DOGA
ASSEMBLY TECHNOLOGY

Instruction manual

WIRELESS DC TOOL
Transducerized BMT series

EN

60425-01/24

www.dogassembly.com

CONTENTS

REMARKS ABOUT THE MANUAL

Symbols

Information

This warning statement indicates important information (for example: damage to property), but no hazard.

Information

Information to view in your customer area on the www.doga.fr web site.

Caution

This warning statement indicates a low risk that may lead to minor or moderate injuries if not avoided.

Wear personal protection equipment

This symbol indicates the need to wear protective gloves.

Warning

This warning statement indicates a moderate risk that may lead to severe or fatal injuries if not avoided.

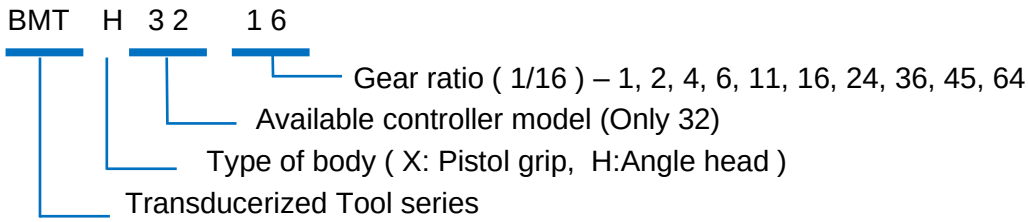
1. INFORMATION

1.1 IMPORTANT

The tool supplied with this manual may have been modified to meet specific needs.
If this is the case, when ordering a replacement or spare parts, please indicate the tool item code and serial number written on shipping note, or contact **DOGA** at **+33 1 30 66 41 41** indicating the approximate delivery date.
In this way, you will be sure to get the required tool and/or parts.

1.2 Product reference

Description	Wireless Transducezized DC tool
Type	See hereunder



1.3 Product description

BMT tool is a wireless transducerized torque and angle control screwdriver.

1.4 Standard packing items

	BMT tool
BMT tool	X 1
USB-A to mini-USB B cable	X 1
CE declaration of conformity	X 1
Calibration test certificate	X 1

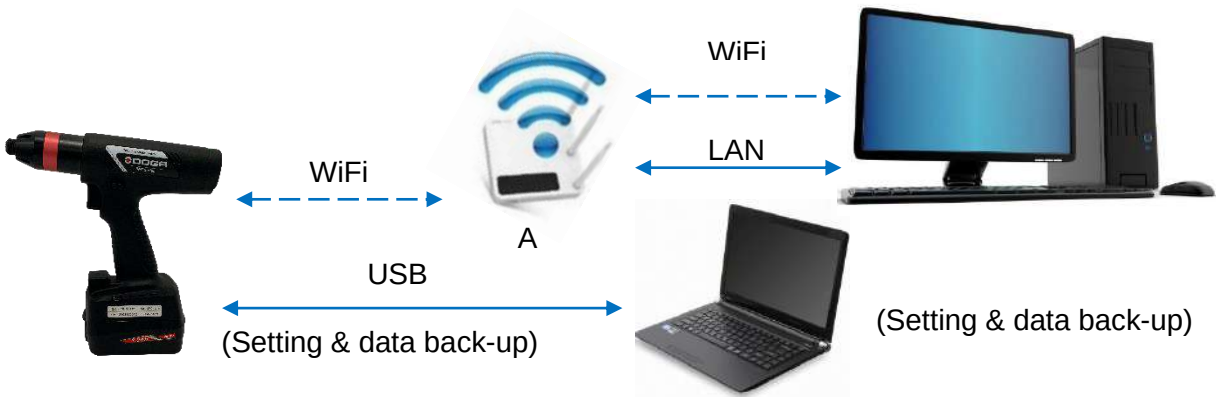
Battery and battery charger sold separately.

1.5 Main features

Torque transducerized and angle encoder
Digital torque and angle program in 15 preset numbers and 2 multi step sequence programs
AMOLED color display
Auto speed setting by torque
Monitoring fastening quality and count of screw numbers
Error information by code display
Easy parameter setting and monitoring by ParaMon (PC software) & Web Server
Real time torque data and curve display
Modbus protocol
USB, Wi-Fi (2,4 GHz & 5 GHz)

1.6 System layout

1.6.1 Connection to PC



1.6.2 Connection to ParaMon-Pro X for Multiple tool management

2. BMT SPECIFICATIONS

2.1 General specification

Specification	
Electric power	25,2 VCC, 3 A max
Motor	Swiss DC servo motor
Torque measurment	Integrated transducer
Wi-Fi	IEEE 802.11a/b/g/n 2,4 GHz & 5 GHz
Weight	0,9 - 1,9 kg (without battery)
Speed	Auto speed by torque setting
Data menory	Total 65,000 data
USB	Mini USB type B port
Dispaly	1.29” AMOLED color display
No. of preset	15 preset programing + 2 multisequences by USB or Wi-Fi

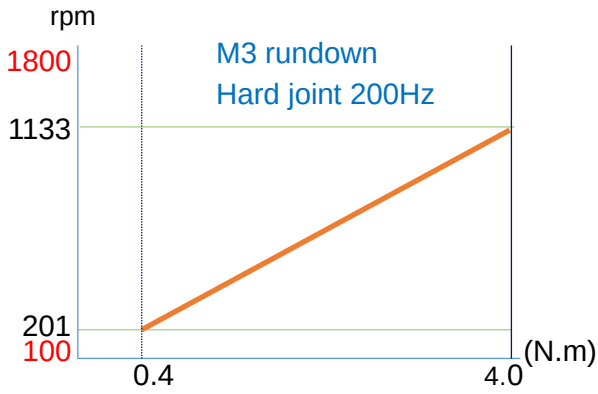
2.2 Model specification

Type	Model	Torque (Nm)	Speed (tr/min)	Weight (kg)	Standard Bit socket
Pistol	BMT3204	0,4 ~ 4,5	100-1800	1,0	Hex 1/4"
	BMT3206	0,6 ~ 6,5	100-1250	1,0	Hex 1/4"
	BMT3211	1,5 ~ 11,5	50-690	1,1	Hex 1/4"
	BMT3216	2 ~ 16	50-470	1,1	Hex 1/4"
	BMT3224	4 ~ 24	50-310	1,1	SQ 3/8" or Hex 1/4"
Angle head	BMTH3204	0,4 ~ 4,5	100-1800	1,4	SQ 3/8" or Hex 1/4"
	BMTH3206	0,8 ~ 6,5	100-1250	1,4	SQ 3/8" or Hex 1/4"
	BMTH3211	1,5 ~ 11,5	50-690	1,6	SQ 3/8" or Hex 1/4"
	BMTH3216	2 ~ 16	50-470	1,6	SQ 3/8" or Hex 1/4"
	BMTH3224	4 ~ 24	50-310	1,6	SQ 3/8" or Hex 1/4"
	BMTH3236	5 ~ 32	50-200	1,7	SQ 3/8"
	BMTH3245	6 ~ 40	50-160	1,7	SQ 3/8" or SQ 1/2"
	BMTH3264	8 ~ 50	50-115	1,9	SQ 3/8" or SQ 1/2"

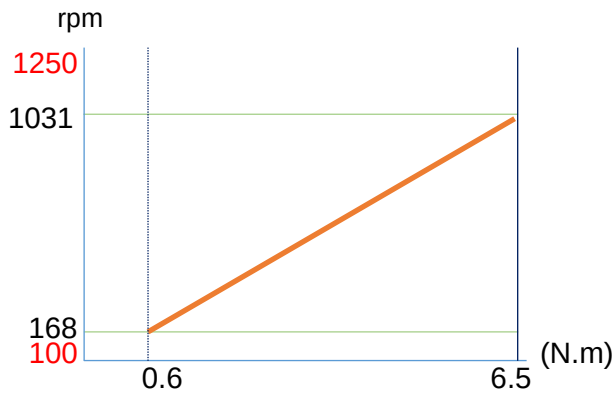
2.3 Auto Speed by torque setting

Speed range : Available setting range by manual

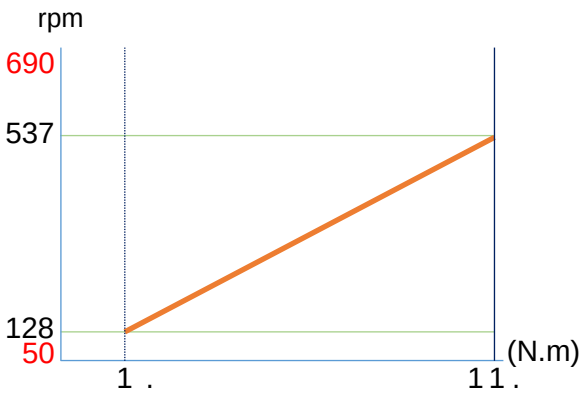
Auto speed by torque setting : Safe speed not exceeding over torque by rotation inertia under the testing conditions described on the chart



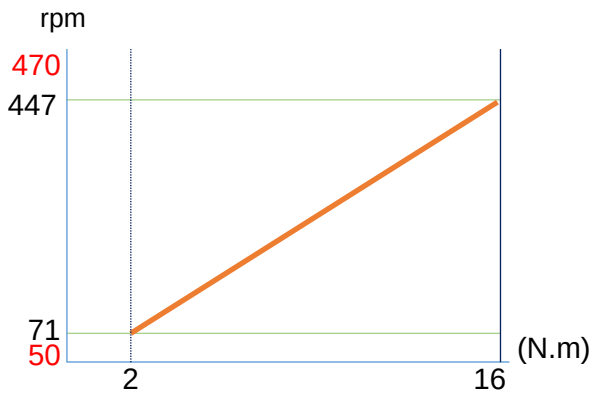
BMT3204



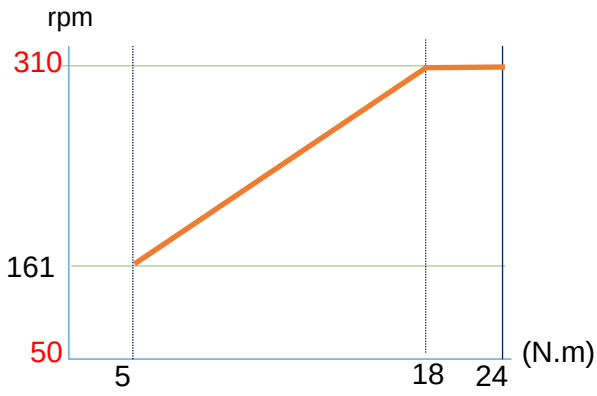
BMT3206



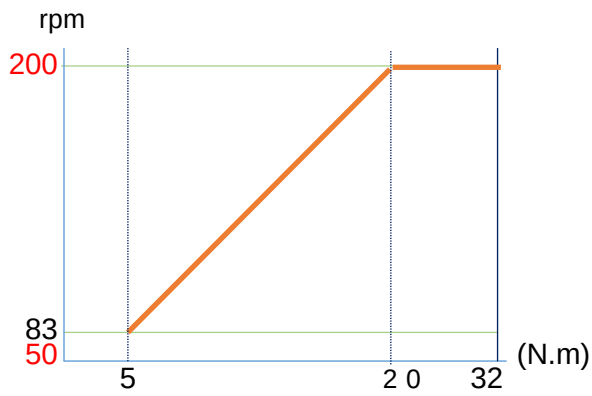
BMT3211



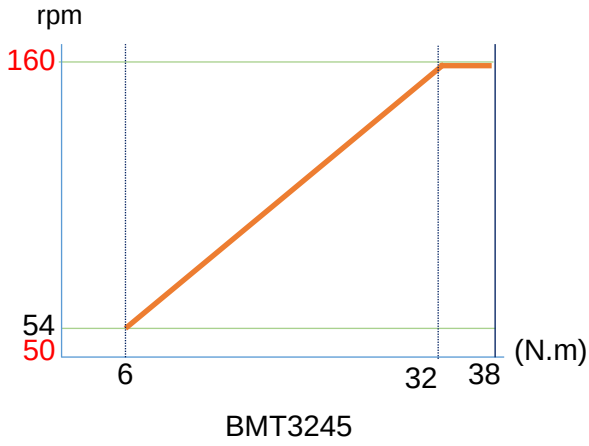
BMT3216



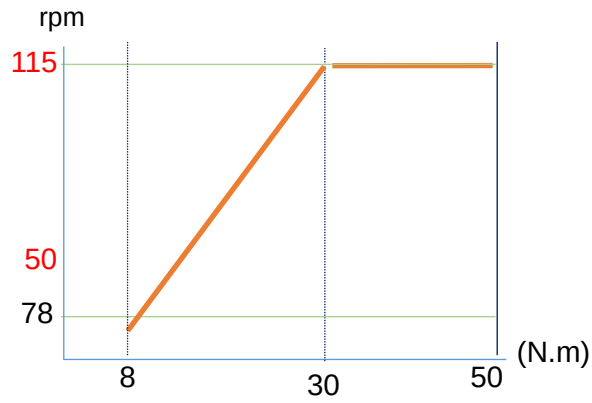
BMT3224



BMT3236



BMT3245



BMT3264

2.4 Screwdriver dimension and layout

2.4.1 Tool dimension

BMT et BMTH : unit in mm

2.4.2 Layout

2.4.3 BMT tool with built-in scanner

Barcode scanner work when trigger is pulled quickly 2 times.

