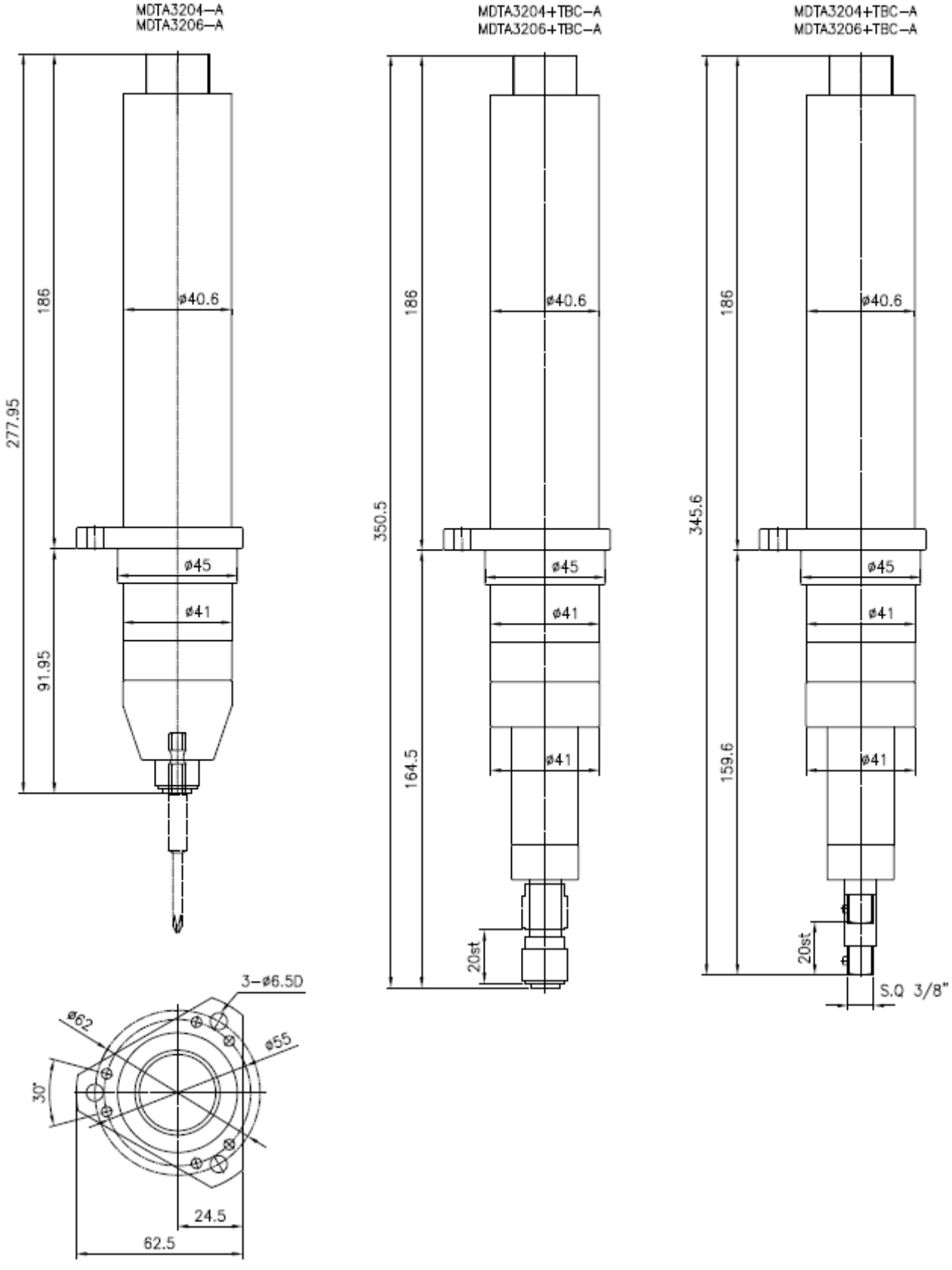
MDTP3245, 3264-Q/U



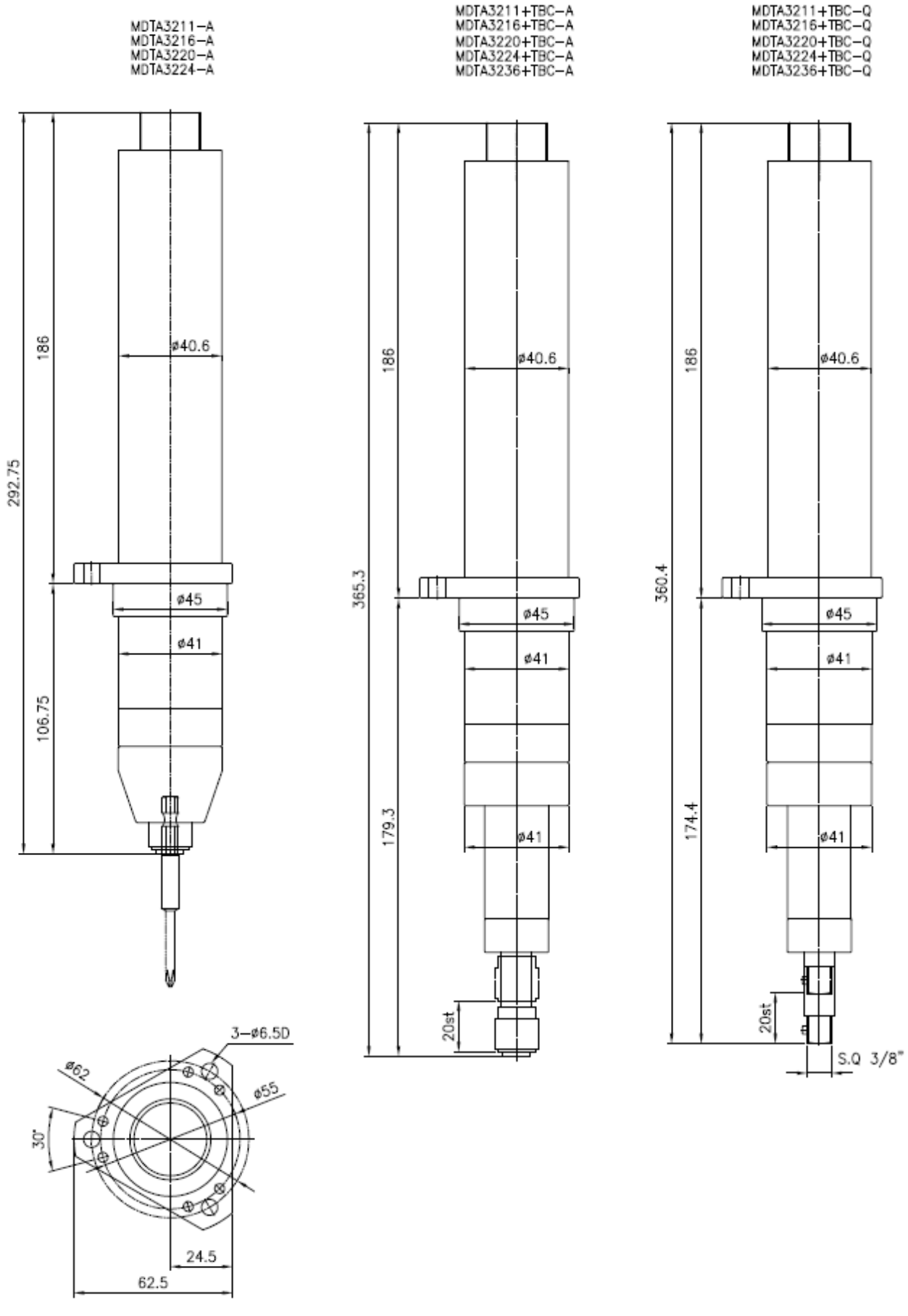
4.5.3 Spindles MDTA

MDTA3204, 3206-A

with telescopic cushion option

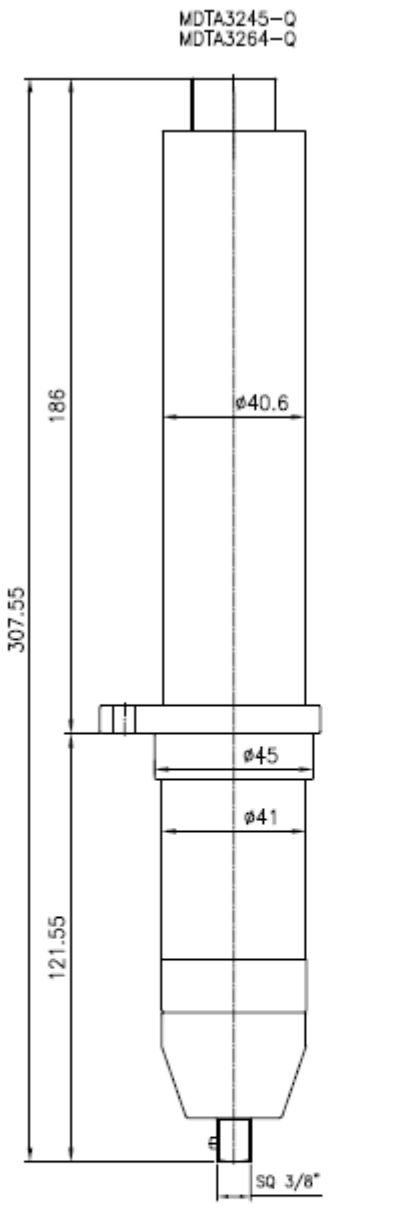


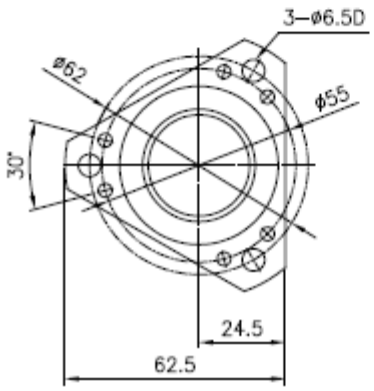
MDTA3211, 3216, 3220, 3224, 3236 -A & -Q with telescopic cushion option

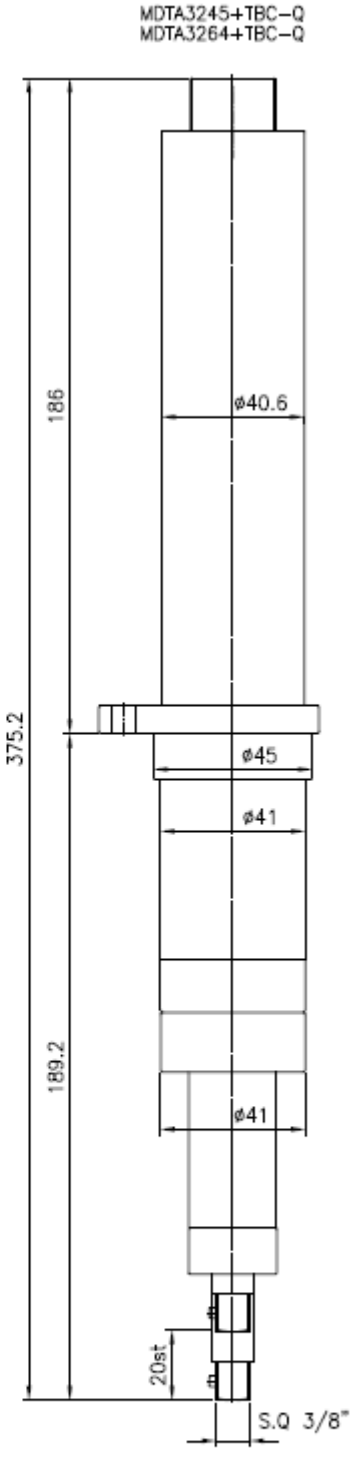


MDTA3245, 3264-Q

with telescopic cushion option







5. MDT SCREWDRIVER CABLE

5.1 Specification

Existing in several length :standard 3 meters and extra long 5 meters and 8 meters.

Cable with rectangular section to avoid twisting

No sense of connection (same connector on both side)

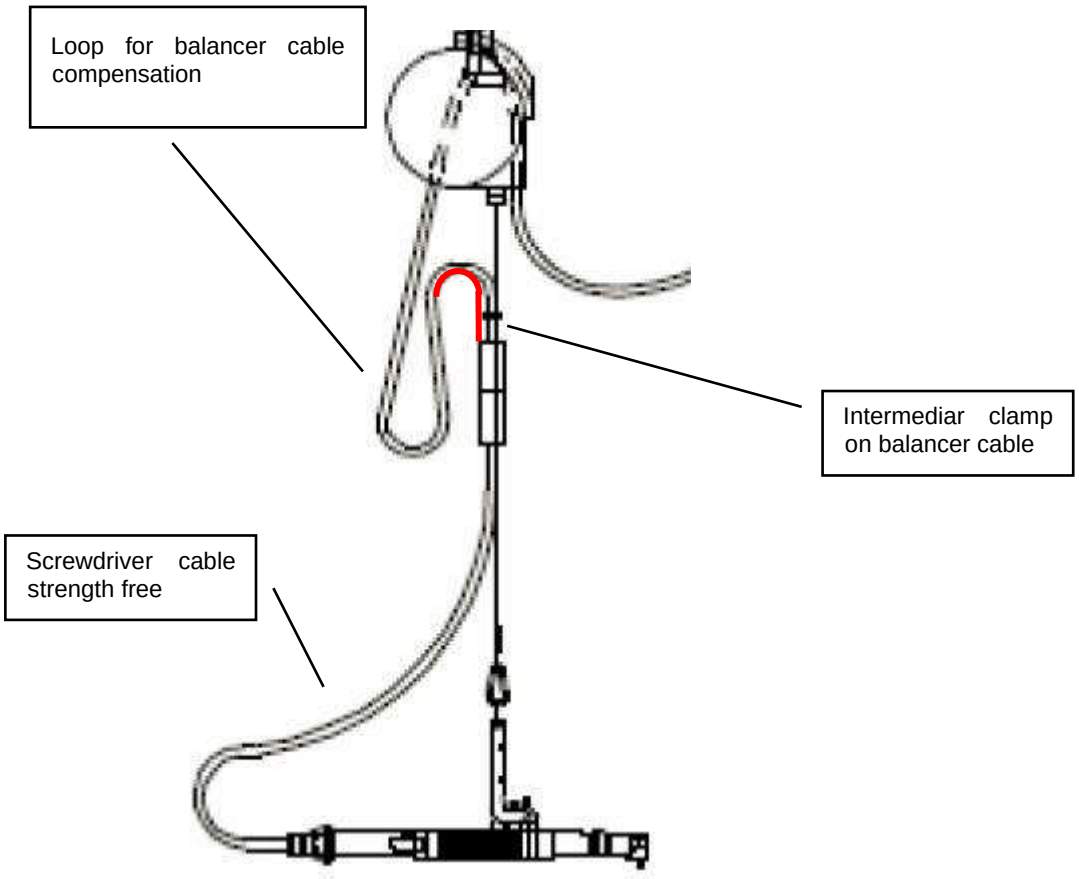
Important : screwdriver max torque can be lower than it's specification by 5% and 20% for extra long 5 and 8 meters cables

5.2 Installation

Cable management should be done in a way to avoid unormal strength and twist applied to cable than natural cable bending.

An appropriate cable management will Use appropriate accessories from

As example below :



Cable bend radius : 100mm minimum

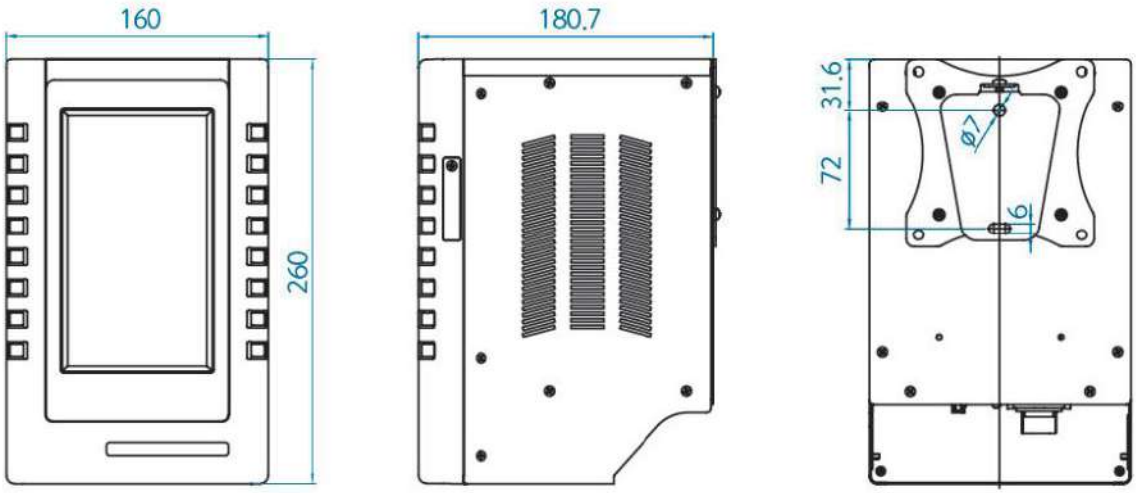
6. CONTROLLER MDTC

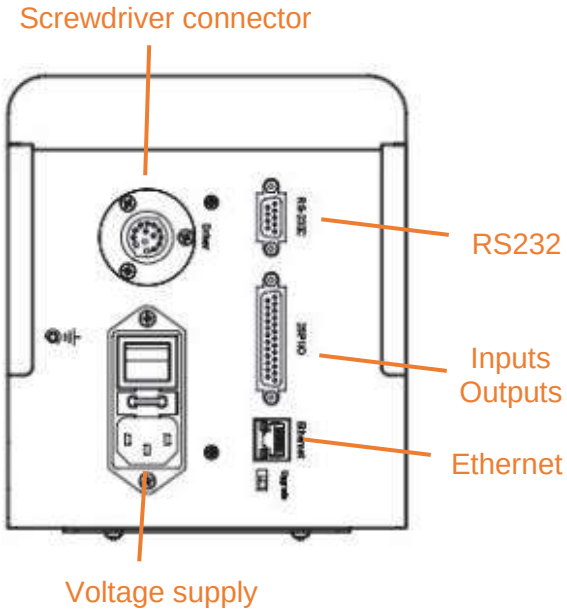
6.1 Specification

Model : one controller MDTC38 to drive all MTD screwdrivers or spindles models.

no	Item	Detail model MDTC38
1	Input	AC230V, 50/60Hz 2.5A
2	Output	DC38V 3.5A – 1 output for 1 screwdriver
3	Fuse	230V 5A
4	Operating environment	0 ~ 40℃ / 15 ~ 80% RH (without dew)
5	Front panel	7” Color LCD with touch screen
6	Communication	1 x RS232C, 1 x Ethernet
7	Protocol	Modbus, Open protocol
8	I/O	Connector 25P D-Sub female Inputs : port 1 to 8 flexible input port 9 to 15 inputs dedicated to model steps Outputs : port 1 to 8 flexible outputs
9	No. of program(Preset)	15 presets
10	No. of Job(Model)	15 jobs with each 20 steps
11	Type of steps	Fastening, Delay, Input & Output, Barcode
12	Torque compensation	- 10% ~ +10%
13	Screwdriver recognition	Auto detection of connected driver when power ON of controller and provide the verification result on the selected tool model
14	Error display	Error code display (3 groups)
15	Fastening result	Fastening data verification (NG/OK) by the preset pattern of angle.
16	Language	English, French, Spanish, German, Czech
17	Firmware update	By SD card
18	Parameter setting	On LCD screen, Web server, PC software, Protocol via com port
19	Mounting bracket	Standard VESA brackets

6.2 Controller layout and connectors





Vertical mounting on the back side :

Standard

Option

Option

7. OPERATION

7.1 Getting started at first power on or after screwdriver change.

It is really important to initialize the controller and driver as a set, before attempting to make any settings, as the information stored within the controller during testing at time of manufacture may not correlate with the driver shipped with the system.

