DOGA®
ASSEMBLY
TECHNOLOGY

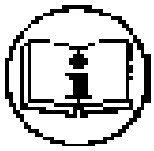
Wireless
DC Tools
BM Series

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.

INDEX

1. GENERAL 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.

2. SPECIFIC SAFETY RULES

2.1 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.

2.2 Never lubricate aerosol oil on to the electrical part.

2. Product

BM tool is a Wireless DC screwdriver with torque and angle control.

2.1 Packing item :

Standard packing items :

- BM tool alone without battery (Battery charger is not included)
- Battery pack 2EA (Battery charger is not included): 1xBM tool + 2xbatteries

Screwdriver pack with 2 x Battery (25.2V/3A)

USB-A to mini-USB B cable

Battery charger
Sold separately

Delivered with CE DoC and calibration test.

2.2 Main features

1) Digital torque and angle program in 15 preset numbers and 2 multi step sequence programs

2) AMOLED color display

3) Auto speed setting by torque

4) Monitoring fastening quality and count of screw numbers

5) Error information by code display

6) Easy parameter setting and monitoring by ParaMonAIR (PC software) & Web Server

7) Real time torque data and curve display

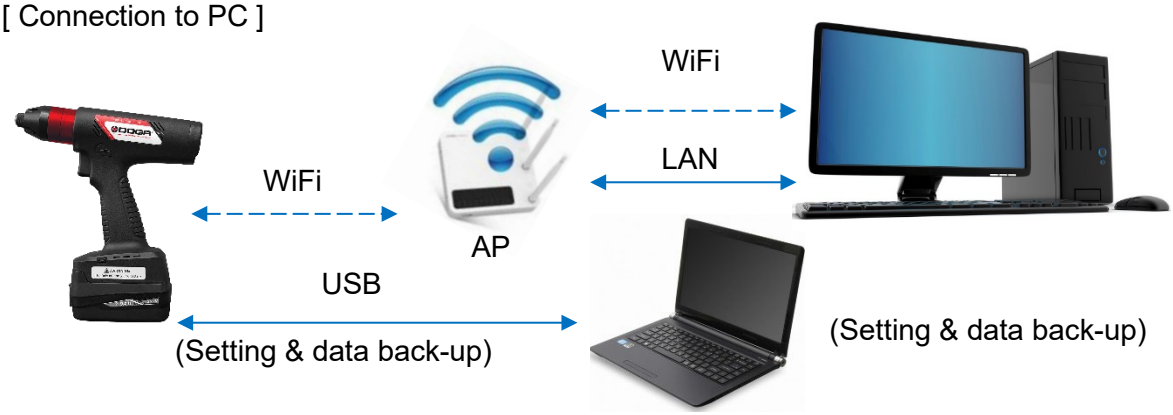
8) Real time fastening data output

9) Modbus protocol

10) USB, WIFI (2.4GHz & 5GHz)

2.3 System layout

[Connection to PC]



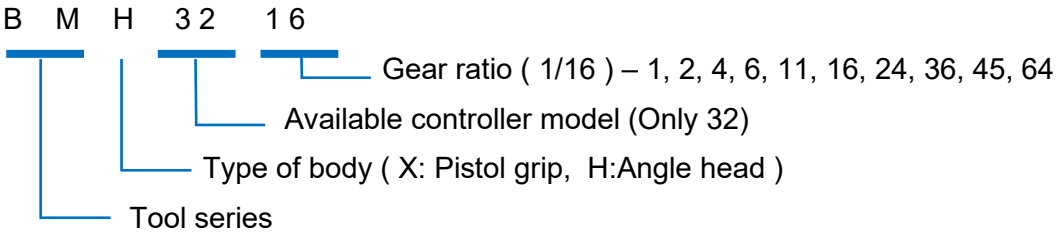
[Connection to ParaMon Pro X] for Multiple tool management

3. Screwdriver

3.1 General specification

no	Item	Specification
1	Electric power	DC25.2V, 3A max
2	Motor	Swiss DC servo motor
6	Torque accuracy	+/- 10%
7	Torque repeatability	+/- 3%
8	WIFI	IEEE 802.11a/b/g/n 2.4GHz & 5GHz dual band
9	Weight	0.9 - 1.9 Kg (without battery)
10	Speed	Auto speed by torque setting
11	Data memory	Total 65,000 data
12	USB	Mini USB type B port
13	Display	1.29” AMOLED color display
14	No. of preset	15 preset programing by USB or Wi-Fi

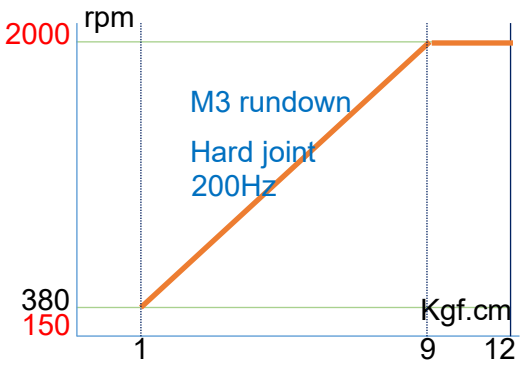
3.2 Model specification



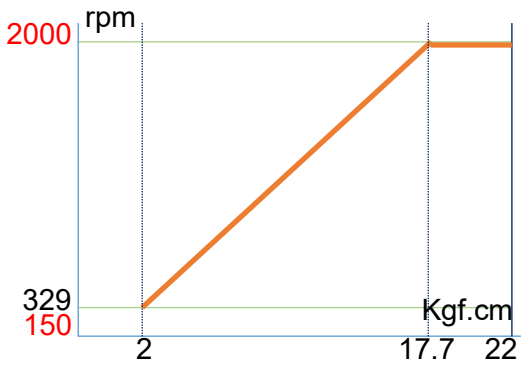
Type	Model	Torque (Nm)	Speed (rpm)	Weight (Kg)	Standard Bit socket
Pistol	BM3201	0.1 ~ 1.2	100-2000	0.9	Hex1/4”
	BM3202	0.2 ~ 2.2	100-2000	0.9	Hex1/4”
	BM3204	0.4 ~ 4.4	100-1800	1.0	Hex1/4”
	BM3206	0.6 ~ 6.4	100-1250	1.0	Hex1/4”
	BM3211	1.5 ~ 11.3	50-690	1.1	Hex1/4”
	BM3216	2.0 ~ 15.7	50-470	1.1	Hex1/4”
	BM3224	3.9 ~ 23.5	50-310	1.1	SQ3/8 or Hex1/4”
Angle 90 °	BMH3204	0.4 ~ 4.4	100-1800	1.4	SQ3/8 or Hex1/4”
	BMH3206	0.8 ~ 6.4	100-1250	1.4	SQ3/8 or Hex1/4”
	BMH3211	1.5 ~ 11.3	50-690	1.6	SQ3/8 or Hex1/4”
	BMH3216	2 ~ 15.7	50-470	1.6	SQ3/8 or Hex1/4”
	BMH3224	3.9 ~ 23.5	50-310	1.6	SQ3/8 or Hex1/4”
	BMH3236	4.9 ~ 31.4	50-200	1.7	SQ3/8
	BMH3245	5.9 ~ 39.2	50-160	1.7	SQ3/8 or SQ1/2
	BMH3264	7.8 ~ 49.1	50-115	1.9	SQ3/8 or SQ1/2

3.3 Auto Speed by torque setting under the each test condition

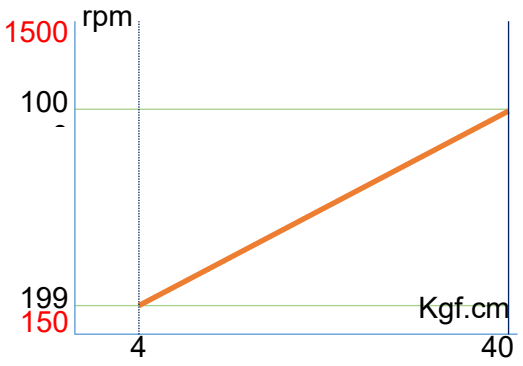
- Speed range : Available setting range by manual
- Auto speed by torque setting : Safe speed not exceeding over torque by rotation inertia under the testing conditions described on the chart



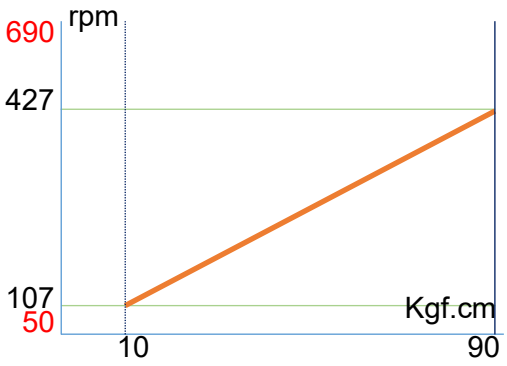
BM3201



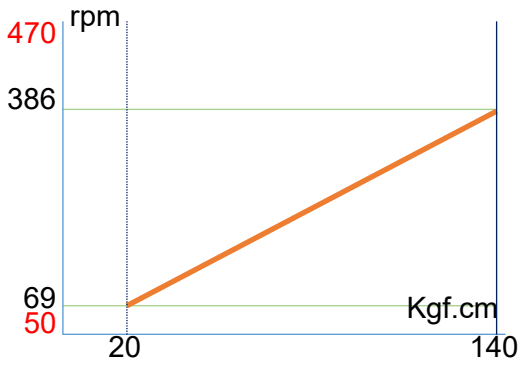
BM3202



BM3204



BM3211



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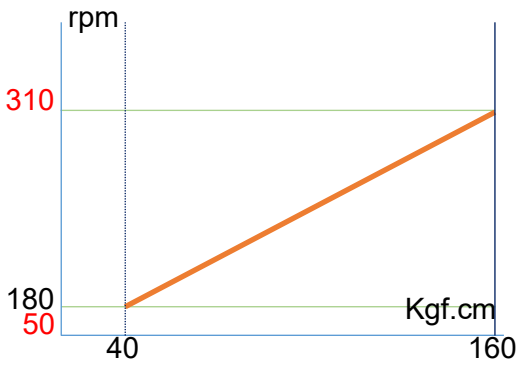
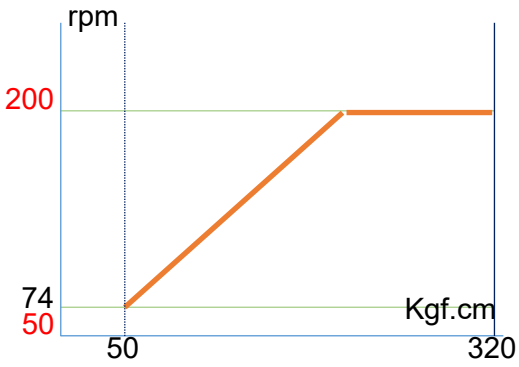


BM3224



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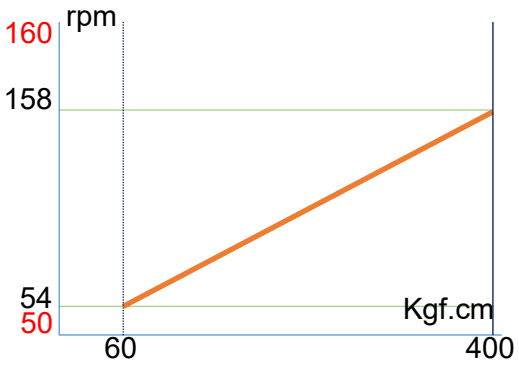
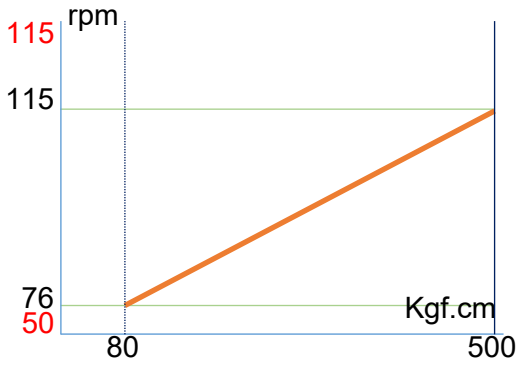


BM3245



BM3264

3.4 Screwdriver dimension and layout

1) Tool Dimension

BM &BMH Unit : mm

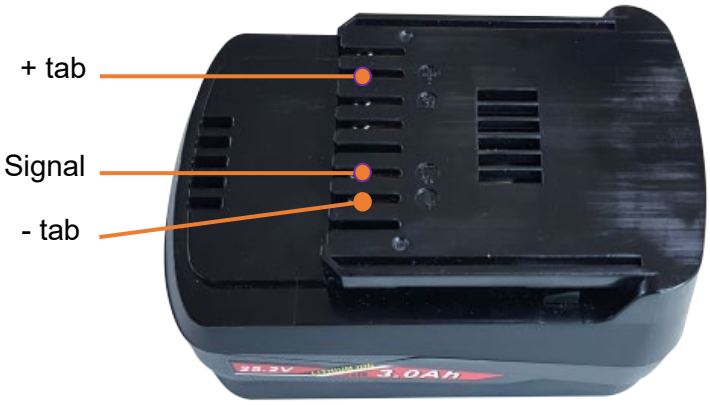
2) Layout

4. Battery & battery charger

4.1 Battery

Item	Description
Model	BL25201
Voltage/Capacity/Energy	25.2V / 3.0Ah / 75.6wh
Number of cell	3.6V x 7 cells
Weight	0.5 kg

Battery pin configuration



NOTE:

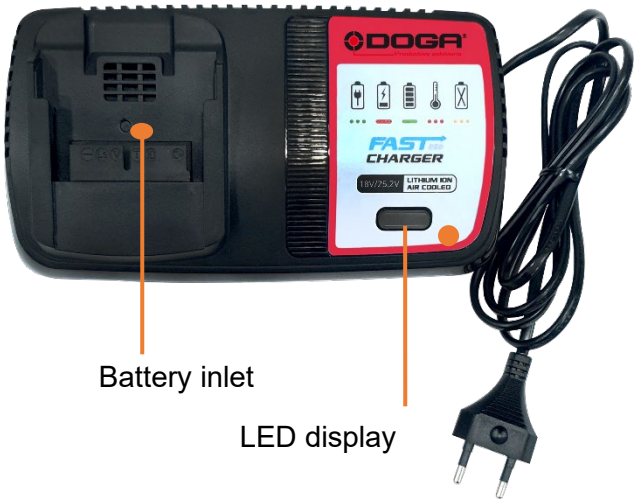
- Your battery is not fully charged at the time of purchase
  Be sure to charge the battery before first use or storage.
- Remove the battery when the tool is in idle for a long time.
- Recharge the battery once every month even if the battery is not in use.