LED turn on when barcode scan start.

Center the red circle on the barcode.

Scanning is complete then LED turn off.

Specification	
Barcode type	1D and 2D, QR code -
Length	Maximum read size is 32 character
Traceability	Barcode data is saved in memory with fastening data. (Max. 65,000) and also merged to Modbus last tightening datas (registers 3200 to 3229)
Change preset automatically by barcode	ParaMon, ParaMon-Pro X can set barcode list. Judged start /end character can be set for each save barcode
Max number of barcode saved	30

3. BATTERY & CHARGER SPECIFICATIONS

3.1 Battery

3.1.1 Specification

Specification	
Model	BL25201
Voltage / Capacity / Energy	25,2 V / 3,0 Ah / 75,6 Wh
Number of cells	3,6 V x 7 cells
Weight	0,5 kg

3.1.2 Battery pin configuration

3.1.3 Use

- Your battery is not fully charged at the time of purchase
- Be sure to charge the battery before first use or storage.
- Remove the battery when the tool is in idle for a long time.
- **Recharge the battery once every 6 months even if the battery is not in use**.

3.1.4 Battery safety rules

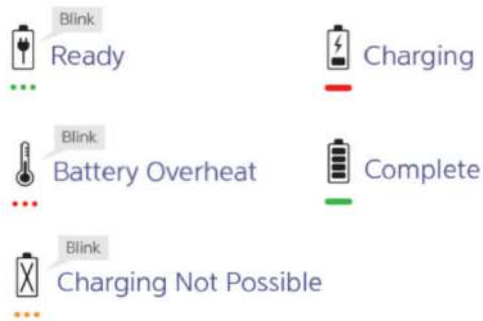
- Do not charge battery when temperature is below 0°C or above 40°C
- Use the specified charger only.
- Do not touch the terminals with any conductive material.
- Do not expose battery to water, rain or condensation.
- A battery short circuit can cause large current flow, overheating, possibly burns and even a break down.
- Do not disassemble battery , take it to a qualified service center when repair is required.
- Incorrect reassembly may result in a risk of electric shock or fire.
- Do not store the tool and battery in locations where the temperature may reach or exceed 50°C
- Do not incinerate the battery even if it is severely damaged or worn out. The battery pack can explode in a fire.
- Be carefull not to drop, shake or strike the battery.
- Do not charge inside a box or container of any kind. The battery must be placed in a well ventilated area during charging.
- Do not dispose of battery into household waste, fire or water. Batteries should be collected, recycled or disposed of an environmentally-friendly manner. Call the authorized warranty centers for places to dispose of damaged or inoperable batteries.

3.2 Battery charger

3.2.1 Specification

Specification	
Model	D25247A
Input	220 - 240 VCA, 50/60 Hz, 1,05 A
Output	25,2 VDC, 4,0 A
Fuse	250 VAC T 3,15 A
Operating environment	0 ~ 40°C / 15 ~ 80 % RH (without dew)
Full charging time	~ 53 minutes
Safety class	Class II
Weight	0,6 kg

3.2.2 LED display



LED display information

Green(blink)	Ready
Red	Charging
Green	Complete
Red(blink)	Battery overheat
Yellow(blink)	Charging Not possible

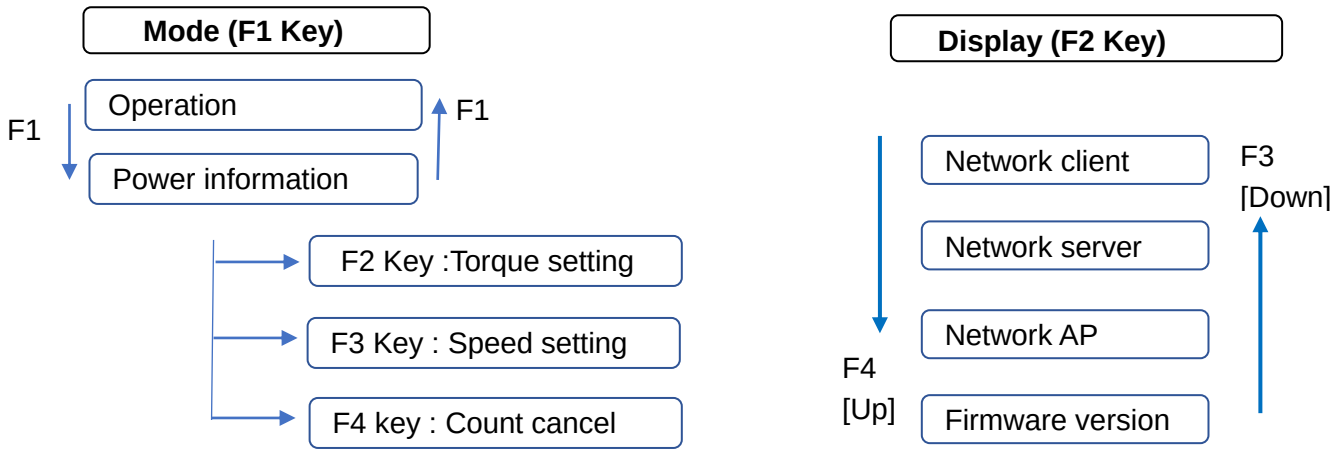
3.2.3 Charger Safety Rules

- Caution: To reduce the risk of injury, charge only authorized batteries. Other types of battery may burst, causing personal injury and damage.
- Before using battery charger, read all instructions and cautionary marking on batteries, chargers and product using batteries.
- Do not allow anything to cover or clog the charger vents and cooling fan.
- Only indoor use : do not expose charger to rain, or wet conditions.
- Do not operate charger if it has been damaged in any way.
- Do not disassemble, take it to a qualified service center for repair.

4. OPERATION

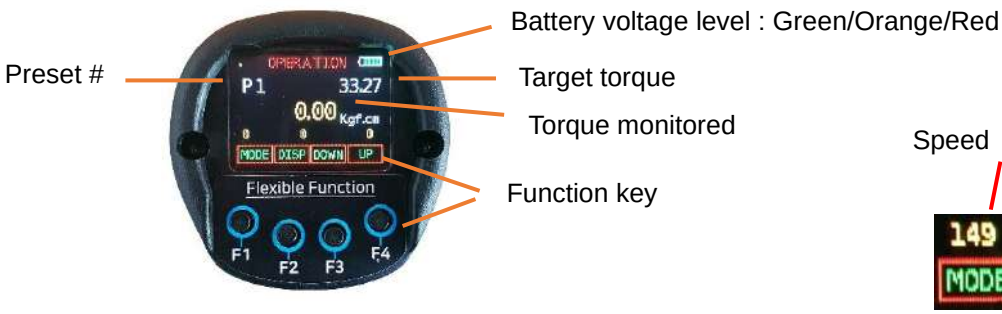
4.1 Screen display structure

Operation mode screen is a default screen when the screwdriver battery power connected.



Information
F1 key can be locked in controller setting 'LCD button lock' function to prevent setting modification. All keys can be locked as well.

4.2 Operation mode



Information
Display enable preset can be set in controller settings – to allow only presets which can be used

Key	Function	Description
F1	MODE	Mode change from Operation to Setting
F2	DISP	Display to show the network information
F3	DOWN	Select Preset # down
F4	UP	Select Preset # up

4.3 Power Information & Setting mode

4.3.1 Power information

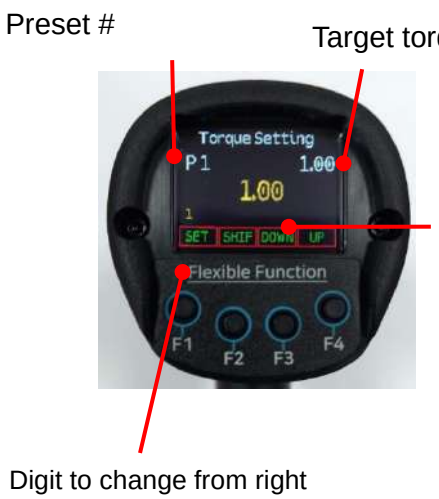
'High power' means that 25.2V battery is connected and screwdriver provides full specifications.

Information
When battery voltage is low, screwdriver will automatically power off.

4.3.2 Torque setting / Speed setting

Target torque and rundown speed can be modified for all presets.

From operation menu first select the preset with key F3[Down] or F4{Up]
Press key F1[MODE] then press key F2 for speed or key F3 for torque.
Speed can be modified manually only if 'AUTOSPEED' setting is off.
All other parameters should be set with ParaMon or embedded web server



Key	Function	Description
F1	SET	Set the torque or speed and change mode to operation
F2	SHIFT	Shift the digits from right to left
F3	DOWN	Decrease number
F4	UP	Increase number

If AUTOSPEED – speed is automatically optimized by torque target.

4.3.3 Count cancel (last count)

dedicated to Job management with ParaMon Pro X controller (option)

The last Fastening OK count can be canceled by pressing " -1 " count cancel key.
From operation menu press key F1[MODE] then press key F4[-1]

Key	Function	Description
F1	Yes	Confirm count cancel (-1)
F2	-	No use
F3	-	No use
F4	No	Return back to operation

4.4 Network information display

From operation menu press key F2[DISP]

Network	Description
Client	Information about networking of the BMT screwdriver Mode : DHCP (Dynamic Host Configuration Protocol) IP address: 192.168.0.4 Gateway : 192.168.0.1 Net Mask : 255.255.255.0
Server	Information about networking of the PC software, ParaMon... IP address: 192.168.0.53 Port : 5000
AP (Access Point)	Information about networking of the AP SSID : Doga
Firmware ver.	Screwdriver firmware version Ver : 0.70.2 S/N : 2102190016 - 21(year)02(Month)19(BMT code)0016(serial) Model : Screwdriver model TS : torque tranducer digital value

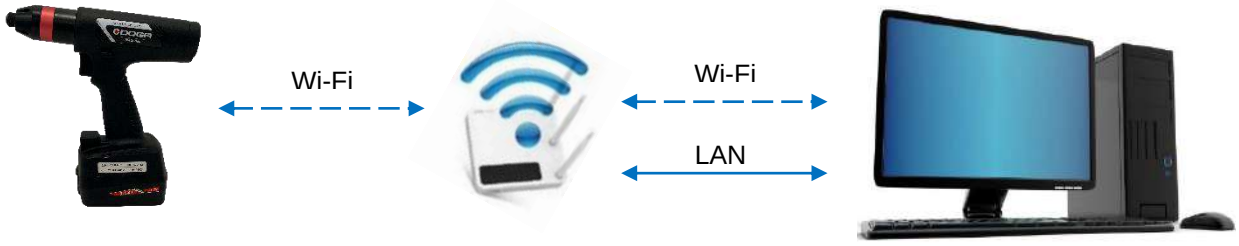
All networking setting are available on PC software ParaMon connected by USB port.