- Connect screwdriver to controller with supplied cable
- Connect controller power cable
- Power on controller with power switch
- If controller screen display error message E114 press reset button
- Click on 

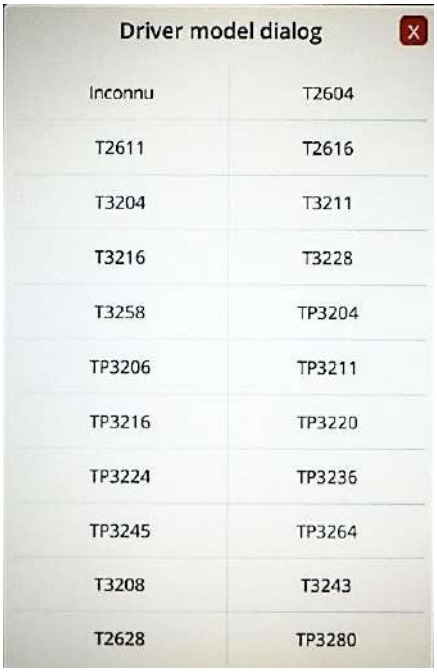
- On login screen, note screwdriver model
- Enter Login with default password ‘0’
- Click on 

- Click on 

- Open Driver model list 

- Select your screwdriver with the model mentioned on Login screen

  MDT, MDTP ,MDTH ,MDTA are all named Txxxx or TPxxxx



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

Torque unit setting

Default torque unit is N.m
If you need to set a different torque unit, continue setting as follows :

Changing torque unit will reset all parameters.

- Click on 

- Enter Login with default password ‘0’
- Enter Login with default password ‘0’
- Click on 

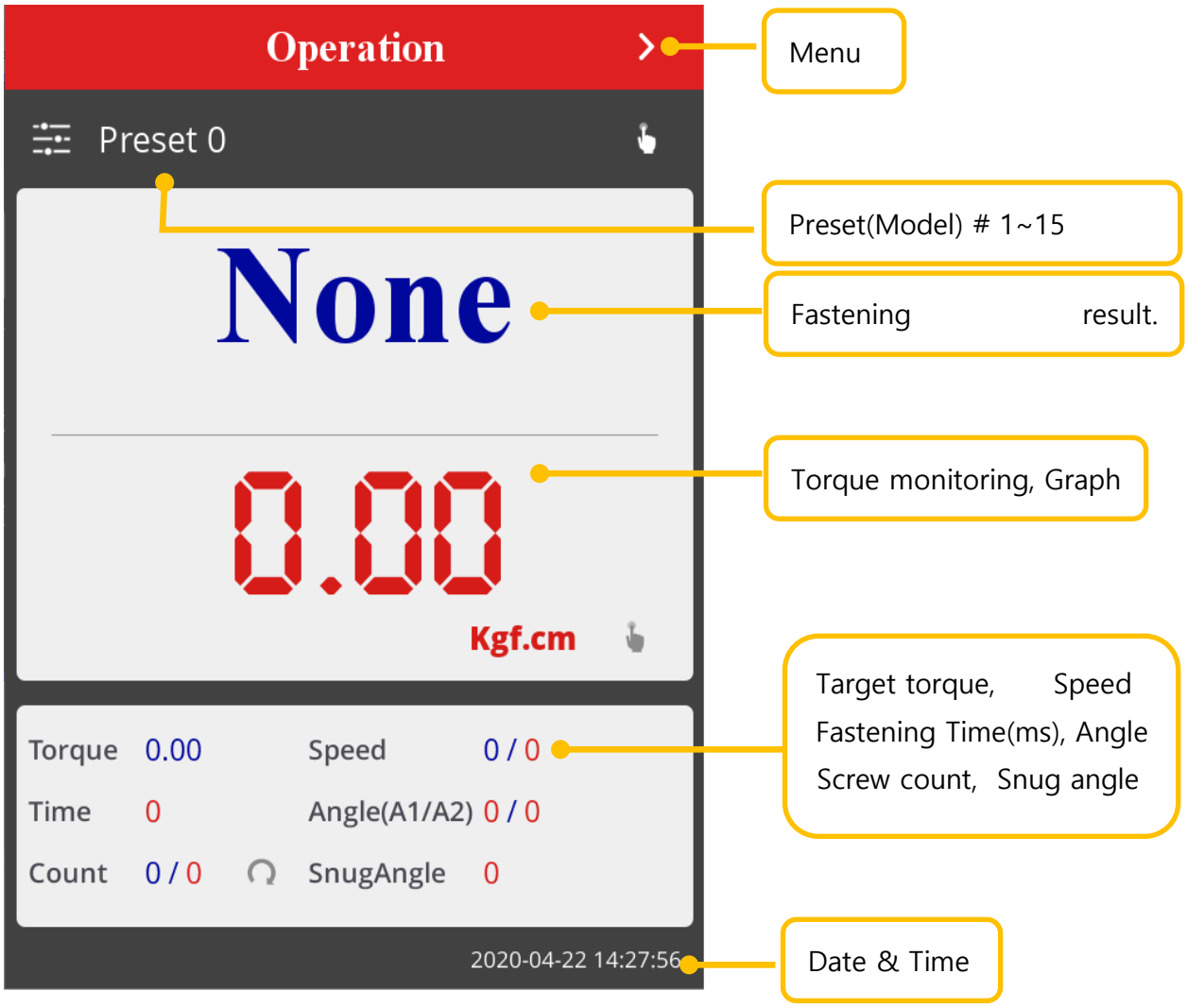
- Click on 

- Open Torque unit 

- Select unit in the list

Power reset is done automatically and parameters are reset to torque unit default settings.

7.2 Operation screen



Real-time monitoring data and target data display on screen.

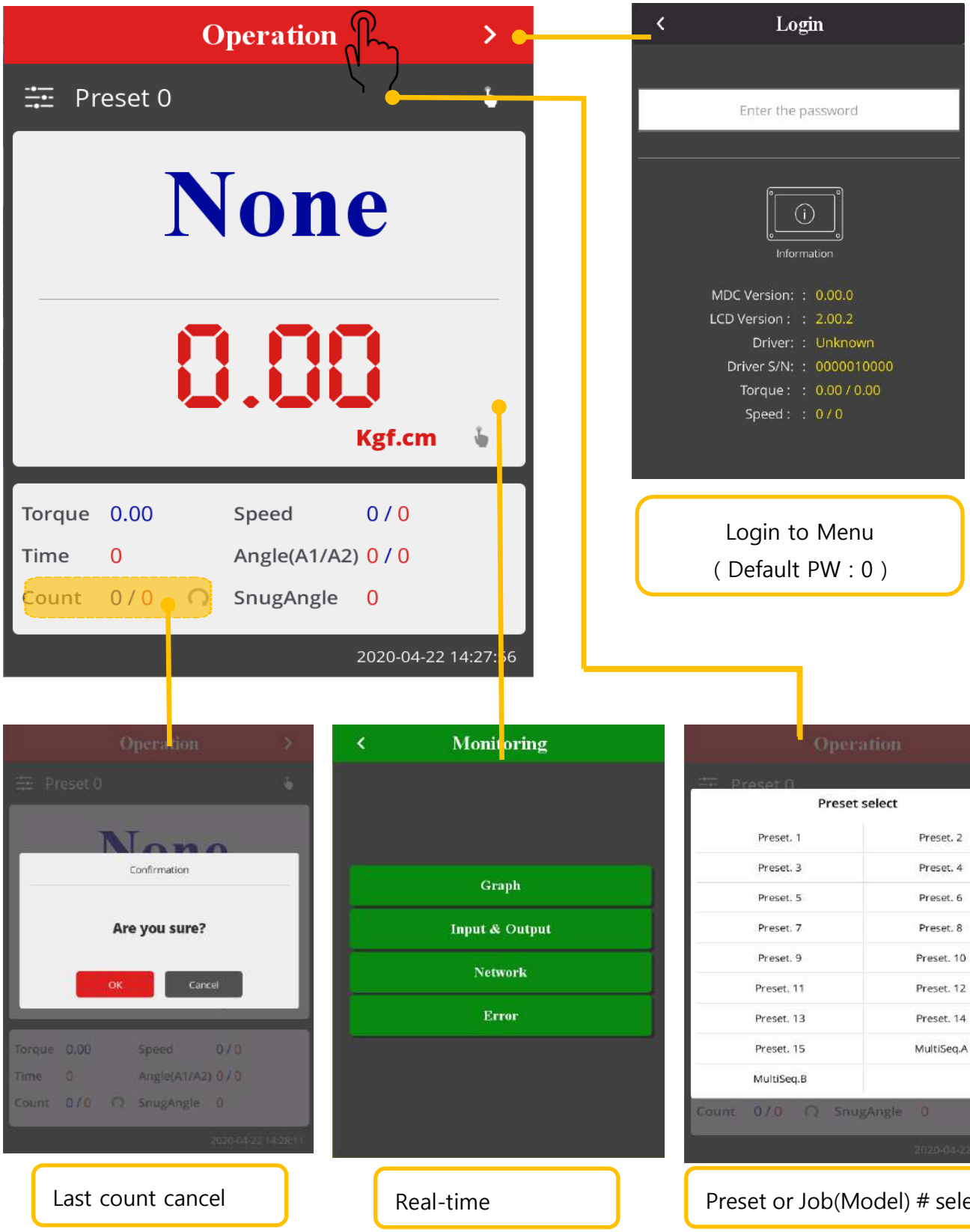
click  button for move to other menu.

There is 4 group of menu

Parameter, Monitoring, Remote(control) and Setting

It requires the log-in password to access these menu

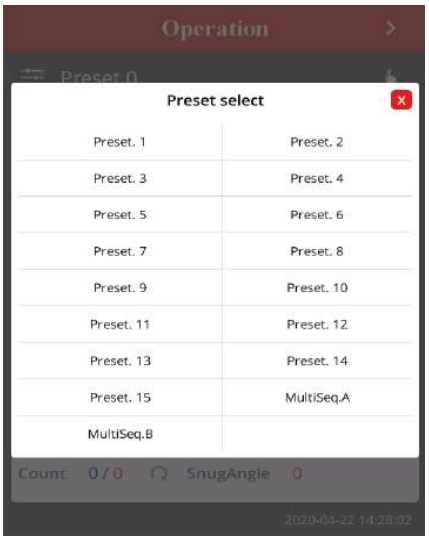
- **Touch screen field**



7.3 Presets or Model select

Before use Model mode, operator require to change parameter, (Parameter>Controller> “Model select” On)

There are 15 presets of program. Each preset contains the following parameters



Each preset # consist of the total 30 parameters in two group including Advanced # 1 to 15 which is optional parameters

Preset 1 ~ 15

Parameter settings

1. Type (TC/AM or AC/TM)
2. Target Torque or Max torque
3. Torque limit(%) or Min torque
4. Target angle or No use
5. Min angle
6. Max angle
7. Snug torque
8. Speed
9. Angle for free speed
10. Free speed
11. Soft start
12. Seating point
13. Torque rising time
14. Ramp-up speed
15. Torque compensation

Advanced 1 ~ 15

Advanced Function parameter

1. Free reverse rotation
   - Speed, Angle
2. Prevailing
   - Min /Max torque
   - Speed, Angle
   - Angle start from prevailing
3. Engaging torque detection
   - Speed, Torque(%)
   - Angle limit (turn)
   - Time limit (sec)
   - Angle start from engaging
4. Angle after torque-up
   - Speed
   - Angle
   - Direction

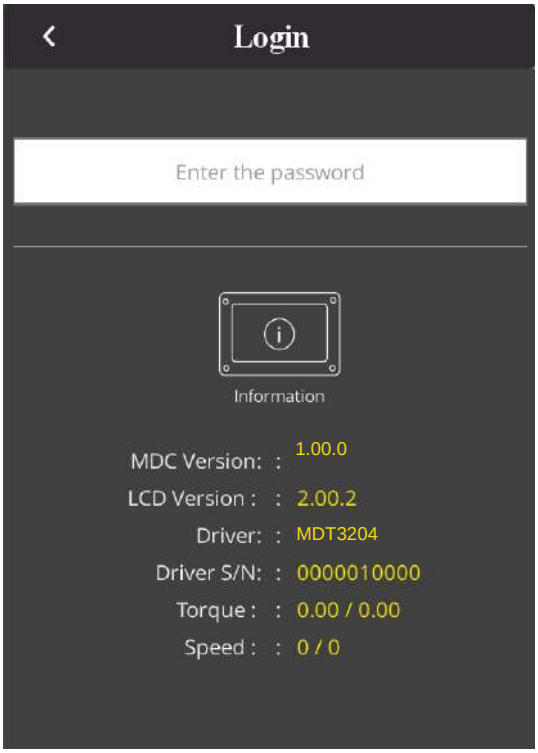
7.4 Parameters

Parameter menu require password to log in the initial factory setting is " 0 " for password

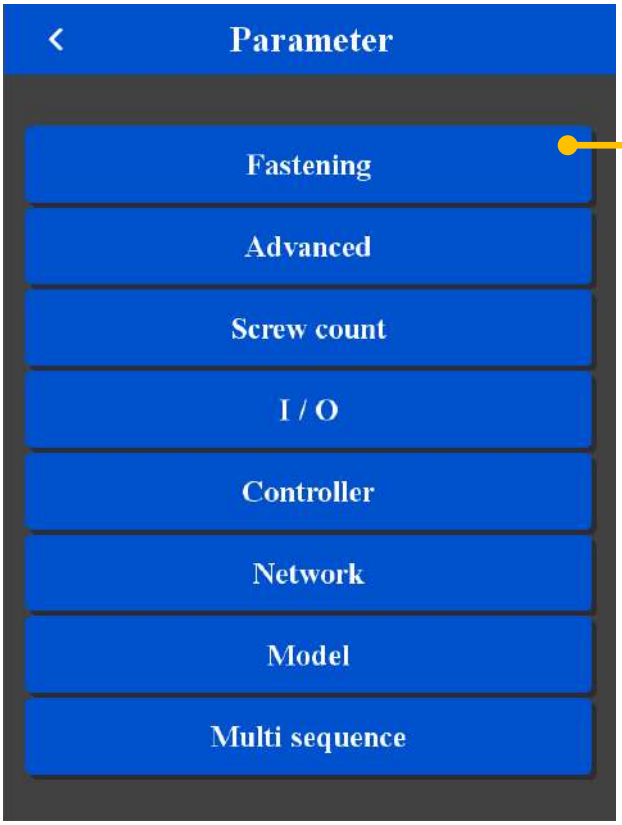
The password can be changed once log in.