4.2 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

4.3 Battery charger

Item	Specification
Model	D25247A
Input	AC220 - 240V, 50/60Hz, 1.05A
Output	DC25.2V, 4.0A
Fuse	250VAC T3.15A
Operating environment	0 ~ 40℃ / 15 ~ 80% RH (without dew)
Full charging time	53 minutes
Safety class	Class II
Weight	0.6 kg



LED display information

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

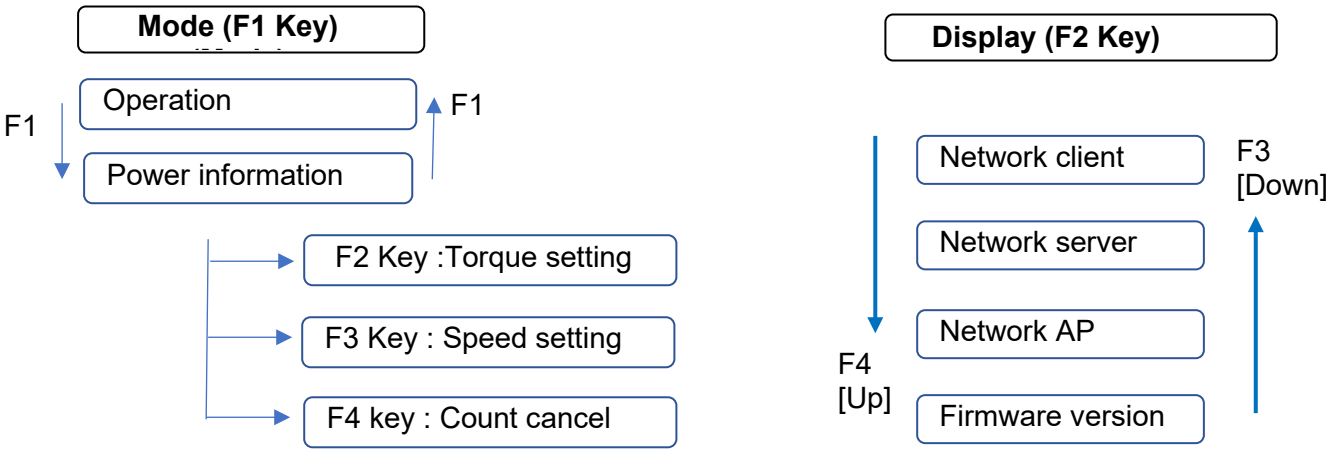
4.4 Charger Safety Rules

- 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.

5. Operation

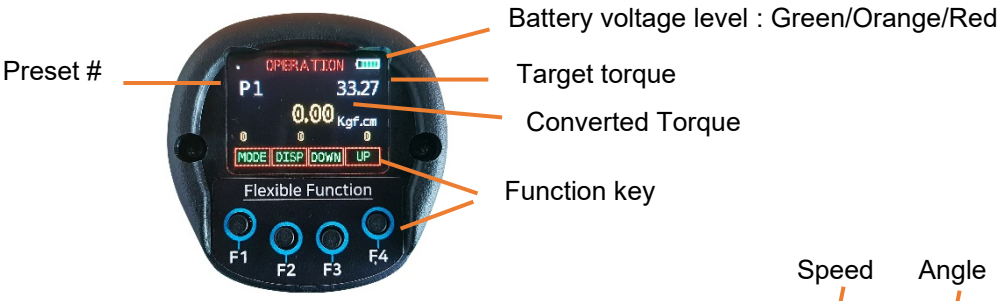
5.1 Screen display structure

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



NOTE: F1 key can be locked in controller setting 'LCD button lock' function to prevent setting modification. All keys can be locked as well.(refer chap 7.5 page 33)

5.2 Operation mode



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

NOTE : Display enable preset can be set in controller settings – to allow only presets which can be used. (refer chap 7.5 page 33)

5.3 Power Information & Setting mode

5.3.1 Power information

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

NOTE :

when battery voltage is low, screwdriver will automatically power off.

5.3.2 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 ParaMonAir or embedded web server

If AUTOSPEED – speed is automatically optimized by torque target

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

5.3.3 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]

Yes

NO

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

5.4 Network information display

From operation menu press key F2[DISP]

F4[Up]

F3[Down]

No	Network	Description
1	Client	Information about networking of the BM screwdriver Mode : DHCP (Dynamic Host Configuration Protocol) IP address: 192.168.0.4 Gateway : 192.168.0.1 Net Mask : 255.255.255.0
2	Server	Information about networking of the PC software, ParaMonAir IP address: 192.168.0.53 Port : 5000
3	AP	Information about networking of the AP SSID : Doga
4	Firmware ver.	Screwdriver firmware version Ver : 0.70.2 S/N : 1812100012 - 18(year)12(Month)10(BM code)0012(serial) Model : Screwdriver model

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

6. Connections overview

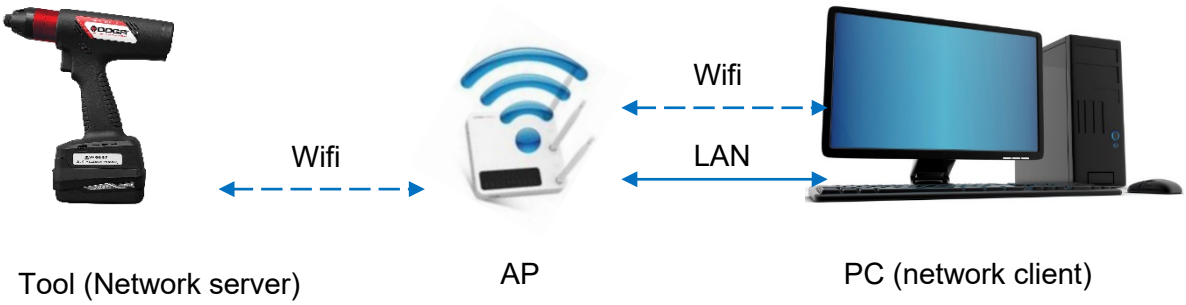
■ USB connection

- Initial network and parameter setting, data monitoring
- Data download from the internal memory
- Tool firmware update

■ Wifi connection to ParaMon Pro-X

- Parameter setting, data monitoring and process guide job managing
- Tool fastening data saving in file system
- Tool remote control

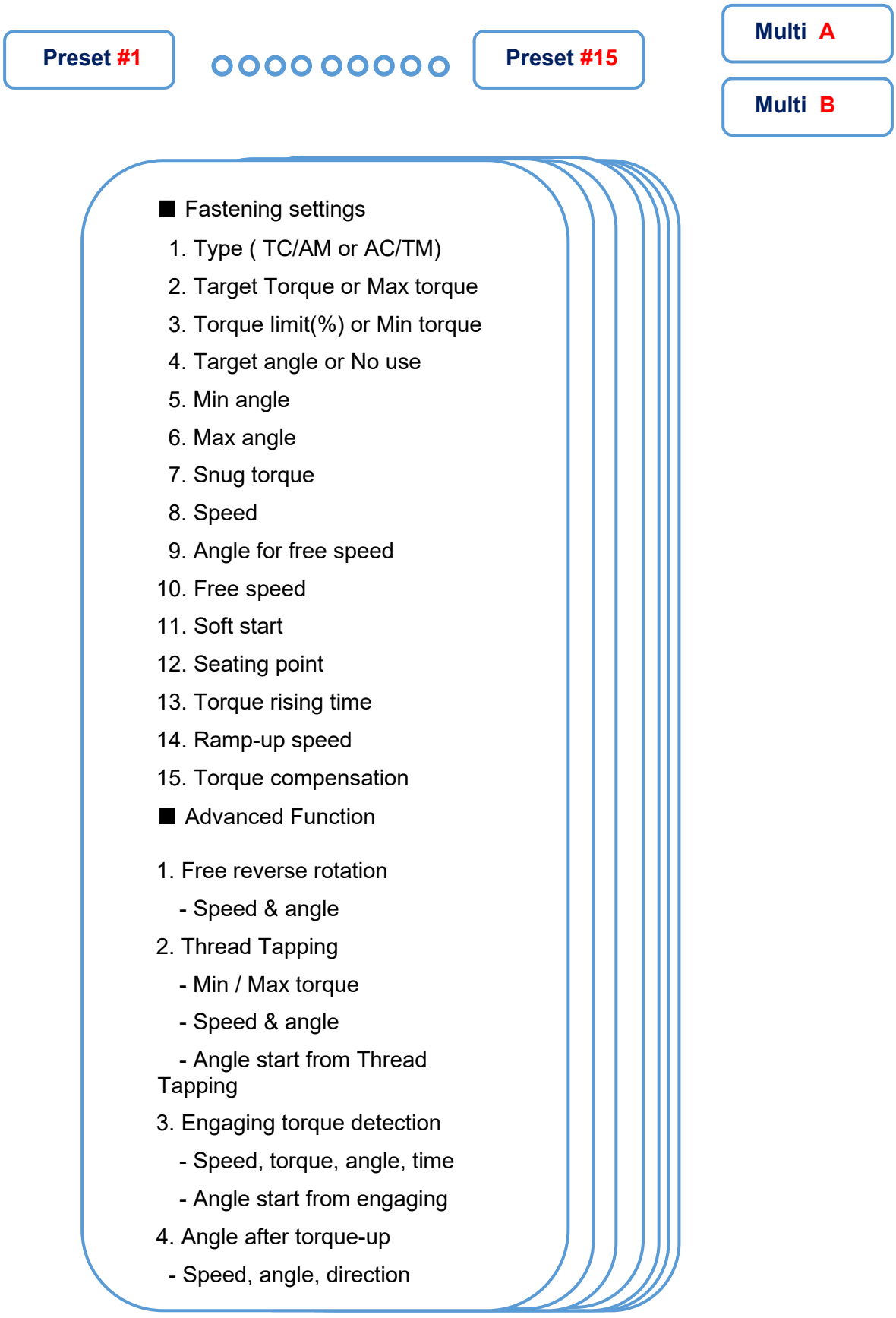
■ Wi-Fi connection to PC via AP



- Parameter setting, data monitoring on PC with ParMon Air or custom software
- Protocols are open for programing the custom software

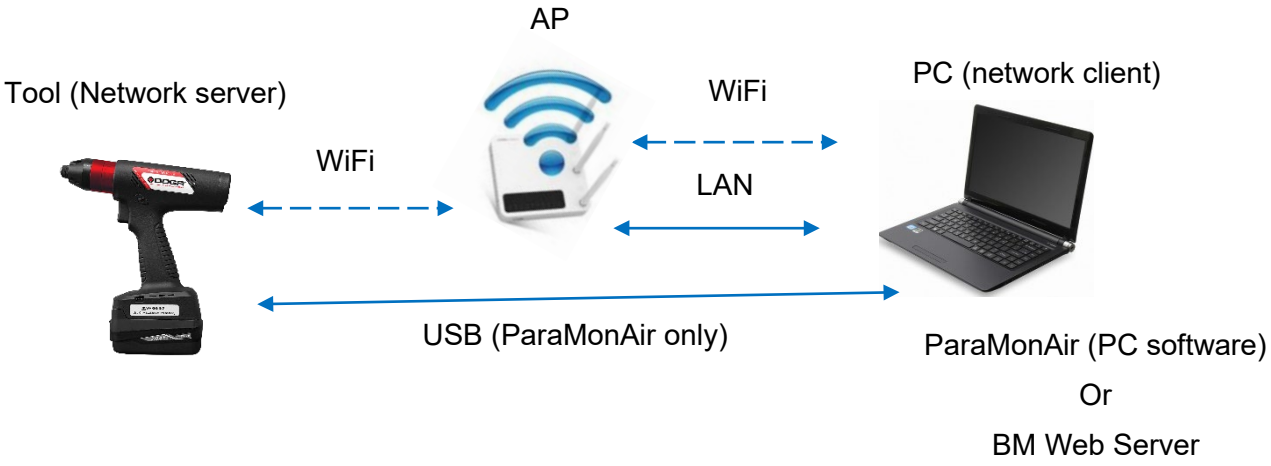
7. Fastening parameters for preset

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



8. Screwdriver set up with ParaMonAir or BM Web server

8.1 Connection



8.2 Features Comparaison

Features	BM Web Server Web browser via Wi-Fi	ParaMonAir 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	✓	✓

