

Instruction manual

# BM SERIES CONTROLLER ParaMon-Pro X





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# **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 <u>www.doga.fr</u> 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 altered to meet specific needs.

If this is the case, when ordering a renewal or spare parts, please indicate the tool item code featured on the delivery document, or contact **DOGA** at **+33 1 30 66 41 41** indicating the approximate delivery date. You will then be sure to get the required tool and/or parts.

### **1.2 Product reference**

Description	BM series controller
Туре	ParaMon-Pro X

### **1.3 Product description**

ParaMon-Pro X offers diverse features to help users use the BM tool more efficiently.. The features of ParaMon-Pro X are as follows:

- •Dual-band (2.4 & 5GHz) WiFi, AP-mode only
- •Able to connect up to 8 BM/MD tools
- •Able to check and change parameter settings
- •Displays fastening data in real time and saves them automatically
- •Directly programs and visualizes assembly procedures
- •Realtime graph monitoring (torque, speed, angle...)
- Remote tool control
- ●I/O port (input x 16 / output x 16)
- •External display extension (HDMI)
- •Supports barcode scanner
- •Supports File Transfer Protocol (FTP) server
- Backup / restore



# 1.4 Standard packing items



	Quantity
ParaMon-Pro X Controller	X 1
Power Cord	X 1
WiFi USB adapter	X 1
Vesa wall mounting support	X 1
CE Declaration of Conformity	X 1

# 1.5 Specifications

No.	Category	Specifications
1	Input Power	AC 100-240 V, 50/60Hz, 0.35A
2	Dimensions	300(W) x 196(H) x 80(D) mm
3	Weight	3.54 kg (including wall mount bracket)
4	Mounting	VESA 100 x 100 (wall mount bracket included)
5	Display	10.1-inch capacitive touchscreen (1280 x 800 px)
6	Extended Display	HDMI x 1 (duplicate)
7	Storage	On-board 8GB eMMC
8	Ethernet	Gigabit ethernet x 1
9	WiFi	Wireless USB adapter included 2.4GHz, 5GHz dual-band, IEEE 802.11 b/g/n/ac AP-mode only
10	Interface	USB 2.0 x 3 24V digital I/O (input x 16, output x 16) Micro-SD slot (up to 32GB)
11	Multi-Language	English, Translation in progress :French, German, Spanish,

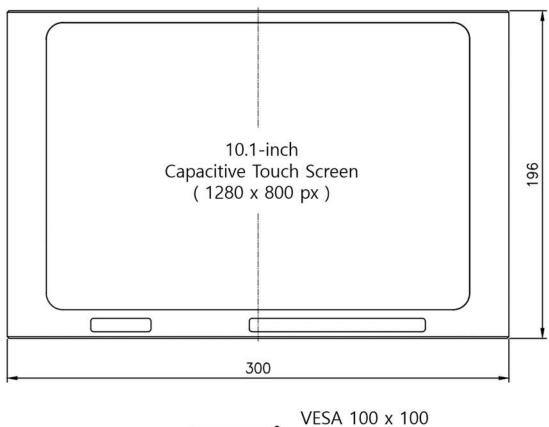
#### Cautions

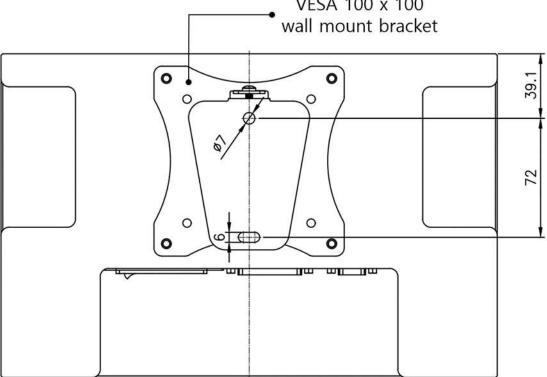
- Do NOT use any item other than the accompanying USB WiFi adapter.
- There is a possibility of signal interference while operating the equipment

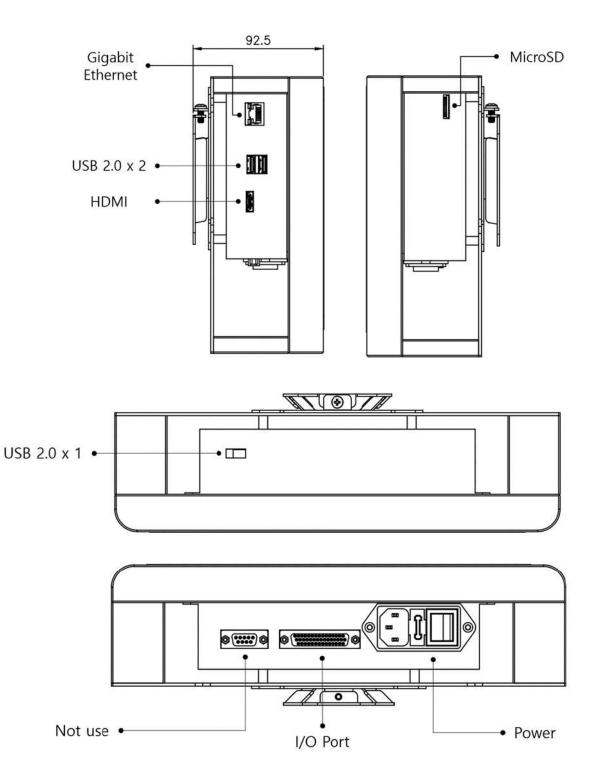
## 1.6 System overview



# 1.7 Dimensions and appearances

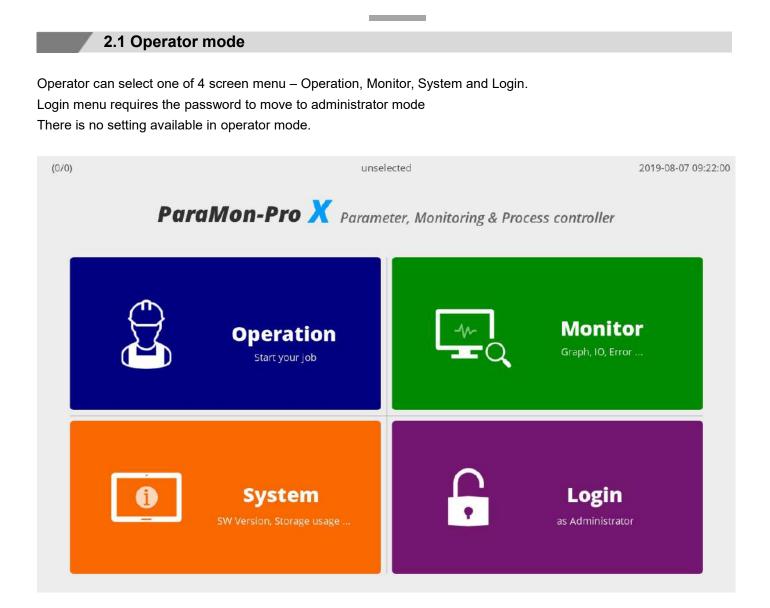








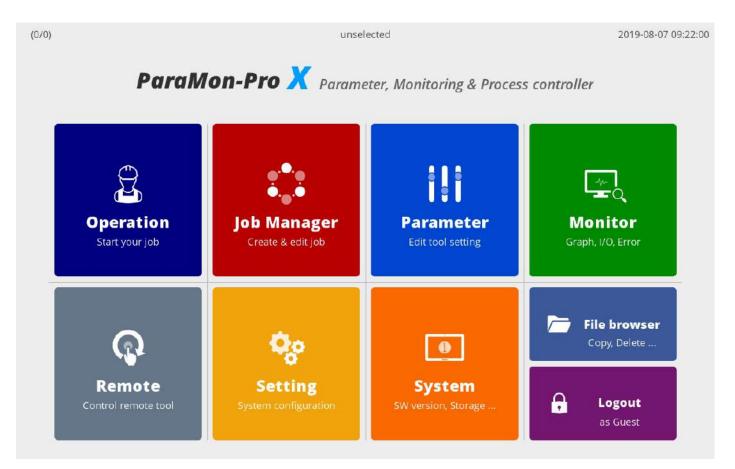
# 2. HOME



No.	Category	Description			
1	Operation	Moves to the OPERATION page			
2	Monitor	Moves to the MONITOR page			
3	System	Moves to the SYSTEM page			
		Enter the password and log into the Admin mode			
4	Login	The default password is "0".			
		Password can be changed in Admin mode.			