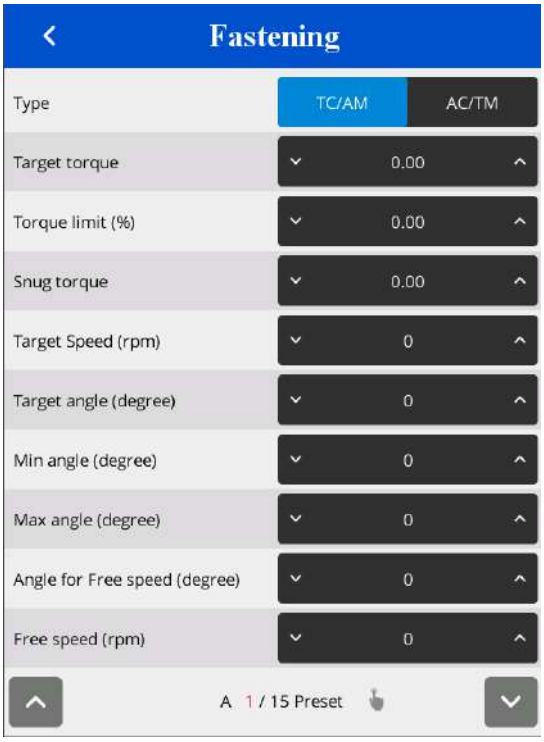
There are approx.. 950 address for each parameters. Parameters are grouped for each settings as below

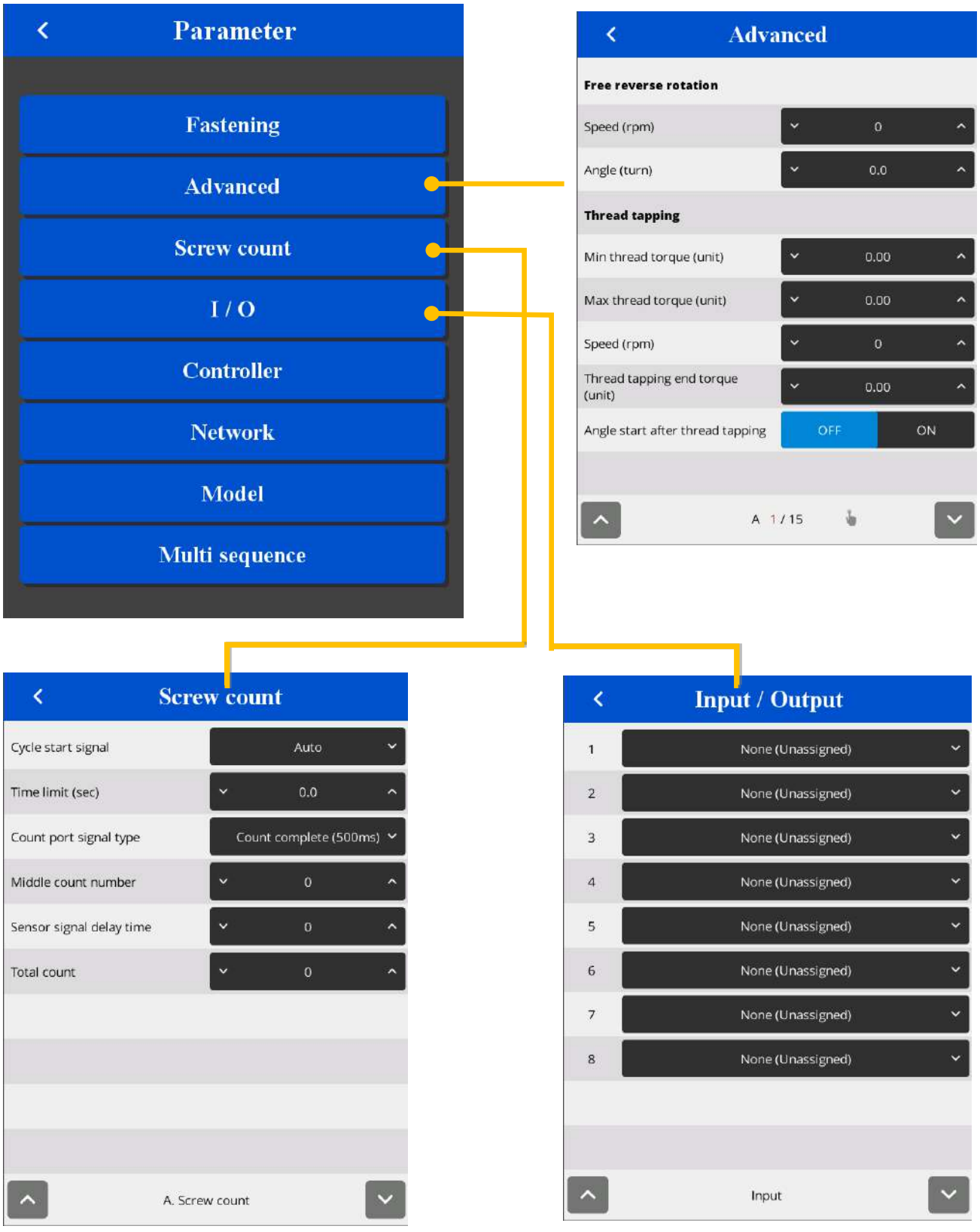
On the log in window, there are tool information about controller firmware version, LCD UI graphic version and option card firmware version, screwdriver model, serial no.

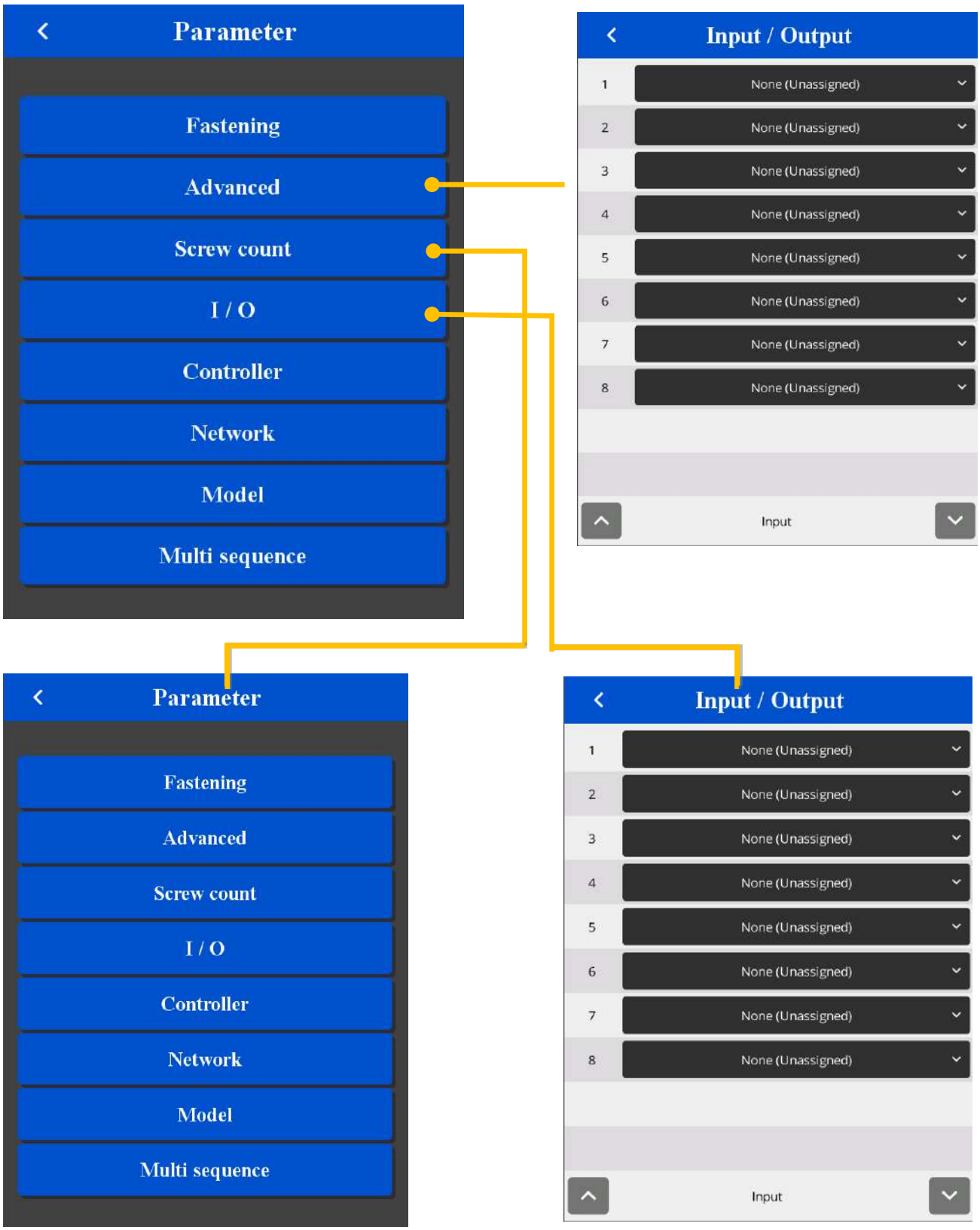


To program each Presets, Click, Operation and go to Parameter






Parameter
Fastening
Advanced
Screw count
I / O
Controller
Network
Model
Multi sequence
Advanced
Free reverse rotation
Speed (rpm)
0
Angle (turn)
0.0
Thread tapping
Min thread torque (unit)
0.00
Max thread torque (unit)
0.00
Speed (rpm)
0
Thread tapping end torque (unit)
0.00
Angle start after thread tapping
OFF
ON
A 1 / 15
Screw count
Cycle start signal
Auto
Time limit (sec)
0.0
Count port signal type
Count complete (500ms)
Middle count number
0
Sensor signal delay time
0
Total count
0
A. Screw count
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


Parameter
Fastening
Advanced
Screw count
I / O
Controller
Network
Model
Multi sequence
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
Parameter
Fastening
Advanced
Screw count
I / O
Controller
Network
Model
Multi sequence
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

7.5 Fastening settings

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

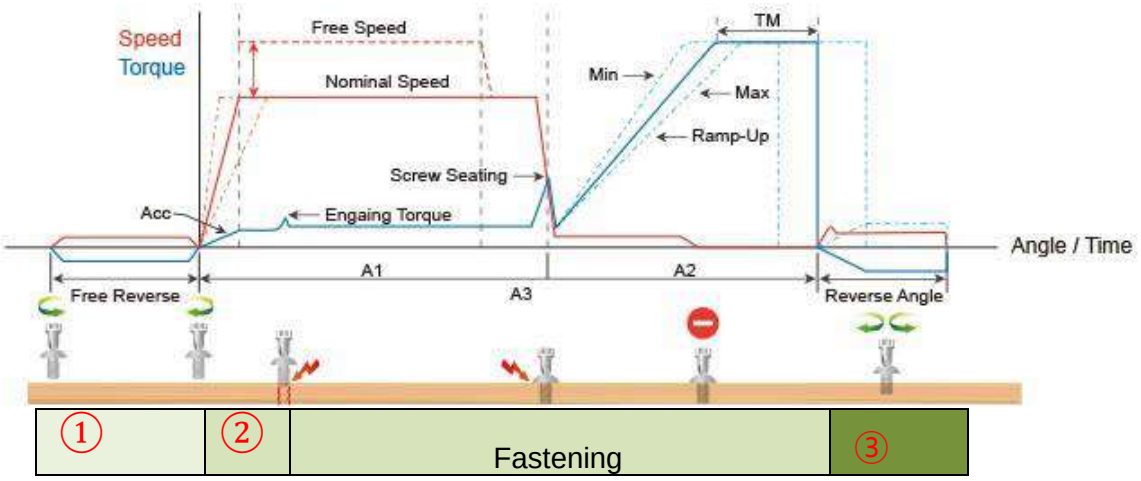
Preset selection

Type			
	Unit	Range	Initial
Description	Control type TC/AM : torque control/ angle monitoring AC/TM: angle control/ torque monitoring		
Torque target/ Max torque			
	Unit	Range	Initial
	set up in controller	Tool range	
Description	TC/AM : Target torque AC/TM : Max torque		
Torque limit / Min torque			
	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 to manual, Auto Speed must be Disabled in Controller menu		
Target angle			
	Unit	Range	Initial
	degree	0 ~ 20000	0
Description	Target angle in AC/TM mode		
Min angle			
	Unit	Range	Initial
	degree	0 ~ 20000	0
Description	Minimum angle to be OK in TC/AM mode		

Max angle			
	Unit	Range	Initial
	degree	0 ~ 20000	0
Description	Maximum angle to be OK in TC/AM mode		
Angle for Free speed			
	Unit	Range	Initial
	degree	0 ~ 20000	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		
Toque 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 chapter 9		

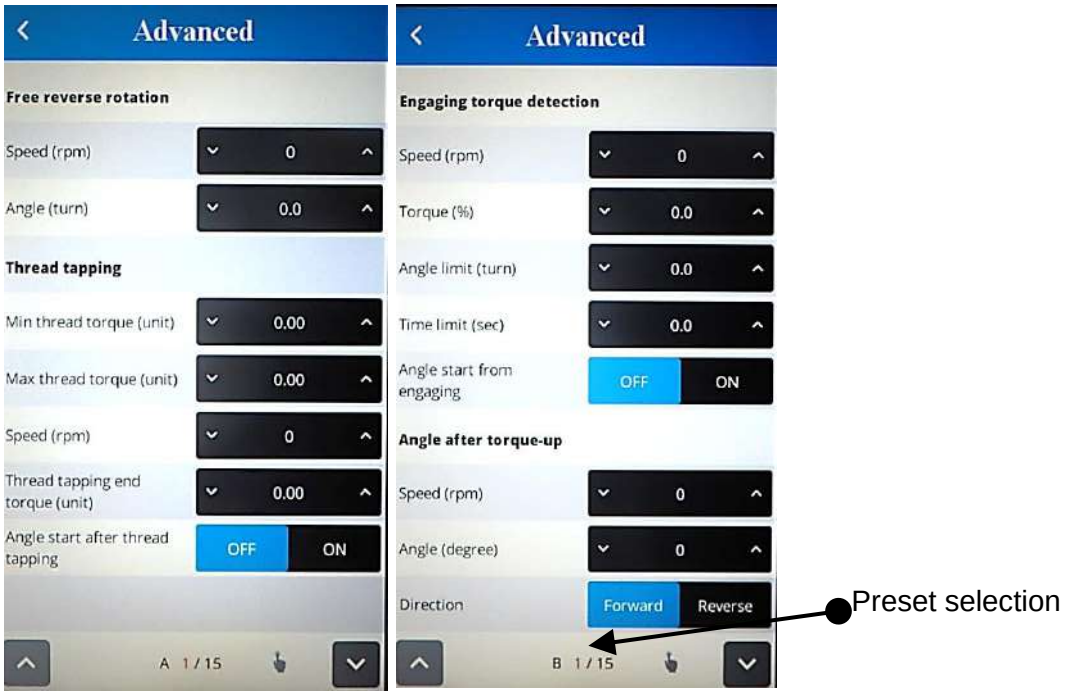
7.6 Advanced functions:
Free reverse rotation, Engaging torque detection, Angle after torque up Thread tapping

4 extra fonctions can be set **independantly** for each Preset



7.6.1 Free reverse rotation before Fastening

Free Reverse rotation to guide the screw into the screw hole smoothly with low speed



Speed			
	Unit	Range	Initial
	rpm	Tool range	0
Description	Tool reverse rotation speed		
Angle			
	Unit	Range	Initial
	0.1 turn	0 ~ 20	0
Description	Reverse rotation angle in rev		

7.6.2 Engaging Torque detection

It is possible only when the screw engaging provide significantly higher torque than 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			
	Unit	Range	Initial
	0.1 turn	0 ~ 20	0
Description	Max engaging rotation in rev		
Time limit			
	Unit	Range	Initial
	sec	0 ~ 10	0
Description	Max engaging timelap		
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.		

7.6.3 Angle after torque up

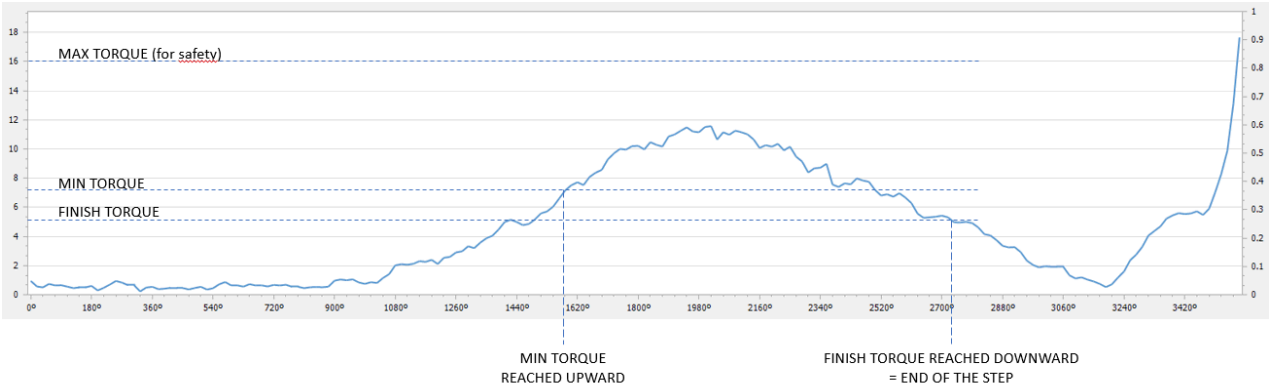
It manage extra angle control in both forward or reverse direction after tightening by torque.

Speed			
	Unit	Range	Initial
	rpm	Tool range	0
Description	Driver rotation speed		
Angle			
	Unit	Range	Initial
	degree	0 ~ 15000	0
Description	Rotation angle		
Direction			
	Unité	Range	Défaut
		Forward - Reverse	Forward
Description	Angle rotation direction		

7.6.4 Thread tapping

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

Typical thread tapping graph



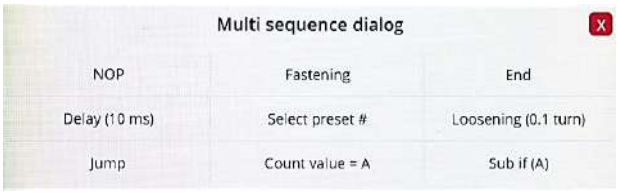
It is not the case in the trace above, but the tapping torque can be higher than target torque (tapping in metal sheets for example)

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.		