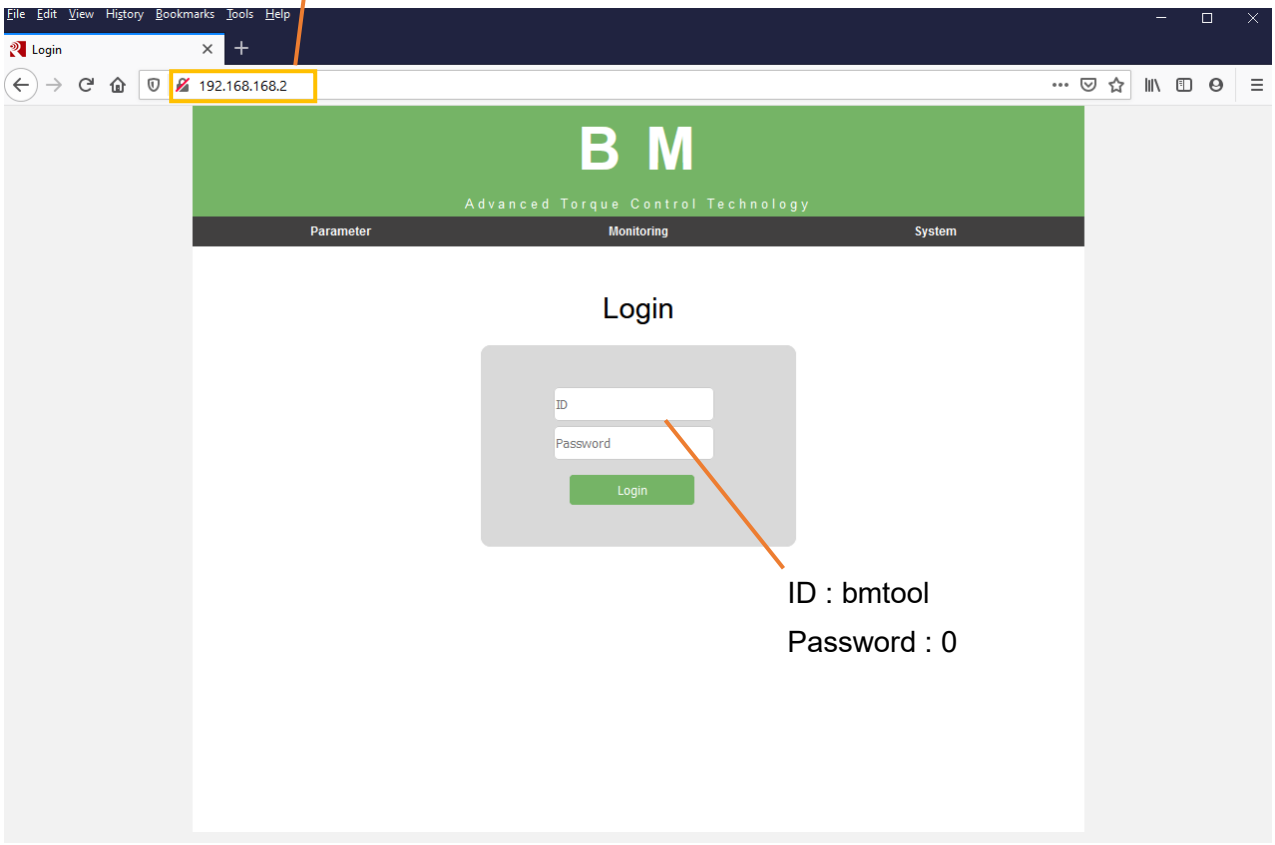
8.3 ParaMonAir

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

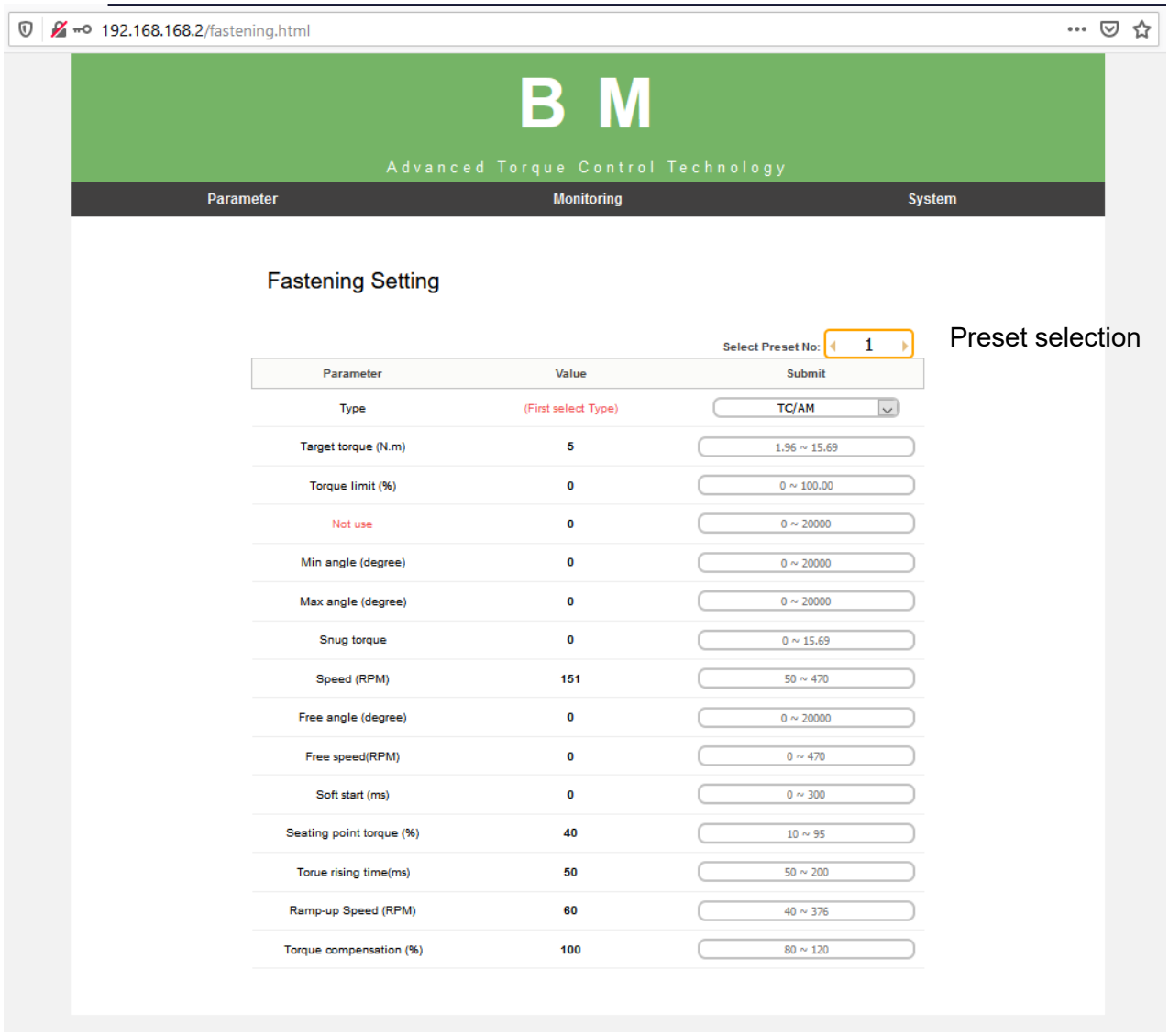
9. BM Web Server

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

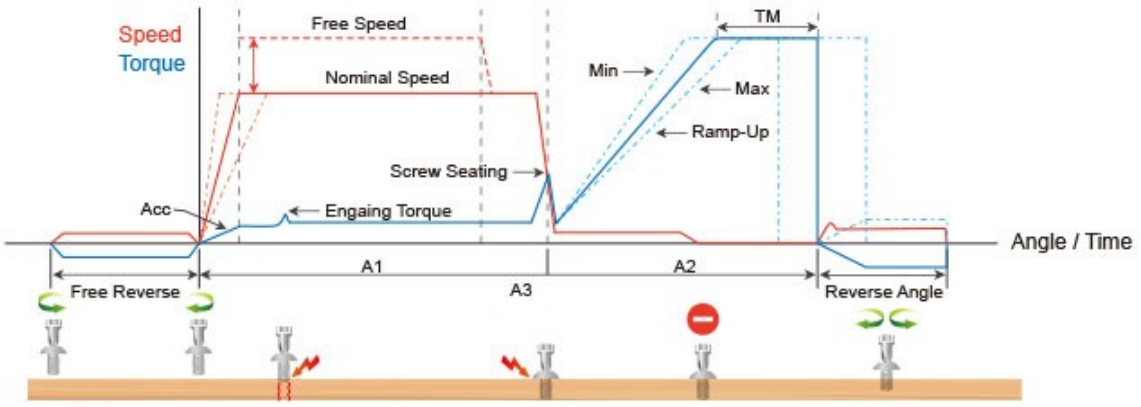
9.1 Login



9.2 Parameter – Fastening setting



Preset selection



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 5/9		

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

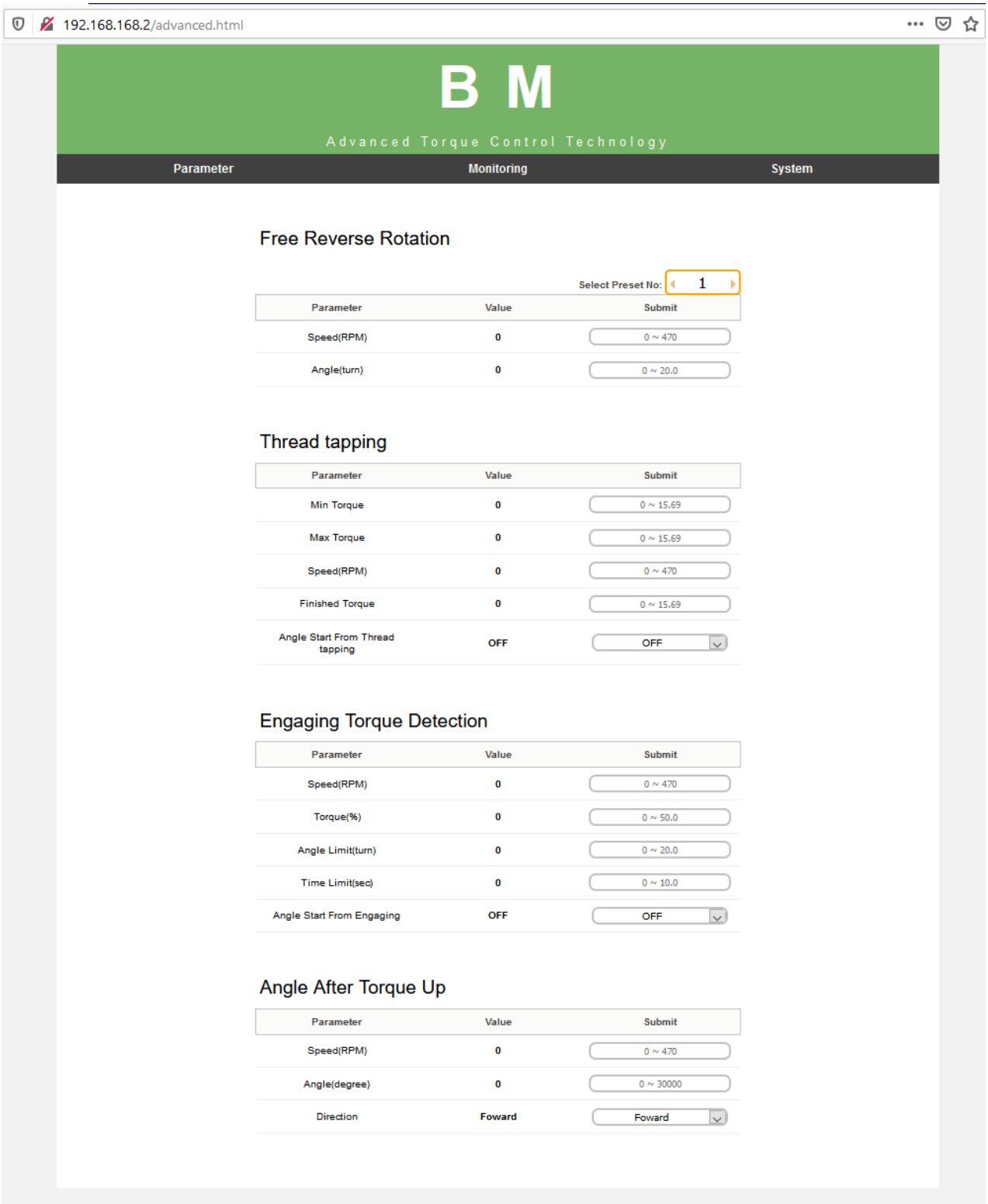
	Unit	Range	Initial
	rpm	Tool range	Auto
Description	Speed after seating to the end of tightening		

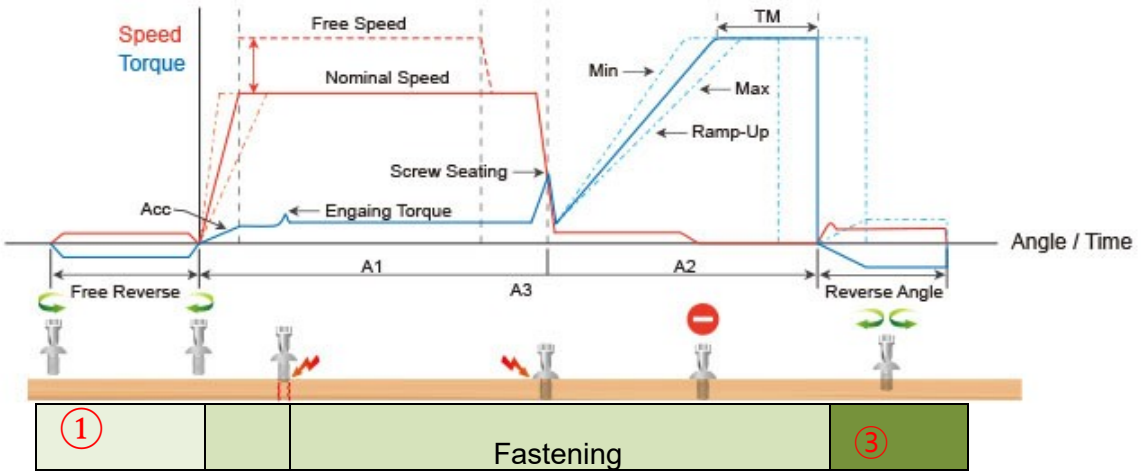
Torque compensation

	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.		

9.3 Parameter – Advanced functions

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





9.3.1 Free reverse rotation before Fastening ①

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

Speed (rpm)

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

Angle (turn)

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

9.3.2 Angle after torque up ③

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

Speed

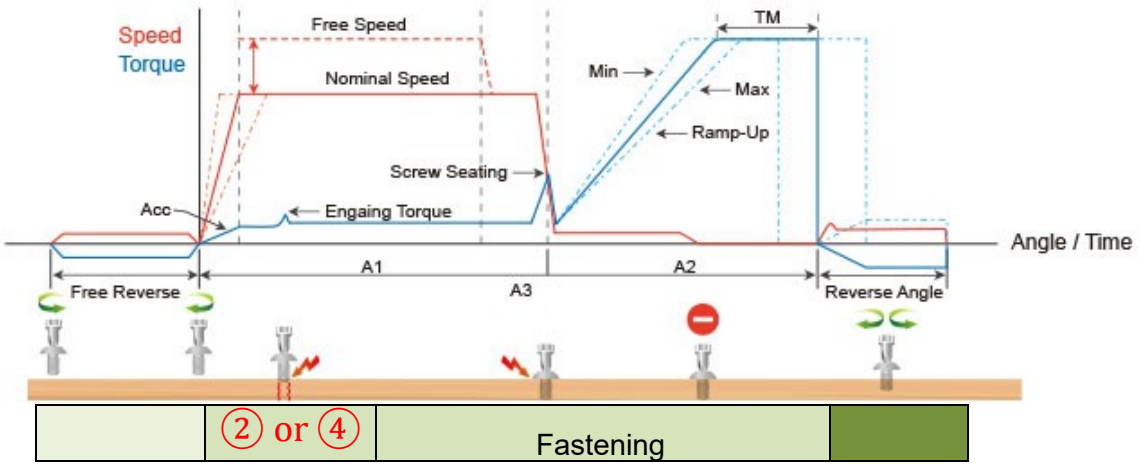
	Unit	Range	Initial
	rpm	Tool range	0
Description	Driver rotation speed		

Angle

	Unit	Range	Initial
	degree	0 ~ 15000	0
Description	Rotation angle		

Direction

	Unité	Range	Défaut
		Forward - Reverse	Forward
Description	Angle rotation direction		



9.3.3 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 (turn)

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

Time limit (sec)