5. 5. CONNECTIONS OVERVIEW

5.1 USB connection

- Initial network configuration and screwdriver settings, real-time monitoring
- Data download from the internal memory (max 65 000)
- Easy screwdriver firmware update

5.2 Wi-Fi connection to PC, smartphone or tablet via access point (AP)



Tool (network server) | Access point | PC, tablet, smartphone (network client)

- Screwdriver parameterization, real-time monitoring on PC
- Free communication protocol (Modbus TCP) for client application communication (PLC, PC, …)
- Profinet, TCP / Ethernet IP protocol…(available as an option)

5.3 Wi-Fi connection to ParaMon-Pro X (option)

Tool (Network server) | ParaMon Pro-X (Network client)

- Simultaneous connection of up to 8 BM tools
- Job Manager: product assembly quality control with screwing strategies, batch counting, assembly visualization, I/O logic management and operator assistance
- Simple, user-friendly programming interface
- 4 USB 2.0 ports - 1D and 2D barcode reader (optional) - HDMI port for display duplication

6. FASTENING PARAMETERS FOR PRESET

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

■ Fastening settings

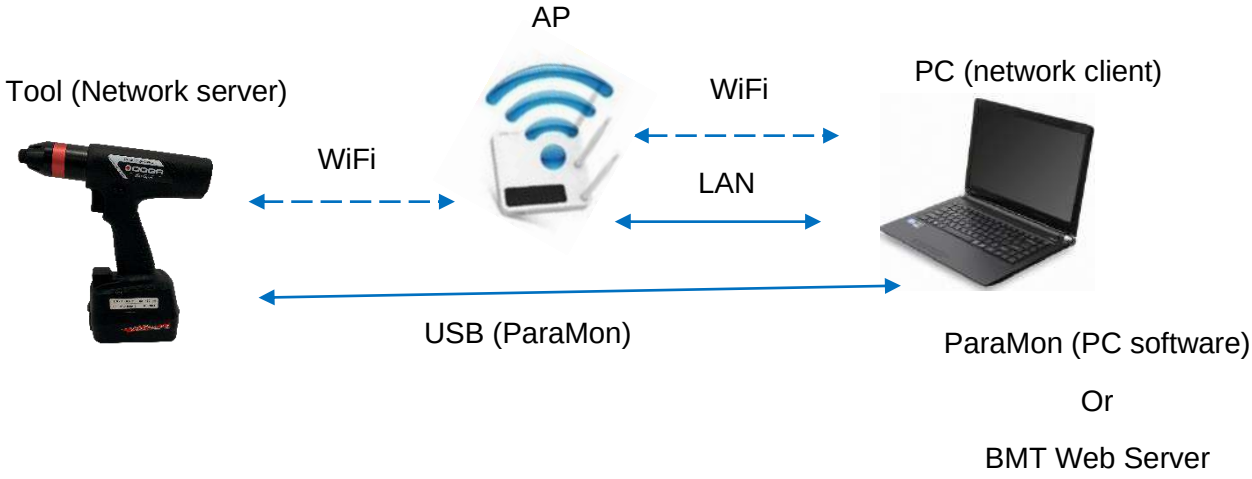
1. Type (TC/AM or AC/TM)
2. Target Torque or Max torque
3. Torque limit (%) or Min torque
4. Target angle or No use
5. Min angle
6. Max angle
7. Snug torque
8. Speed
9. Angle for free speed
10. Free speed
11. Soft start
12. Seating point
13. Torque rising time
14. Ramp-up speed
15. Torque compensation

■ Advanced Function

1. Free reverse rotation
   - Speed & angle
2. Thread Tapping
   - Min / Max torque
   - Speed & angle
   - Angle start from Thread Tapping
3. Engaging torque detection
   - Speed, torque, angle, time
   - Angle start from engaging
4. Angle after torque-up
   - Speed, angle, direction

7. SCREWDRIVER SETUP with ParaMon & Web server

7.1 Connection



7.2 Features comparaison

Features	BMT Web Server Web browser via Wi-Fi	ParaMon software USB or Wi-Fi
Initial network settings		✓(USB)
BM Firmware update		✓(USB)
WiFi firmware update	✓	
Data download from the tool		✓(USB)
Settings Fastening	✓	✓
Settings Advance functions	✓	✓
Settings Controller	✓	✓
Settings Multisequence	✓	✓
Settings Network	✓	✓
Monitoring Real-time (data)	✓	✓
Real-time data save (csv file)	✓	✓
Monitoring Graph	✓	✓
Graph data save (csv file)		✓
Remote control	✓	✓
Parameter back up	✓	✓
Parameter load	✓	✓
Barcode setup for preset # selection		✓
Torque transducer adjustment		✓

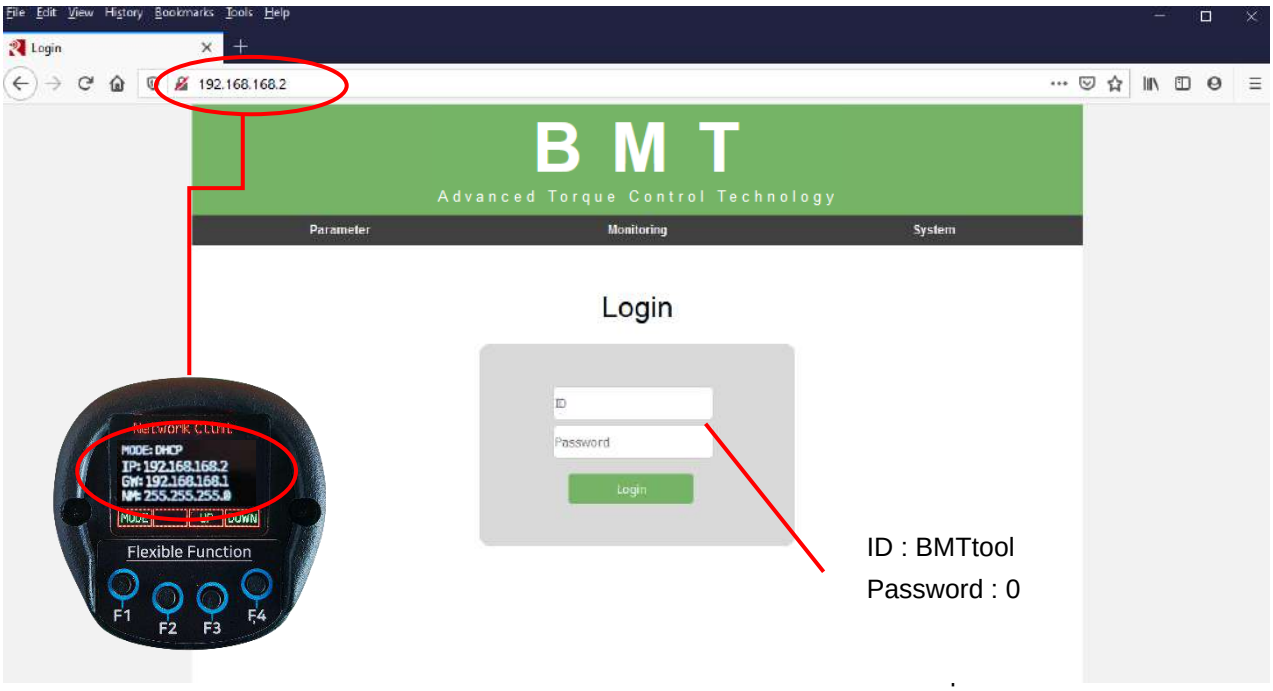
7.3 ParaMon

Please download the latest version from our Web site www.doga.fr
and refer to dedicated ParaMon instruction manual..

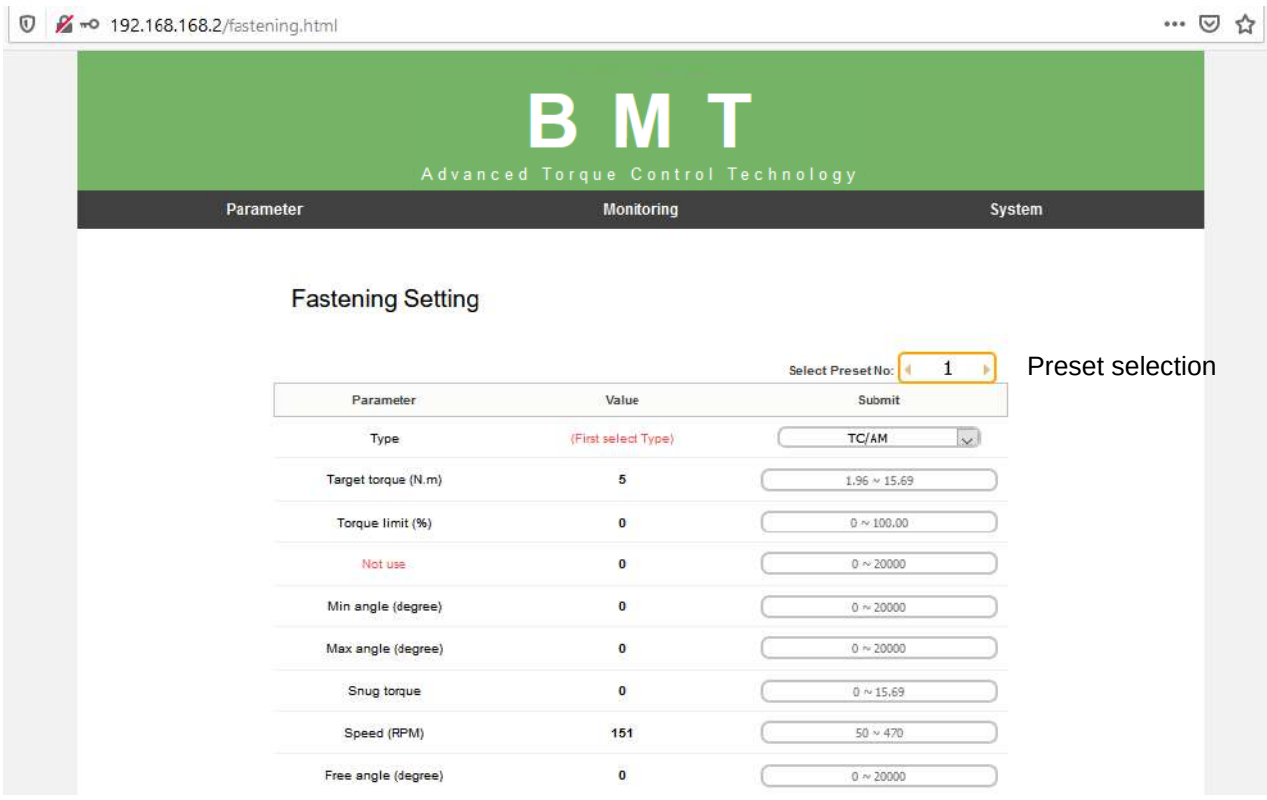
8. BMT WEB SERVEUR

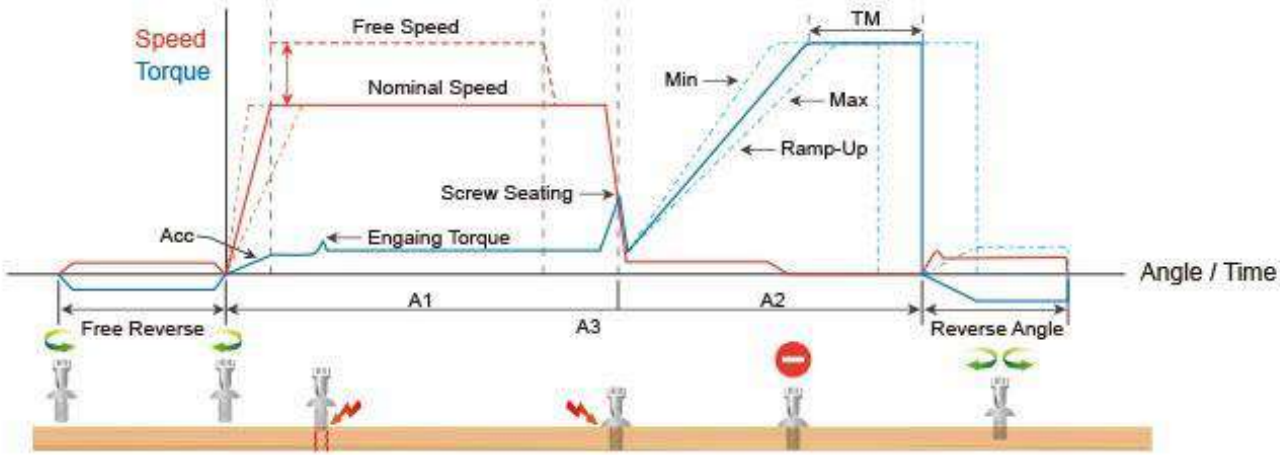
8.1. Login

Computer should be connected to same LAN (local Area Network) as BMT tool.
Web browser program as Chrome or Firefox are more recommended.
Check the IP* address of the BMT tool and type it in URL bar of web browser on your PC.