7.7 Multi Sequence settings

Multi sequence provide a cycle of fastening by a start signal.
Total 10 steps of programing is allowed in MA(Multi A) and MB(Multi B) presets
To program, select the command and required parameter on each step.
To finish the multi sequence programing, last step command should be “END”
For screw counting and I/O’s connexions, please use Models

◆



Command details

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 carreful : Data can be set from 0 et 999. Please set correct value in fields

Example : please refer to ParaMon Instruction Manual

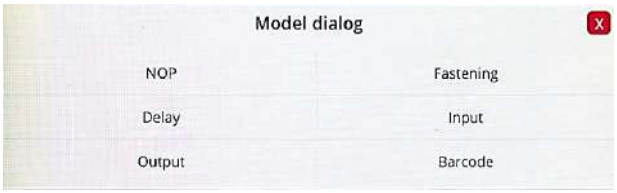
7.8 Model settings

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 : Input, Output, Fastening,Time delay and bar code 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 automaticaly 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

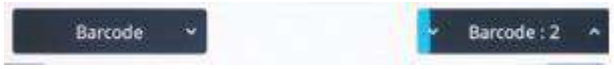
Possible settings

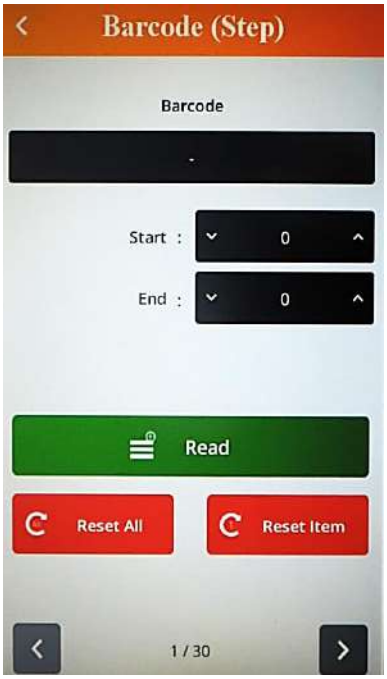
◆ Command details

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 multisequence .

Bar code : receiving a barcode to go to next step



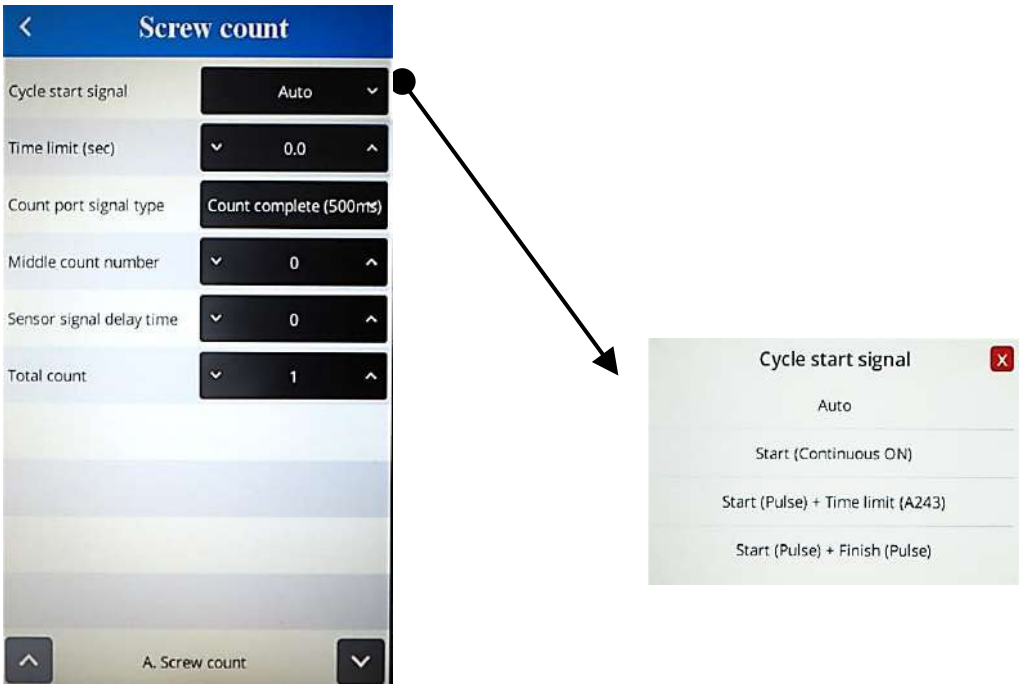


- If model barcode step data is set between 1 to 30 :
  It can go next step by receiving only barcode data scanned in setting menu 'Barcode(step)

- 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

7.9 Screw count settings

Screw count parameters are set for presets and models.



Sensor 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

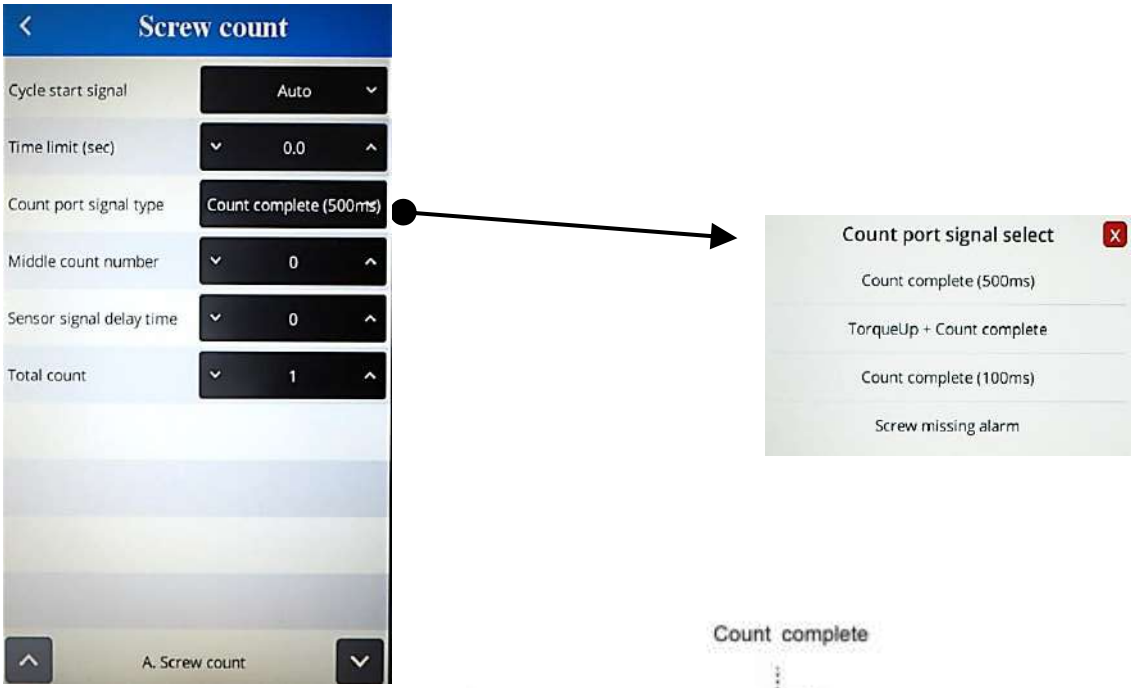
Time limit : only set if sensor signal is ‘start pulse+ time limit’
The fastening time limit from Count START for NG judgment.
The fastening work should be finished within the set time.
Otherwise, the work piece leave the working area

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.

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

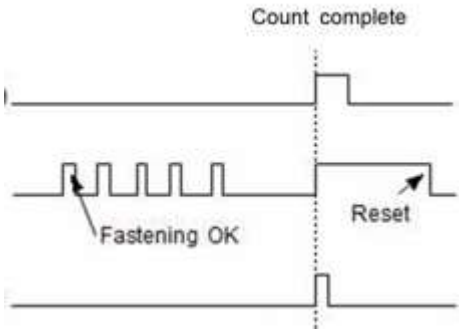


Count complete(500ms)

Torque up + Count complete

Count complete(100ms)

Screw missing alarm



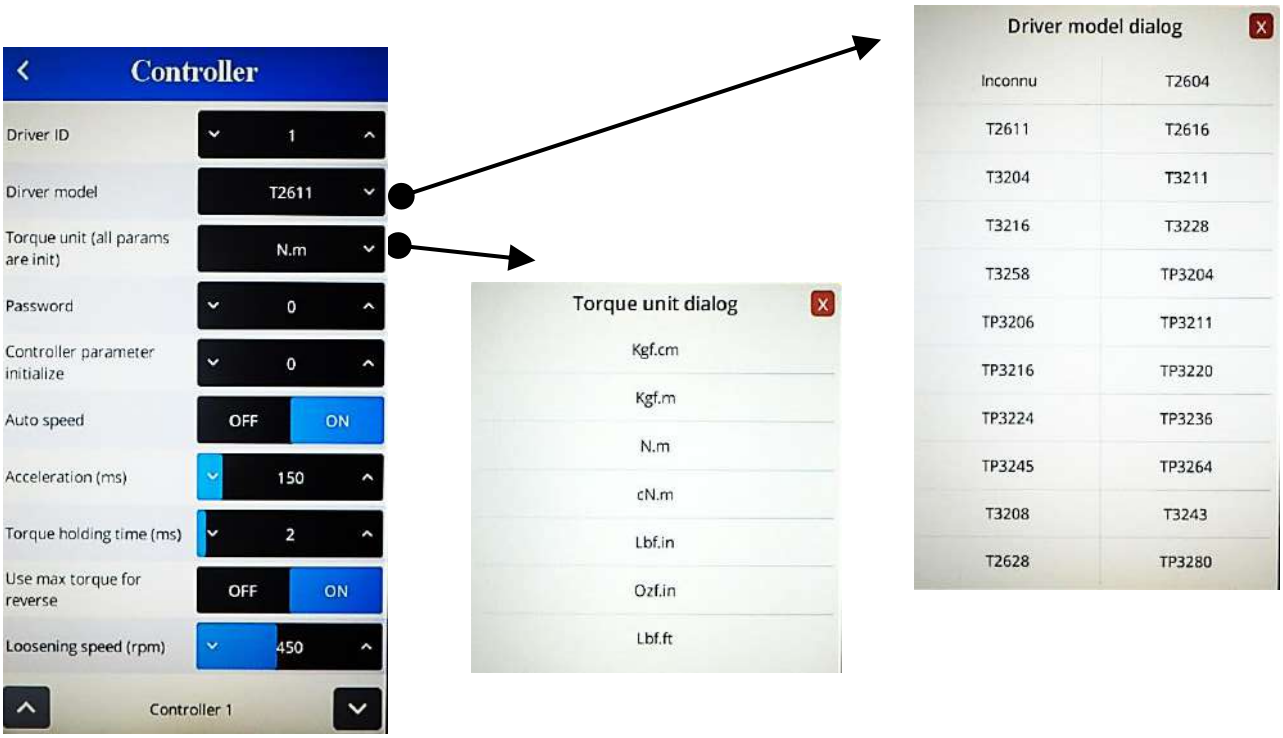
Count complete(500ms) : it provides 500ms of pulse type count complete signal after fasten all set numbers.

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 workpiece is tightened.

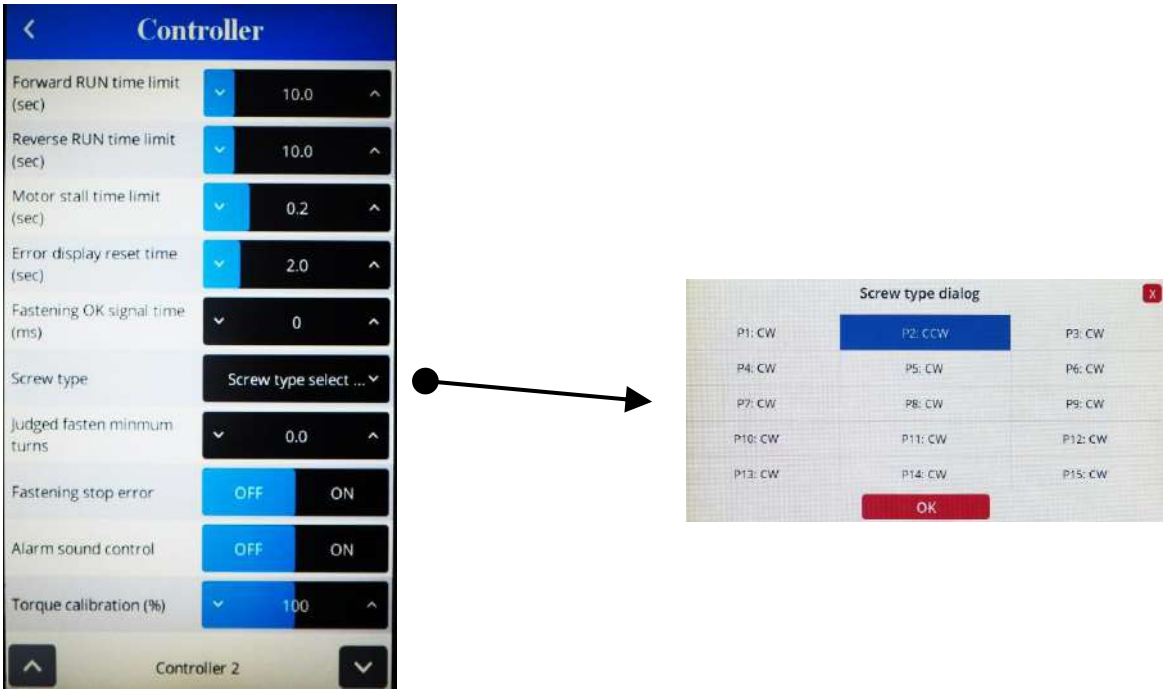
Count complete(100ms) : it provide a 100ms of pulse type count complete signal after fasten all set numbers.

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

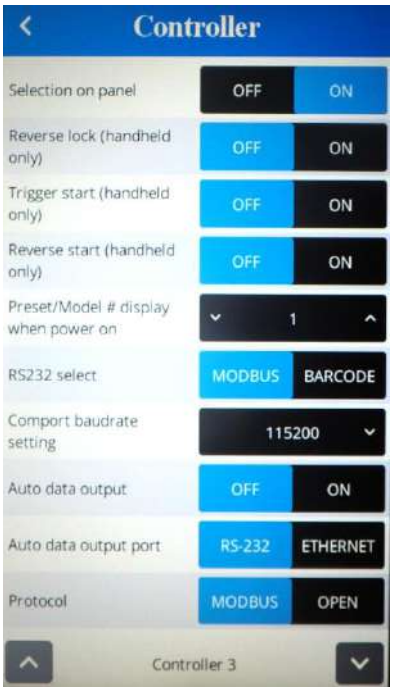
7.10 Controller settings



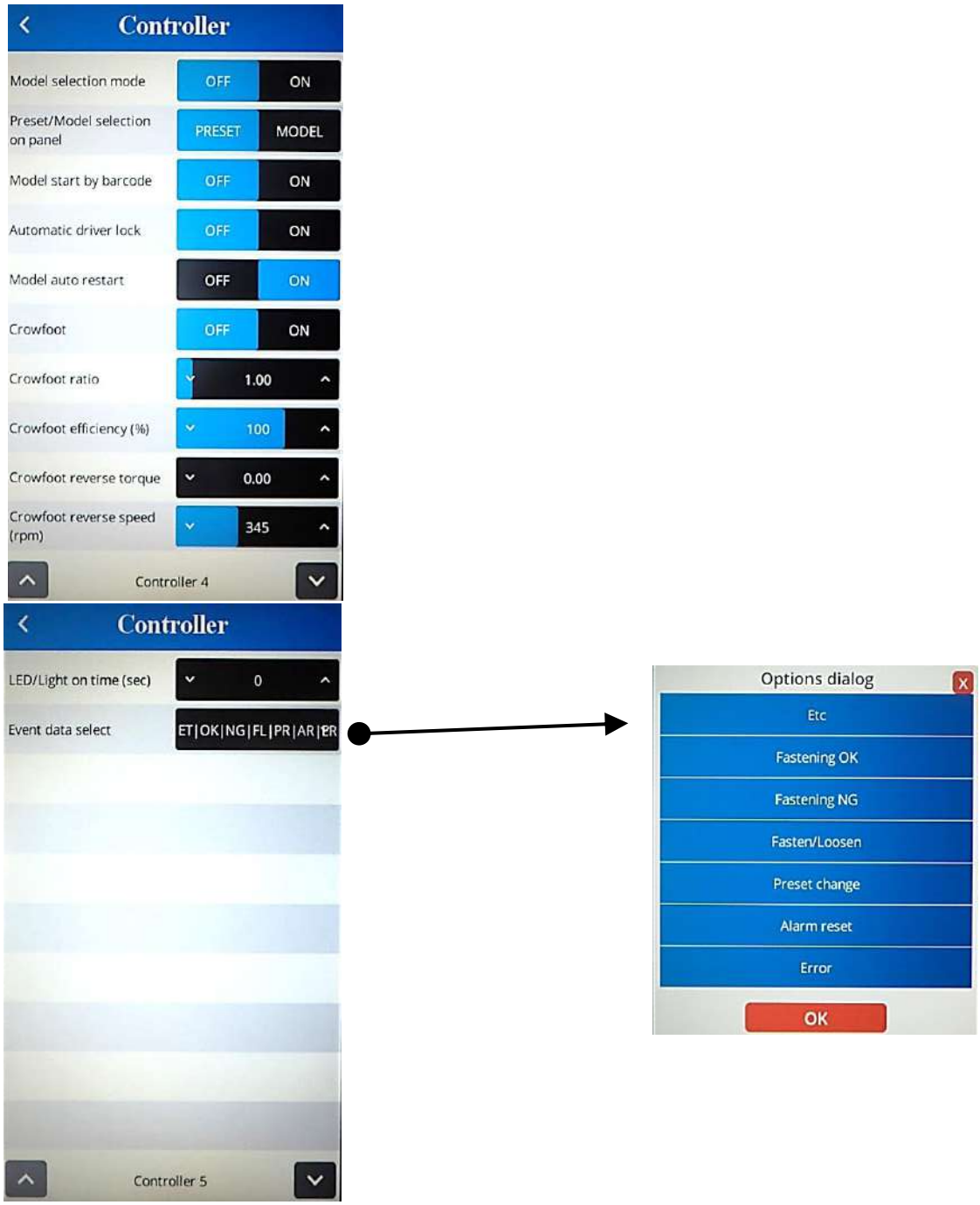
Driver ID			
	Unit	Range	Initial
		1 ~ 99	1
Description	MDC ID used to identify ethernet data communication.		
Driver model			
	Unit	Range	Initial
		Screwdriver list	Unknown
Description	Screwdriver model : to be specified to pair screwdriver with controller else driver is looked and Err114 is displayed		
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 should be reboot..		
Password			
	Unit	Range	Initial
		0 ~ 20000	0
Description	Password to access controller menu Factory setting password is ‘0’ at the initial.		
Controller parameter initialize			
	Unit	Range	Initial
		0 to 20000	0
Description	Key in ‘77’ and press enter button. Flash the parameters back to factory settings - screwdriver is paired to controller.		
Autospeed			
	Unit	Range	Initial
		OFF- ON	YES
Description	ON : Provide the safe speed on the torque setting (P1 ~ P15). The speed is automatically calculated OFF : speed can be set manually within the screwdriver speed range		
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	Timelap torque is maintained after torque		
Use max torque for reverse			
	Unit	Range	Initial
		OFF- ON	NO
Description	OFF : max loosening torque +20% selected preset torque target ON : full power loosening.		
Loosening speed			
	Unit	Range	Initial
	rpm	Tool range	½ Max tool speed
Description	Tool reverse rotation speed		