### 2.2 Administrator mode

All settings and job creation is available in admin mode only.



No.	Category	Description
1	Operation	Moves to the OPERATION page
2	Job Manager	Moves to the JOB MANAGER page
3	Parameter	Moves to the PARAMETER page
4	Monitor	Moves to the MONITOR page
5	Remote	Moves to the REMOTE page
6	Setting	Moves to the SETTING page
7	System	Moves to the SYSTEM page
8	File Browser	Moves to the FILE BROWSER page
9	Logout	Logs out from Administrator to Operator mode

# **3. NETWORK CONFIGURATION**

For connection between ParaMon-Pro X and BM, a network can be configured as follows:

Category	Description			
Connection through Internal AP	The most common type Through a USB WiFi adapter in ParaMon-Pro X, ParaMon-Pro X is operated in AP mode and connected to BM.			
Connection through External AP	ParaMon-Pro X is connected to BM, using a separate AP. Can be used when wider WiFi coverage is needed or a particular feature provided by the AP is required			

## 3.1 Connect through internal AP



The most common type.

Through a WiFi adapter in ParaMon-Pro X, ParaMon-Pro X is operated in AP mode and connected to BM. The WiFi module in ParaMon-Pro X is operated in AP mode only, not in Station mode.

- A. Log into the system in Admin mode. The default password is "0".
- B. Press [Setting].
- C. Select the NETWORK tab on the left.
- D. Set the SSID, password and band in WiFi settings. The default settings are as follows:

Category	Default Settings
SSID	Paramon
Password	12345678
Band	5 GHz

(0/0)				unselected			2019-08-07 09:22:00
	Back Home	🗢 Wi-Fi AP	SSID :	paramon		max 32	
			Password :	12345678		min 8 ~ max 32	Apply
3	Operation	Į.	Band :	🔵 2.4 GHz 🧕 🧕	5 GHz	Advanced	
4	1/0	Ethernet	Онср (с	Obtain an IP address autom	atically)		
<b>L</b>	Log		Static (U	Jse the following IP address	):		
			IP addr	ress :			Apply
	Barcode		Subnet	t mask :			
			Defaul	t gateway :			
X	Network						
	Share						
°0	System						

- E. Press [Apply].
- F. As shown in the figure below, WiFi is enabled after searching for the best channel.

(0.0)	4		unselected		2019-08-07-09:22:00
	🌩 🛛 WI-FI AP				
Ó					
0.1					
1	C Etherne		Scanning		
B		Sea	arching for the bes		
			Please wait.		
×	_				
0 <sub>0</sub>					

### 3.2 Connection through external AP



Connect ParaMon-Pro X and BM, using a separate AP.

This connection type can be used when wider WiFi coverage is needed or a particular feature by the AP is required. The WiFi adapter in ParaMon-Pro X is not operated in Station mode.

Therefore, Ethernet wiring is needed for connection between ParaMon-Pro X and a separate AP.

- A. Log into the system in Admin mode. The default password is "0".
- B. Press [Setting].
- C. Select the NETWORK tab on the left.
- D. Choose either DHCP or STATIC in the ETHERNET according to network configuration.
- E. Press [Apply].

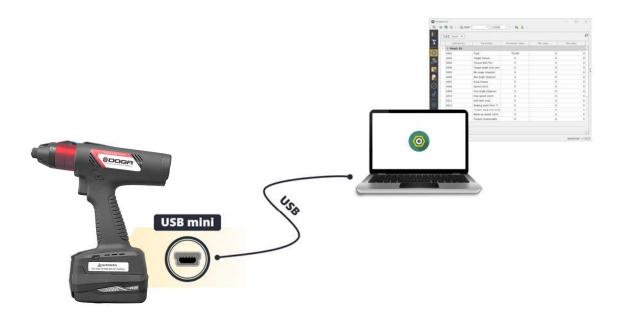
(0/0)	_		unselected			2019-08-07 09:22:00
A- Back		SSID :	paramon		max 32	
	_	Password :	12345678		min 8 – max 32	Apply
Operat	ion	Band :	🔵 2.4 GHz 🧕	5 GHz	Advanced	
<b>\$</b> 1/0	문 Ethernet		Obtain an IP address autom	atically)		````
Log		Static (L	Ise the following IP address	):		
		IP add	ress :			Apply
Barco	de		mask :	.[].[		
		Defaul	t gateway :		].[]	
Netwo	"K					······
Shar	e					
Syste	m					

F. Check the IP address by the DHCP server in the following order: Home  $\rightarrow$  System  $\rightarrow$  Network.

(0/0)		unselected	2019-08-07 09:22:00
Back Home	Ethernet		
1	- IP address :	192.168.0.17	
Device info	- Netmask :	255.255.255.0	1
	- Gateway :	192.168.0.1	
Storage	- MAC :	fc-c2-3d-2a-bc-11	·····
× Network	Wi-Fi		
	- IP address :	0.0.0.0	
	- Netmask :	0.0.0	
	- MAC :	00:00:00:00:00	

# 4. BM WIFI SETUP

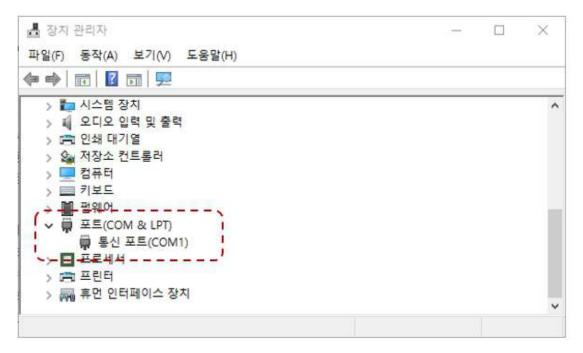
## 4.1 Setup using ParaMon Air (PC)



Depending on circumstances, there might be multiple COM ports in the PC.

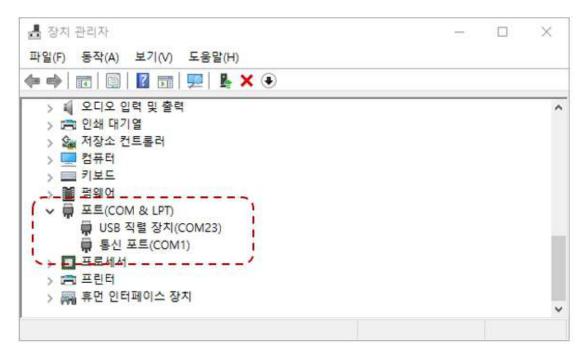
Therefore, it is required to check the COM port numbers connected to the BM before starting the ParaMon Air.

- A. Open the Device Manager in the Windows PC.
- B. Check the COM & LPT category as shown below:



C.Connect the PC with the BM, using the accompanying USB cable.

D.Once the BM is connected properly, a new COM port appears in the COM & LPT category. The COM port number can vary depending on configuration.



- E. Start the ParaMon Air program.
- F. Extend the COM Port List box as shown below:
- G. Select the COM port number of BM confirmed in the device manager.
- H. Press [OPEN] and start the connection.

	🕹 🖪 🗟 - :		CONTRACTOR OF A DESCRIPTION OF A DESCRIP	- 1	15200 -	- : 🚳 👱 -
	Drag a column		COM1		olumn	
	brag a column		COM25		olumn	
-	State	Serial no		Model	IP	Port

I.Once connected normally, the product's model No., serial No. and firmware version appear at the bottom as follows:



- J. Select the NETWORK tab on the left.
- K. Match the SSID and Password settings with ParaMon-Pro X.
- L. Press [CLOSE] and finish the connection.

Menus Tool register	Category  Address No.		
Tool register	Address No.		
	Audress No.	<ul> <li>Parameter</li> </ul>	Parameter value
	~ Category: To	ol setting	be
Fastening	A267	Network enable	O NO  VES
	A268	Mode	○ STATIC ● DHCP
dvanced function	A269	IP address	000.000.000.000
Controller	A273	Subnet mask	000.000.000.000
contabilor	A277	Gateway	000.000.000.000
Multi sequence	A281	Port	5000
	Category: Se	rver setting	
Network	A320	Password (Web)	
Driver	Category: AF     AF	setting	
Diver	A287	SSID	paramon
	► A303	Password	******
	dvanced function Controller	dvanced function Controller Multi sequence Network Driver Controller A268 A269 A273 A277 A281 ✓ Category: Set A320 ✓ Category: AP A287 A303	A268 Mode A269 IP address A273 Subnet mask A277 Gateway Multi sequence Network Driver A281 Port A320 Password (Web) Category: AP setting A287 A303 Password

- M. Remove the BM battery and cut off the power.
- N. Connect the BM battery and turn on the power.
- O. The BM's WiFi settings are done.