8.2 Parameter - Fastening setting





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

Target torque / 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		

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 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 and AC/TM mode		

Max angle			
	Unit	Range	Initial
	degree	0 ~ 20000	0
Description	Maximum angle to be OK in TC/AM and AC/TM 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		

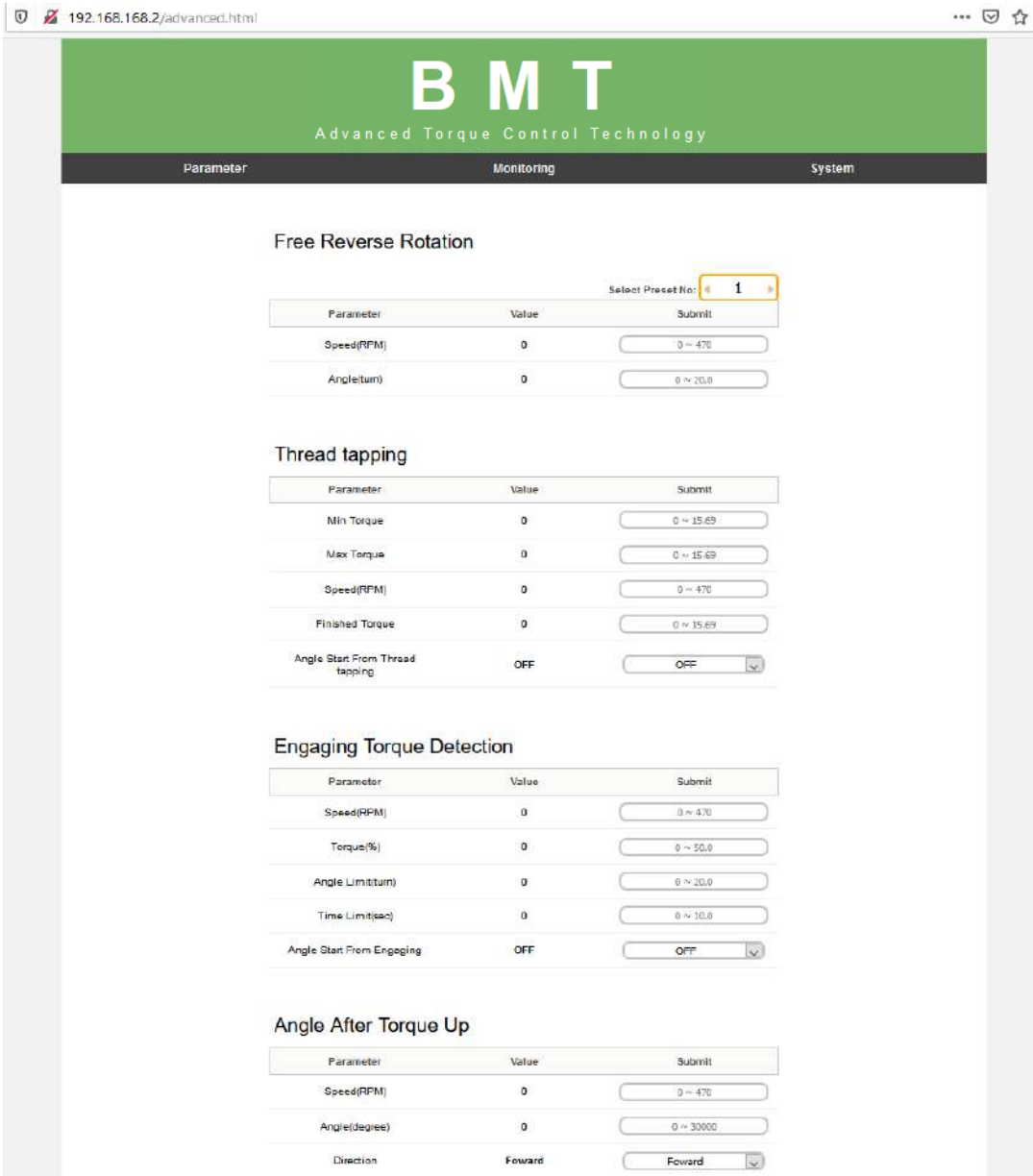
Torque rising time			
	Unit	Range	Initial
	msec	50 ~ 200	50
Description	Time setting from seating point to the target		

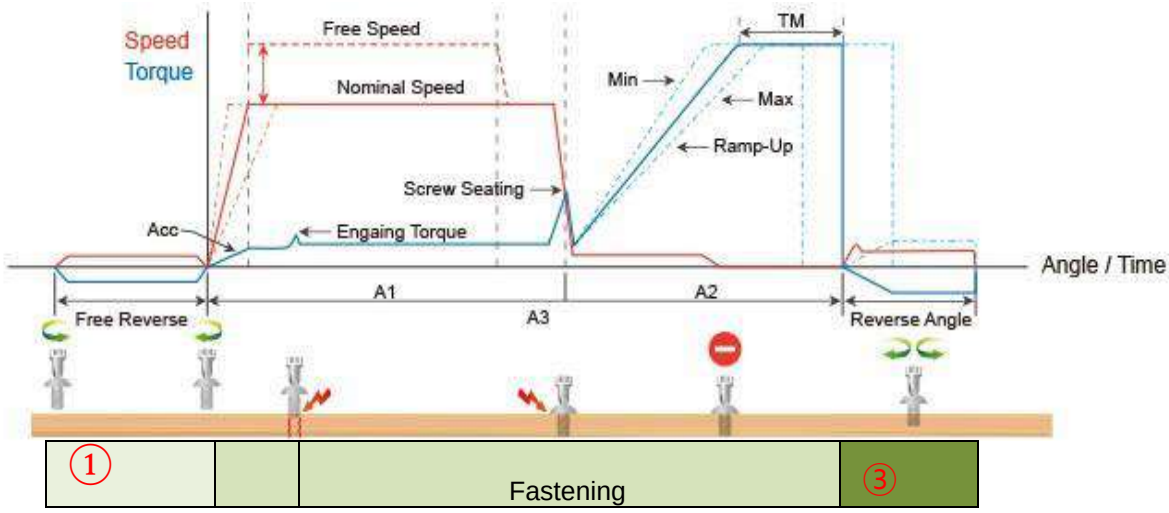
Ramp-up speed			
	Unit	Range	Initial
	rpm	Tool range	Auto
Description	Speed after seating to the end of tightening		

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.		

8.3 Parameter - Advanced functions

There are 4 Advanced Function settings to customize the screw fastening process.





8.3.1 Free reverse rotation before fastening ①

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		

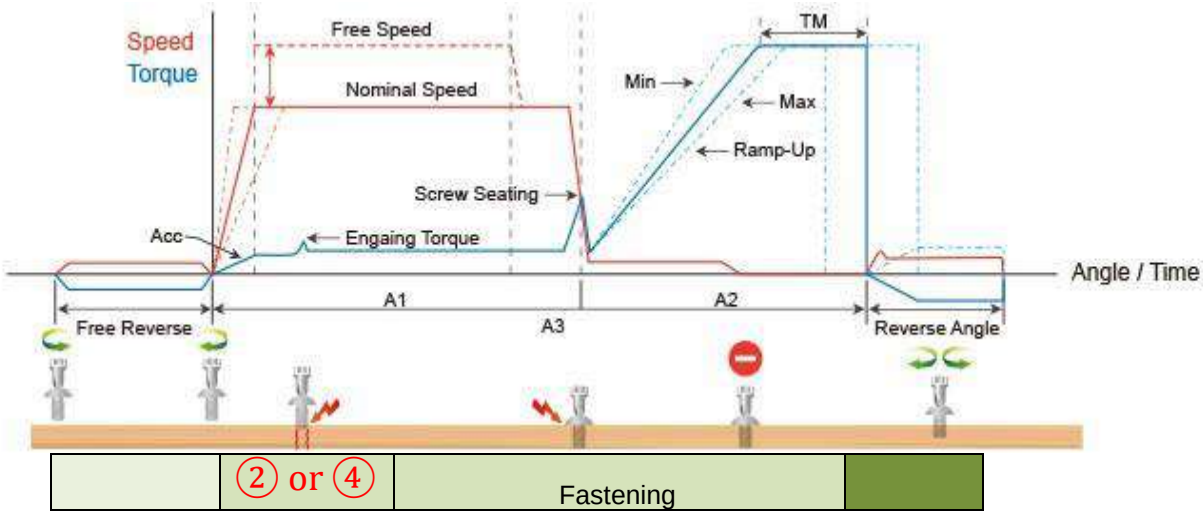
8.3.2 Angle after torque up ③

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		



8.3.3 Engaging Torque detection ②

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		

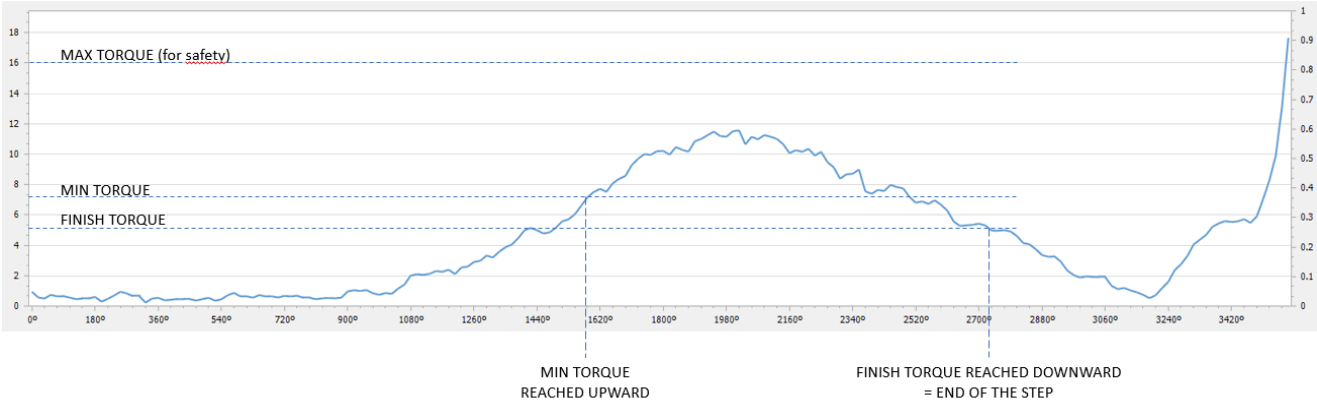
Time limit			
	Unit	Range	Initial
	sec	0 ~ 10	0
Description	Max engaging timelap		

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.		

8.3.4 Thread tapping ④

This function is dedicated to 'trough hole tapping' with a torque pic during thread tapping.
Torque pic during tapping can be higher than target torque, within the range of the screwdriver.
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.		