Controller
Forward RUN time limit (sec)
10.0
Reverse RUN time limit (sec)
10.0
Motor stall time limit (sec)
0.2
Error display reset time (sec)
2.0
Fastening OK signal time (ms)
0
Screw type
Screw type select ...
Judged fasten minmum turns
0.0
Fastening stop error
OFF
ON
Alarm sound control
OFF
ON
Torque calibration (%)
100
Controller 2
Screw type dialog
P1: CW
P2: CCW
P3: CW
P4: CW
P5: CW
P6: CW
P7: CW
P8: CW
P9: CW
P10: CW
P11: CW
P12: CW
P13: CW
P14: CW
P15: CW
OK

Forward run time limit			
	Unit	Range	Initial
	Sec	0 - 60	10
Description	Run limit to forward rotation – It prevent the continuous running over the preset time. The driver stops automaticaly 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 prevent the continuous running over the preset time. The driver stops automaticaly at the preset time and provides the pattern NG with error code		
Motor stall time			
	Unit	Range	Initial
	Sec	0,1 – 0,5	0,2
Description	Immediate stop when motor is stalled.- It prevent 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 200ms 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
		YES - NO	NO
Description	NO : does not create any NG when the tool stops without fully tightening by torque up.		
Alarm sound control			
	Unit	Range	Initial
		YES NO	YES
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 chapter 9		


Controller
Selection on panel
OFF
ON
Reverse lock (handheld only)
OFF
ON
Trigger start (handheld only)
OFF
ON
Reverse start (handheld only)
OFF
ON
Preset/Model # display when power on
1
RS232 select
MODBUS
BARCODE
Comport baudrate setting
115200
Auto data output
OFF
ON
Auto data output port
RS-232
ETHERNET
Protocol
MODBUS
OPEN
Controller 3

Selection on panel			
	Unit	Range	Initial
		OFF- ON	ON
Description	OFF : disable touch screen ON : allow touch screen use		
Reverse lock (handheld only)			
	Unit	Range	Initial
		YES - NO	NO
Description	YES will disable the reverse rotation switch on screwdriver.		
Trigger start (handheld only)			
	Unit	Range	Initial
		YES- NO	NO
Description	Trigger (⎍) start Enable/Disable with start lever		
Reverse start (handheld only)			
	Unit	Range	Initial
		YES - NO	NO
Description	Reverse rotation switch can start the screwdriver in reverse by pushing it and stops by moving it back		
Preset/Model # display when power on			
	Unit	Range	Initial
		0 ~ 15	1
Description	Choice of initial preset or model selection on display when power on. 0 : select same preset/model as before power off		
RS232 select			
	Unit	Range	Initial
		MODBUS - Barcode	MODBUS
Description	RS232 Port use : for data report or barcode reader **Please ensure that baudrate is set to correct value**		
Comport baudrate setting			
	Unit	Range	Initial
	bauds	9600 ~ 230400	115200
Description	RS232 communication speed To be set as computer com port :115200 bauds for ParaMon or barcode reader setting : 9600 bauds		
Auto data output			
	Unit	Range	Initial
		YES - NO	NO
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 : Communication protocol MODBUS on COM PORT OPEN : Communication protocol OPEN PROTOCOL Refer to Protocol manual		

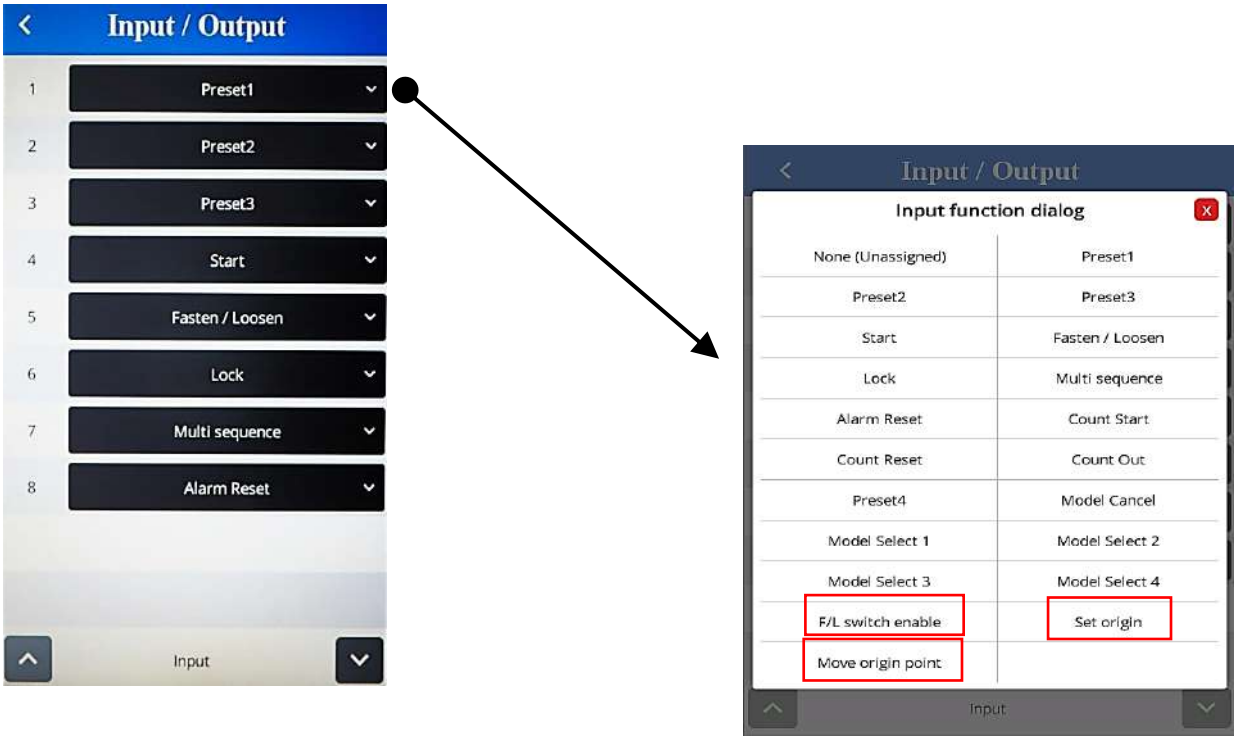


Led/light on time			
	Unit	Range	Initial
	sec	0 ~ 30	0
Description	Screwdriver LED lamp off timer (used only with pistols MDP) 0 = lamp off timer disable.		
Event data select			
	Unit	Range	Initial
		List	all
Description	Select the events to be send by ‘auto data output’ and saved on the SD card. SD card should be set ON in Setting/Option menu to save selected data on SD card		

Model selection mode			
	Unit	Range	Initial
		OFF- ON	OFF
Description	ON : model selection on operation screen or IO's OFF : Preset and MA/MB selection on operation screen or IO's		
Preset/Model selection on panel			
	Unit	Range	Initial
		Preset - Model	Preset
Description	Allow Model or Preset selection on operation screen This setting is automatically set identical to above setting 'Model selection mode'		
Model start by barcode			
	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	NO
Description	Driver is locked in non tightening model steps		
Model auto restart			
	Unit	Range	Initial
		OFF- ON	OFF
Description	ON : model restart automatically after previous one is completed OFF : when model is finished driver is locked and NOP model 0 is auto selected. A model have to be selected.		
Crowfoot			
	Unit	Range	Initial
		OFF ON	OFF
Description	ON : activate crowfoot setting below: Gear ratio, efficiency, reverse torque and speed.		
Crowfoot ratio			
	Unit	Range	Initial
		0 to 10	1
Description	Crowfoot gear ratio including angle head		
Crowfoot efficiency (%)			
	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	100
Description	For open crowfoot : speed for return to open position		

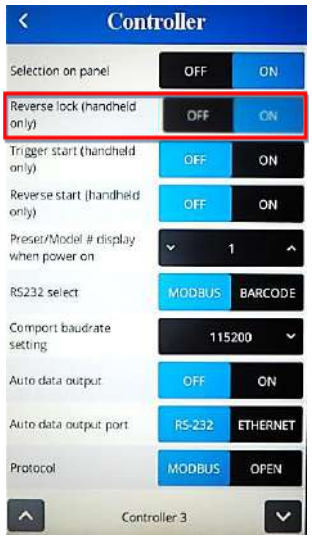
7.11 I/O settings

Inputs



Note :
Inputs 9 to 15 are ‘unassigned’ and are not listed in this menu as they cannot be set differently. So inputs 9 to 15 can only be used in models

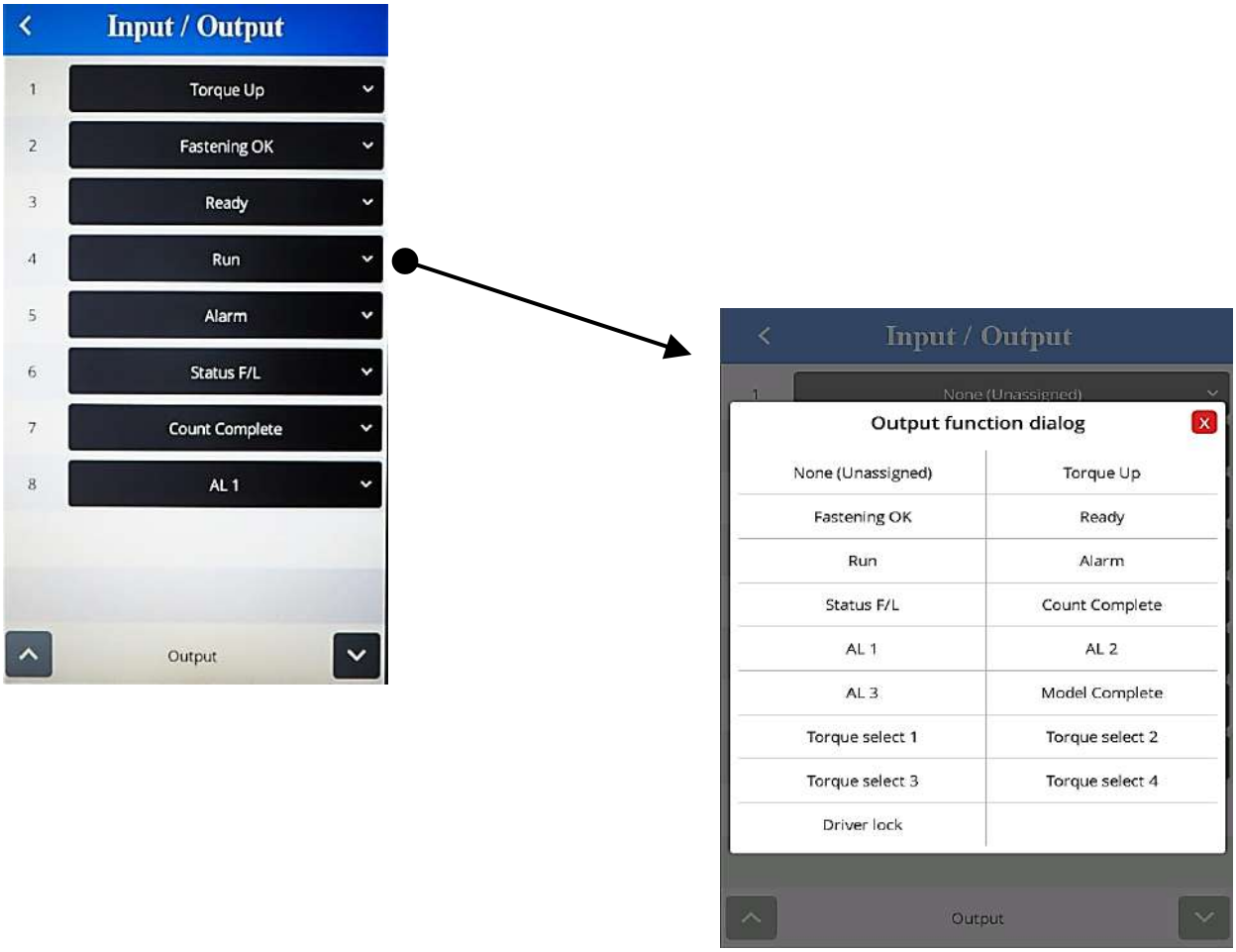
F/L switch enable input :
allow reverse by external input only
F/L switch have to be locked by controller setting



Absolute home bit/socket position
Set origin :
When this input is set high, controller keep in memory the actual absolute position of the bit holder as an origin position.
Screwdriver should not run during the activation of this input.

Move origin point :
Bit holder goes in forward direction to origin position previously registered.

Outputs

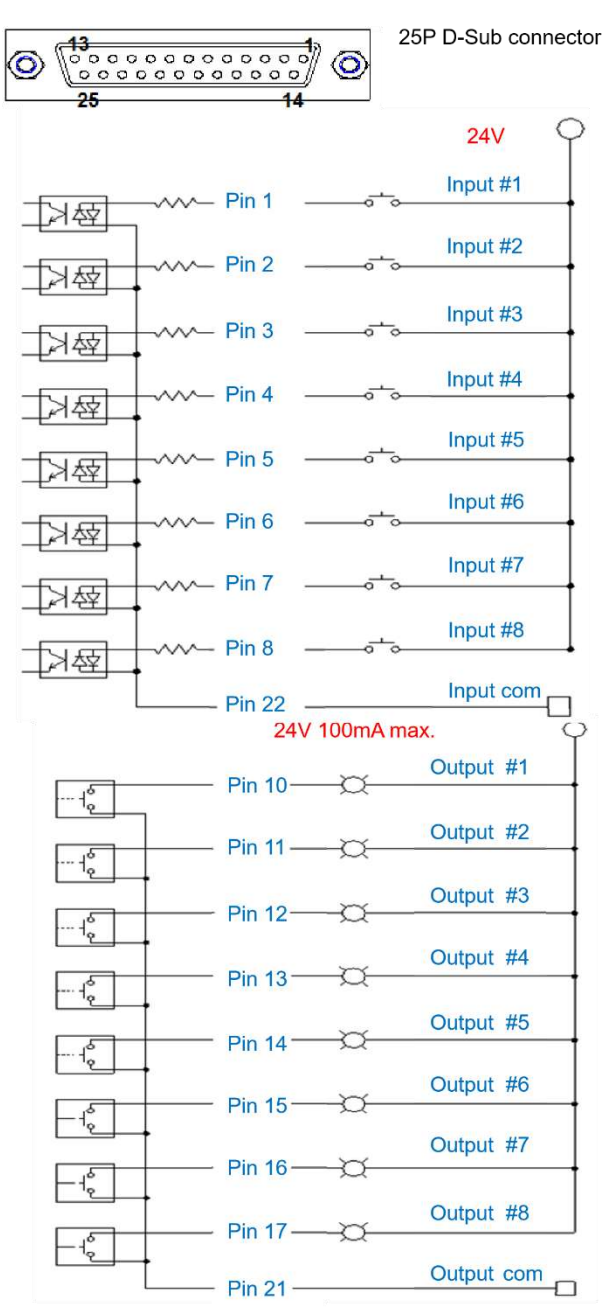

Input / Output
1 Torque Up
2 Fastening OK
3 Ready
4 Run
5 Alarm
6 Status F/L
7 Count Complete
8 AL 1
Output
Input / Output
None (Unassigned)
Output function dialog
None (Unassigned)
Torque Up
Fastening OK
Ready
Run
Alarm
Status F/L
Count Complete
AL 1
AL 2
AL 3
Model Complete
Torque select 1
Torque select 2
Torque select 3
Torque select 4
Driver lock
Output