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

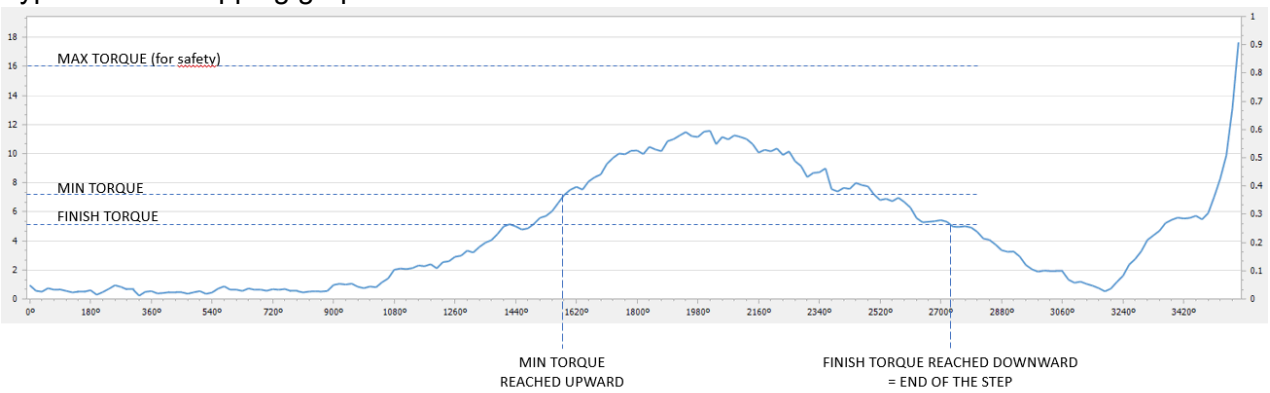
Angle start from engaging

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

9.3.4 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

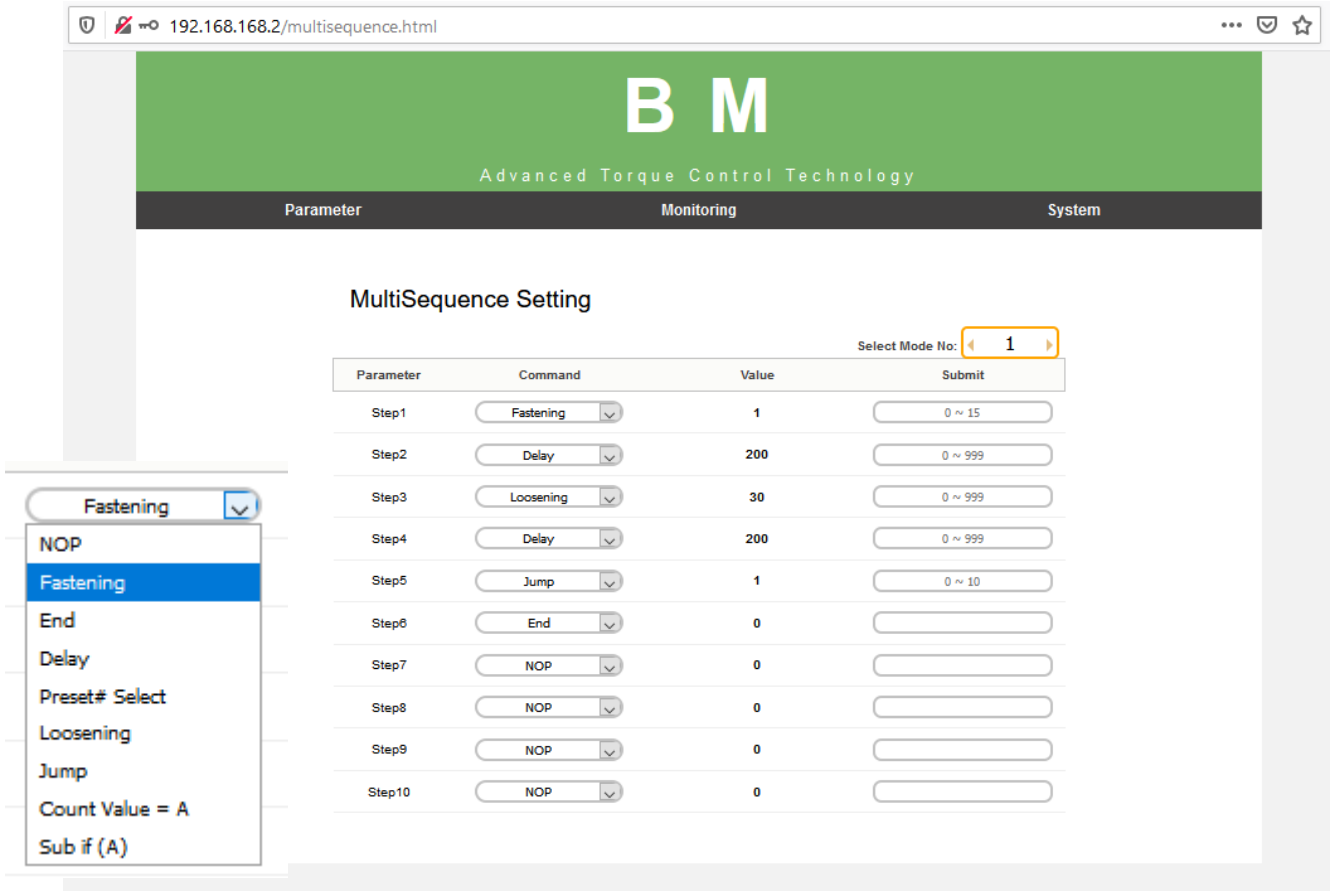
	Unit	Range	Initial
	set up in controller	Tool range	0
Description	Torque level to end the thread tapping advance function Reach downward and lower than min thread torque parameter		

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.		

9.4 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) presets
To program, select the command and required parameter on each step.
To finish the multi sequence programing, last step command should be “END”



◆ 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

[Example of Multi sequence step program]

Setp no	Command	Parameter
Step 1	Count Value = A	10
Step 2	Fastening	1 (Preset#1)
Step 3	Loosening	5
Step 4	Fastening	3 (Preset#3)
Step 5	Sub if (A)	
Step 6	Jump	2
Step 7	End	

Step 1 : Total counting number is 10

Step 2 : Start fastening with Preset #1 and stop by torque or angle setting, and move to the next step

Step 3 : Loosen 5 turns and move to the next step

Step 4 : Start fastening with Preset #3 and stop by torque or angle setting, and move to the next step:

Step 5 : 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

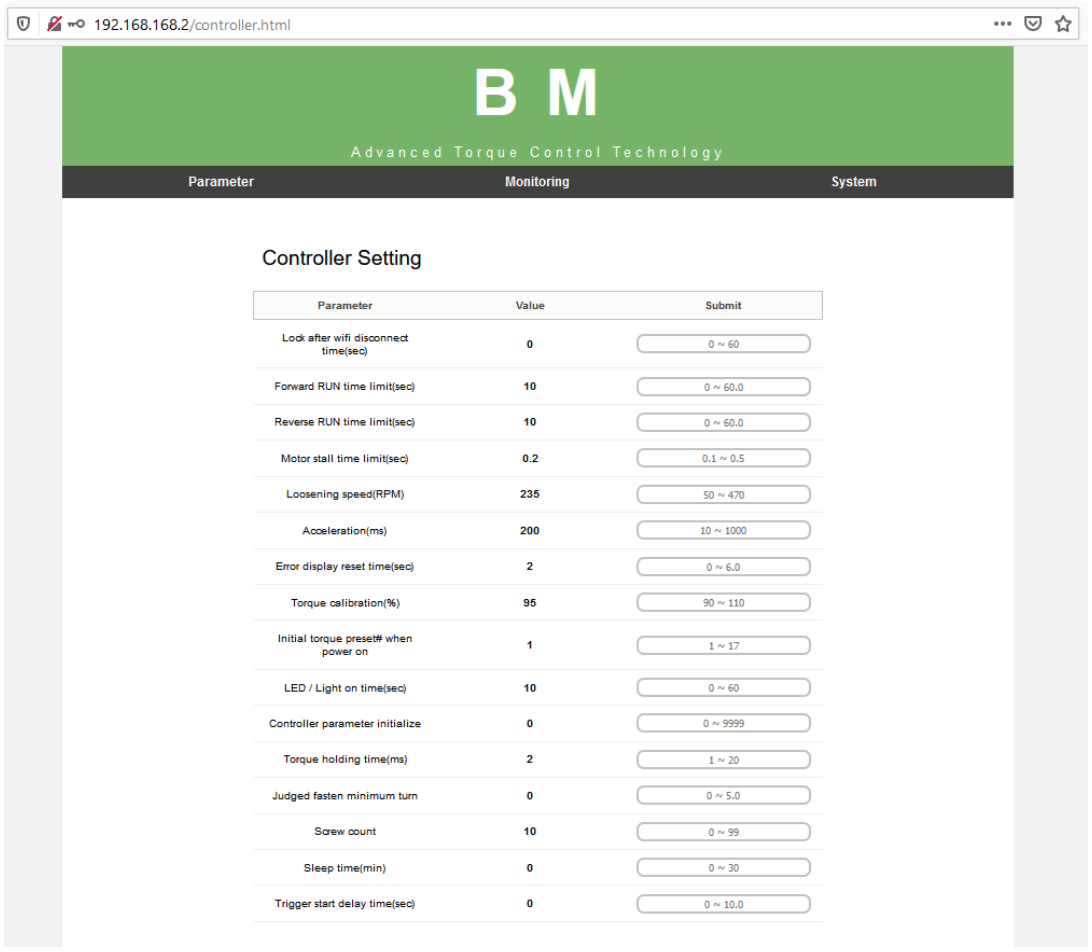
Step 6 : Jump to step no. 2

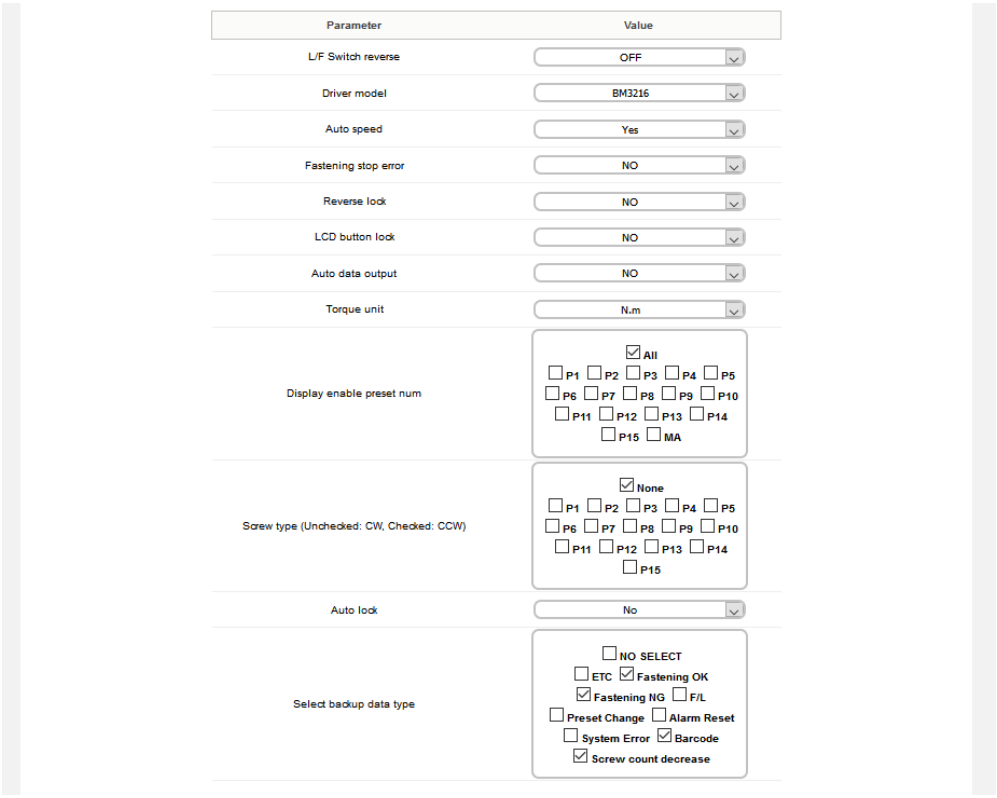
Step 7 : End

Step no.2 to Step no. 4 works for a cycle. Total 10 cycles are operated automatically by a start signal.

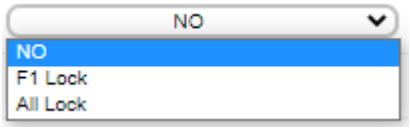
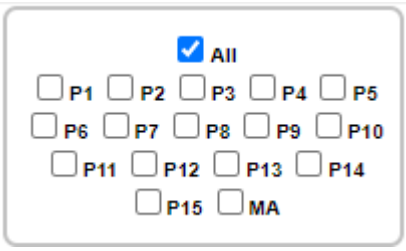
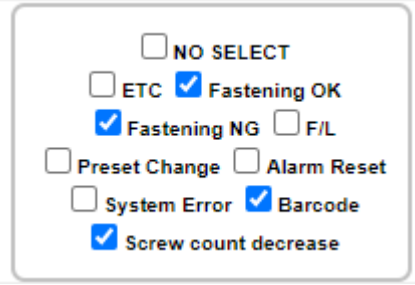
Any failure or NG on each step, Multi-sequence process stops and provide the alarm signal. Once all steps are finished successfully, there is FASTENING OK signal output. Every successful fastening in steps provide TORQUE UP signals.

9.5 Parameter – Controller setting

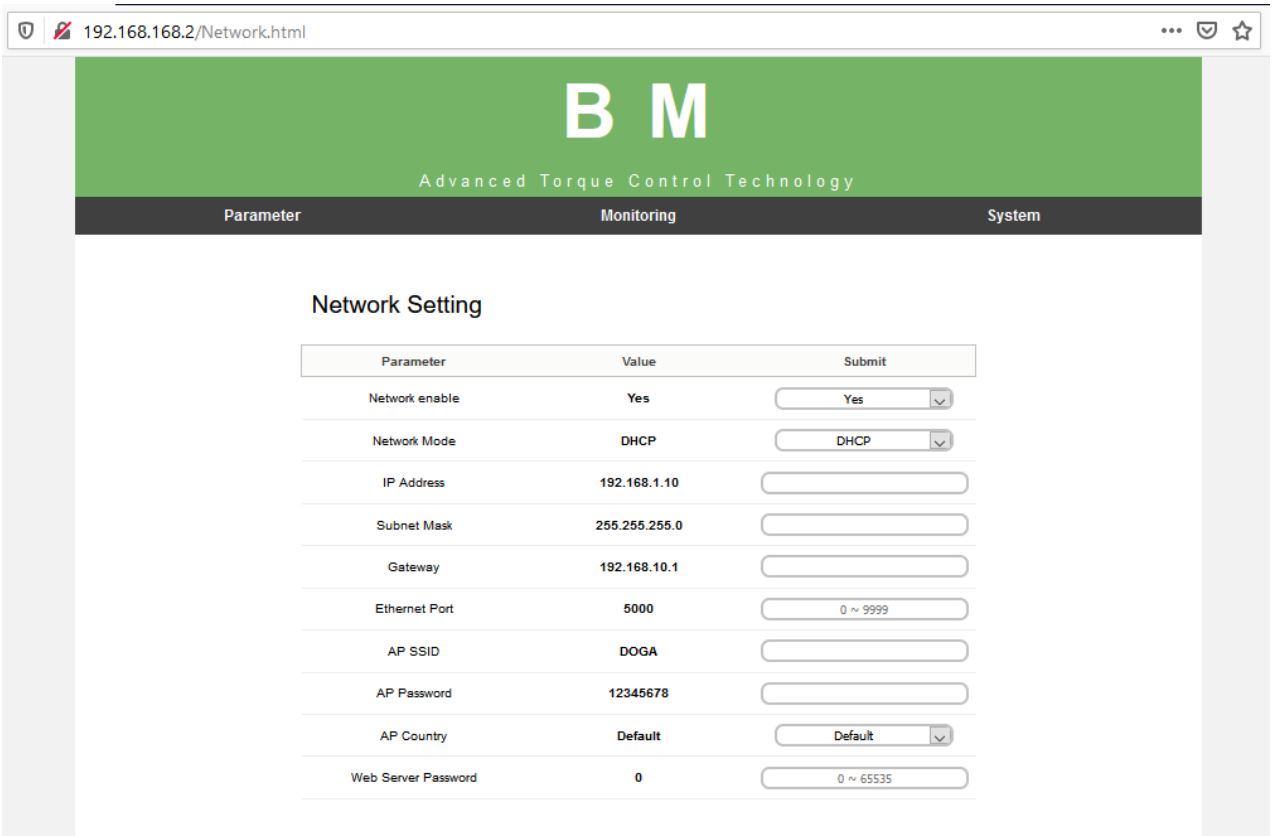


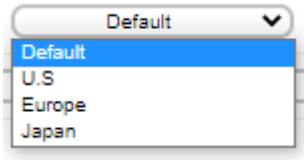


Parameter	Description
Lock after wifi disconnect time(sec)	If wifi disconnect during setting time. Then Driver lock. '0' will desactivate the function
Forward RUN time limit(sec)	Run limit to forward rotation
Reverse RUN time limit(sec)	Run limit to reverse rotation
Motor Stall time limit(sec)	Immediate 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