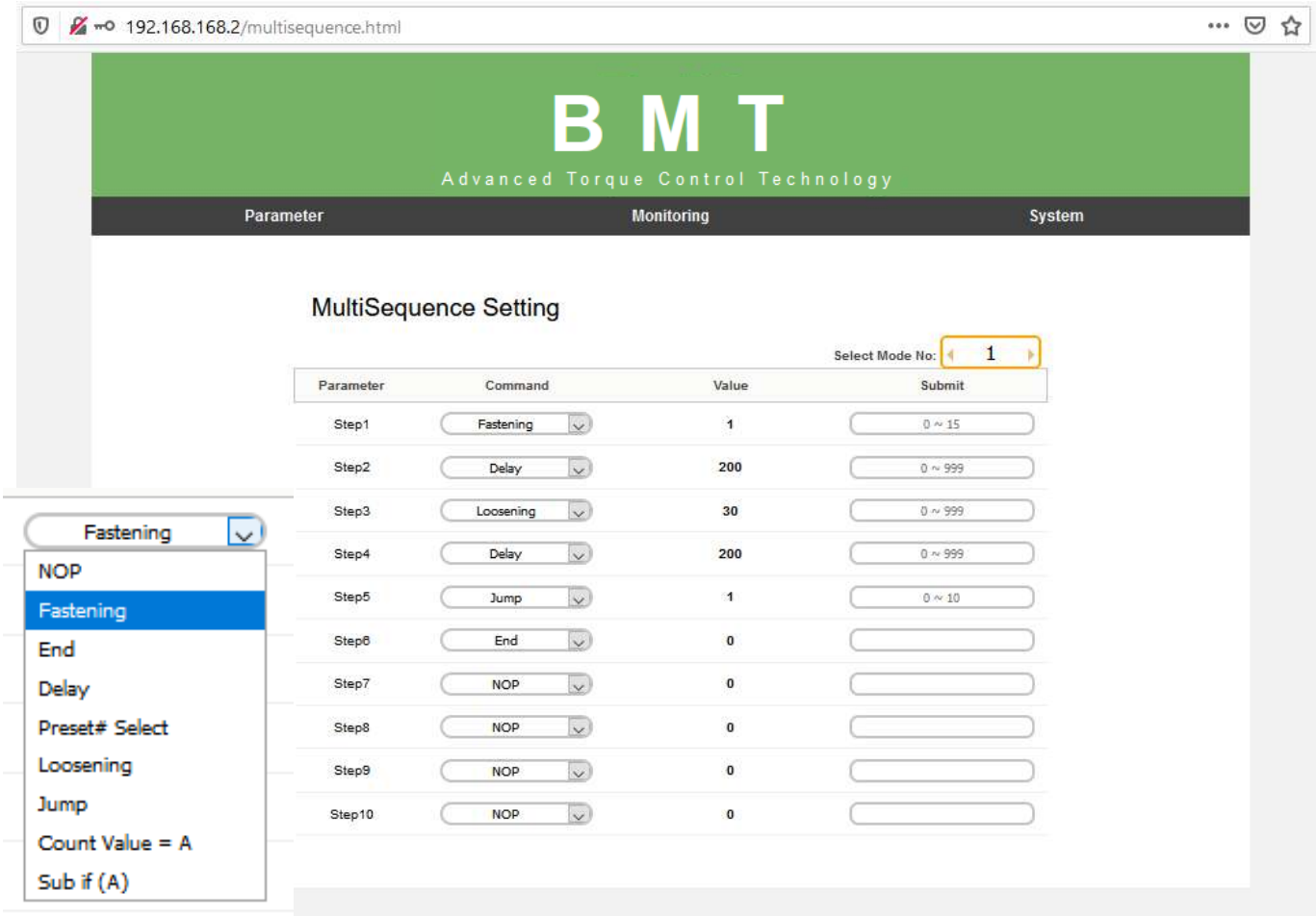
8.4 Parameter – Multisequence setting

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) prese

To program, select the command and required parameter on each step.

To finish the multi sequence programing, last step command should be “END”



8.4.1 Command details

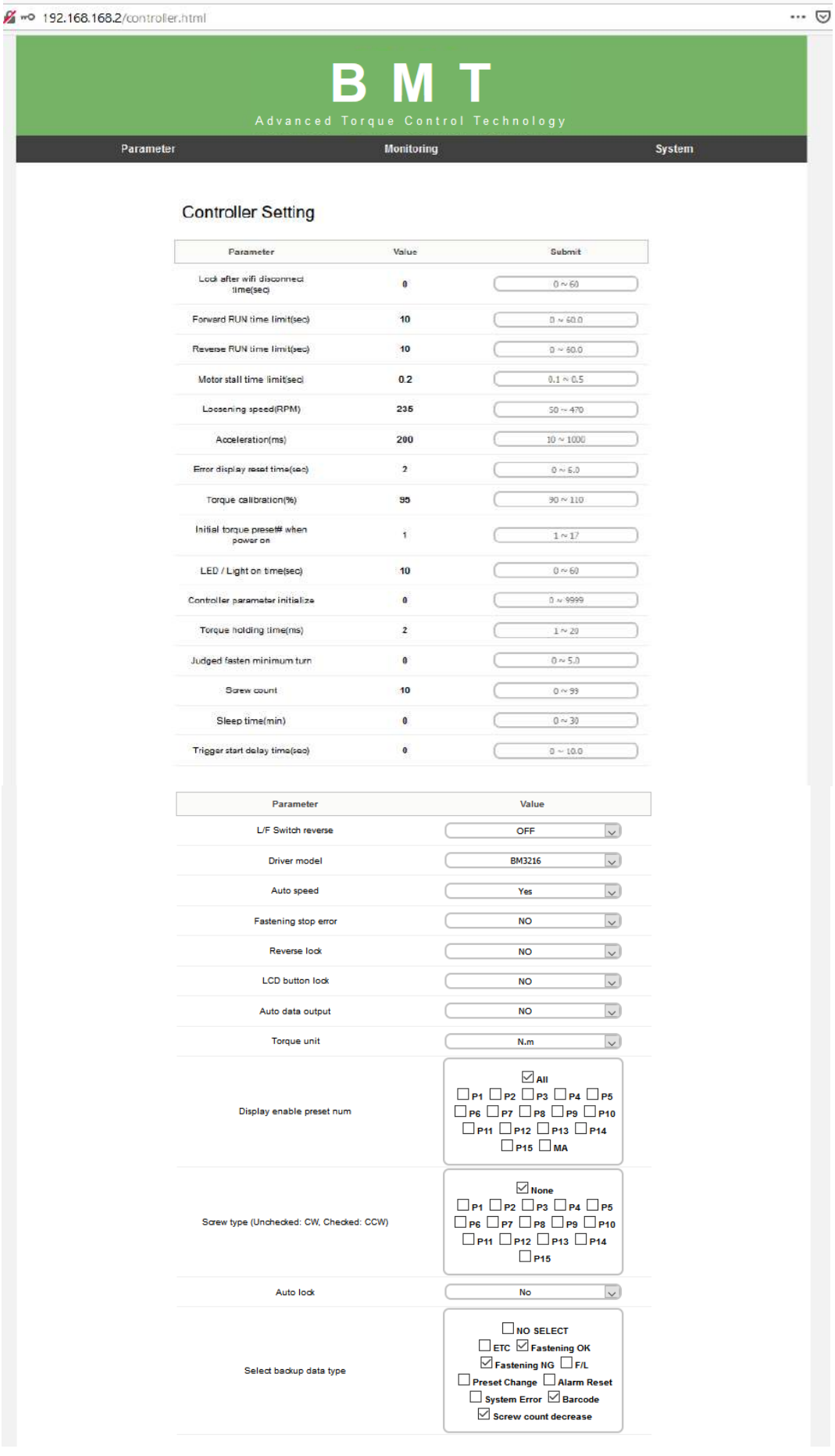
Command	Description	Data (range)
NOP	No operation	No use
Fastening	Tool start fastening process in forward rotation Selected Preset is fill in Data field	Preset selection 1 to 15
Loosening	tool start loosening process in reverse rotation	Angle in 0.1 turn up to 999
Select preset#	Select preset # (not 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

8.4.2 Example of Multisequence step program

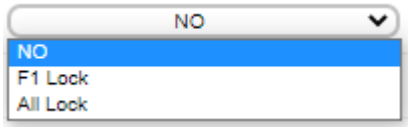
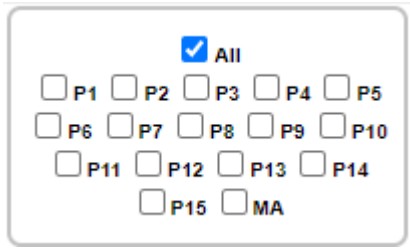
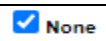
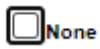
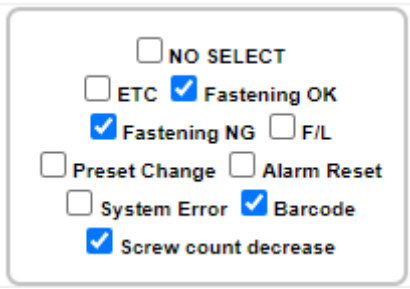
Step no	Command	Parameter	Description
Step 1	Count Value = A	10	Total counting number is 10.
Step 2	Fastening	1 (Preset #1)	Start fastening with Preset #1 and stop by torque or angle setting, and move to the next step
Step 3	Loosening	5	Loosen 5 turns and move to the next step
Step 4	Fastening	3 (Preset #3)	Start fastening with Preset #3 and stop by torque or angle setting, and move to the next step.
Step 5	Sub if (A)		Subtract 1 from “10” and save “9” by replacing “10”. 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
Step 6	Jump	2	Jump to step no. 2
Step 7	End		End

Step no.2 to Step no. 4 works for a cycle. Total 10 cycles are operated automatically by a start signal.
Any failure or NG on each step, Multi-sequence process stops and provide the alarm signal. Once all steps are finished successfully, there is FASTENING OK signal output. Every successful fastening in steps provide TORQUE UP signals.