# 4.1 Setup using ParaMon-Pro X



- A. Connect ParaMon-Pro X with the BM, using the accompanying USB cable.
- B. If successfully connected, the NETWORK SETTNG page appears automatically.

	Network setting
Wi-Fi :	On Off
SSID : max 32	paramon
Password :	set Set the same as the current controller.
8 ~ max 32	12345678
Country :	💿 Default 🔵 US 🔵 Europe 🔵 Japan
2	
DHCP (	Obtain an IP address automatically)
Static (	Use the following IP address) :
CAMPACITY AND A	
1P addr	
	mask :
Subnet	
Subnet	mask :

Connect the battery and switch on the BM. Ensure to connect the USB cable after the system is successfully reset. If switched on after the USB cable is connected when the system is OFF, or the USB cable is connected while the BM is being reset, The NETWORK SETTING page may not appear on the screen. If not, remove the battery and reassemble it.

- C. Select the text box and enter SSID and Password in person.
- D. Press [SET]. Then, it is set with the SSID and Password from ParaMon-Pro X.
- E. Press [Save].

	Network setting
Wi-Fi :	🗿 On 🕥 Off
SSID :	paramon
max 32 Password :	Set Set the same as the current controller.
8 ~ max 32	12345678
Country :	Default US Europe japan
10022000000000000000000000000000000000	
DHCP (	Obtain an IP address automatically)
DHCP (	
DHCP (	Obtain an IP address automatically) Jse the following IP address) :
DHCP (     Static (     IP addre	Dbtain an IP address automatically)       Jse the following IP address) :
DHCP (     Static (     IP addre	Obtain an IP address automatically) Jse the following IP address) :
DHCP (     Static (     IP addr     Subnet	Dbtain an IP address automatically)       Jse the following IP address) :

F.Remove the BM battery and cut off the power.

G.Assemble the BM battery and switch on the power.

H.The BM WiFi settings are successfully done.

# **5. MEMBER TOOL MANAGEMENT**

To use tools in ParaMon-Pro X, they should be registered as 'Member Tools'.

Able to register up to 8 member tools

This section describes how to manage member tools.

<b>4</b> 9)	Volume	) Mute	25 %	50 9	6 🔵 75 %	0	100 %		
રુ	Total Connected / Registerd :	5 / 5 ea							
Õ	Name	S/N	Model	F/W ver	IP address	Port	MAC address		Backup
1	BMT2003100003	2003100003	BMT3204	0.90.0	192.168.131.30	5000	88:da:1a:52:2b:7c	20.8	ك ك
<b>T</b> 2	BMT1907100121	1907100121	BMT3211	0.87.7	192.168.131.191	5000	88:da:1a:52:29:b0	21.7	ن ىك
3	BMT2003100012	2003100012	BMT3206	0.90.0	192.168.131.90	5000	88:da:1a:52:2c:70	21.9	ى ئ
4	BMT2003100123	2003100123	BMT3216	0.90.0	192.168.131.122	5000	88:da:1a:52:2b:d8	20.7	ى ئ
5	BMT2003100022	2003100022	BMT3224	1.0.0	192.168.131.163	5000	88:da:1a:52:2a:4c	19.9	ى ئ
an a	Remote		ietting		System				

### 5.1 Register Member Tools

A.Press [Login] and log into the system. The default password is "0".B.As shown in the figure, swipe from top to the bottom.



C.Select the EDIT icon for member tool registration.

<b>4</b> 0)	Volume	Mute	25%	50 %	75 %	0	100 %		
ş	Total Connected / Registerd :	0/0ea						(	1
Ð	Name	S/N	Model	F/W ver	IP address	Port	MAC address		Backu

D. ParaMon-Pro X automatically searches all tools accessible on wired and wireless networks and displays target tools on the right table.

egistere	d list to use : 0 ea			- Availa	ble list : 4 ea	
	Tool name	Serial number   M	odel	No	Serial number	Model
				1	2003100012	BMT3206
				2	2003100123	BMT3216
			Register	3	2003100022	BMT3224
				4	2002100009	BMT3204
				Ĩ		
			Release			

E. Check the model No. and serial number on the label or DRIVER INFORMATION page.



- F. Select the tool matched by the model No. and serial number on the right table.
- G. Press [Register] and register the selected tool on ParaMon-Pro X.

Registered	d list to use : 0 ea				- Availa	ble list: 4 ea	
0	Tool name	Serial number	Model		No	Serial number	Model
					1	2003100012	BMT3206
					2	2003100123	BMT3216
				Register	3	2003100022	BMT3224
				·'	4	2002100009	BMT3204
					0		
				Release			
				Refease			

H. The tools on the right list move to the left, and the registration process is done.

\$	ł	Edit member tools						ОК
- f	Reg	istered list to use :1 ea				- Availa	ble list:3 ea	
N	lo	Tool name	Serial number	Model		No	Serial number	Model
	1	BMT2002100009	2002100009	BMT3204		1	2003100012	BMT3206
×						2	2003100123	BMT3216
					Register	з	2003100022	BMT3224
					-			
					Release			

I. Press [OK] and end the settings.

# 5.2 Deregister Member Tools

A.Press [Login] and log into the system. The default password is "0".B.As shown in the figure, swipe from top to the bottom.

(0/0)		unselected						
	ParaM	Ion-Pro X Param	eter, Moi	ontroller				
	Operation Start your job	Job Manager Create & edit job	<b>Parameter</b> Edit tool setting	Monitor Graph, I/O, Error				
	Remote Control remote tool	<b>Occ</b> Setting System configuration	<b>System</b> SW version, Storage	File browser Copy, Delete Copy. Delete Copy. Delete				

C.Select the EDIT icon for member tool registration.

<b>4</b> -3)	Volume	) Mute	25 %	50 9	6 🔿 75 %	0	100 %			
ş	Total Connected / Registerd :	1/1 ea	_						1	(
0	Name	S/N	Model	F/W ver	IP address	Port	MAC address	l	Bad	ckuj
T 1	BMT2002100009	2002100009	BMT3204	0.90.0	192.168.131.30	5000	88:da:1a:52:2b:7c	22.2	بل	L
	Startyour job		interesti interesti		Edit tool settin	5	Graph. I/O			

D.Check the model No. and serial number on the label or DRIVER INFORMATION page.



E.Select the tool matched by the model No. and serial number on the left table.

F.Press [Release].

G.Once the confirmation page pops up, press [OK] and deregister the tool from ParaMon-Pro X.

	istered list to use : 1 ea			N	- Availa	ble list: 3 ea	
•	Tool name	Serial number	Model		No	Serial number	Model
	BMT2002100009	2002100009	BMT3204		1	2003100012	BMT320
-					2	2003100123	BMT321
				Register	3	2003100022	BMT3224
				,	2		
				-			
				Release			

H.Press [OK] and end the settings.

### 5.3 Modify member tool names

At member tool registration, tool names are basically formed in the following format: "Tool Type (BM, BMT, etc.) + Serial No.". It is okay to use the default tool name, but it can be modified for the convenience of tool identification.

1			
Tool name	Serial number	Model	No Serial number M
BMT2002100009	2002100009 B	MT3204	
BMT2003100012	🥒 2003100012 В	MT3206	
BMT2003100123	2003100123 B	MT3216 Register	
BMT2003100022	✓ 2003100022 B	MT3224	
BMT2003100022	2003100022 B	NT3224	

A.Select the EDIT icon.

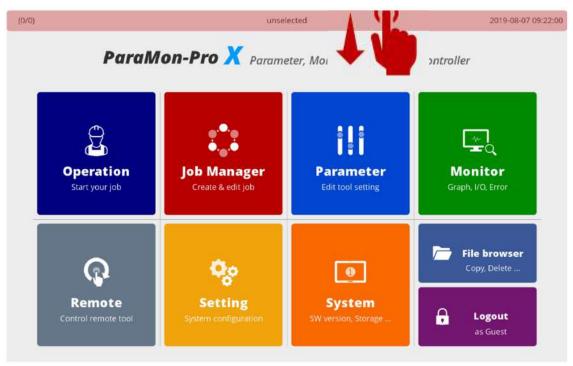
B.If a keyword pops up, enter the tool name and press [Enter].