Parameter	Description
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
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 

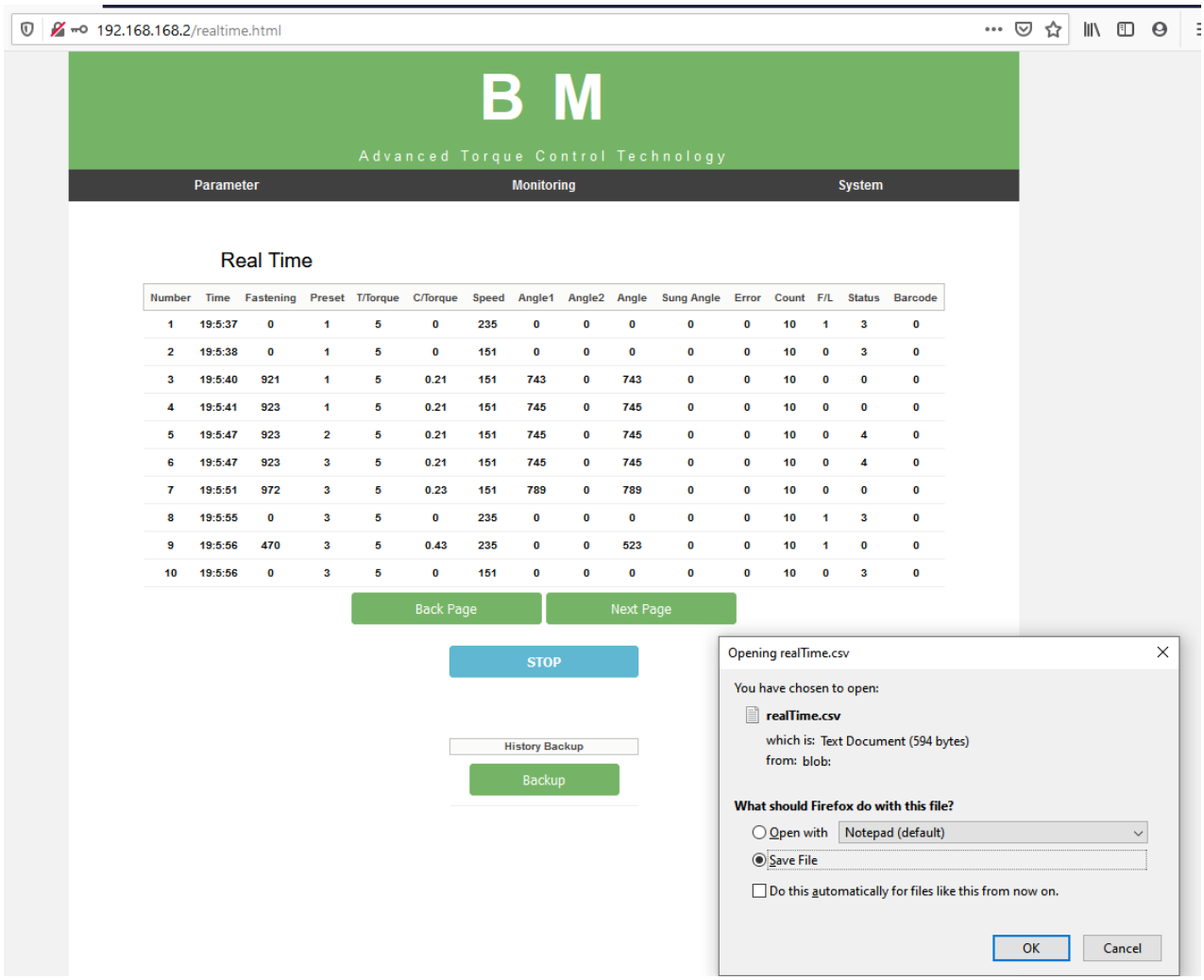
9.6 Parameter – Network Setting



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’

IMPORTANT: changing Network setting could disconnect screwdriver from WiFi Network

9.7 Monitoring - Real Time

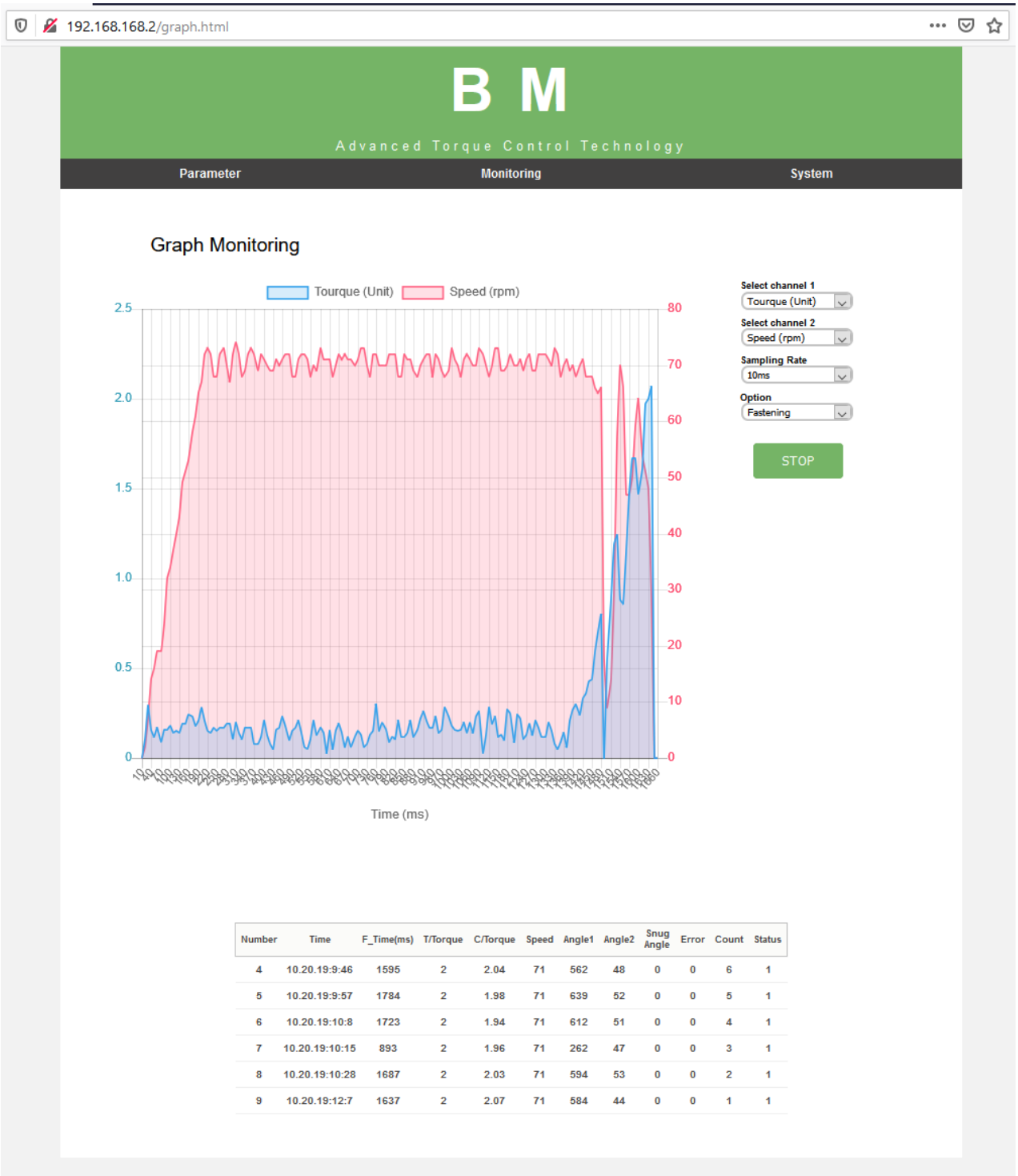


The following data are monitored automatically on every event as like motor run, torque up, Forward / Reverse change, preset # change, etc.

- 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

The monitoring data can be saved in CSV file.

9.8 Monitoring - Graph

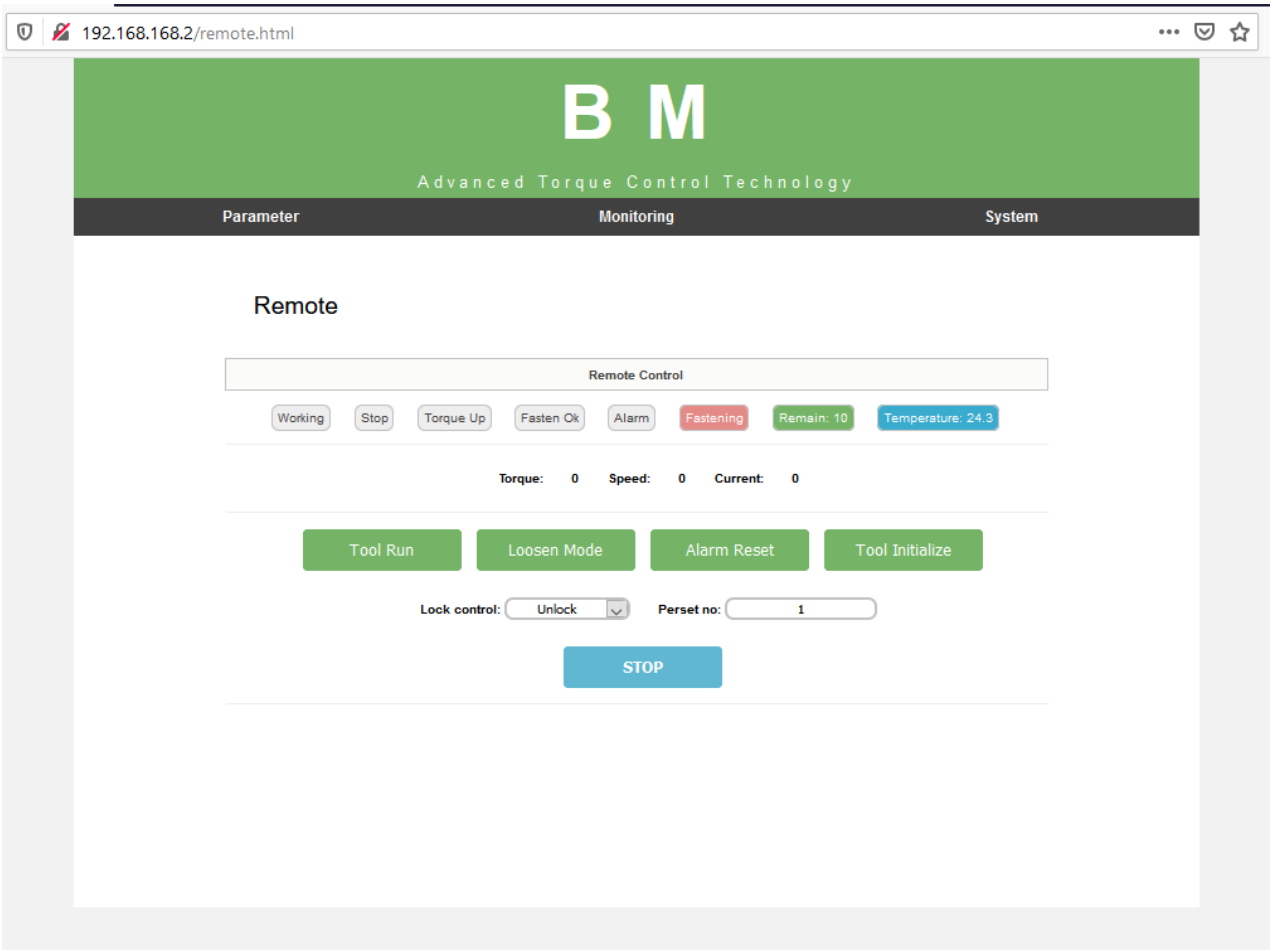


Number	Time	F_Time(ms)	T/Torque	C/Torque	Speed	Angle1	Angle2	Snug Angle	Error	Count	Status
4	10.20.19:9:46	1595	2	2.04	71	562	48	0	0	6	1
5	10.20.19:9:57	1784	2	1.98	71	639	52	0	0	5	1
6	10.20.19:10:8	1723	2	1.94	71	612	51	0	0	4	1
7	10.20.19:10:15	893	2	1.96	71	262	47	0	0	3	1
8	10.20.19:10:28	1687	2	2.03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