MDC 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*

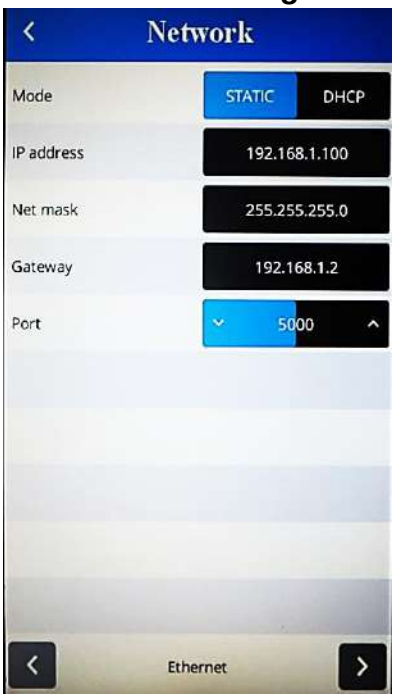
Binary coding with 5 inputs to select preset # and Mode (identical for Model)

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

7.12 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 adress		192.168.1.100
Description	Used with Static mode to set manualy IP address		
Net mask			
	Unit	Range	Initial
			255.255.255.0
Description	To create a subnetwork		
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		

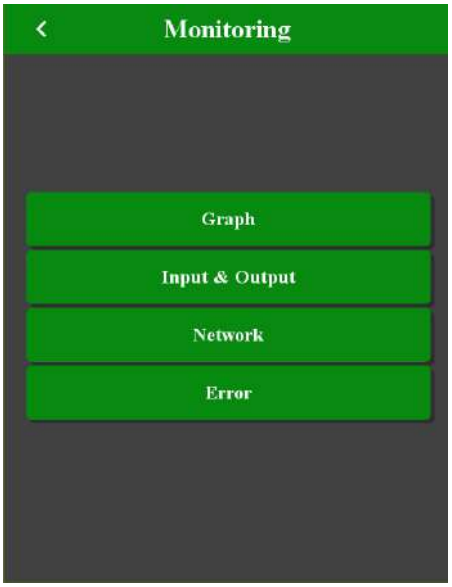
7.13 Monitoring

To monitor fastening data and I/O, click 

and go to 

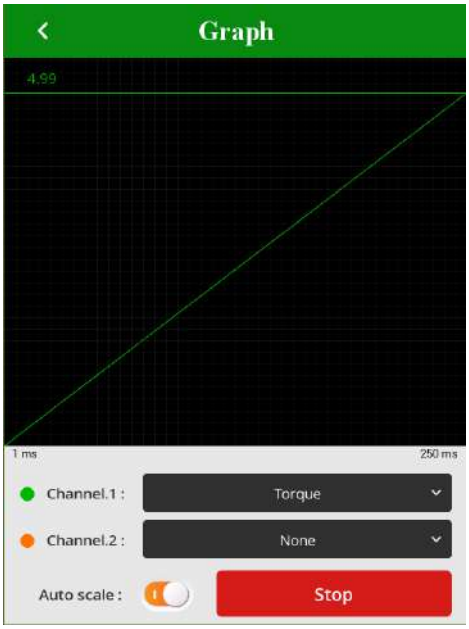
There are three(3) real-time monitoring menu and one error history.

- Graph : torque, Angle, Speed and current
- 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



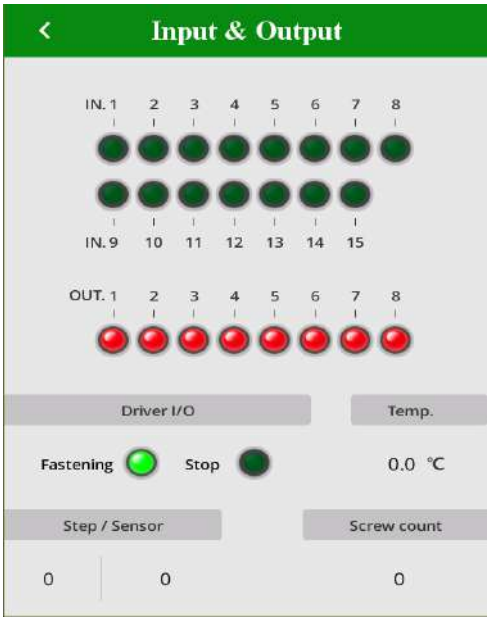
The sampling rate is 1ms (0.001second) for limitless data.

Auto scale will display all data on one single screen by changing real-time sampling rate automatically.

The curve is displayed during the operation time and completed by operation stop.

So the graph monitoring does not make any time delay issue for the operation.

◆ **I/O Status monitoring**



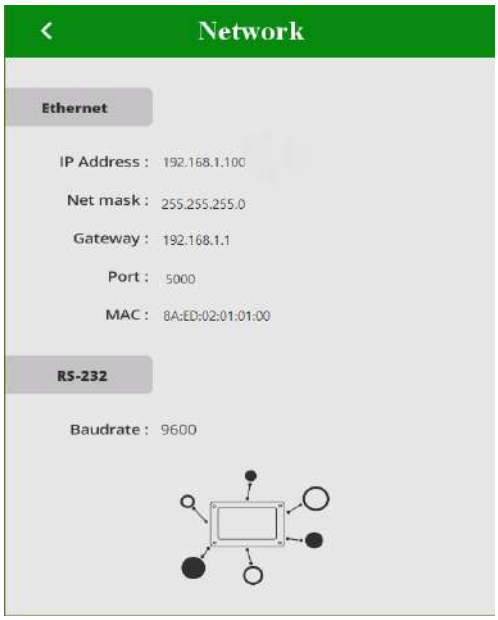
The I/O & tool operation signals are displayed when they are activated

The temperature of the motor surface is also displayed.

Torque sensor digital value is also monitored

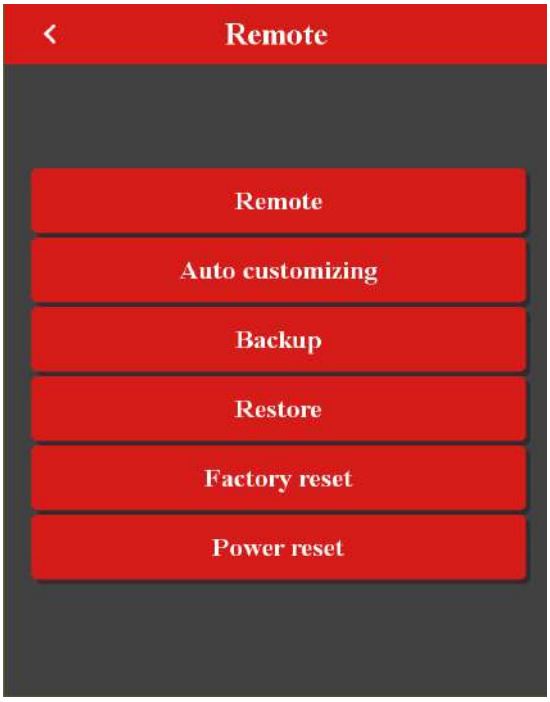
Tightening and loosening total counter for connected screwdriver

◆ **Network setting**



7.14 Remote control & Auto customizing

Remote menu provides remote tool operation, Auto customizing parameters to have highest cycle time and resets. Click Operation, and go to REMOTE group



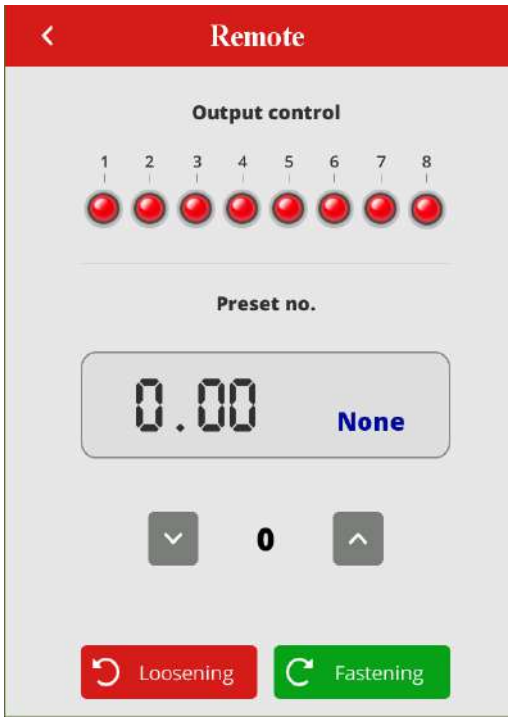
◆ **Remote**

The tool and output signal can be operated remotely by click the screen.

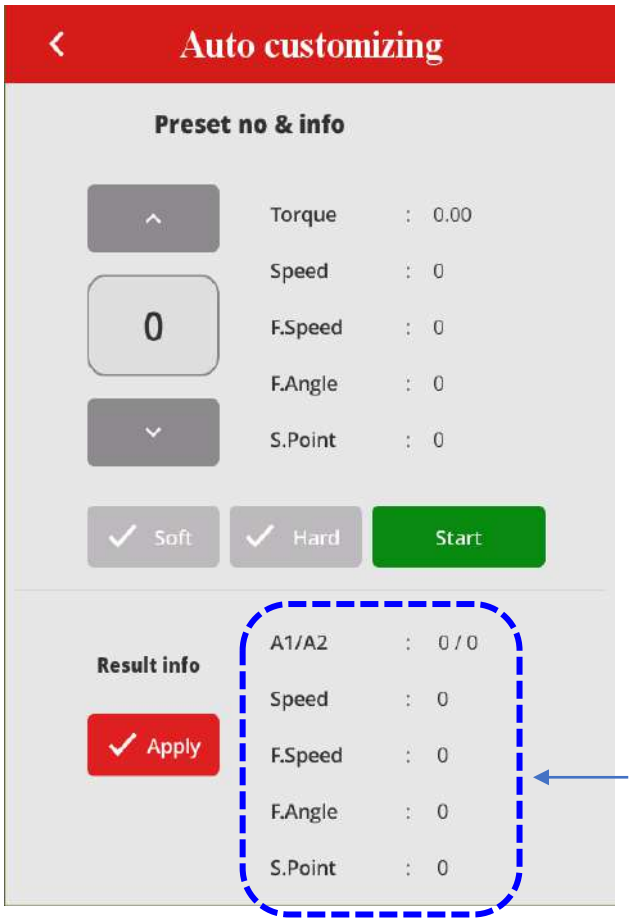
It is useful feature to simulate the tools in automation integration.

Easy to find the output wiring and tool test without PLC.

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



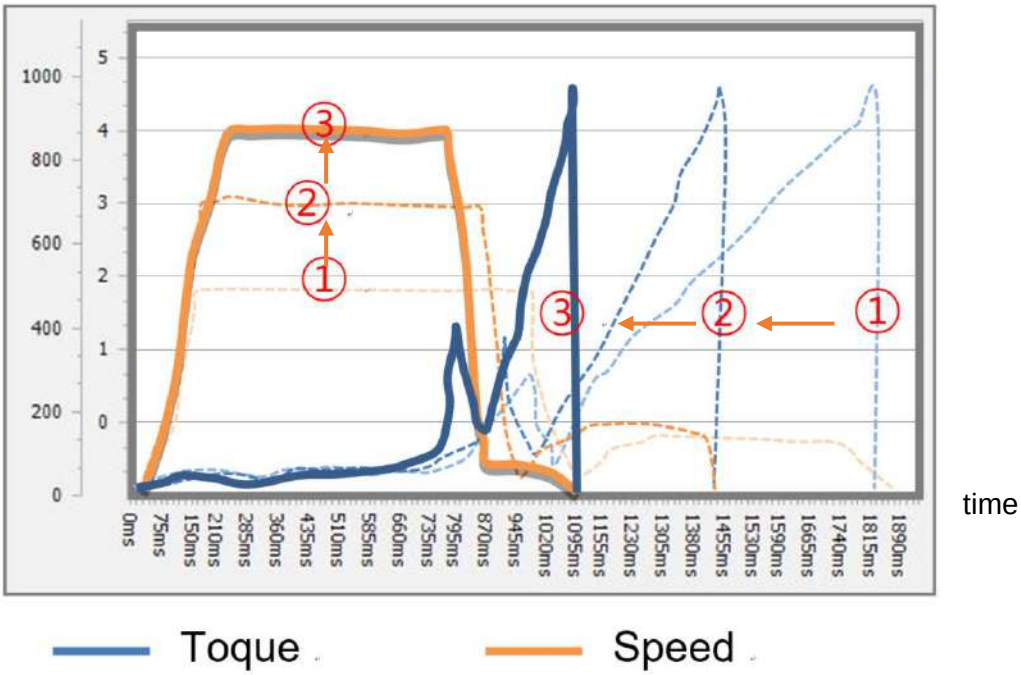
◆ Auto customizing parameters



Simulation & modification window

MD tool has the auto speed setting feature against torque setting not to provide any 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 most optimized parameter settings for saving cycle time on the real application.

Speed Torque



time

① Select Preset # to modify parameter settings

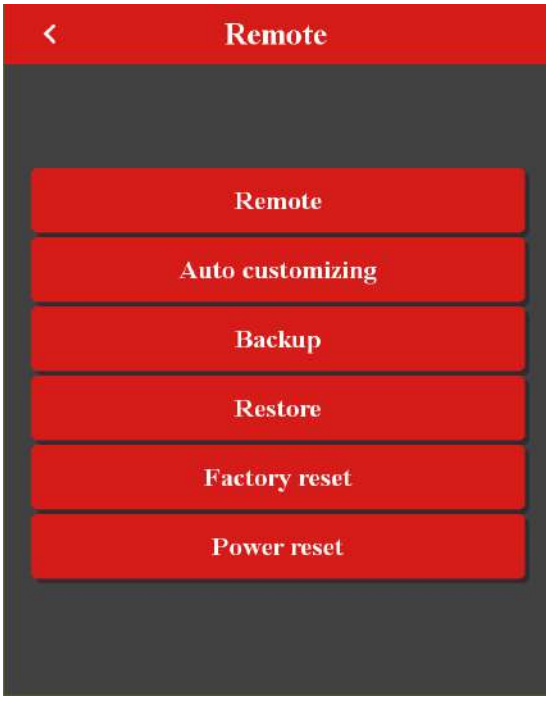
② Select one of Soft & Hard joint condition when it is obviously clear or both together when it is not clear to be clarified, then click START

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.

7.15 Remote : Back up / Restore / Power Reset / Factory reset



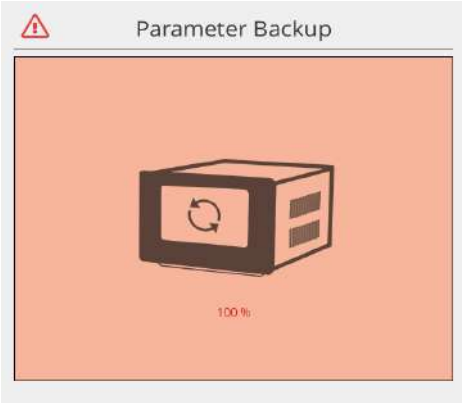
- **Backup**

Parameter back up save in SD-Card.

Save on \SD-Card\PARAM folder.

Back up file name : yyyymmdd.csv

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



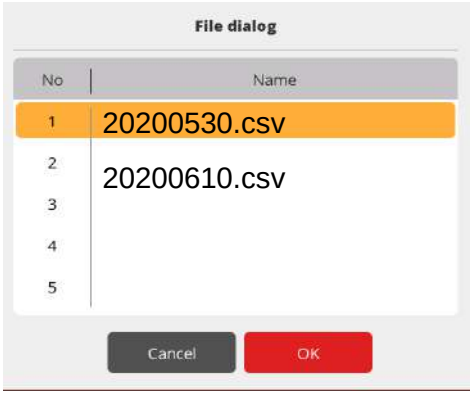
- **Restore**

Load backup file from SD-Card.

Only compatible with files saved with controller backup (see above)

Do not restore with backup files saved with Webserver or ParaMon MDTC

Back up and restore should have been made with same controller firmware version



- **Power reset**

Power reset provide the equal effect of system rebooting by power switch OFF and ON.

- **Factory reset**

All parameter reset, when click this button, reboot system and all parameter(setting) initialized by factory setting

7.16 General Settings : Date / Storage / Options

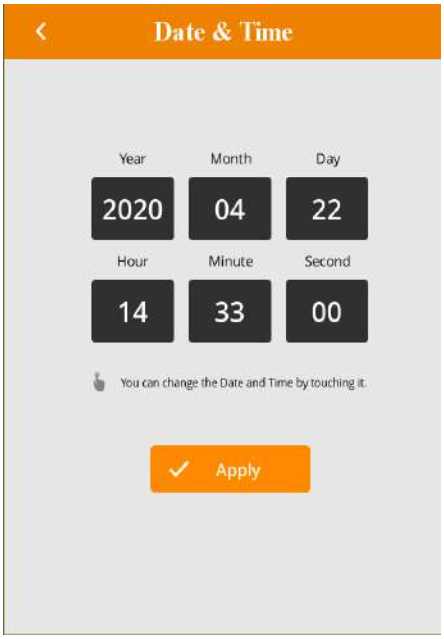
To modify Date, Time and backlight brightness ,

Click 

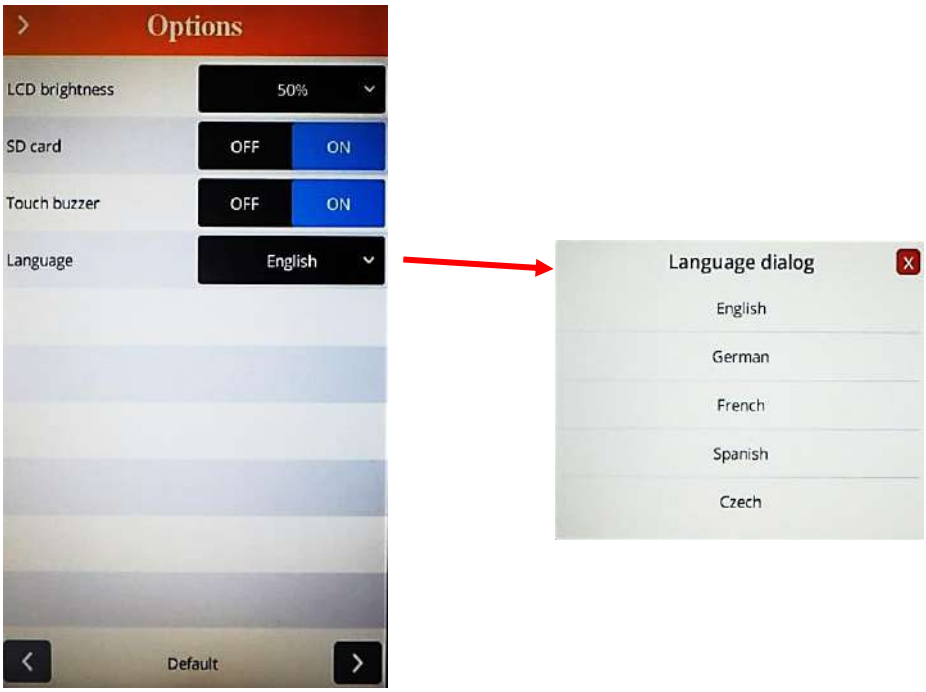
and 

- **Date and time**

System date and time can be modified.