C.Confirm the new tool name.

eg	istered list to use : 4 ea					- Availal	ble list: 0 ea	
,	Tool name		Serial number	Model		No	Serial number	Model
-	tool1	1	2002100009	BMT3204				
	BMT2003100012	1	2003100012	BMT3206				
	BMT2003100123		2003100123	BMT3216	Register			
	BMT2003100022	1	2003100022	BMT3224				
					Release			

### 5.4 Check member tool status

A.As shown in the figure, swipe from top to the bottom.



B.A list of the member tools currently registered on ParaMon-Pro X appears.

4	) Volume	) Mute	25 %	50 50 50 50 50 50 50 50 50 50 50 50 50 5	6 🔵 75 %	0	100 %		
Ş	Total Connected / Registerd :	4 / 4 ea	_						
0	Name	S/N	Model	F/W ver	IP address	Port	MAC address	l	Backu
T	BMT2003100012	2003100012	BMT3206	0.90.0	192.168.131.90	5000	88:da:1a:52:2c:70	21.7	ታ ፣
2	BMT2003100123	2003100123	BMT3216	0.90.0	192.168.131.122	5000	88:da:1a:52:2b:d8	20.8	<u>њ</u> ,
3	BMT2003100022	2003100022	BMT3224	1.0.0	192.168.131.163	5000	88:da:1a:52:2a:4c	21.1	ι.
4	BMT2002100009	2002100009	BMT3204	0.90.0	192.168.131.30	5000	88:da:1a:52:2b:7c	23.0	±.
	Q		Qe				enje		91

C.The member tool list includes the followings:

No.	Category	Description			
		Not connected yet			
1	Status	Successfully connected			
I	Status	Connection failed; required to reset the tool			
		The tool occupied by the other ParaMon-Pro X			
2	Name	Name			
3	S/N	Serial No.			
4	Model	Model No.			
5	F/W ver	Firmware version			
6	IP address	IP address			
7	Port	Modbus-TCP port number			
8	MAC address	MAC address			
9	Temperature	Realtime temperature			
10	Backup/Restore	BM parameter backup & restore			
10	Dackup/Itestole	For more information, refer to '16. Backup & Restore'.			

# 6. STATUS BAR TTTT (4/4) unselected 2019-08-07 09:22:00 **ParaMon-Pro** X Parameter, Monitoring & Process controller Operation **Job Manager** Parameter Monitor Start your job Create & edit job Graph, I/O, Error Edit tool setting **File browser** Copy, Delete ... 1 Remote System Setting A Logout as Guest

The Status Bar appears on top always and includes the followings:

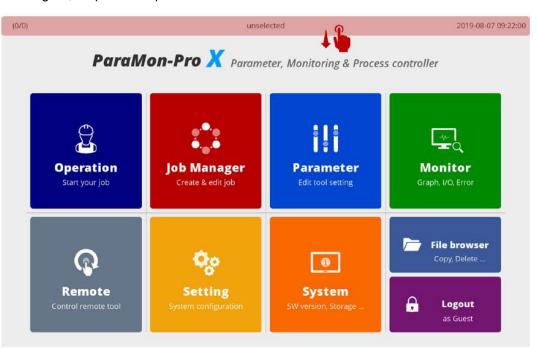
No.			Description
		7	Not connected yet
1	Member tool connection (X/Y) X: No. of tools connected	T	Successfully connected
I	Y: Total number of member tools	T	Connection failed; required to reset the tool
		7	The tool occupied by the other ParaMon-Pro X
2	Name of the target tool selected		·
3	Date and present time		

#### ParaMon-Pro X instruction manual

# 7. SELECT TARGET TOOL

Since ParaMon-Pro X registers and manages multiple member tools, it is required to specify a target tool on the menu for a certain tool such as Parameter, Monitor and Remote. This section describes how to select a target tool.

A. As shown in the figure, swipe from top to the bottom.

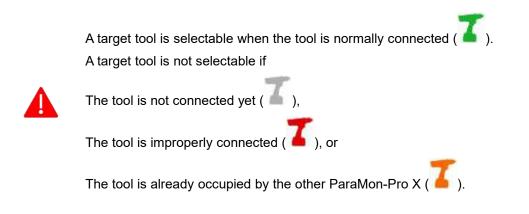


B. A list of the member tools currently registered on ParaMon-Pro X appears.

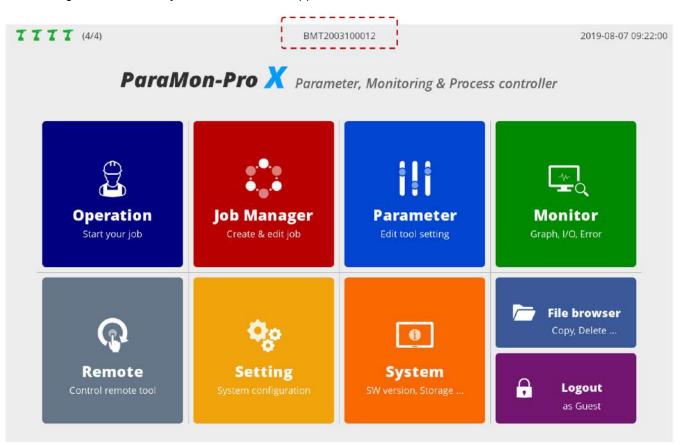
Protein Connected / Registerd:         4 / 4 ea           Protein Connected / Registerd:         4 / 4 ea           Protein Connected / Registerd:         S/N         Model         F/W ver         IP address         Port         MAC address           Point         BMT2003100012         2003100012         BMT3206         0.90.0         192.168.131.90         5000         88:da:1a:52:2c:70		
T         BMT2003100012         2003100012         BMT3206         0.90.0         192.168.131.90         5000         88:da:1a:52:2c:70	J	1 337.372
		Backu
	21.7	÷
2         BMT2003100123         2003100123         BMT3216         0.90.0         192.168.131.122         5000         88:da:1a:52:2b:d8	20.8	土
T 3         BMT2003100022         2003100022         BMT3224         1.0.0         192.168.131.163         5000         88:da:1a:52:2a:4c	21.1	ı.
T 4         BMT2002100009         2002100009         BMT3204         0.90.0         192.168.131.30         5000         88:da:1a:52:2b:7c	23.0	÷
	brows Celes	



C. If a target tool is selected on the member tool list, the system goes back to the previous page automatically.



D. If the target tool is normally selected, its name appears on the status bar.



# 8. PARAMETER

Able to manage the parameters of all BM tools registered in ParaMon-Pro X Unless a target tool is specified, the following page appears. Refer to '7. Select Target tool'.

TTTT (4/4) Back Home	unselected	2019-08-07 09:22:00
Advanced	Please select a tool.	
	`·	
●→● ■←●		
and the second se		
Multi Sequence		
*		
Network		

### 8.1 Fastening

The system supports a total of 15 preset groups, and each group includes the followings:

<b>TTTT</b> (4/4)		BN	MT2003100012			2019-08-07	09:22:00
â	Туре	TC/AM	AC/TM	Soft start (ms)	•	0	►
Back Home	Target torque	◄ 1.	.00 🕨	Seating point from Target torque (%)	•	40	•
Q	Torque limit (%)	۹ ٥.	.00 🕨	Torque rising time (ms)	•	50	•
Fastening	Target angle (not use)	10	• 000	Ramp-up speed (rpm)		250	►
ø	Min angle (degree)	٩	o 🕨	Torque compensation (%)	4	100	•
Advanced	Max angle (degree)	•	o 🕨				
•	Snug torque	۹ 0.	.00 🕨				
Contoller	Speed (rpm)	2	27 🕨				
●→◆ ↓ ■←●	Free angle (degree)	•	o 🕨				
Multi Sequence	Free speed (rpm)	•	0 🕨				
Ketwork	1 2 3	4 5	6 7 8	9 10 11 12	13 1	4 15	

### A.Type

TC/AM	Torque control / angle monitoring Torque values (TARGET) are critical in judging fastening (OK/NG) while angle values are sub-values.
AC/TM	Angle control / torque monitoring Angle values (TARGET) are critical in judging fastening (OK/NG) while torque values are sub-values.