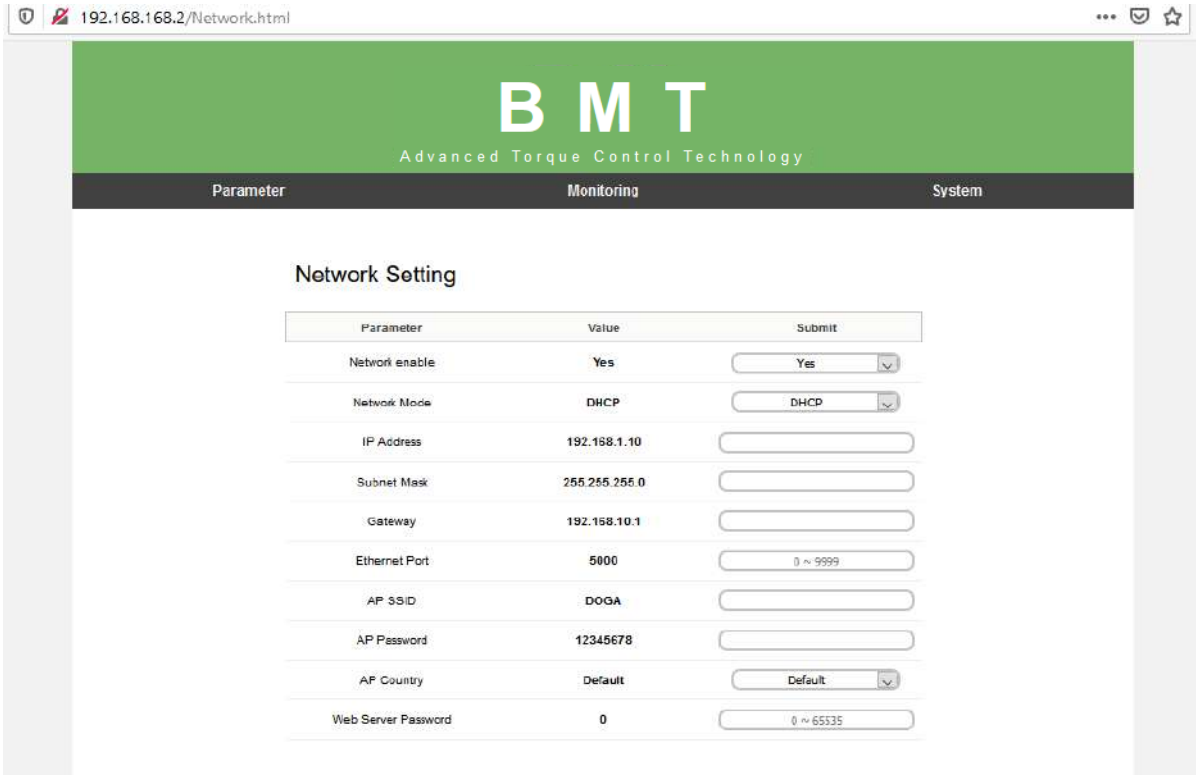
8.5 Parameter – Controller setting

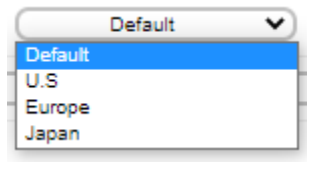


Parameter	Description
Lock after wifi disconnect time(sec)	If wifi disconnect during setting time. Then Driver lock. '0' will desactivate the function
Forward RUN time limit(sec)	Run limit to forward rotation
Reverse RUN time limit(sec)	Run limit to reverse rotation
Motor Stall time limit(sec)	Immediate stop when motor is stalled
Loosening speed(RPM)	Loosening speed for all presets in rpm
Acceleration(ms)	Slow start of motor to the target speed
Error display reset time(sec)	Auto error reset time in ms of alarm message on tool display '0' means a manual reset with F4 tool button.
Torque calibration(%)	It is master calibration of torque. Keep "Reverse" of the F/R switch of the screwdriver during calibration.
Initial torque preset# when power on	When power on, automatically select and display the preset #
LED light on time(sec)	Whenever tool starts, LED light is turn on together for the time Only available for pistol tools
Controller parameter initialize	Key in " 77 " to flash the parameters back to the factory settings Fastening data initialize in memory
Torque holding time(ms)	Screwdriver keep the target torque for the set time. The long holding time can make heat issue of the motor.
Judged fasten minimum turns	Turns off the judgement for the turns
Screw count	Key in the total number of screw to count down Used for counting in Job Management by ParaMon-Pro X(option)
Sleep time(min)	Time setting to sleep mode. Any operation will awake the sleep mode. Tool display will be switched off.
Trigger start delay time (sec)	It is software filter to prevent chattering of the start signal
L/F Switch reverse (ON/OFF)	Change L/F switch type : L/F or F/L switch
Driver model	Select the right driver model Do NOT change as it is a factory setting
Auto speed(Yes/NO)	ENABLE provides the safe speed on the torque setting

Parameter	Description
Fastening stop error (Yes/NO)	DISABLE does not create any NG when the tool stops without fully tightening by torque up
Reverse lock (Yes/NO)	Driver can be locked in reverse rotation.
LCD button lock	the buttons on the tool can be locked.  F1 lock : used to lock tool F1 button will lock access to torque and speed manual setting
Auto data output (Yes/NO)	Fastening data output automatically on every event as like run, For/Rev change, torque up, preset change, etc.
Torque unit	Kgf.cm / Kgf.m / cNm / Nm / ozf.in / lbf.in / lbf.ft (Whenever the unit is changed, the tool should be reboot again.)
Display enable preset num	Choose the preset which will be selectable by operator on tool display 
Screw type	 checked : all preset will tighten in CW direction  unchecked : choose for each preset rotation direction
Auto lock (Yes/NO)	Set NO when tool is used stand alone. Yes always lock the tool. the unlock signal can release the lock Use in job management by ParaMon-Pro X
Select backup data	Select data to be saved in the internal memory of the tool 

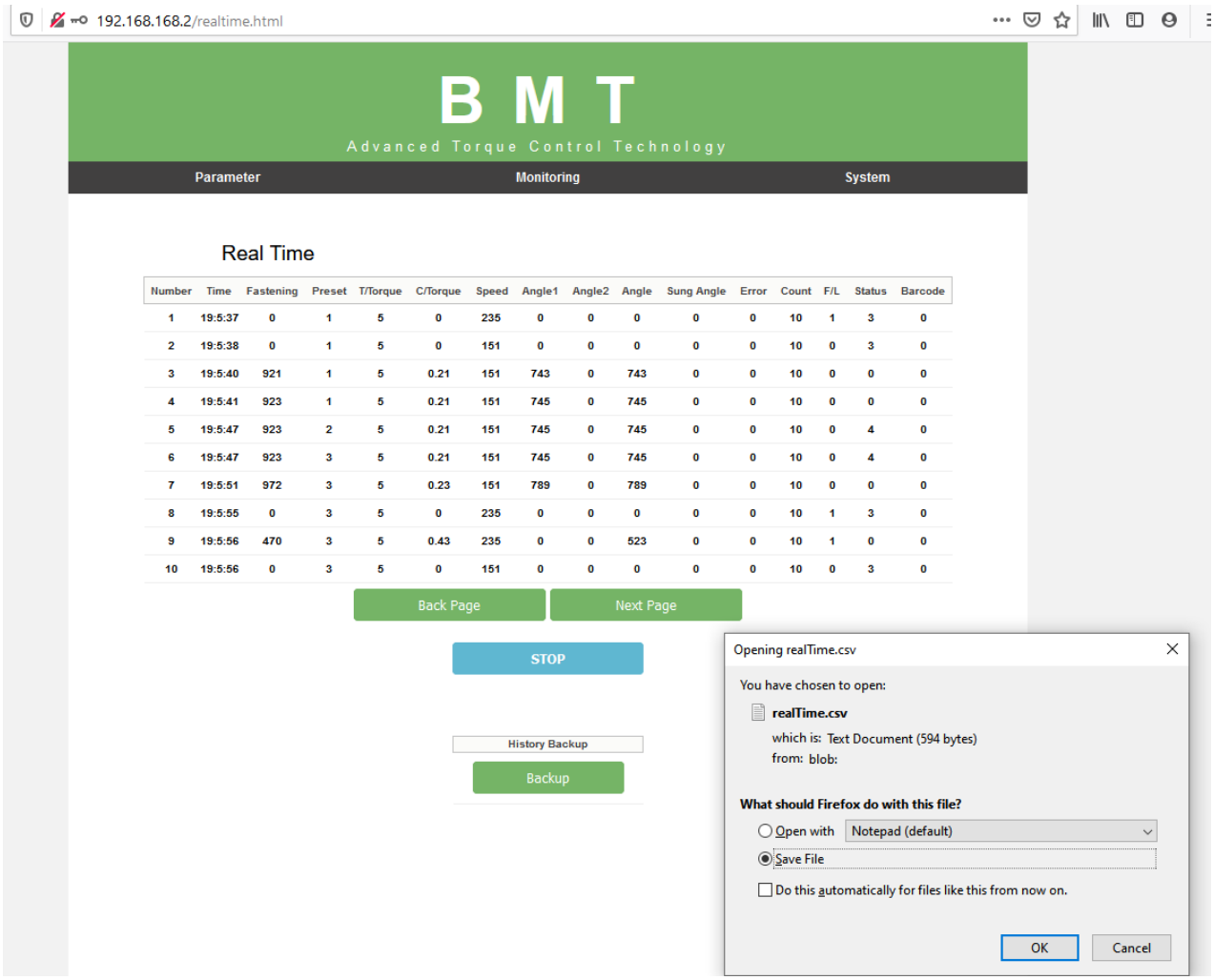
8.6 Parameter – Network Setting



Parameter	Description
Network enable	Yes : activate WiFi
Network mode	DHCP : automatic IP addressing if connected to a DHCP server Static : to enter manually IP settings in fields below
IP Address	To be fulfilled if network mode is static
Subnet Mask	To be fulfilled if network mode is static
Gateway	To be fulfilled if network mode is static
Ethernet Port	5000 default setting for Doga software
AP SSID	WiFi Access Point name
AP Password	WiFi Access Point password
AP Country	Select your location 
Web Server Password	Default ‘0’

Information
Changing Network setting could disconnect screwdriver from WiFi Network

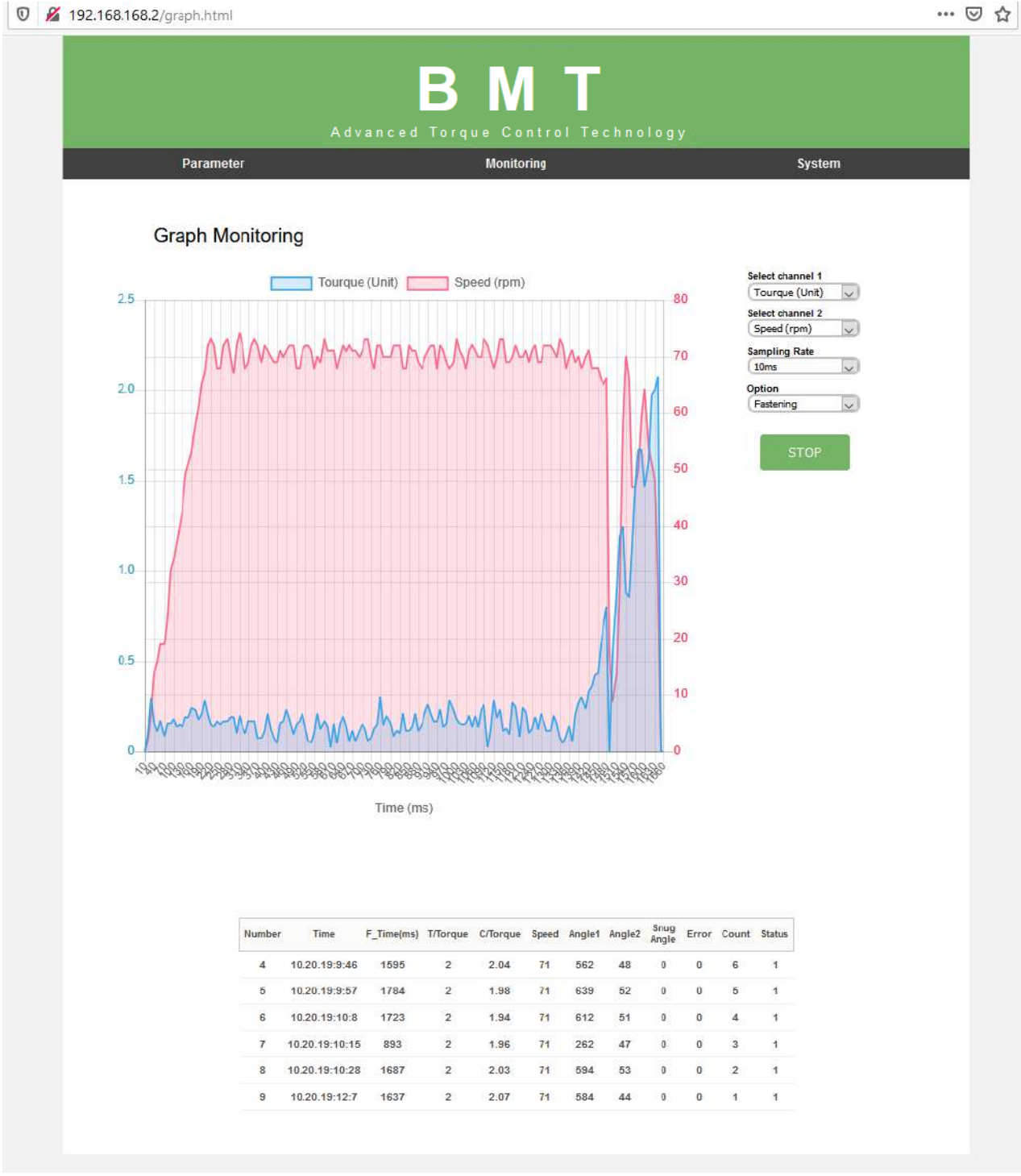
8.7 Monitoring - Real Time



The following data are monitored automatically on every event as like motor run, torque up, Forward / Reverse change, preset # change, etc. The monitoring data can be saved in CSV file.