9.9 Monitoring - Remote control



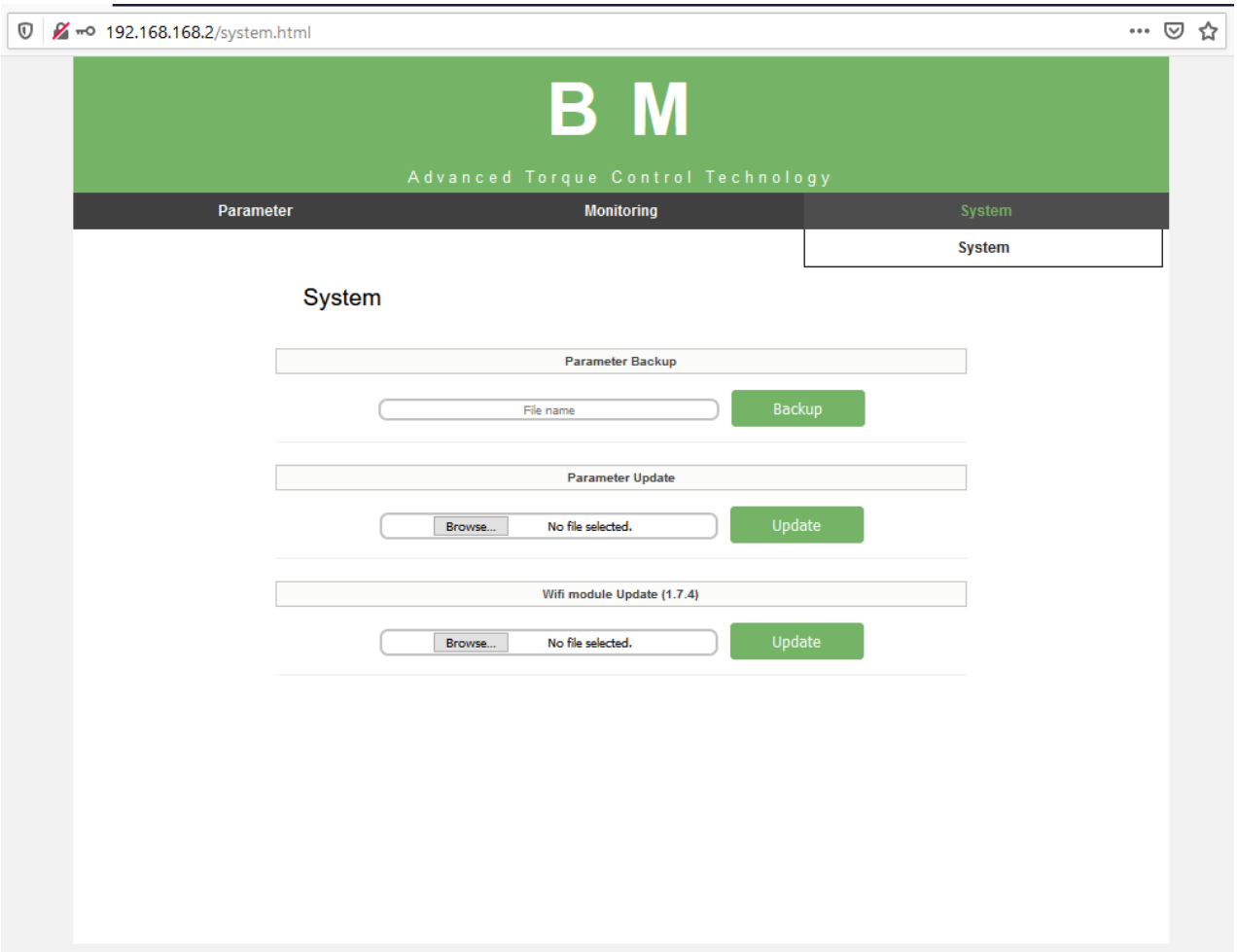
The tool is operated remotely for the followings.

- 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

9.10 System



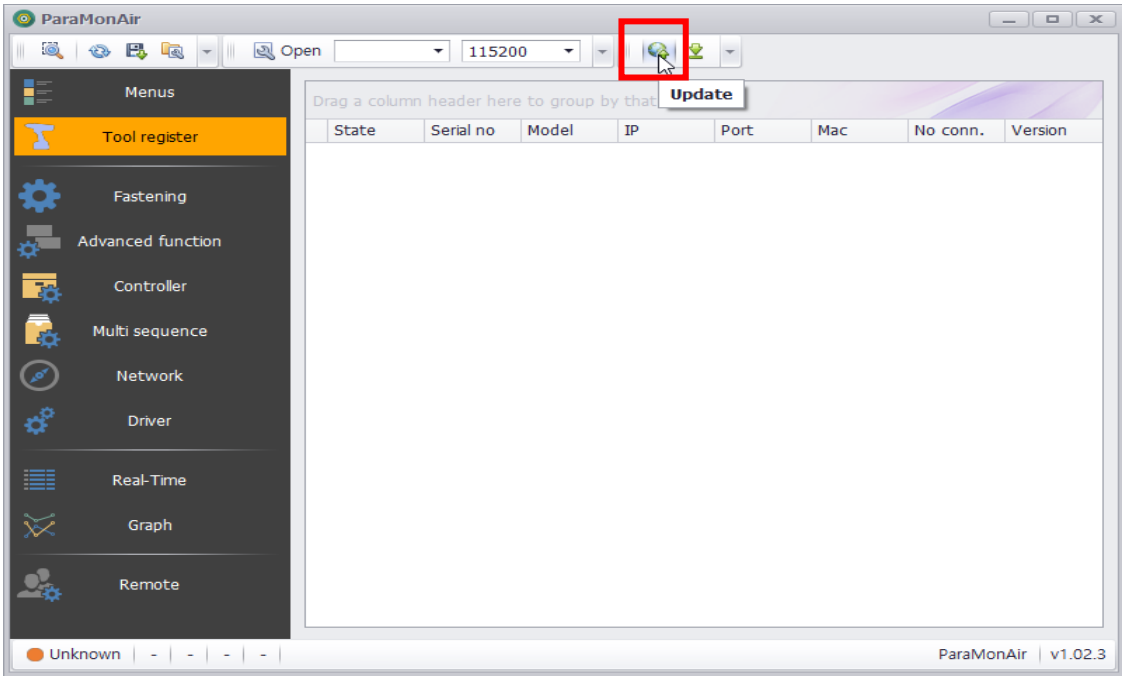
- **Parameter Backup :** Back-up file creation
  Click “Back-up” icon to create the parameter setting back-up file. The file format is csv.

- **Parameter Update :** Load file
  The parameter back-up file is loaded to the BM tool.

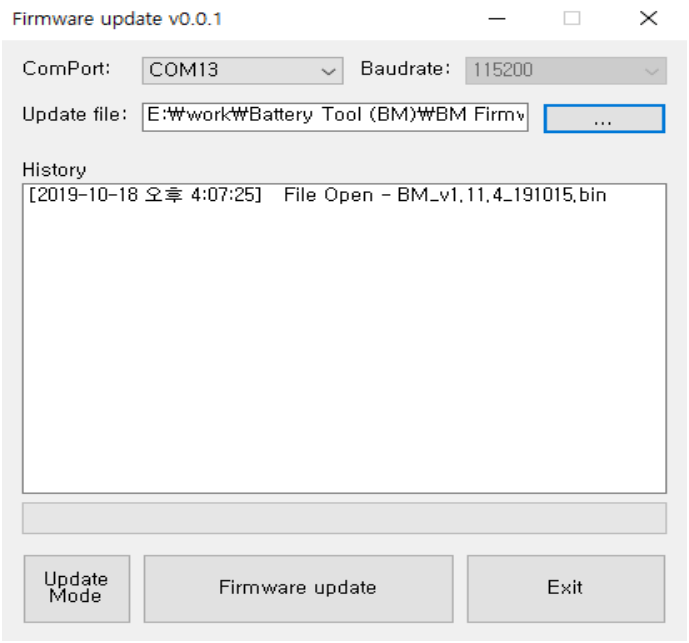
- **WiFi module Firmware update**

10. Firmware upgrade

Only with USB cable connection using ParaMon Air software.



1. Run a “ParaMonAir” PC program.
2. Click [Update].



3. Set “Com Port”,

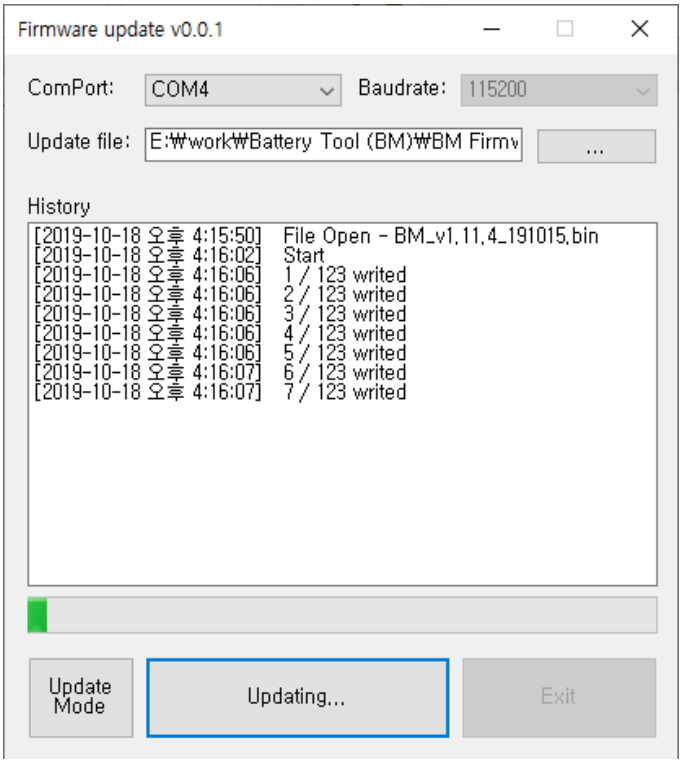
Caution

If cable disconnect during upgrade: End program, BM battery remove

Start firmware upgrade first step.

[Update 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.

11. Error code

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

11.1 System errors

Code	Number	Description
UNDER VOLTAGE	104	Low Battery voltage
BACKUP DATA R/W	108	Back up (Fastening) data read / write Error
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

11.2 Fastening errors

Code	Number	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
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

12. Parameter details and factory setting

Appendix A:	Parameter factory setting, Address and Function code details for BM					version 20_10_16

	Preset #	Parameter	Address	Factory setting	Address for Min value	Address for Max value	Function code
Fastening	1	TC/AM_AC/TM	1	0	1001	2001	Read : 0x03 Write : 0x06
		Torque	2	Auto	1002	2002	Read : 0x03 Write : 0x06
		Torque min/max (%)	3	0	1003	2003	Read : 0x03 Write : 0x06
		Target angle(degree)	4	0	1004	2004	Read : 0x03 Write : 0x06
		Min angle(degree)	5	0	1005	2005	Read : 0x03 Write : 0x06
		Max angle(degree)	6	0	1006	2006	Read : 0x03 Write : 0x06
		Snug torque	7	0	1007	2007	Read : 0x03 Write : 0x06
		Speed (rpm)	8	Auto	1008	2008	Read : 0x03 Write : 0x06
		Free fastenig angle(degree)	9	0	1009	2009	Read : 0x03 Write : 0x06
		Free fastenig speed(rpm)	10	0	1010	2010	Read : 0x03 Write : 0x06
		Soft start(1-300ms)	11	0	1011	2011	Read : 0x03 Write : 0x06
		Seating point (%) 10-90	12	Auto	1012	2012	Read : 0x03 Write : 0x06
		Torque rising rate(ms) 50-200	13	50	1013	2013	Read : 0x03 Write : 0x06
		Ramp up speed(rpm) 20-80% of max	14	Auto	1014	2014	Read : 0x03 Write : 0x06
		Torque compensation (%) 90-110	15	100	1015	2015	Read : 0x03 Write : 0x06
	2	TC/AM_AC/TM	16	0	1016	2016	Read : 0x03 Write : 0x06
		Torque	17	Auto	1017	2017	Read : 0x03 Write : 0x06
		Torque min/max (%)	18	0	1018	2018	Read : 0x03 Write : 0x06
		Target angle(degree)	19	0	1019	2019	Read : 0x03 Write : 0x06
		Min angle(degree)	20	0	1020	2020	Read : 0x03 Write : 0x06
		Max angle(degree)	21	0	1021	2021	Read : 0x03 Write : 0x06
		Snug torque	22	0	1022	2022	Read : 0x03 Write : 0x06
		Speed (rpm)	23	Auto	1023	2023	Read : 0x03 Write : 0x06
		Free fastenig angle(degree)	24	0	1024	2024	Read : 0x03 Write : 0x06
		Free fastenig speed(rpm)	25	0	1025	2025	Read : 0x03 Write : 0x06
		Soft start(1-300ms)	26	0	1026	2026	Read : 0x03 Write : 0x06
		Seating point (%) 10-90	27	Auto	1027	2027	Read : 0x03 Write : 0x06
		Torque rising rate(ms) 50-200	28	50	1028	2028	Read : 0x03 Write : 0x06
		Ramp up speed(rpm) 20-80% of max	29	Auto	1029	2029	Read : 0x03 Write : 0x06
		Torque compensation (%) 90-110	30	100	1030	2030	Read : 0x03 Write : 0x06
	3	TC/AM_AC/TM	31	0	1031	2031	Read : 0x03 Write : 0x06
		Torque	32	Auto	1032	2032	Read : 0x03 Write : 0x06
		Torque min/max (%)	33	0	1033	2033	Read : 0x03 Write : 0x06
		Target angle(degree)	34	0	1034	2034	Read : 0x03 Write : 0x06
		Min angle(degree)	35	0	1035	2035	Read : 0x03 Write : 0x06
		Max angle(degree)	36	0	1036	2036	Read : 0x03 Write : 0x06
		Snug torque	37	0	1037	2037	Read : 0x03 Write : 0x06

		Speed (rpm)	38	Auto	1038	2038	Read : 0x03 Write : 0x06
		Free fastenig angle(degree)	39	0	1039	2039	Read : 0x03 Write : 0x06
		Free fastenig speed(rpm)	40	0	1040	2040	Read : 0x03 Write : 0x06
		Soft start(1-300ms)	41	0	1041	2041	Read : 0x03 Write : 0x06
		Seating point (%) 10-90	42	Auto	1042	2042	Read : 0x03 Write : 0x06
		Torque rising rate(ms) 50-200	43	50	1043	2043	Read : 0x03 Write : 0x06
		Ramp up speed(rpm) 20-80% of max	44	Auto	1044	2044	Read : 0x03 Write : 0x06
		Torque compensation (%) 90-110	45	100	1045	2045	Read : 0x03 Write : 0x06
	4	TC/AM_AC/TM	46	0	1046	2046	Read : 0x03 Write : 0x06
		Torque	47	Auto	1047	2047	Read : 0x03 Write : 0x06
		Torque min/max (%)	48	0	1048	2048	Read : 0x03 Write : 0x06
		Target angle(degree)	49	0	1049	2049	Read : 0x03 Write : 0x06
		Min angle(degree)	50	0	1050	2050	Read : 0x03 Write : 0x06
		Max angle(degree)	51	0	1051	2051	Read : 0x03 Write : 0x06
		Snug torque	52	0	1052	2052	Read : 0x03 Write : 0x06
		Speed (rpm)	53	Auto	1053	2053	Read : 0x03 Write : 0x06
		Free fastenig angle(degree)	54	0	1054	2054	Read : 0x03 Write : 0x06
		Free fastenig speed(rpm)	55	0	1055	2055	Read : 0x03 Write : 0x06
		Soft start(1-300ms)	56	0	1056	2056	Read : 0x03 Write : 0x06
		Seating point (%) 10-90	57	Auto	1057	2057	Read : 0x03 Write : 0x06
		Torque rising rate(ms) 50-200	58	50	1058	2058	Read : 0x03 Write : 0x06
		Ramp up speed(rpm) 20-80% of max	59	Auto	1059	2059	Read : 0x03 Write : 0x06
		Torque compensation (%) 90-110	60	100	1060	2060	Read : 0x03 Write : 0x06
	5	TC/AM_AC/TM	61	0	1061	2061	Read : 0x03 Write : 0x06
		Torque	62	Auto	1062	2062	Read : 0x03 Write : 0x06
		Torque min/max (%)	63	0	1063	2063	Read : 0x03 Write : 0x06
		Target angle(degree)	64	0	1064	2064	Read : 0x03 Write : 0x06
		Min angle(degree)	65	0	1065	2065	Read : 0x03 Write : 0x06
		Max angle(degree)	66	0	1066	2066	Read : 0x03 Write : 0x06
		Snug torque	67	0	1067	2067	Read : 0x03 Write : 0x06
		Speed (rpm)	68	Auto	1068	2068	Read : 0x03 Write : 0x06
		Free fastenig angle(degree)	69	0	1069	2069	Read : 0x03 Write : 0x06
		Free fastenig speed(rpm)	70	0	1070	2070	Read : 0x03 Write : 0x06
		Soft start(1-300ms)	71	0	1071	2071	Read : 0x03 Write : 0x06
		Seating point (%) 10-90	72	Auto	1072	2072	Read : 0x03 Write : 0x06
		Torque rising rate(ms) 50-200	73	50	1073	2073	Read : 0x03 Write : 0x06
		Ramp up speed(rpm) 20-80% of max	74	Auto	1074	2074	Read : 0x03 Write : 0x06
		Torque compensation (%) 90-110	75	100	1075	2075	Read : 0x03 Write : 0x06
	6	TC/AM_AC/TM	76	0	1076	2076	Read : 0x03 Write : 0x06
		Torque	77	Auto	1077	2077	Read : 0x03 Write : 0x06
		Torque min/max (%)	78	0	1078	2078	Read : 0x03 Write : 0x06
		Target angle(degree)	79	0	1079	2079	Read : 0x03 Write : 0x06
		Min angle(degree)	80	0	1080	2080	Read : 0x03 Write : 0x06
		Max angle(degree)	81	0	1081	2081	Read : 0x03 Write : 0x06
		Snug torque	82	0	1082	2082	Read : 0x03 Write : 0x06
		Speed (rpm)	83	Auto	1083	2083	Read : 0x03 Write : 0x06
		Free fastenig angle(degree)	84	0	1084	2084	Read : 0x03 Write : 0x06