- **Options**

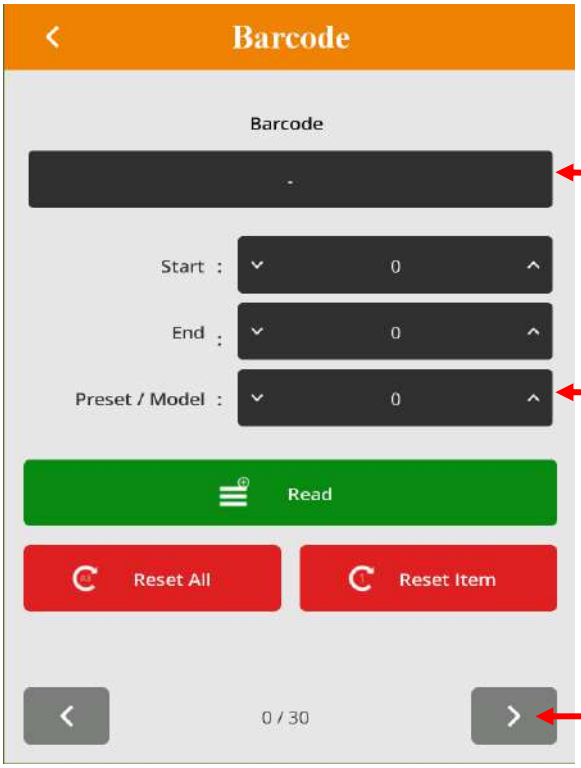


LCD brightness			
	Unit	Range	Initial
		1-100	100
Description	Manual LCD backlight brightness adjustment		
SD card			
	Unit	Range	Initial
		OFF ON	OFF
Description	In order to save the fastening data, Select ON of SD card and select the items to be saved on the SD card ;		
Touch buzzer			
	Unit	Range	Initial
		OFF ON	ON
Language			
	Unit	Range	Initial
		List	English
Description	Choose in a list of 5 languages : English, German,Franch, Spanish and Czech – change is applied is applied in the menu		

7.17 General Settings : 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] R2232C : Modbus / Barcode (O)
RS232C baud rate : Select right one for the scanner - usually 9600



Barcode data

Preset / Model

Barcode registration #
(total 30)

- 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 # to be linked with the registered scan data
4) Click UP 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.

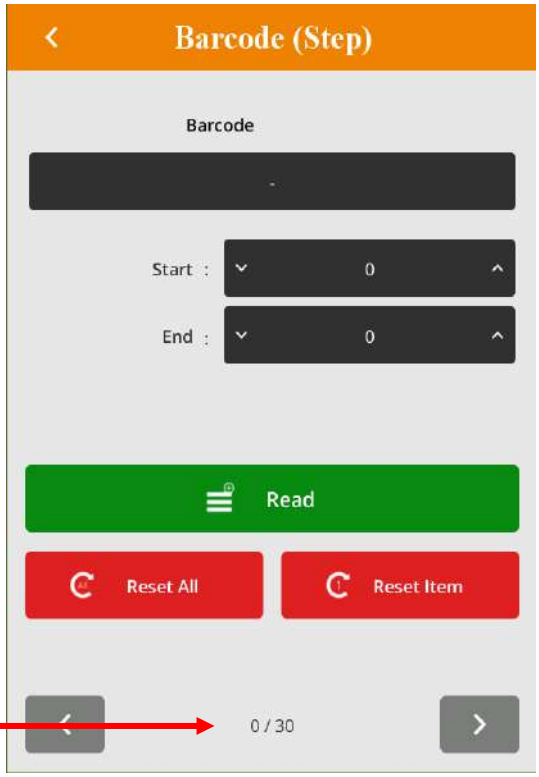
◆ Barcode Step setting

In model operation for Barcode step

Registration of barcode dedicated to model step.

Total number of barcode registration : up to 30

Max number of barcode data length :
32 characters (including CR data)



Barcode number

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 below 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

7.18 SD memory card tightening datas saving

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

◆ **Storage**

Check SD card informations and available memory

Important :

Format will delete all datas saved on memory card

To avoid loosing datas please make a copy before.

◆ **Tightening data saving**

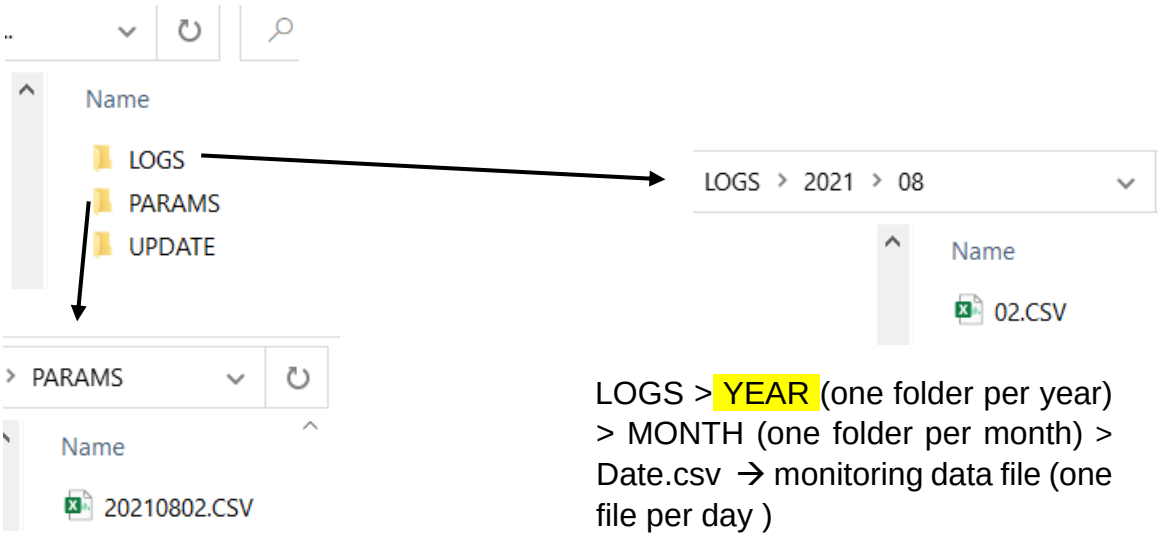
To use this option, check:

- SD card is ON in \Setting\Options menu
- Event datas to be saved have been selected in \Parameter\Controller menu

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

The real time fastening data in Monitoring menu are stored together with the system clock time of the controller.


SD Memory card



LOGS > YEAR (one folder per year) > MONTH (one folder per month) > Date.csv → monitoring data file (one file per day)

Parameters file backup named YYYYMMDD.csv

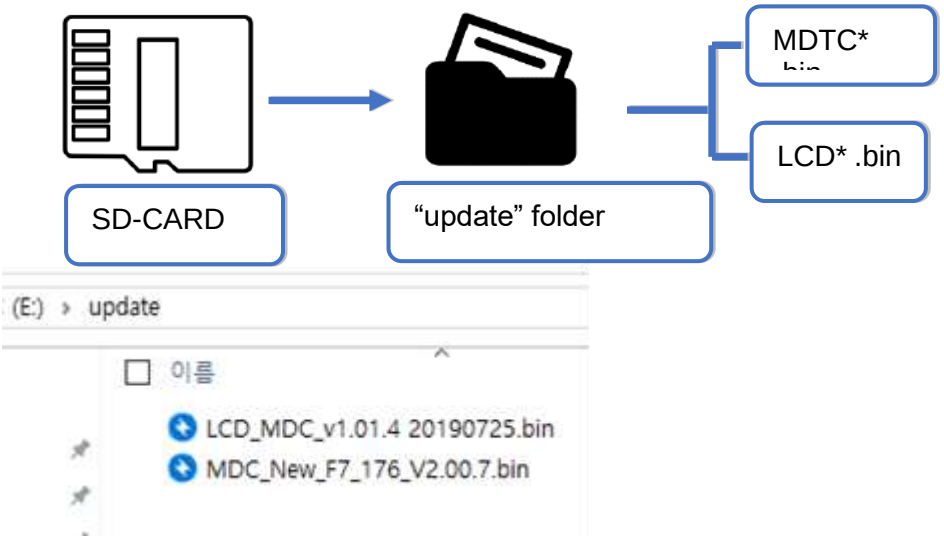
Example csv file opened with a spreadsheet software

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Time	Serial	Barcode	F_time	Preset	T_torque	C_torque	Speed	A1	A2	A3	Count	Error	F/L	Status	Snug angle
2	%16:11:27	16.11.0005	:B170728025201/3	0	1	10	0	214	0	0	0	5	0	0	0	0
3	16:11:30	16.11.0005	:B170601011304/10	0	2	10	0	214	0	0	0	5	0	0	0	0
4	16:11:33	16.11.0005	:B170728025201/3	0	1	10	0	214	0	0	0	5	0	0	0	0
5	16:12:11	16.11.0005	:B170728025201/3	699	1	5	5.14	113	381	8	389	4	0	0	1	0
6	16:12:13	16.11.0005	:B170728025201/3	650	1	5	5.08	113	336	16	352	3	0	0	1	0
7	16:12:15	16.11.0005	:B170728025201/3	1278	1	5	5.09	113	766	11	777	2	0	0	1	0
8	16:12:17	16.11.0005	:B170728025201/3	1000	1	5	4.94	113	581	9	590	1	0	0	1	0
9	16:12:19	16.11.0005	:B170728025201/3	1059	1	5	5.24	113	625	7	632	5	0	0	1	0
10	16:12:21	16.11.0005	:B170728025201/3	813	1	5	5.1	113	464	4	468	4	0	0	1	0
11	16:12:23	16.11.0005	:B170728025201/3	647	1	5	5.11	113	344	8	352	3	0	0	1	0
12	16:12:25	16.11.0005	:B170728025201/3	1029	1	5	4.95	113	597	13	610	2	0	0	1	0
13	16:12:26	16.11.0005	:B170728025201/3	1001	1	5	5.09	113	558	16	574	1	0	0	1	0
14	16:12:28	16.11.0005	:B170728025201/3	0	1	5	0	113	0	0	0	1	0	0	0	0
15	16:12:30	16.11.0005	:B170728025201/3	919	1	5	5.02	113	530	6	536	5	0	0	1	0
16	16:12:32	16.11.0005	:B170728025201/3	0	1	5	0	113	0	0	0	5	0	0	0	0
17	16:12:35	16.11.0005	:B170601011304/10	0	2	7.5	0	163	0	0	0	5	0	0	0	0
18	16:12:38	16.11.0005	:B170601011304/10	890	2	7.5	7.7	163	729	12	741	4	0	0	1	0
19	16:12:40	16.11.0005	:B170601011304/10	942	2	7.5	7.73	163	776	15	791	3	0	0	1	0
20	16:12:42	16.11.0005	:B170601011304/10	936	2	7.5	7.28	163	766	16	782	2	0	0	1	0
21	16:12:43	16.11.0005	:B170601011304/10	942	2	7.5	7.51	163	768	19	787	1	0	0	1	0

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

8. FIRMWARE UPDATE

1) Remove the SD card for data saving and use the new SD card for firmware update only.
2) Create the folder “ Update “
3) And copy the firmware files in each folder
4) Insert the SD card, and power ON the controller, then it is updated automatically.

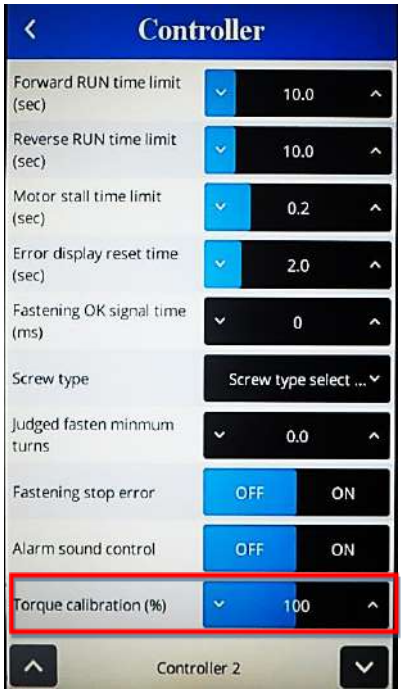


9. TORQUE CALIBRATION AND COMPENSATION

◆ **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.

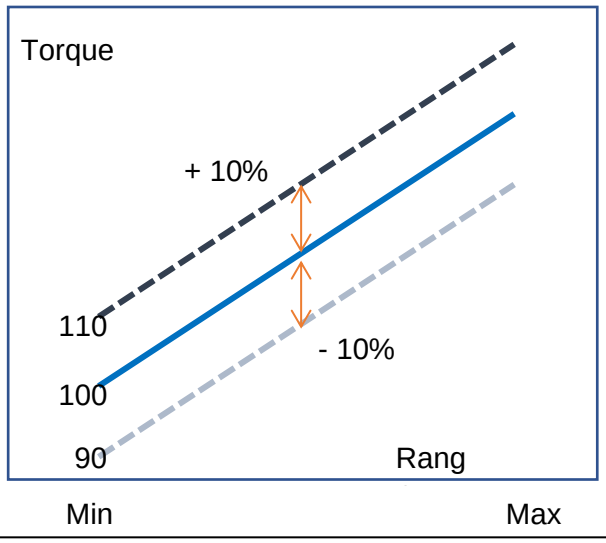
The torque calibration is required when :
- The torque reading on the torque meter is different with the setting
- Tool is repaired by replacing motor or gear mechanism
- If there is a big mass of the bit which is exceptional from the normal one, speed should be slower to reduce the inertia spike.

Torque calibration on the controller panel



When the reading on the torque meter is lower than the setting on the tool, increase the calibration value more than 100(%) which is basic on production. To increase the output torque 5% more, key in 105(%). The calibration value works through whole range of torque. It will be refreshed and stored in the memory chip in the tool. So it can be still effective on other controller. Be sure that the different torque test conditions can make different torque reading.

- 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 : auto-speed should be used
- Low pass filter of the torque meter



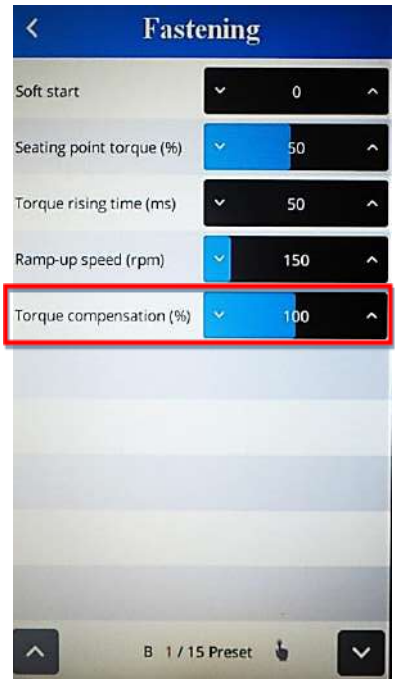
A periodical torque calibration is required to keep the accuracy of fastening quality.

◆ **<u>Torque compensation</u>** : 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

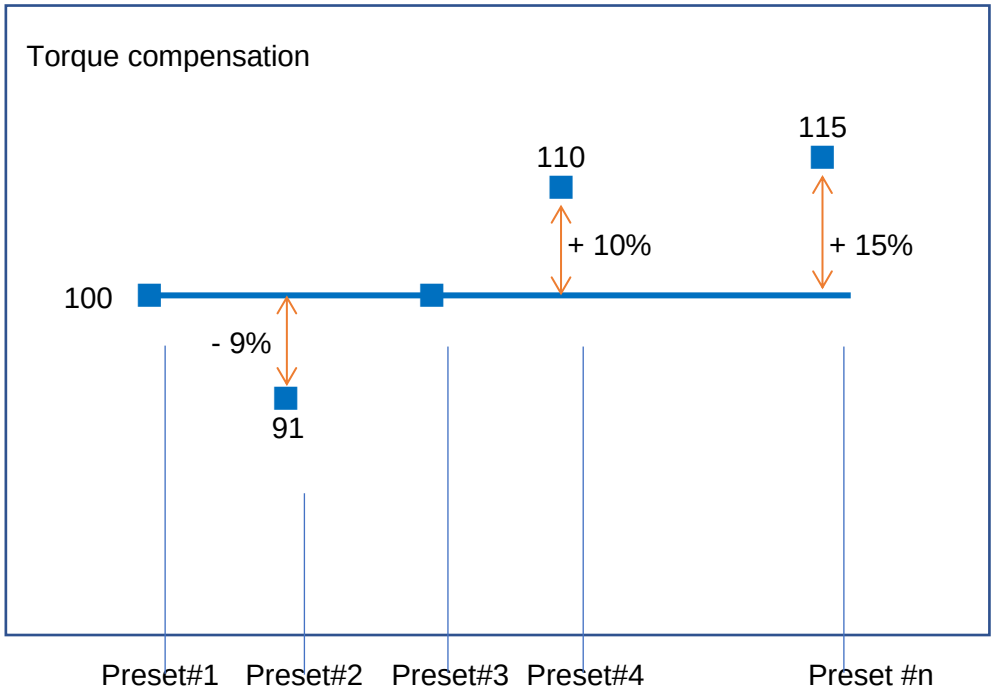


Total adjustable range is +/- 20% (80% to 120%) for 15 presets.