Date & time
Fastening time
Preset #
Target torque
Converted torque
Speed
Angle 1 (angle from motor start to screw seating point)
Angle 2 (angle from screw seating point to the end)
Angle 3 (Angle 1 + Angle 2)
Snug Angle(degree) : angle from snug torque to the end
Error code
Screw count no.
Forward / Reverse status
Status (Free run =0, Fastening OK=1, Fastening NG=2, F/R change=3, Preset# change=4, Alarm reset=5, System error = 6, Barcode = 7, Screw -1 = 8)
Barcode data

8.8 Monitoring - Graph



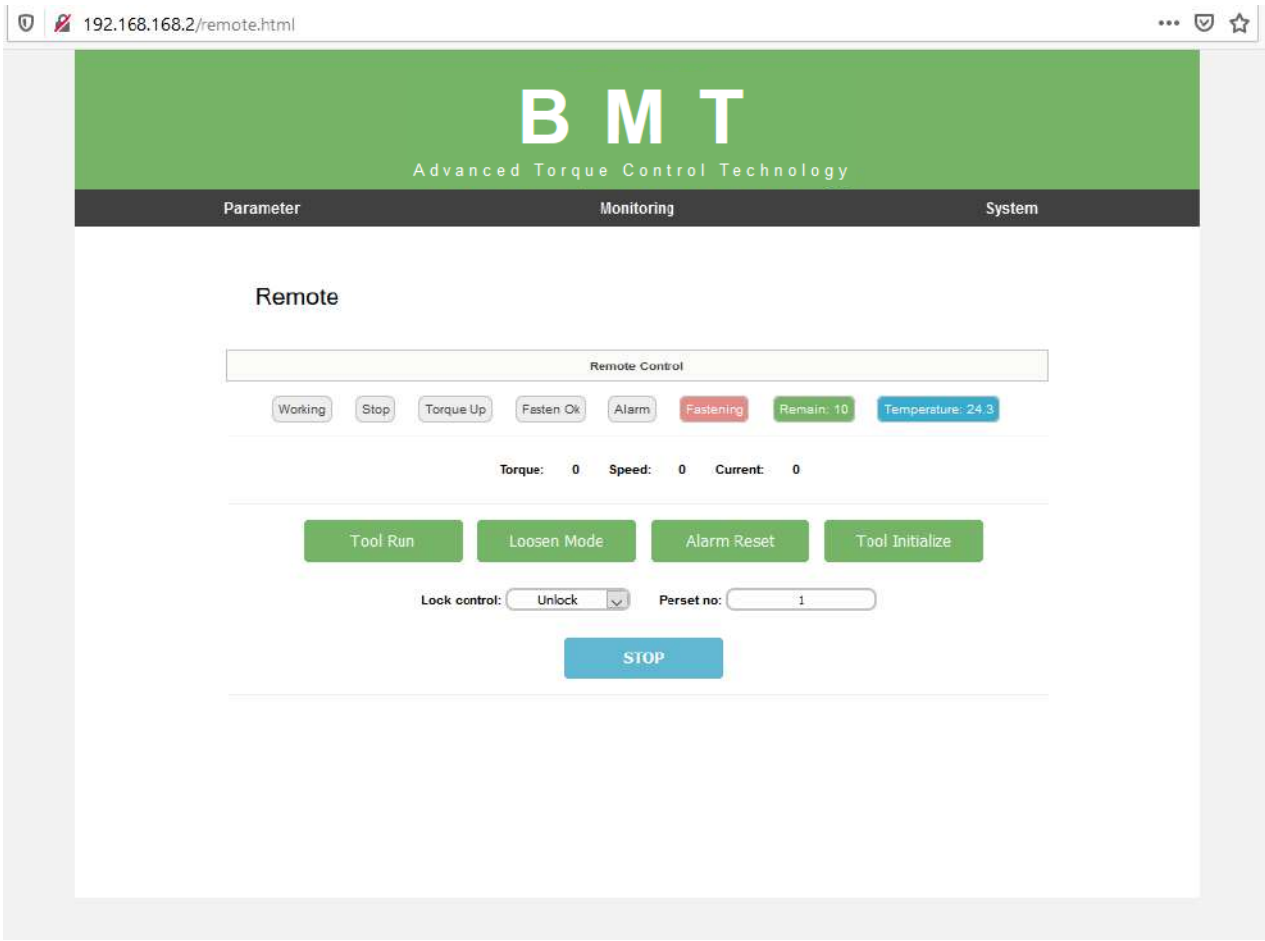
Number	Time	F_Time(ms)	T/Torque	C/Torque	Speed	Angle1	Angle2	Snug Angle	Error	Count	Status
4	10.20.19:9:46	1595	2	2.04	71	562	48	0	0	6	1
5	10.20.19:9:57	1784	2	1.98	71	639	52	0	0	5	1
6	10.20.19:10:8	1723	2	1.94	71	612	51	0	0	4	1
7	10.20.19:10:15	893	2	1.96	71	262	47	0	0	3	1
8	10.20.19:10:28	1687	2	2.03	71	594	53	0	0	2	1
9	10.20.19:12:7	1637	2	2.07	71	584	44	0	0	1	1

2 curves can be displayed together.

Channel selection vs time :

- Torque, Speed, Angle(degree) and current
- Data sampling rate : 5ms, 10ms, 15ms
- Data display option : Fastening, Loosening, All

8.9 Monitoring - Remote control



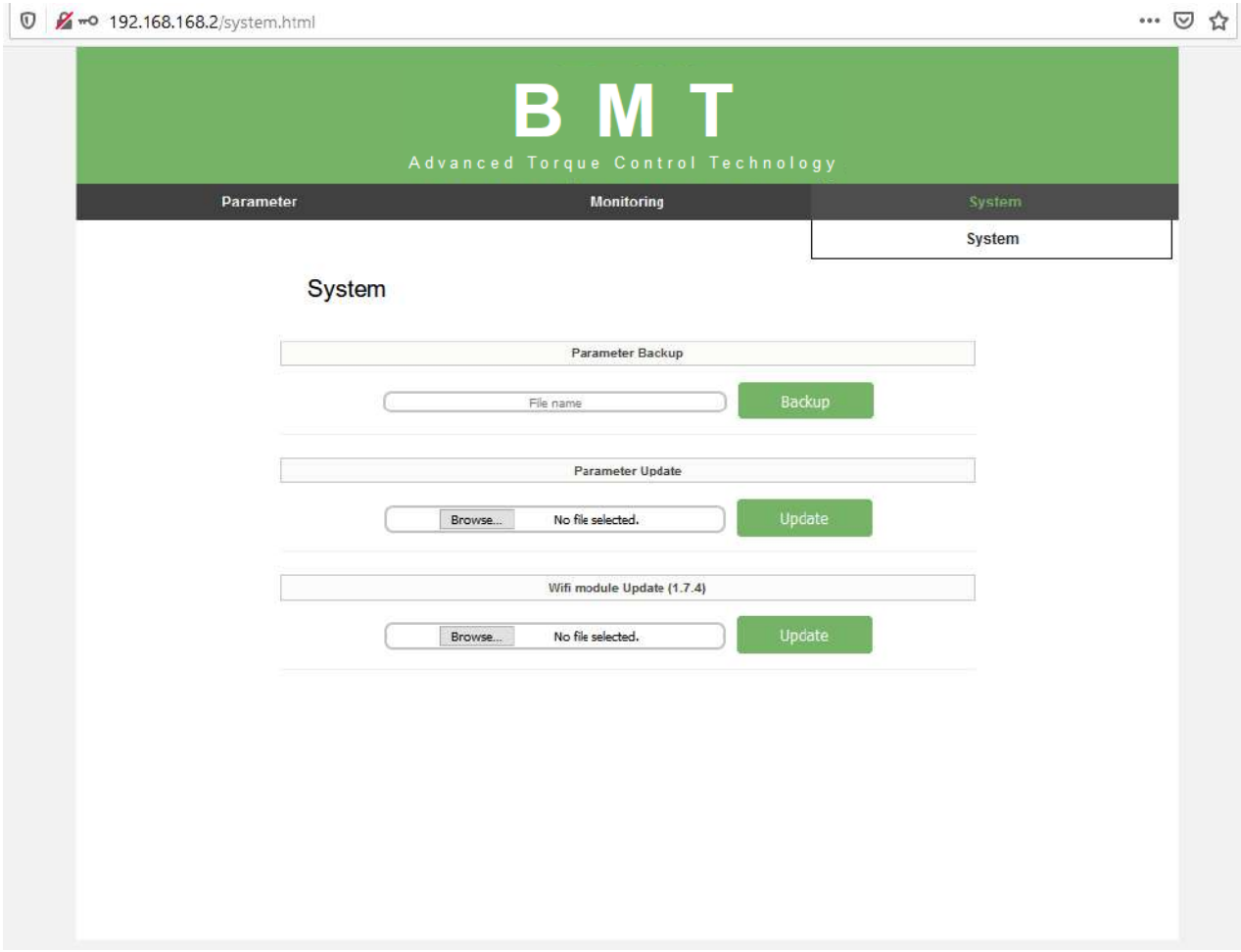
The tool is operated remotely for the followings.

- Fastening / loosening rotation,
- Tool Start
- Tool lock & unlock

The following main signal status and I/O are monitored and displayed together with torque, speed and current curves.

- Ready, Tool start/stop, Torque up, Fastening OK, Alarm, F/R, I/O

8.10 System



- **Parameter Backup : Back-up file creation**

Click on the “Backup” button to create the parameter setting back-up file. The file format is csv.

- **Parameter Update : Load file**

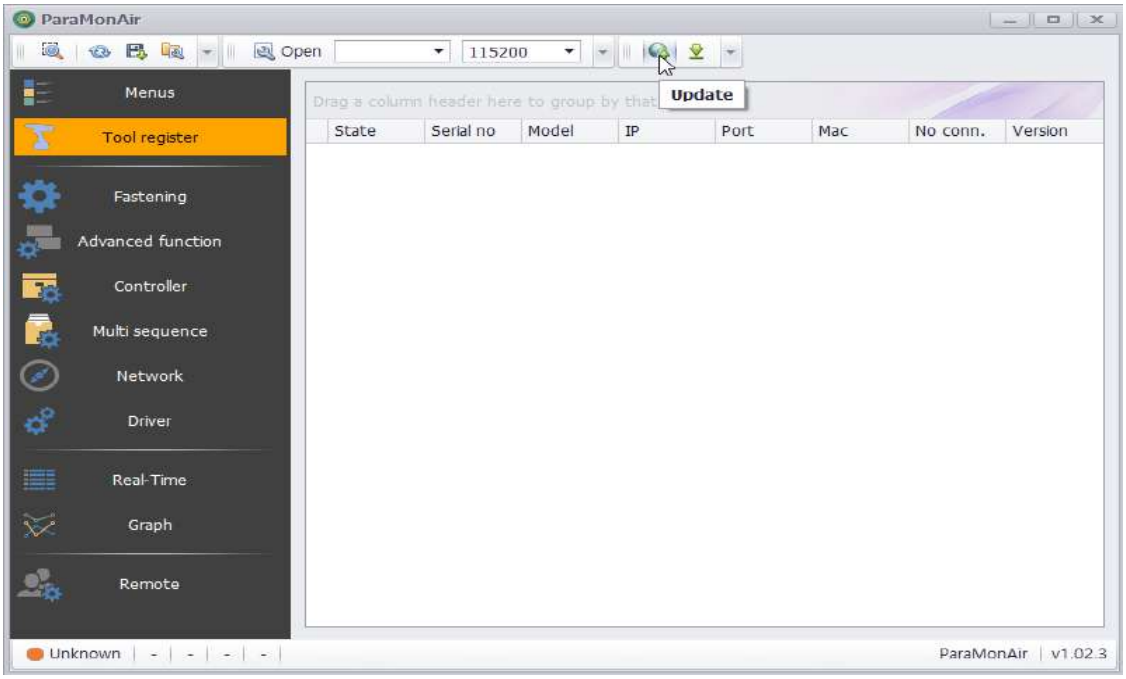
Click on the "Browse" button to select the file to be loaded.
Click on the "Update" button to load the backup file into the screwdriver.