### B.Target torque / Max. torque

TC/AM	Target torque	Sets target torque values in TC/AM
AC/TM	Max. torque	Sets maximum torque tolerance in reaching target angle in AC/TM. If the torque exceeds the maximum torque in reaching the target angle, an error occurs right away.

#### C.Torque limit / Min. torque

TC/AM	Torque limit	Sets OK range in percentage based on target torque E.g.). In the case of 100.00 kgf.cm of target torque and 10% torque limit, '90.00-110.00 kgf.cm' is OK while other areas are NG.
AC/TM	Min. torque	Sets minimum torque tolerance in reaching target torque E.g.). In the case of 1,000 target angle and 1.00 kgf.cm of minimum torque, torque should be at its minimum level or higher even at a temporary situation while reaching the target angle.

#### D.Target angle

TC/AM	Target angle	Unused
AC/TM	Target angle	Sets the target angle

#### E.Min angle

Able to apply the minimum angle value in judging OK/NG.

Resulted in 'NG' if the angle is lower than the minimum level even after the target torque is reached in TC/AM mode.

### F.Max angle

Able to apply the maximum angle value in judging OK/NG.

Resulted in 'NG' if the angle is greater than the maximum level even after the target torque is reached in TC/AM mode.

#### G.Snug torque

Sets the measurement point of angle values used in judging OK/NG.

'0' refers to 'Disabled'. Angle measurement begins as soon as the tool is operated.

If not '0', angle measurement starts as soon as the torque reaches the snug torque value.

Setting snug torque to a value other than '0'.

In other words, alteration of the angle measurement point means the application of angle values in judging OK/NG.

If the snug torque is not '0', therefore, both minimum and maximum angle values should be set together.

#### H.Speed (RPM)

Able to set tool speed in person

Not permitted to modify if the Controller  $\rightarrow$  Auto Speed settings are 'ON'. Able to modify if the Controller  $\rightarrow$  Auto Speed settings are 'OFF'.

#### I.Free Angle & speed

If the free angle value is '0 (disabled)', the system is operated at \_\_\_\_\_ speed (RPM) until the seating point. If the free angle value is not '0', the system is operated at free speed until the free angle. Since the free angle, it is run at \_\_\_\_\_ speed (RPM).

Mostly used to reduce fastening time.

In case of relatively long screws, fastening time can be reduced by setting free angle and speed to proper levels and increasing operating speed in the beginning when torque is relatively weak. Recommended to set the free angle to a level lower than the overall angle by at least 2 turns (720°).

#### J.Soft Start (ms)

Able to adjust acceleration until the target speed is reached.

Able to set the time taken to reach target speed after the start of tool operation, using 'Controller  $\rightarrow$  Acceleration (ms)'.

Here, 'Acceleration (ms)' refers to a value commonly applied to all presets.

Able to control acceleration by preset, using Soft start (ms) additionally.

In other words, total time taken to reach target speed can be obtained as follows: 'Controller  $\rightarrow$  Acceleration (ms)' + 'Soft start (ms)'.

The above target speed can be interpreted differently depending on situations.

Unless free angle & speed is set, target speed is \_\_\_\_ (RPM).

If free angle & speed is set, target speed becomes 'free speed (RPM)'.

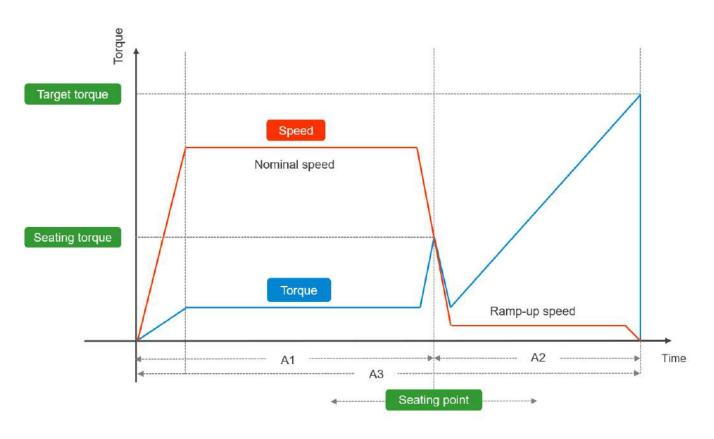
#### K.Seating point from target torque (%)

Modification not recommended for hard joint Modified recommended for soft joint only

The part where target starts to increase when the screw head touches the surface of a target object is called 'seating point'.

For example, in the event of 10.00 kgf.cm of target torque and 40% in seating point from target torque, tool torque starts to increase. A seating point is detected when 4.00 kgf.cm is reached.

The figure below reveals correlations among torque, speed and seating:



Once a seating point is sensed, speed is adjusted to 'Ramp-up speed (RPM)', increasing torque. As illustrated in the above graph, nominal speed before a seating point is usually higher than ramp-up speed after the seating point.

Therefore, the position of a seating point on the time axis is closely related with total fastening time.

In the graph, the left nominal speed, right ramp-up speed and total (A1+A2) areas are set to A1, A2 and A3 respectively.

As stated above, nominal speed in the A1 section is usually higher than ramp-up speed in the A2.

Therefore, total time (A3) increases when the A1 section is reduced by lowering the seating point from target torque (%) while it decreases if the A1 section is enlarged by increasing the seating point from target torque (%).

As a usual, the latter is more common than the former.

If tool speed drops to the ramp-up speed level, and total fastening time increases after a seating point is sensed before the screw head touches the surface of a target object in soft-joint environment, total fastening time can be reduced by moving the seating point to the right by increasing a seating point from target torque (%).

#### L.Torque rising time (ms)

In the above graph, a torque curve rebounds in a V shape after a seating point and rises up to the target torque.

Able to adjust the time taken to rise up to target torque after the V-shaped rebound, using 'torque rising time (ms)'.

#### M.Ramp-up speed (RPM)

Sets operating speed in order for the torque to rise up to target level after a seating point. The ramp-up speed adjustment brings similar results with the 'seating point from target torque (%)'. If ramp-up speed is reduced, the time in the A2 section rises, and total fastening time increases. If ramp-up speed is increased, the time in the A2 section drops, and total fastening time decreases.

However, if ramp-up speed is set excessively to reduce fastening time, the rapidly spinning screw abruptly stops, and over torque (torque ripple) can take place due to inertia.



Therefore, if attempted to reduce total fastening time by adjusting the time in the A2 area, it is recommended to increase a seating point from target torque (%) instead of adjusting ramp-up speed.

#### N.Torque compensation (%)

Depending on a vendor, various types of torque meters exist, and measurements can vary according to each vendor's implementation mechanism.

For example, when target torque is 10.00 kgf.cm, it could be 9.5 kgf.cm in a torque meter. In this case, it is required to select a base device for torque management. Once a tool for torque management is set, no additional action is necessary.

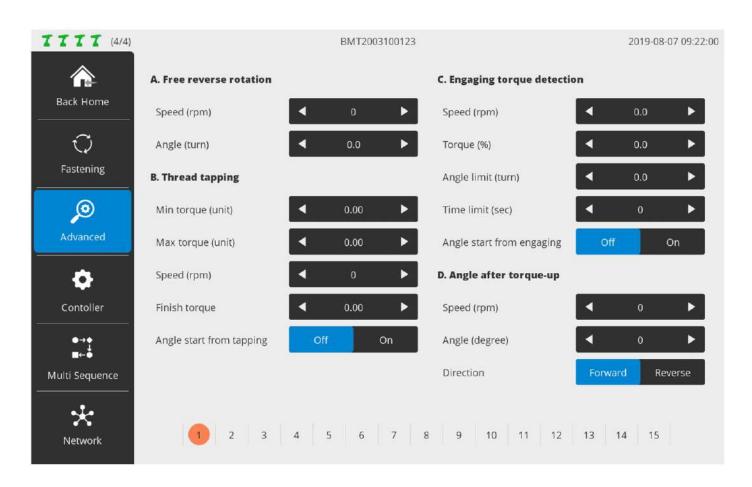
If the criteria for torque management are set with a torque meter, it is able to calibrate the tool torque by setting 'Controller  $\rightarrow$  Torque calibration' and 'Torque compensation (%)'. 'Controller  $\rightarrow$  Torque calibration' can be set within ±10% and applied to all presets. 'Torque compensation(%)' can be set within ±30% and applied by preset.

#### 8.2 Advanced

'Advanced' is comprised of four possible features.

Each feature is implemented by a combination of multiple parameters. It provides 15 advanced presets and is paired with fastening preset.