It is additional tuning from the Torque Calibration. So the total adjustment is made by Torque calibration + Torque compensation.

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

Some model of tool can have the limit of compensation in Min / Max according to the motor capacity. If the total value is over the capability, it does not work at all.



10. ERROR CODE

10.1 System error

Code	Error message	Description	How to reset
105	Transducer sensor error	Transducer sensor problem.	Power reset. If error remain , check the transducer sensor
109	Over current	Over current during driver run.	
110	AD offset error	Over the option range of system AD, when turn on power	Re-boot. If repeat same error, need to repair
111	Under voltage	Low voltage from SMPS power source.	Check the 14P cable state and connection
112	Over speed	Over speed happened during driver run.	Re-boot, Check the 14P cable state and connection.
113	Driver data read	Fail to reading parameter data	Re-boot, Check the 14P cable state and connection..
114	Screwdriver recognition error	Parameter mismatch driver to controller	Select correct driver model in controller menu
115	Controller recognition error	Occurs when the controller model cannot find the specifications set in the program	Select correct driver model in controller menu. Check the 14P cable state.
116	Com error related with I/O data	Fail to read I/O data from system.	Re-boot.
117	Driver communication fail	Driver communication fail	Check the 14P cable state and connection.
118	No motor rotation error	Motor didn’t run	Reset and re-boot.
120	Barcode read/wirte error	Barcode data R/W fail in memory	Re-Boot
121	Ethernet data send fail	Ethernet data send fail.	
122	SD card removed	SD card removed.	
123	SD card save fail	SD card save fail	Check SD card slot
124	SD card fail	Error occur in sd card process.	Check SD card slot, SD card check
125	No Ramp up torque	Torque is not increase in ramp up speed section	
200	Parameter reading failure	It failed to read parameter at all. Check the EEP-ROM damage or communication failure	
201	Parameter Checksum error	The read parameter is wrong by the checksum routine	
220	Multi-sequence program error	Multi-sequence program is wrong	Multi-sequence program is wrong

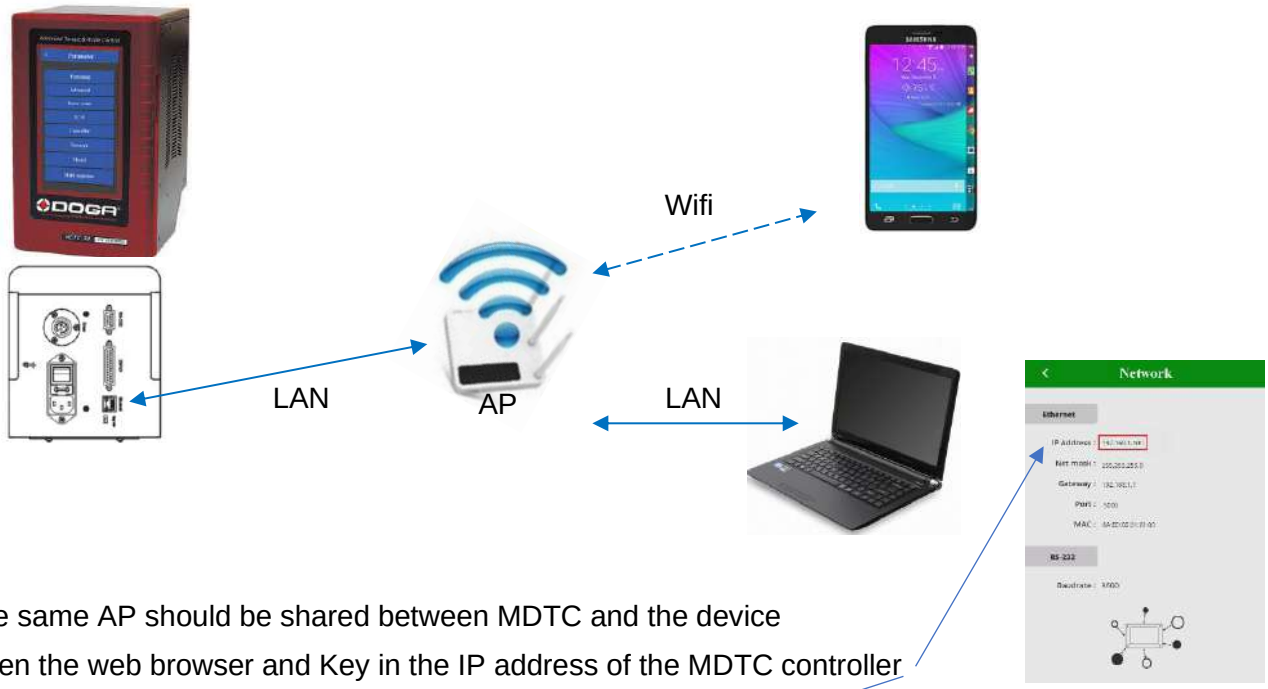
10.2 Fastening error by the pattern setting

Code	Error message	Description	How to reset
300	Run time limit (Forward)	Over time limit on parameter	Check the parameter
301	Run time limit (Reverse)	Over time limit on parameter	Check the parameter
302	Model setting error	Failure in Model programing	Check the model process
303	Model cancel	The Model process is canceled	
304	Motor stall by loosening failure	Motor stall by loosening failure within time limit on parameter	Check the parameter
305	Torque up before ramp up	Reach target torque before ramp up speed.	Error reset
310	Time over in screw counting	Over the time limit of screw counting	Check time limit in screw count menu
311	Screw missing	When the work-piece moves out of the working area without complete number of fastening	Error reset
330	Min Angle error	Target torque reached before the Min angle	
331	Target angle setting error	Target angle setting is out of the range [AC/TM mode]	Set the Target Angle
332	Angle over	Target torque reached over the 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 (%)	
336	Over torque error	[AC/TM] Torque reached to the high limit of torque capacity	Change max torque parameter
337	Torque up at free speed	Torque up occur at Free speed	
338	Thread tap max torque error	Over max torque during thread tap advance function	Check the Thread tap max torque parameter
339	Thread tap min max range error	Thread tap setting min, max torque range invalid	Check the parameter setting
400	Ethernet port fail	Ethernet device IC initializing fail	
401	Ethernet socket error	Ethernet communication error related with socket	
500	Over temperature	Overtemperature over 80°C	Auto reset under 80°C

11.WEB SERVER

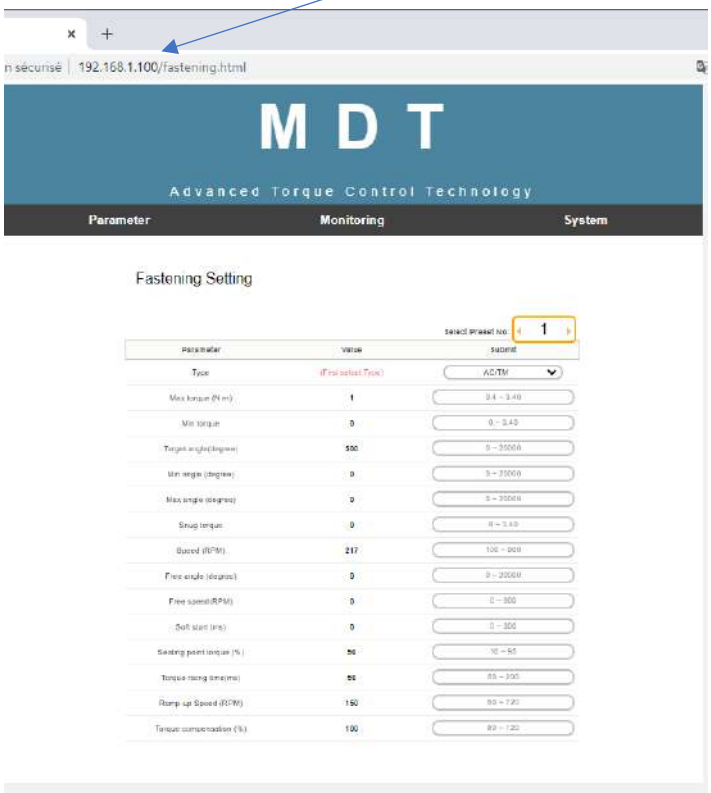
- Web server software is added in the MDTC controller
- Web surfing program of Chrome or Firefox is more recommended.
- Access to the IP address of the MDC controller via the web browser.
- Parameter setting and monitoring are available on the web browser.

Ethernet connection layout



The same AP should be shared between MDTC and the device

Open the web browser and Key in the IP address of the MDTC controller



Web server log-in ID : mdtc

Password : 0

12. REGISTERS LIST SUMMARY

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. Controller	Setting	A250 – A290
5. Network	IP Address	A307 - A320
6. Multi Sequence	Multi-A, Multi-B	A321 – A340
7. Error	Last 8 error history	A341 – A348
8. Controller model	Controller model	A349
9. Model program data	Model #1 to #15	A350 – A649
10. Advanced Function	Advanced #1 to 15	A650 – A949
11. Firmware Version.		A950
12. Monitoring data	Data updated on event	A3100 – A3249
	Realtime data	A3300 – A3320
13. Temporary parameter in RAM	Virtual Preset #1	A3500 – A3514
	Virtual Model #1 - 20	A3535 – A3554
	Virtual Advanced #1	A3520 – A3540
14. Remote control	Operation	A4000 – A4008

Please refer to separate datasheet for details

13.COM PROTOCOLS

13.1 MODBUS Server

MDTC controller is capable of connecting to the host controller (Handy Loader, HMI, PLC, PC, etc.) through RS232 serial communication or Ethernet, allowing the user to use such functions as parameter change and data monitoring.

Please refer to dedicated instruction manual 60307.

13.2 OPEN PROTOCOL Server

MDTC controller is capable of connecting to the host controller through Ethernet using hereunder listed MID.

ID	Description	Sent by
0001	Communication start	Integrator
0002	Communication start acknowledge	Controller
0003	Communication stop	Integrator
0004	Command error	Controller
0005	Command accepted	Controller
0010	Parameter set ID(Preset number) upload request	Integrator
0011	Parameter set ID(Preset number) upload reply	Controller
0012	Parameter set(Preset) data upload request	Integrator
0013	Parameter set(Preset) data upload reply	Controller
0018	Select Parameter set(Preset)	Integrator
0060	Last tightening result data subscribe	Integrator
0061	Last tightening result data	Controller
0062	Last tightening result data acknowledge	Integrator
0063	Last tightening result data unsubscribe	Integrator
0070	Alarm subscribe	Integrator
0071	Alarm	Controller
0072	Alarm acknowledge	Integrator
0073	Alarm unsubscribe	Integrator
1000	Read Parameter value	Integrator
1001	Read Parameter value acknowledge	Controller
1002	Write parameter value	Integrator
1003	Write parameter value acknowledge	Controller
9999	Keep alive open protocol communication	Integrator

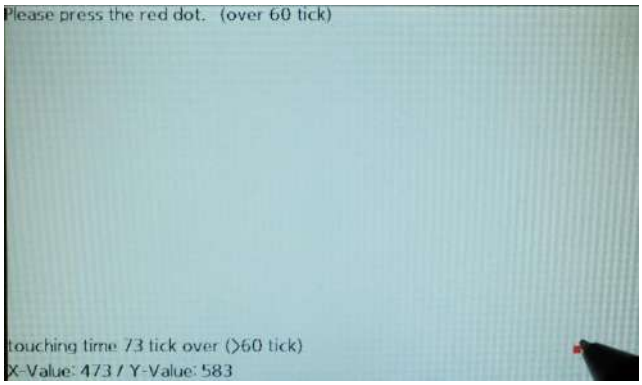
Please refer to dedicated instruction manual.

14.MAINTENANCE

14.1 LCD display calibration

Procedure for LCD firmware version up to v2.01.5
To be done in case touch screen is inactive or detection area is inaccurate
On the operation screen, touch one point until 20sec.
Screen change to calibration mode (see below) :

Press on the first red dot for over 60 tick with a thin pen.



Press on the second red dot for over 60 tick with a thin pen.

Controller will reboot automatically.

14.2 Troubleshooting

If the device has a malfunction, it will display an alarm.
Check how to reset the alarm in the error code chapter 10.

Caution
All repair tasks requiring the box to be opened must be carried out by DOGA or a contractor authorized by DOGA.

If, despite reading this manual, you are unable to solve a problem, please contact the DOGA after-sales department.

My client area on www.doga.fr
Go to your client area on www.doga.fr, click “Your contacts”, then select your specific **After-sales department contact** depending on the device type.

14.3 Phone support

For any questions about using the device

Please contact your technical salesperson

My client area on www.doga.fr
Go to your client area on www.doga.fr, click “Your contacts”, then select your specific **technical salesperson contact** depending on the device type.

For any questions about repairs

Please contact your After-sales department contact.

My client area on www.doga.fr
Go to your client area on www.doga.fr, click “Your contacts”, then select your specific **After-sales department contact** depending on the device type.

If your technician is unable to determine the cause of the problem remotely, they will give you the procedure to make the repair yourselves if possible.

14.4 After-sales returns

It is imperative that all returned equipment has a completed after-sales return form attached to the shipment.
The repair, maintenance, calibration or adjustment service cannot be initiated without this form.

Information
Compliance with this procedure means that your request will be processed quickly with reduced troubleshooting costs.
DOGA reserves the right to apply a trade-in discount and, when applicable, to invoice repair and packaging costs.

Download the after-sales return form

You can download the form using one of the following links:
http://service.doga.fr/syst/dogatech.nsf/liste/00184
https://www.doga.fr/en/our-services/industrial-maintenance

Information
You can use your own after-sales return form if it contains all the data required to work on your device as listed below.

Send your equipment

Returned parcels must be sent carriage paid to the following addresses depending on your transport mode:

Postal parcels	**Carrier parcels**
DOGA - Service SAV 8, avenue Gutenberg - CS 50510 78317 Maurepas Cedex, France	DOGA - Service SAV 11, rue Lavoisier 78310 MAUREPAS, France

14.5 On-site repair

Even though it seems convenient, on-site repair is seldom the best solution for transportable equipment. The conditions in which the trchnician will work are worst than in our workshops and technician travel expenses are costly.

If you require an on-site intervention, please contact the After-sales department.

My client area on www.doga.fr
Go to your client area on www.doga.fr, click “Your contacts”, then select your specific **After-sales department contact** depending on the device type.

Our services will organize the intervention.

14.6 Warranty

DOGA guarantees its products for parts or manufacturing defects for 12 months.
To benefit from this parts and labor warranty, the following conditions must be met:

- The device must have been used in a professional context and in compliance with the normal use conditions described in this user manual.
- The device must not have suffered storage, maintenance or incorrect handling related damage.
- The device must not have been adapted or repaired by unqualified persons.

15.STANDARDS

15.1 Manufacturer details

Importer: DOGA

Address: ZA Pariwest

8 avenue Gutenberg CS 50510

78317 MAUREPAS CEDEX - FRANCE

15.2 Markings

MDT / MDTC	Equipment name
Type	Equipment reference
Serial no.	Unique equipment serial number
Mm/yyyy	Equipment month/year of manufacture (first digits of the S/N)
CE	Equipment designed and built in compliance with the requirements of European directives 2006/42/EU and 2014/30/EU
	All safety instructions and other instructions must be read

15.3 Transport and storage

Information

Your equipment may be damaged if you transport or store it in unsuitable conditions. Comply with the transport and storage information for your equipment.

Transport

Use a container suitable for the transport of the equipment in order to protect it from external influences.

Comply with the following instructions before each transport:

- Shut down the device
- Disconnect the power supply cord

Storage

Comply with the following instructions before storing:

- Shut down the device
- Disconnect the power supply cord
- Clean the device following the indications in the Maintenance section.
- Store it in a suitable container to protect it from dust and exposure to direct sunlight.
- Store it in a dry location at a temperature below 40°C.

15.4 WEEE recycling and end of service life

The symbol showing a crossed out trash container, when placed on an electric or electronic device, means that it should not be disposed of with household trash.

Collection solutions are the following:

Collection and recycling scheme

In compliance with the French Environmental Code covering professional Waste Electric and Electronic Equipment (WEEE) (art. R543-195 et seq.), DOGA is a member of ECOSYSTEM, an eco-organization approved by public authorities under the conditions defined by art. R564-197.

You can also benefit from collection and recycling system proposed by ECOSYSTEM for WEEE originating from the professional equipment marketed by DOGA. Further information on www.ecosystem.eco.

Collection points

Free collection points for used electric or electronic devices are available near your company.

Your local authorities can provide their addresses.

DOGA | ASSEMBLY TECHNOLOGY

international@doga.fr

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78317 Maurepas Cedex - FRANCE