- **WiFi module Firmware update**

Click on the "Browse" button to select the Wi-Fi module firmware to be loaded.
Click on the "Update" button to load the Wi-Fi module firmware into the screwdriver.

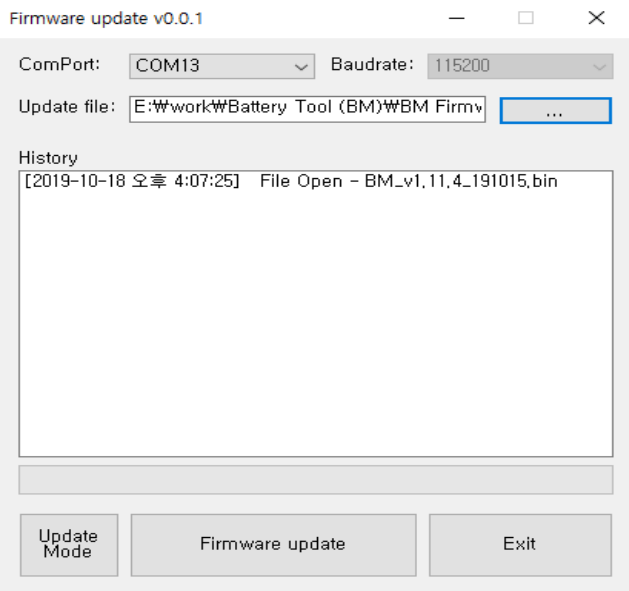
9. FIRMWARE UPGRADE

Only with USB cable connection using ParaMon software.



1.Run a “ParaMon” PC program.

2.Click [Update].

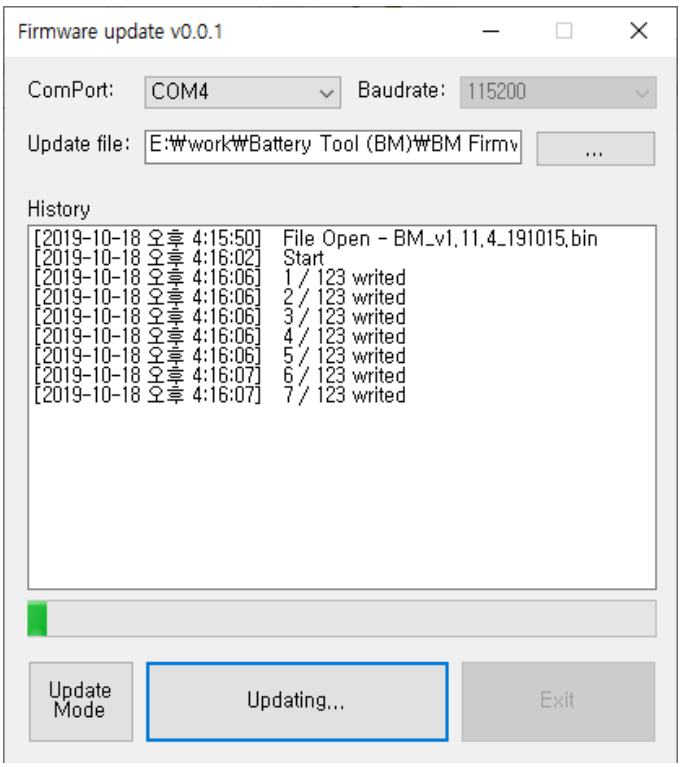


3.Set “Com Port”,.

Caution
If cable disconnect during upgrade: End program, BM battery remove
Start firmware upgrade first step. .

[Mise à jour du mode]

4.Click “Update Mode” (If already Update mode then don’t click “update mode”)
5.Check firmware update mode
6.Check “Com Port” change.
7.Select firmware file.
8.Click “Firmware update”.



9.End the program after upgrade complete.

10. MODBUS COM PROTOCOL

BM tool is capable of connecting to a host controller (Handy Loader, HMI, PLC, PC, etc.) through WiFi, allowing the user to use such functions as parameter change and data monitoring.

Please refer to dedicated instruction manual BM COM protocol MODBUS TCP.

Please refer to register list in appendice .

11. MAINTENANCE

11.1 Maintenance

Please maintain tools according to Doga preventive maintenance guidelines.
Check for misalignment or binding of moving parts, breakage of parts, and any other condition that may affect the tool operation.

Warming

If damaged, have the tool serviced before using. Many accidents are caused by poorly maintained tools.

11.2 Trouble shooting

During manufacturing the proper functioning of the unit is checked multiple times.
However, if the unit malfunctions, troubleshoot it using the error list in net chapter.

Warming

All troubleshooting tasks requiring the opening of the box must be performed by DOGA or a company authorised by DOGA..

If you cannot resolve a problem despite reading this manual, 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 contact** depending on the device type.

11.3 Error code

When error occur. Tool display error code and blink red LED.

11.3.1 System errors

Code	Nombre	Description
UNDER VOLTAGE	104	Low Battery voltage
TRANSDUCER_SENSOR_ERR	105	Torque sensor offset value error
BACKUP DATA R/W	108	Back up (Fastening) data read / write Error
OVER_CURRENT	109	Screwdriver motor over current
CURRENT OFFSET	110	Current calculation error
BAT_UNDER_VOLTAGE	111	Battery error signal
OVER SPEED	112	Over Motor max speed
DRIVER PARAMETER	113	Can’t read driver parameter
UNKNOWN DRIVER	114	Controller driver model setting different with driver
NOT RECOGNIZE CTL	115	Program itself can not recognize the controller information.
NO SPEED	118	When motor rotation is not monitored
WIFI COMM FAIL	120	Disconnect with AP
USB COMM FAIL	122	USB communication Fail
WIFI INIT FAIL	123	Wi-Fi connect fail with AP
PARAMETER R/W	200	Parameter read / write Error
PARAMETER CHKSUM	201	The read parameter is wrong by the checksum routine
MULTI SEQUEN PGM	220	Multi-sequence program is wrong

11.3.2 Fastening errors

Code	Nombre	Description
FASTENING TIMOUT	300	Over time limit on A242(Forward run time limit)
LOOSENING TIMOUT	301	Over time limit on A243(Loosen run time limit)
OVER TIME LOOSEN	304	Motor stall by loosening failure within time limit on A244
OVER_TRQ_BEFORE_RAMP_UP	305	Target torque reached before seating point and ramp up.
MIN ANGLE	330	Target torque reached before the Min angle
TARGET ANGLE SET	331	Target angle setting is out of the range [AC/TM mode]
MAX ANGLE	332	Target torque reached over the Max angle
FASTENING STOP	333	Operation stops before complete cycle of torque up by releasing lever trigger
FIND ENGAGING TQ	334	The engaging torque is not detected in time or angle limit
C_TORQUE LIMIT	335	Converted torque is out of torque limit (%)
FASTEN OVER TQ	336	Torque reached to the high limit of torque capacity
TQ_UP DURING F_SPEE	337	Torque up when free speed zone
THREADTAP MAX TORQUE	338	Torque reached when ThreadTap max torque zone
THREADTAP MIN MAX RANGE OVER	339	Over ThreadTap torque Min, Max range
OVER TEMP MOTOR	500	Motor temperature over 80°C
OVER TEMP BATTEY	501	Battery temperature over 80°C

11.4 Spare parts

When repairing a tool, use only original spare parts. Use of unauthorized parts or no respect of maintenance instructions may create a risk of electric shock or injury.

For any spare parts order, contact your DOGA technical sales representative.
Indicate the model of your screwdriver and serial number.

11.5 Hotline

11.5.1 For any information regarding the use of the tool

Please contact your Technical Salespeople.

My client area on www.doga.fr

Go to your client area on www.doga.fr, click “Your contacts”, then select your **Technical Salespeople** depending on the tool type.

11.5.2 For any information regarding troubleshooting

Please contact your After-Sales contact.

My client area on www.doga.fr

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

If our technician can remotely determine the origin of the fault, he will tell you what to do to allow you to repair it by yourself as far as possible.

11.6 After-sales Returns

All material must be returned with a after-sales service Return Form, that you must complete and attach to your package.
The repair, maintenance or adjustment service can only start at the receipt of this form.

Information
Following this procedure allows you to quickly take charge of your request and reduce the troubleshooting costs.
DOGA reserve the right to apply a trade-in discount and to invoice, if applicable, the costs of repairing and packaging.

11.6.1 Download the after-sales return form

You can download the return form by following this link:

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 service return form as long as it contains all the information necessary to take care of your equipment.

11.6.2 Send your equipment

The returned package must be postage paid to the following addresses depending your transport mode::

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

11.7 On-site repair

Even though it seems convenient, on-site repair is seldom the best solution for transportable equipment. The conditions in which the technician 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-salesdepartment.

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 contact** depending on the device type.

Our services will organize the intervention.

11.8 Warranty

DOGA guarantee all his products against any defect in parts or fabrication for a period of **12 months**.
To benefit from the parts and labor warranty, the following conditions must be respected:

- The tool must have been used in a professional use and in accordance with the normal conditions of use described in the instruction manual.
- The tool must not have suffered any damage from storage,maintenance or improper handling.
- The tool must not have been adapted or repaired by unqualified persons.

12. SAFETY

12.1 General dispositions

The instruction manual must be carefully stored in a known place and easily accessible to the potential users of the product.

Warning

Read this manual and have each operator read it carefully before installing, using or repairing.

Make absolutely sure that the operator has fully understood the rules of use and the meaning of any symbols affixed to the product.

Most accidents can be avoided by following the instruction manual.
These rules have been drafted with reference to the European Directives and their various amendments as well as standard rules product.
In each case, respect and comply the National Safety Standards.
Do not remove or damage the labels and annotations affixed to the product,more particularly those imposed by the law.

12.2 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.

12.3 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 inside or outside**. 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.

12.4 Personnal 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, protective gloves or hearing protection must be used for appropriate conditions.

12.5 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.

12.6 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**. Use of unauthorized parts or may create a risk of electric shock or injury.

12.7 Contra-indications

- Do not cover.
- Do not immerse.
- Do not expose to splashing liquids.
- Do not use near to a heat source.
- Never lubricate aerosol oil on to the electrical part.

13. STANDARDS

13.1 Manufacturer details

Importer : DOGA

Adress : ZA Pariwest
8 avenue Gutenberg CS 50510
78317 MAUREPAS CEDEX - FRANCE

13.2 Markings

BMT / BMTH	Designation of equipment
Type	Equipment reference
Serial No MM/YYYY XXXX	Serial number with Month/Year of production
DOGA 8 avenue Gutenberg – CS 50510 78317 Maurepas Cedex – FRANCE	Name of the equipment manufacturer
25.2V	Electric power
CE	Equipment designed and manufactured in accordance with the requirements of European Directives 2014/35/UE, 2014/30/UE et 2011/65/UE

13.3 Transport and storage

Information
Your equipment can be damage if you store it or transport it improperly. Observe the transport and storage information for your equipment.

13.3.1 Transport

Use a suitable container to transport the unit and protect it during shipment.
Power off (remove battery) before packing.

13.3.2 Storage

Respect the following guidelines before each storage:

- Turn off BMT tool (remove battery).
- Clean the tool according to the instruction manual (Maintenance Chapter).
- Store it in a suitable container to protect it from dust and direct sunlight.
- Store it in a dry place at an ambient temperature, below 40°C.

13.4 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 as follows:

13.4.1 Collection and recycling scheme

In compliance with the French Environmental Code covering professsional 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 R543-197.
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.

13.4.2 Collection points

Free collection points for used electric or electronic devices are available near your company.
Your local authorities can provide their addresses.

14. APPENDICES

14.1 EC Declaration of Conformity

Modèle	Lien de téléchargement	QR code
BMT / BMTH	http://service.doga.fr/syst/dogatech.nsf/liste/00266	

14.2 Parameter details and factory settings

Refer to data sheet **60452.**
https://www.doga.fr/sites/doga/files/uploads/documents/zip-com-modbus-bm-bmt-60427-60451-60452.zip

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