Unless otherwise set, default values of 'Advanced' are '0 (disabled)'.

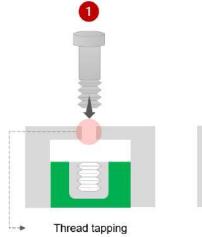


#### 8.2.1 Free reverse rotation

Able to set reverse rotation up to 20 turns to make the bit spontaneously enter into a screw hole or fastened object hole before fastening the screw.

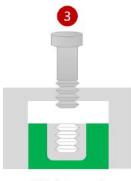
Speed (RPM)	Sets reverse speed	
Angle (turn)	Sets reverse angle	

#### 8.2.2 Thread tapping





Min ~ Max torque on Speed (rpm)



Finish torque & Angle reset

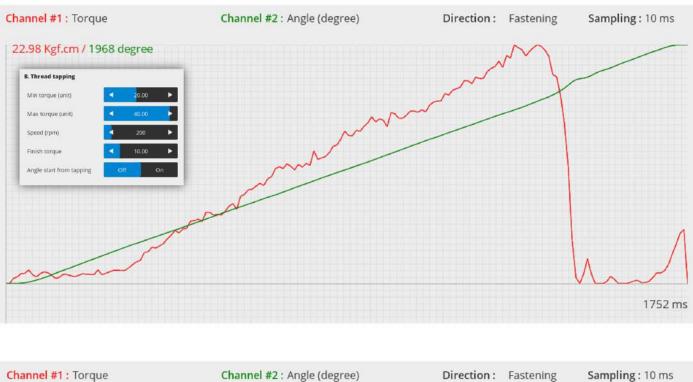


Torque-Up !!

#### The figure above reveals the 4 steps of thread tapping.

It also illustrates how the five parameters in the thread tapping are utilized.

Step 1	If the screw is in the housing before reaching a hole, thread tapping can be used.		
Step 2	If the fastening torque is greater than the torque when passing through the housing, the screw passes through the housing at the preset speed within min. – max. torque in the thread tapping.		
Step 3	In general, torque drops rapidly when the screw passes through the housing. Then, torque is set to the finish torque level to detect the passing of the housing. If the angle start from tapping is ON, the angle is reset and starts from '0' all over again when the finish torque is detected.		
Step 4	The screw is fastened by the preset torque.		

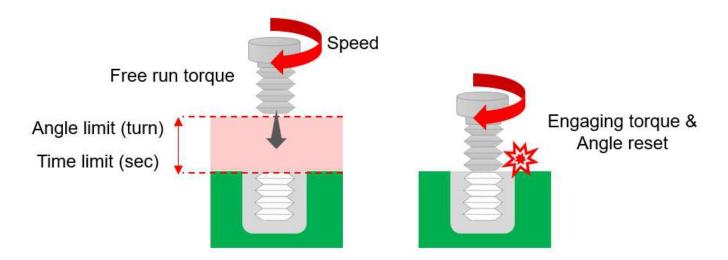


The figures below reveal graphs displayed after setting thread tapping in ParaMon-Pro X. The torque-angle correlations can be checked depending on the status of angle start from tapping.



#### 8.2.3 Engaging torque detection

Able to detect a point where the screw is engaged with the screw groove by monitoring torque. To use this feature, engaging torque when the tool is matched with the screw thread should be greater than free-run torque when the tool is activated in the air.



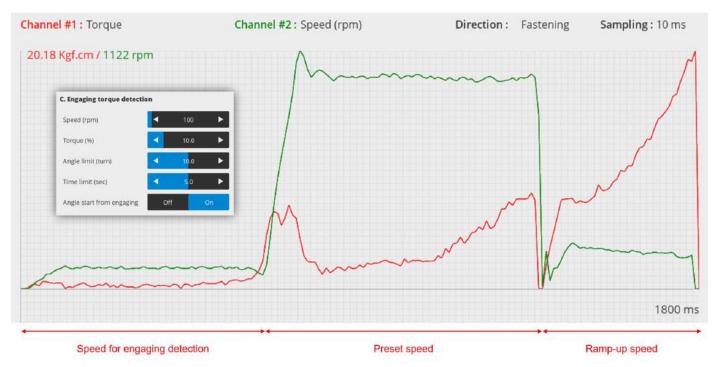
Speed (RPM)	Sets tool speed until the engaging torque is detected.
Torque (%)	Sets engaging torque in percentage (%) against the preset target torque up to 50%.
Angle Limit	Needed to detect engaging torque until the preset angle is reached after tool operation; an error occurs if the preset angle is exceeded.
Time Limit	Needed to detect engaging torque until the time limit is reached after tool operation; an error occurs if the time limit is exceeded.
Angle Start from Engaging	Able to set whether or not the angle is reset when engaging torque is detected.

The figure below reveals graphs displayed after setting engaging torque detection in ParaMon-Pro X. It reveals torque-speed correlations and is able to check 3 speed steps with torque changes.

1.Advanced  $\rightarrow$  Speed for engaging detection

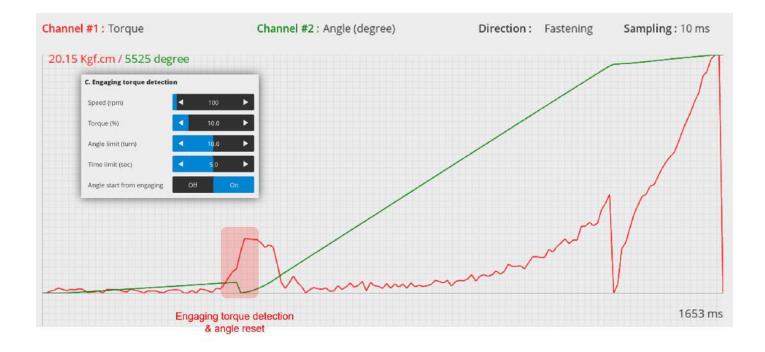
#### $\textbf{2.Preset} \rightarrow \textbf{Speed}$

#### 3.Preset $\rightarrow$ Ramp-up speed



The figure below reveals torque-angle correlations.

It is able to confirm that angles can be reset as soon as engaging torque is detected if 'angle start from engaging' is ON.



#### 8.2.4 Angle after torque up

After 'torque-up' is sensed, an additional action can be set if necessary.

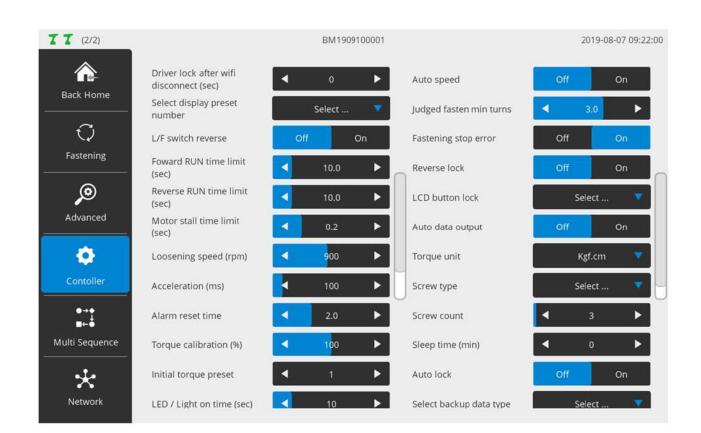
Speed (RPM)	
Angle (degree)	After 'torque-up' is detected, it rotates at speed by angle in direction.
Direction	

### E.g.

Screws are not fastened completely for next processing.

If needed to maintain a certain degree of fastening, it is able to keep the degree of fastening constant by spinning them reversely by 2 turns (720°) after torque-up detection.

# 8.3 Controller



If necessary, the settings for the items in the controller can be adjusted. However, it is recommended to use the default settings if possible.

#### A. Driver lock after WiFi disconnect (sec)

If WiFi is disconnected, the tool is automatically locked after the elapse of the preset time.

#### B. Select display preset number

The adjustment of the preset, using F3 (Preset DOWN) or F4 (Preset UP) button can be limited to the selection of particular presets only.



#### C. L/F Switch reverse

Able to set the Forward/Reverse switch settings inversely.

#### D. Forward RUN time limit (sec)

Limits forward operation time; an error occurs if exceeded.

#### E. Reverse RUN time limit (sec)

Limits reverse operation time; an error occurs if exceeded.