		Free fastenig speed(rpm)	85	0	1085	2085	Read : 0x03 Write : 0x06
		Soft start(1-300ms)	86	0	1086	2086	Read : 0x03 Write : 0x06
		Seating point (%) 10-90	87	Auto	1087	2087	Read : 0x03 Write : 0x06
		Torque rising rate(ms) 50-200	88	50	1088	2088	Read : 0x03 Write : 0x06
		Ramp up speed(rpm) 20-80% of max	89	Auto	1089	2089	Read : 0x03 Write : 0x06
		Torque compensation (%) 90-110	90	100	1090	2090	Read : 0x03 Write : 0x06
	7	TC/AM_AC/TM	91	0	1091	2091	Read : 0x03 Write : 0x06
		Torque	92	Auto	1092	2092	Read : 0x03 Write : 0x06
		Torque min/max (%)	93	0	1093	2093	Read : 0x03 Write : 0x06
		Target angle(degree)	94	0	1094	2094	Read : 0x03 Write : 0x06
		Min angle(degree)	95	0	1095	2095	Read : 0x03 Write : 0x06
		Max angle(degree)	96	0	1096	2096	Read : 0x03 Write : 0x06
		Snug torque	97	0	1097	2097	Read : 0x03 Write : 0x06
		Speed (rpm)	98	Auto	1098	2098	Read : 0x03 Write : 0x06
		Free fastenig angle(degree)	99	0	1099	2099	Read : 0x03 Write : 0x06
		Free fastenig speed(rpm)	100	0	1100	2100	Read : 0x03 Write : 0x06
		Soft start(1-300ms)	101	0	1101	2101	Read : 0x03 Write : 0x06
		Seating point (%) 10-90	102	Auto	1102	2102	Read : 0x03 Write : 0x06
		Torque rising rate(ms) 50-200	103	50	1103	2103	Read : 0x03 Write : 0x06
		Ramp up speed(rpm) 20-80% of max	104	Auto	1104	2104	Read : 0x03 Write : 0x06
		Torque compensation (%) 90-110	105	100	1105	2105	Read : 0x03 Write : 0x06
	8	TC/AM_AC/TM	106	0	1106	2106	Read : 0x03 Write : 0x06
		Torque	107	Auto	1107	2107	Read : 0x03 Write : 0x06
		Torque min/max (%)	108	0	1108	2108	Read : 0x03 Write : 0x06
		Target angle(degree)	109	0	1109	2109	Read : 0x03 Write : 0x06
		Min angle(degree)	110	0	1110	2110	Read : 0x03 Write : 0x06
		Max angle(degree)	111	0	1111	2111	Read : 0x03 Write : 0x06
		Snug torque	112	0	1112	2112	Read : 0x03 Write : 0x06
		Speed (rpm)	113	Auto	1113	2113	Read : 0x03 Write : 0x06
		Free fastenig angle(degree)	114	0	1114	2114	Read : 0x03 Write : 0x06
		Free fastenig speed(rpm)	115	0	1115	2115	Read : 0x03 Write : 0x06
		Soft start(1-300ms)	116	0	1116	2116	Read : 0x03 Write : 0x06
		Seating point (%) 10-90	117	Auto	1117	2117	Read : 0x03 Write : 0x06
		Torque rising rate(ms) 50-200	118	50	1118	2118	Read : 0x03 Write : 0x06
		Ramp up speed(rpm) 20-80% of max	119	Auto	1119	2119	Read : 0x03 Write : 0x06
		Torque compensation (%) 90-110	120	100	1120	2120	Read : 0x03 Write : 0x06
	9	TC/AM_AC/TM	121	0	1121	2121	Read : 0x03 Write : 0x06
		Torque	122	Auto	1122	2122	Read : 0x03 Write : 0x06
		Torque min/max (%)	123	0	1123	2123	Read : 0x03 Write : 0x06
		Target angle(degree)	124	0	1124	2124	Read : 0x03 Write : 0x06
		Min angle(degree)	125	0	1125	2125	Read : 0x03 Write : 0x06
		Max angle(degree)	126	0	1126	2126	Read : 0x03 Write : 0x06
		Snug torque	127	0	1127	2127	Read : 0x03 Write : 0x06
		Speed (rpm)	128	Auto	1128	2128	Read : 0x03 Write : 0x06
		Free fastenig angle(degree)	129	0	1129	2129	Read : 0x03 Write : 0x06
		Free fastenig speed(rpm)	130	0	1130	2130	Read : 0x03 Write : 0x06
		Soft start(1-300ms)	131	0	1131	2131	Read : 0x03 Write : 0x06

		Seating point (%) 10-90	132	Auto	1132	2132	Read : 0x03 Write : 0x06
		Torque rising rate(ms) 50-200	133	50	1133	2133	Read : 0x03 Write : 0x06
		Ramp up speed(rpm) 20-80% of max	134	Auto	1134	2134	Read : 0x03 Write : 0x06
		Torque compensation (%) 90-110	135	100	1135	2135	Read : 0x03 Write : 0x06
	10	TC/AM_AC/TM	136	0	1136	2136	Read : 0x03 Write : 0x06
		Torque	137	Auto	1137	2137	Read : 0x03 Write : 0x06
		Torque min/max (%)	138	0	1138	2138	Read : 0x03 Write : 0x06
		Target angle(degree)	139	0	1139	2139	Read : 0x03 Write : 0x06
		Min angle(degree)	140	0	1140	2140	Read : 0x03 Write : 0x06
		Max angle(degree)	141	0	1141	2141	Read : 0x03 Write : 0x06
		Snug torque	142	0	1142	2142	Read : 0x03 Write : 0x06
		Speed (rpm)	143	Auto	1143	2143	Read : 0x03 Write : 0x06
		Free fastenig angle(degree)	144	0	1144	2144	Read : 0x03 Write : 0x06
		Free fastenig speed(rpm)	145	0	1145	2145	Read : 0x03 Write : 0x06
		Soft start(1-300ms)	146	0	1146	2146	Read : 0x03 Write : 0x06
		Seating point (%) 10-90	147	Auto	1147	2147	Read : 0x03 Write : 0x06
		Torque rising rate(ms) 50-200	148	50	1148	2148	Read : 0x03 Write : 0x06
		Ramp up speed(rpm) 20-80% of max	149	Auto	1149	2149	Read : 0x03 Write : 0x06
		Torque compensation (%) 90-110	150	100	1150	2150	Read : 0x03 Write : 0x06
	11	TC/AM_AC/TM	151	0	1151	2151	Read : 0x03 Write : 0x06
		Torque	152	Auto	1152	2152	Read : 0x03 Write : 0x06
		Torque min/max (%)	153	0	1153	2153	Read : 0x03 Write : 0x06
		Target angle(degree)	154	0	1154	2154	Read : 0x03 Write : 0x06
		Min angle(degree)	155	0	1155	2155	Read : 0x03 Write : 0x06
		Max angle(degree)	156	0	1156	2156	Read : 0x03 Write : 0x06
		Snug torque	157	0	1157	2157	Read : 0x03 Write : 0x06
		Speed (rpm)	158	Auto	1158	2158	Read : 0x03 Write : 0x06
		Free fastenig angle(degree)	159	0	1159	2159	Read : 0x03 Write : 0x06
		Free fastenig speed(rpm)	160	0	1160	2160	Read : 0x03 Write : 0x06
		Soft start(1-300ms)	161	0	1161	2161	Read : 0x03 Write : 0x06
		Seating point (%) 10-90	162	Auto	1162	2162	Read : 0x03 Write : 0x06
		Torque rising rate(ms) 50-200	163	50	1163	2163	Read : 0x03 Write : 0x06
		Ramp up speed(rpm) 20-80% of max	164	Auto	1164	2164	Read : 0x03 Write : 0x06
		Torque compensation (%) 90-110	165	100	1165	2165	Read : 0x03 Write : 0x06
	12	TC/AM_AC/TM	166	0	1166	2166	Read : 0x03 Write : 0x06
		Torque	167	Auto	1167	2167	Read : 0x03 Write : 0x06
		Torque min/max (%)	168	0	1168	2168	Read : 0x03 Write : 0x06
		Target angle(degree)	169	0	1169	2169	Read : 0x03 Write : 0x06
		Min angle(degree)	170	0	1170	2170	Read : 0x03 Write : 0x06
		Max angle(degree)	171	0	1171	2171	Read : 0x03 Write : 0x06
		Snug torque	172	0	1172	2172	Read : 0x03 Write : 0x06
		Speed (rpm)	173	Auto	1173	2173	Read : 0x03 Write : 0x06
		Free fastenig angle(degree)	174	0	1174	2174	Read : 0x03 Write : 0x06
		Free fastenig speed(rpm)	175	0	1175	2175	Read : 0x03 Write : 0x06
		Soft start(1-300ms)	176	0	1176	2176	Read : 0x03 Write : 0x06
		Seating point (%) 10-90	177	Auto	1177	2177	Read : 0x03 Write : 0x06
		Torque rising rate(ms) 50-200	178	50	1178	2178	Read : 0x03 Write : 0x06

		Ramp up speed(rpm) 20-80% of max	179	Auto	1179	2179	Read : 0x03 Write : 0x06
		Torque compensation (%) 90-110	180	100	1180	2180	Read : 0x03 Write : 0x06
	13	TC/AM_AC/TM	181	0	1181	2181	Read : 0x03 Write : 0x06
		Torque	182	Auto	1182	2182	Read : 0x03 Write : 0x06
		Torque min/max (%)	183	0	1183	2183	Read : 0x03 Write : 0x06
		Target angle(degree)	184	0	1184	2184	Read : 0x03 Write : 0x06
		Min angle(degree)	185	0	1185	2185	Read : 0x03 Write : 0x06
		Max angle(degree)	186	0	1186	2186	Read : 0x03 Write : 0x06
		Snug torque	187	0	1187	2187	Read : 0x03 Write : 0x06
		Speed (rpm)	188	Auto	1188	2188	Read : 0x03 Write : 0x06
		Free fastenig angle(degree)	189	0	1189	2189	Read : 0x03 Write : 0x06
		Free fastenig speed(rpm)	190	0	1190	2190	Read : 0x03 Write : 0x06
		Soft start(1-300ms)	191	0	1191	2191	Read : 0x03 Write : 0x06
		Seating point (%) 10-90	192	Auto	1192	2192	Read : 0x03 Write : 0x06
		Torque rising rate(ms) 50-200	193	50	1193	2193	Read : 0x03 Write : 0x06
		Ramp up speed(rpm) 20-80% of max	194	Auto	1194	2194	Read : 0x03 Write : 0x06
		Torque compensation (%) 90-110	195	100	1195	2195	Read : 0x03 Write : 0x06
	14	TC/AM_AC/TM	196	0	1196	2196	Read : 0x03 Write : 0x06
		Torque	197	Auto	1197	2197	Read : 0x03 Write : 0x06
		Torque min/max (%)	198	0	1198	2198	Read : 0x03 Write : 0x06
		Target angle(degree)	199	0	1199	2199	Read : 0x03 Write : 0x06
		Min angle(degree)	200	0	1200	2200	Read : 0x03 Write : 0x06
		Max angle(degree)	201	0	1201	2201	Read : 0x03 Write : 0x06
		Snug torque	202	0	1202	2202	Read : 0x03 Write : 0x06
		Speed (rpm)	203	Auto	1203	2203	Read : 0x03 Write : 0x06
		Free fastenig angle(degree)	204	0	1204	2204	Read : 0x03 Write : 0x06
		Free fastenig speed(rpm)	205	0	1205	2205	Read : 0x03 Write : 0x06
		Soft start(1-300ms)	206	0	1206	2206	Read : 0x03 Write : 0x06
		Seating point (%) 10-90	207	Auto	1207	2207	Read : 0x03 Write : 0x06
		Torque rising rate(ms) 50-200	208	50	1208	2208	Read : 0x03 Write : 0x06
		Ramp up speed(rpm) 20-80% of max	209	Auto	1209	2209	Read : 0x03 Write : 0x06
		Torque compensation (%) 90-110	210	100	1210	2210	Read : 0x03 Write : 0x06
	15	TC/AM_AC/TM	211	0	1211	2211	Read : 0x03 Write : 0x06
		Torque	212	Auto	1212	2212	Read : 0x03 Write : 0x06
		Torque min/max (%)	213	0	1213	2213	Read : 0x03 Write : 0x06
		Target angle(degree)	214	0	1214	2214	Read : 0x03 Write : 0x06
		Min angle(degree)	215	0	1215	2215	Read : 0x03 Write : 0x06
		Max angle(degree)	216	0	1216	2216	Read : 0x03 Write : 0x06
		Snug torque	217	0	1217	2217	Read : 0x03 Write : 0x06
		Speed (rpm)	218	Auto	1218	2218	Read : 0x03 Write : 0x06
		Free fastenig angle(degree)	219	0	1219	2219	Read : 0x03 Write : 0x06
		Free fastenig speed(rpm)	220	0	1220	2220	Read : 0x03 Write : 0x06
		Soft start(1-300ms)	221	0	1221	2221	Read : 0x03 Write : 0x06
		Seating point (%) 10-90	222	Auto	1222	2222	Read : 0x03 Write : 0x06
		Torque rising rate(ms) 50-200	223	50	1223	2223	Read : 0x03 Write : 0x06
		Ramp up speed(rpm) 20-80% of max	224	Auto	1224	2224	Read : 0x03 Write : 0x06
		Torque compensation (%) 90-110	225	100	1225	2225	Read : 0x03 Write : 0x06