#### F. Motor Stall time limit (sec)

At reverse rotation, maximum hold time can be set in a stationary state. The torque set in the Preset is applied equally for unscrewing as well as fastening.

For example, to unscrew the screws fastened with 10 kgf.cm, using 2 kgf.cm torque, the tool is unable to unscrew the screws and gets into a stationary state. Then, maximum hold time can be set.

#### G. Loosening speed (rpm)

Able to set reverse rotation speed.

#### H. Acceleration (ms)

Able to adjust acceleration to reach target speed from the start of operation. For more information, refer to '8.1 Fastening  $\rightarrow$  Soft Start'.

#### I. Alarm reset time

Clears alarm automatically after the elapse of the preset time.

#### J. Torque calibration (%)

Depending on a vendor, there are various types of torque meters. Measurements can differ according to each vendor's implementation mechanism.

For example, when target torque is 10.00 kgf.cm, the torque meter can measure 9.5 kgf.cm.

In this case, it is required to select apparatus which can be the standard for torque management.

Once a tool is chosen for such torque management, no additional action is necessary.

If a torque meter is selected, on the contrary, it is able to calibrate the tool's torque values by setting Torque Calibration and 'Fastening  $\rightarrow$  Torque Compensation'.

Torque calibration can be set within ±10% and commonly applied to overall preset.

'Fastening  $\rightarrow$  Torque Compensation' can be set within ±30% and applied to the preset only.

#### K. Initial torque preset

Able to set default preset values at tool reset. The numbers 1-15 respond to the preset numbers. The numbers 16-17 respond to multi-sequences 'A' and 'B' respectively.

#### L. LED / Light on time (sec)

If the trigger is executed, LED light is turned ON over the preset period of time.

#### M. Driver model

Sets a driver model.



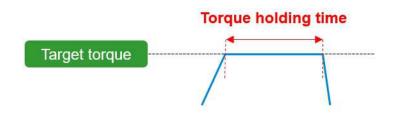
Do not randomly alter without discussion with the manufacturer. Such unauthorized alteration may result in incorrect operation and system failure.

#### N. Controller parameter initialize

Enter '77' to reset all settings to the default settings.

#### O. Torque holding time (ms)

After reaching target torque, the force is kept for a while. Excessive time setting can cause heating.





This function is not available in BMT lines.

#### P. Auto speed

According to target torque settings, proper speed is automatically set.

Recommended to use in ON state.

If AUTO Speed is turned OFF, and 'Preset  $\rightarrow$  Speed' is set too high to reduce fastening time, the fast rotating screws can stop abruptly, and over torque (torque ripple) can occur due to inertia.



#### Q. Judged fasten min. turns

It becomes the gauge to judge if a user executes the trigger intentionally. The default setting is '3.0 turns'.

It is reasonable to conclude that a user intentionally executed the trigger after 3.0 turns (1,080°). For more information, refer to 'Fastening stop error'.

#### R. Fastening stop error

Unless 'Torque UP' is detected during 'Trigger ON – OFF', this feature decides if 'Fastening stop error' alarm should go off.

If 'ON', operating procedures are as follows:

- 1.Press the trigger for a while and release to start the tool.
- 2.If torque is increased after the process 1 above, 'Fastening stop error' does not occur.
- 3.Unless torque is increased after the process 1 above, check if the tool rotated up to the number of turns preset in 'Judged fasten min. turns'.
- 4.If greater than 'Judged fasten min. turns', the 'Fastening stop error' alarm goes off.
- 5.If rotated by less than 'Judged fasten min. turns', the fastening stop error does not occur.

#### S. Reverse lock

Decides if reverse rotation should be allowed.



If ON, it rotates in a forward direction only regardless of forward/reverse switch settings.

#### T. LCD button lock

Able to restrict the function keys and use them for three purposes:

Off	Permits the use of all keys without any functional restrictions		
Lock Only F1	F1 is restricted. The restriction on F1 permits changes in preset No. However, changes in preset torque and speed are not allowed.		
Lock All	Restricts the use of all keys except for alarm reset. Unable to modify all settings such as preset No., torque and speed. Used in situations which are strictly controlled by an external controller such as ParaMon-Pro X.		

#### U. Auto data output

Not available when the BM is used together with ParaMon-Pro X. Automatically turned off if the BM is connected to ParaMon-Pro X. If set to 'ON' by force, communication between the BM and ParaMon-Pro X become abnormal. Ensure to keep it OFF all the time when ParaMon-Pro X is used.

#### V. Torque unit

Sets a torque unit.



The tool is automatically reset when torque unit is being set.

#### W. Screw type

If the screw is fastened counterclockwise, it is able to set a screw-fastening direction by preset.



#### X. Screw ount

Able to set the number of screws and use for diverse purposes.

In case there are a total of 10 target screws, the screw count is set to '10'.

Whenever fastened, the screw count is reduced one by one (e.g., 10, 9, 8, ...) and saved together with fastening data.

Able to check which screw has been fastened, using the count value.

#### Y. Sleep time (min.)

Able to set the system to go into sleep mode if left untouched for a certain period of time. Able to turn off the sleep mode, using the trigger.

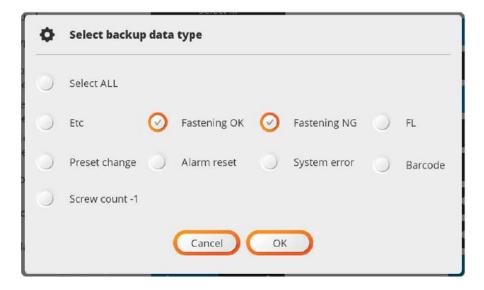
#### Z. Auto lock

Able to set the system to be locked automatically when the screw count is '0'.

#### AA. Select backup data type

The BM is able to back up event data (up to 65,000 events) in internal memory. Such events saved in the internal memory are classified into various types. If necessary, whether or not they are enabled is set by type, optimizing log data. In addition, it is able to use the limited memory space more efficiently.

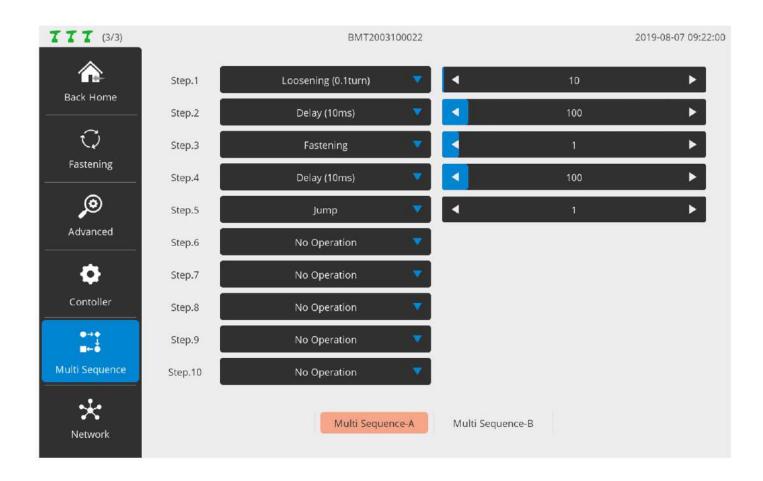
Etc.	Unable to confirm OK or NG during the trigger ON-OFF	
Fastening OK	Fastening results not satisfying preset fastening conditions	
Fastening NG	Fastening results not satisfying preset fastening conditions	
FL	Change in forward/reverse switch (fastening / loosening)	
Preset change	Preset changes	
Alarm reset	Alarm cleared manually or automatically	
System error	Violates preset conditions	
Barcode	Gets scan data from the scanner-integrated BM	
Screw count -1	Selects '-1' for a screw count in the BM	



#### AB. Trigger start delay time

Able to restrict the use of the trigger from its execution to the preset time. Able to prevent its excessive use.

#### 8.4 Multi-sequence



Able to program fastening and loosening to a desired pattern in 'Multi Sequence'. Supports two different patterns ('A', 'B') and able to program up to 10 steps each. Each step is comprised of a pair of command and parameter.

Command	Description	Parameter
No operation	Disables the step Finished when 'No Operation' is encountered during execution	None
Fastening	Fastens based on the preset	Sets the preset No. for fastening
End	Ends the execution	None
Delay (10ms)	Waits for the preset time	Sets delay time by 10m 100 = 1,000ms (1 sec.)
Select preset	Edits the PRESET to the set value Substitution by 'Fastening' recommended	Sets the target preset No.