Controller	Setting	Driver lock after wifi disconnect (sec)	239	0	1239	2239	Read : 0x03 Write : 0x06
		Select display preset number	240	0	1240	2240	Read : 0x03 Write : 0x06
		Loosening / Fastening Switch type	241	0	1241	2241	Read : 0x03 Write : 0x06
		Run time limit / Forward (sec)	242	10	1242	2242	Read : 0x03 Write : 0x06
		Run time limit / Reverse (sec)	243	10	1243	2243	Read : 0x03 Write : 0x06
		Motor stall time limit (sec)	244	0,2	1244	2244	Read : 0x03 Write : 0x06
		Loosening speed (rpm)	245	Auto	1245	2245	Read : 0x03 Write : 0x06
		Motor acceleration (ms)	246	100	1246	2246	Read : 0x03 Write : 0x06
		Error display reset time	247	2	1247	2247	Read : 0x03 Write : 0x06
		Torque compensation master (%) 90-110	248	100	1248	2248	Read : 0x03 Write : 0x06
		Initial preset # when power ON	249	1	1249	2249	Read : 0x03 Write : 0x06
		LED / Light on time	250	10	1250	2250	Read : 0x03 Write : 0x06
		Driver model no. 1-99	251	Select	1251	2251	Read : 0x03 Write : 0x06
		Parameter initialize to factory setting	252	0	1252	2252	Read : 0x03 Write : 0x06
		Torque holding time(ms) 1-20	253	2	1253	2253	Read : 0x03 Write : 0x06
		Auto speed on torque setting	254	1	1254	2254	Read : 0x03 Write : 0x06
		Judge fastening min turns	255	0	1255	2255	Read : 0x03 Write : 0x06
		Fastening stop error	256	0	1256	2256	Read : 0x03 Write : 0x06
		Reverse Lock	257	0	1257	2257	Read : 0x03 Write : 0x06
		LCD button lock	258	0	1258	2258	Read : 0x03 Write : 0x06
		Auto data output	259	0	1259	2259	Read : 0x03 Write : 0x06
		Torque unit	260	0	1260	2260	Read : 0x03 Write : 0x06
		Screw type	261	0	1261	2261	Read : 0x03 Write : 0x06
		Screw count	262	10	1262	2262	Read : 0x03 Write : 0x06
		Sleep time	263	0	1263	2263	Read : 0x03 Write : 0x06
		Auto lock	264	0	1264	2264	Read : 0x03 Write : 0x06
		Select back up data type	265	6	1265	2265	Read : 0x03 Write : 0x06
		Trigger start delay time	266	0	1266	2266	Read : 0x03 Write : 0x06
Network	Setting	Network enable	267	0	1267	2267	Read : 0x03 Write : 0x06
		Static / DHCP	268	0	1268	2268	Read : 0x03 Write : 0x06
	Tool setting	IP Address1	269	192	1269	2269	Read : 0x03 Write : 0x06
		IP Address2	270	168	1270	2270	Read : 0x03 Write : 0x06
		IP Address3	271	1	1271	2271	Read : 0x03 Write : 0x06
		IP Address4	272	100	1272	2272	Read : 0x03 Write : 0x06
		subnet mask 1	273	255	1273	2273	Read : 0x03 Write : 0x06
		subnet mask 2	274	255	1274	2274	Read : 0x03 Write : 0x06
		subnet mask 3	275	255	1275	2275	Read : 0x03 Write : 0x06
		subnet mask 4	276	0	1276	2276	Read : 0x03 Write : 0x06
		Gateway 1	277	192	1277	2277	Read : 0x03 Write : 0x06
		Gateway 2	278	168	1278	2278	Read : 0x03 Write : 0x06
		Gateway 3	279	1	1279	2279	Read : 0x03 Write : 0x06
		Gateway 4	280	1	1280	2280	Read : 0x03 Write : 0x06
		Port	281	5000	1281	2281	Read : 0x03 Write : 0x06
	Server setting	IP Address1	282	192	1282	2282	Read : 0x03 Write : 0x06
		IP Address2	283	168	1283	2283	Read : 0x03 Write : 0x06

		IP Address3	284	1	1284	2284	Read : 0x03 Write : 0x06
		IP Address4	285	100	1285	2285	Read : 0x03 Write : 0x06
		Port	286	5000	1286	2286	Read : 0x03 Write : 0x06
	AP setting	SSID (32 char)	287-302				Read : 0x03 Write : 0x06
		Password (32 char)	303-318				Read : 0x03 Write : 0x06
		Country type	319	0	1319	2319	Read : 0x03 Write : 0x06
	WEB Page	Password	320	0	1320	2320	Read : 0x03 Write : 0x06
Multi SQ	PG1	MS PG 1	321	0	1321	2321	Read : 0x03 Write : 0x06
		MS PG 2	322	0	1322	2322	Read : 0x03 Write : 0x06
		MS PG 3	323	0	1323	2323	Read : 0x03 Write : 0x06
		MS PG 4	324	0	1324	2324	Read : 0x03 Write : 0x06
		MS PG 5	325	0	1325	2325	Read : 0x03 Write : 0x06
		MS PG 6	326	0	1326	2326	Read : 0x03 Write : 0x06
		MS PG 7	327	0	1327	2327	Read : 0x03 Write : 0x06
		MS PG 8	328	0	1328	2328	Read : 0x03 Write : 0x06
		MS PG 9	329	0	1329	2329	Read : 0x03 Write : 0x06
		MS PG 10	330	0	1330	2330	Read : 0x03 Write : 0x06
	PG2	MS PG 11	331	0	1331	2331	Read : 0x03 Write : 0x06
		MS PG 12	332	0	1332	2332	Read : 0x03 Write : 0x06
		MS PG 13	333	0	1333	2333	Read : 0x03 Write : 0x06
		MS PG 14	334	0	1334	2334	Read : 0x03 Write : 0x06
		MS PG 15	335	0	1335	2335	Read : 0x03 Write : 0x06
		MS PG 16	336	0	1336	2336	Read : 0x03 Write : 0x06
		MS PG 17	337	0	1337	2337	Read : 0x03 Write : 0x06
		MS PG 18	338	0	1338	2338	Read : 0x03 Write : 0x06
		MS PG 19	339	0	1339	2339	Read : 0x03 Write : 0x06
		MS PG 20	340	0	1340	2340	Read : 0x03 Write : 0x06
ERROR		ERROR 1	341	0	1341	2341	Read : 0x03 Write : 0x06
		ERROR 2	342	0	1342	2342	Read : 0x03 Write : 0x06
		ERROR 3	343	0	1343	2343	Read : 0x03 Write : 0x06
		ERROR 4	344	0	1344	2344	Read : 0x03 Write : 0x06
		ERROR 5	345	0	1345	2345	Read : 0x03 Write : 0x06
		ERROR 6	346	0	1346	2346	Read : 0x03 Write : 0x06
		ERROR 7	347	0	1347	2347	Read : 0x03 Write : 0x06
		ERROR 8	348	0	1348	2348	Read : 0x03 Write : 0x06
		Controller model	349	Auto	1349	2349	Read : 0x03 Write : 0x06
Advanced preset 1	Free reverse rotation	Speed (rpm)	500	0	1500	2500	Read : 0x03 Write : 0x06
		Angle (turn) 0 - 20	501	0	1501	2501	Read : 0x03 Write : 0x06
	Thread tapping	Min torque	502	0	1502	2502	Read : 0x03 Write : 0x06
		Max torque	503	0	1503	2503	Read : 0x03 Write : 0x06
		Speed (rpm)	504	0	1504	2504	Read : 0x03 Write : 0x06
		Finish Torque	505	0	1505	2505	Read : 0x03 Write : 0x06
		Angle start from Thread tapping	506	0	1506	2506	Read : 0x03 Write : 0x06
	Engaging torque detection	Speed (rpm)	507	0	1507	2507	Read : 0x03 Write : 0x06
		Torque(%)	508	0	1508	2508	Read : 0x03 Write : 0x06
		Angle limit (turn) 0 - 20	509	0	1509	2509	Read : 0x03 Write : 0x06

		Time limit (sec)	510	0	1510	2510	Read : 0x03 Write : 0x06
		Angle start from engaging	511	0	1511	2511	Read : 0x03 Write : 0x06
	Angel after torque up	Speed (rpm)	512	0	1512	2512	Read : 0x03 Write : 0x06
		Angle (degree) 0-3600	513	0	1513	2513	Read : 0x03 Write : 0x06
		Direction	514	0	1514	2514	Read : 0x03 Write : 0x06
Advanced preset 2	Free reverse rotation	Speed (rpm)	515	0	1515	2515	Read : 0x03 Write : 0x06
		Angle (turn) 0 - 20	516	0	1516	2516	Read : 0x03 Write : 0x06
	Thread tapping	Min torque	517	0	1517	2517	Read : 0x03 Write : 0x06
		Max torque	518	0	1518	2518	Read : 0x03 Write : 0x06
		Speed (rpm)	519	0	1519	2519	Read : 0x03 Write : 0x06
		Finish Torque	520	0	1520	2520	Read : 0x03 Write : 0x06
		Angle start from Thread tapping	521	0	1521	2521	Read : 0x03 Write : 0x06
	Engaging torque detection	Speed (rpm)	522	0	1522	2522	Read : 0x03 Write : 0x06
		Torque(%)	523	0	1523	2523	Read : 0x03 Write : 0x06
		Angle limit (turn) 0 - 20	524	0	1524	2524	Read : 0x03 Write : 0x06
		Time limit (sec)	525	0	1525	2525	Read : 0x03 Write : 0x06
		Angle start from engaging	526	0	1526	2526	Read : 0x03 Write : 0x06
	Angel after torque up	Speed (rpm)	527	0	1527	2527	Read : 0x03 Write : 0x06
		Angle (degree) 0-3600	528	0	1528	2528	Read : 0x03 Write : 0x06
		Direction	529	0	1529	2529	Read : 0x03 Write : 0x06
continue	...	...	...	...	...	...	...
Advanced preset 15	Free reverse rotation	Speed (rpm)	710	0	1710	2710	Read : 0x03 Write : 0x06
		Angle (turn) 0 - 20	711	0	1711	2711	Read : 0x03 Write : 0x06
	Thread tapping	Min torque	712	0	1712	2712	Read : 0x03 Write : 0x06
		Max torque	713	0	1713	2713	Read : 0x03 Write : 0x06
		Speed (rpm)	714	0	1714	2714	Read : 0x03 Write : 0x06
		Finish Torque	715	0	1715	2715	Read : 0x03 Write : 0x06
		Angle start from Thread tapping	716	0	1716	2716	Read : 0x03 Write : 0x06
	Engaging torque detection	Speed (rpm)	717	0	1717	2717	Read : 0x03 Write : 0x06
		Torque(%)	718	0	1718	2718	Read : 0x03 Write : 0x06
		Angle limit (turn) 0 - 20	719	0	1719	2719	Read : 0x03 Write : 0x06
		Time limit (sec)	720	0	1720	2720	Read : 0x03 Write : 0x06
		Angle start from engaging	721	0	1721	2721	Read : 0x03 Write : 0x06
	Angel after torque up	Speed (rpm)	722	0	1722	2722	Read : 0x03 Write : 0x06
		Angle (degree) 0-3600	723	0	1723	2723	Read : 0x03 Write : 0x06
		Direction	724	0	1724	2724	Read : 0x03 Write : 0x06
Firmware Version			725	Auto			Read : 0x03
Monitoring data	Alarm data	Alarm no.	3100				Read : 0x04
		Waring no.	3101				Read : 0x04
	Data updated on events (Start, F/L, Preset,	Event count no. (1- 65,535)	3200				Read : 0x04
		Fastening time (ms)	3201				Read : 0x04
		Preset no.	3202				Read : 0x04
		Target torque (* x 100)	3203				Read : 0x04

	Torque up)	Converted torque (* x 100)	3204	Read : 0x04
		Target speed (rpm)	3205	Read : 0x04
		A1 (degree)	3206	Read : 0x04
		A2 (degree)	3207	Read : 0x04
		A3 (degree)	3208	Read : 0x04
		Screw count value	3209	Read : 0x04
		Error	3210	Read : 0x04
		Forward / Loosening	3211	Read : 0x04
		Status	3212	Read : 0x04
		Snug torque angle (degree)	3213	Read : 0x04
		Barcode 1, 2	3214	Read : 0x04
		Barcode 3, 4	3215	Read : 0x04
		…		Read : 0x04
		Barcode 31, 32	3229	Read : 0x04
	Realtime Data	Converted torque (* x 100)	3300	Read : 0x04
		Speed (rpm)	3301	Read : 0x04
		Motor current (mA)	3302	Read : 0x04
		Current Preset #	3303	Read : 0x04
		Torque up	3304	Read : 0x04
		Fastening OK	3305	Read : 0x04
		Ready	3306	Read : 0x04
		Motor RUN	3307	Read : 0x04
		Alarm no.	3308	Read : 0x04
		Forward / Loosening	3309	Read : 0x04
		Screw count value	3310	Read : 0x04
		Motor Temperature	3313	Read : 0x04
Temporary parameter in RAM	Virtual Preset #1	TC/AM_AC/TM	731	Write : 0x06
		Torque	732	Write : 0x06
		Torque min/max (%)	733	Write : 0x06
		Target angle(degree)	734	Write : 0x06
		Min angle(degree)	735	Write : 0x06
		Max angle(degree)	736	Write : 0x06
		Snug torque(%)	737	Write : 0x06
		Speed (rpm)	738	Write : 0x06
		Free fastenig angle(degree)	739	Write : 0x06
		Free fastenig speed(rpm)	740	Write : 0x06
		Soft start(1-300ms)	741	Write : 0x06
		Seating point (%) 10-90	742	Write : 0x06
		Torque rising rate(ms) 50-200	743	Write : 0x06

		Torque holding time(ms) 1-20	744		Write : 0x06
		Torque compensation (%) 90-110	745		Write : 0x06
Remote control	Operation	Alarm reset	4000		Write : 0x06
		Driver Lock	4001		Write : 0x06
		No use (Factory only)	4002		Write : 0x06
		Remote start	4003		Write : 0x06
		Preset # change (Not available on RUN)	4004		Write : 0x06
		Forward / Loosening	4005		Write : 0x06

13. 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.

14. MAINTENANCE

14.1 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.

14.2 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.

14.3 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

14.4 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.

14.5 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

BM / BMH	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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