NO.	Command	Parameter	
Loosening (0.1 turn)	Rotates reversely up to the number of preset turns	Sets the number of reverse turns by 0.1 turn 10 = 1 turn (360°)	
Jump	Moves to the preset step No.	Sets the target step No.	
Count Value = A	Each multi-sequence has a variable called 'A'. Allocates the set value into the variable 'A' Variable 'A' commonly used in limiting the number of pattern executions	Sets positive integer to be allocated into the variable 'A'	
Sub if (A)	Each multi-sequence has a variable called 'A'. Reduces 'A' value by '1' if 'Sub If' is encountered. The next step is executed if 'A' is greater than '0'. If 'A' is '0', the following step is executed.	None	

## Multi sequence (sample)

Repeat the pattern '2 reverse turns  $\rightarrow$  hold (1 second)  $\rightarrow$  fastening (Preset. 1)  $\rightarrow$  hold (1 second)' 10 times.

Step	Command	Parameter	Description	
1	Count value = A	10	Allocates '10' to the variable 'A'	
2	Loosening	20	Rotates 2 turns (720°) reversely	
3	Delay	100	Holds 1 second	
4	Fastening	1	Fastens (Preset. 1)	
5	Delay	100	Holds 1 second	
6	Sub if (A)	-	<ul> <li>Reduces the variable 'A' by '1'</li> <li>Moves to the Step 7 unless '0'</li> <li>Moves to the Step 8 if '0'</li> </ul>	
7	Jump	2	Moves to the Step 2	
8	End	-	Ends the execution	

8.5 Network

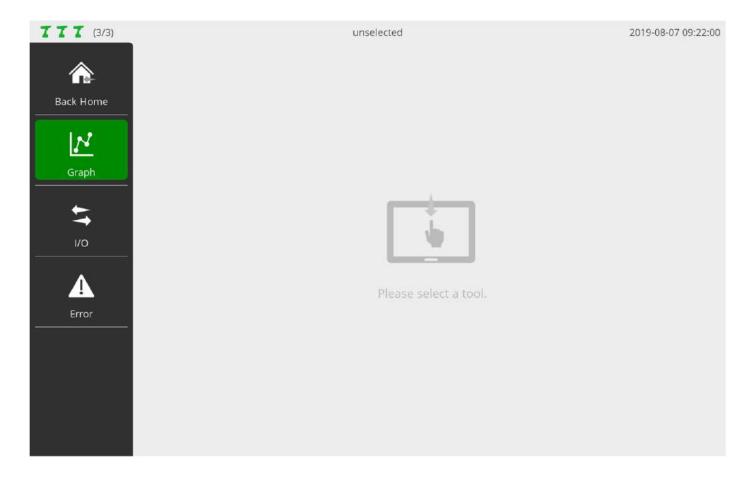
77 (3/3)	r	BM	72003100022		2019-08-07 09:22:0
Back Home	SSID :	paramon	max 32 charact	ters	
	Password :	12345678	min 8 - max 32	characters	
Ç Fastening		🔵 Default 🔵 US	🔵 Europe 🔵 Ja	pan	
ø		otain an IP address automatically)			
Advanced	Static (Us	e the following IP address) :			
•	IP addre	ss ;			
Contoller	Subnet	nask :			
●→◆ ⊥ ■←●	Default	gateway :		(Optional)	
Multi Sequence	Port :	5000			
Network	Web passwor	1: 0			

Able to set the WiFi network of the BM; needed to reset the system to apply the new settings

Category		Description		
SSID	Enters the	Enters the SSID of the target WiFi AP		
Password	Enters the	Enters the password of the target WiFi AP		
Country		Sets an area 'Default' is recommended for general users		
	DHCP	An IP address automatically allocated from the server		
DHCP or static	Static	Sets an IP address manually When an IP address is manually set, set it according to the IP band of AP. If ParaMon-Pro X's internal AP is used, set the IP address in the range of 192.168.131.2-192.168.131.254. Set subnet mask and default gateway to 255.255.255.0 and 192.168.0.1 respectively. For the use of external AP, contact the network manager.		
Port		BM's Modbus-TCP server port No. Recommended to use the default (5000)		
Web password	-	A password used to get access to the BM's web server For more information about the web server, refer to the BM user manual.		

# 9. MONITOR

Unless the target tool is specified, the following figure appears on the screen. Refer to <u>'7. Select target tool'</u>.



9.1 Graph



It is able to check the target tool's fastening data in realtime graph.

In addition, it is possible to compare and analyze correlations between two different source data by providing a total of 2 channels and supporting 8 different source data by channel.

The source data selectable by channel are as follows:

Category	Description
Torque	Torque changes by time (ms)
Current (mA)	Current changes by time (ms)
Speed (RPM)	Speed changes by time (ms)
Angle (degree)	Angle changes by time (ms)
Speed command (RPM)	<ul> <li>While the above speed represents the actual revolving speed of the tool, speed command refers to target speed to control.</li> <li>In other words, if speed and speed command are set and compared in two channels, it is able to compare and analyze if the tool is operated according to the desired speed.</li> </ul>

Category	Description
Current command (mA)	<ul><li>While the above current represents the actual current consumption of the tool, current command refers to target current to control.</li><li>In other words, if current and current command are set and compared in two channels, it is able to compare and analyze both actual and target current values.</li></ul>
Snug angle (degree)	Represents changes in snug angle by time (ms). For more information about snug angle, refer to '8.1 Fastening $\rightarrow$ Snug torque'.
Torque/angle	Applicable to channel 1 only In upper data sources, x-axis all represents time (ms). In torque and angle, x-axis is angle, representing torque changes by angle.
Disable	Applicable to channel 2 only; disables channel 2

# A. Press [Setting] and set the graph output.In the START state, the SETTING button is disabled.

Category	Description
Channel #1	Sets the source data of channel #1
Channel #2	Sets the source data of channel #2
Direction	Sets a direction of graph output
Sampling	<ul> <li>Sets the sampling interval of source data</li> <li>Since a graph can represent up to 200 points per channel, precision increases as sampling interval decreases. However, time slot is reduced.</li> <li>The maximum time sloths by channel according to sampling settings are as follows</li> <li>5ms x 200 = 1,000 ms (1 sec)</li> <li>10ms x 200 = 2,000 ms (2 sec)</li> <li>15ms x 200 = 3,000 ms (3 sec)</li> <li>30ms x 200 = 6,000 ms (6 sec)</li> <li>If operating time exceeds the above level, the latest data only appear.</li> </ul>

B. Press [Start] and enable graph output.

C. Press [Clear] and reset data output.

9.2 I/O



Able to check the current status of I/O port.

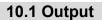
If system functions are allocated to the I/O port, function names also appear.

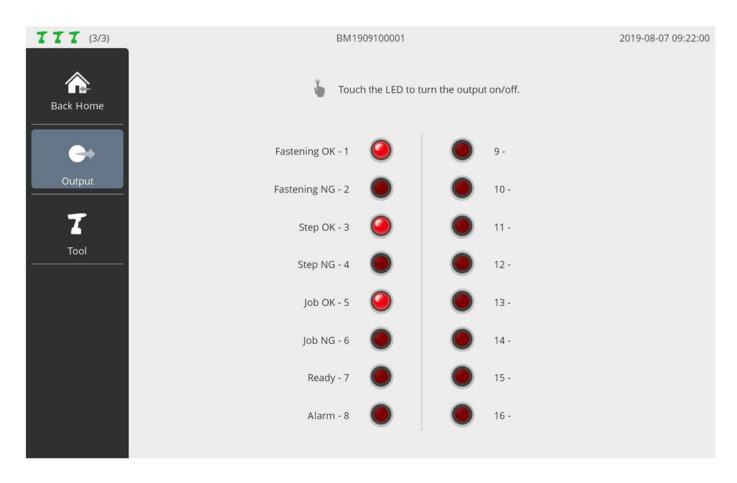
# 9.3 Error

Back Home	No	Code	Description	
<u>N</u>	1	E123	Wi-Fi connect fail with AP	
	2	E120	Disconnect with AP	
Graph	3	E123	Wi-Fi connect fail with AP	
5	4	E120	Disconnect with AP	
i/o	5	E120	Disconnect with AP	
	6	E123	Wi-Fi connect fail with AP	
A	7	E123	Wi-Fi connect fail with AP	
Error	8	E123	Wi-Fi connect fail with AP	

The latest 8 errors from the target tool appear.

# **10. REMOTE**





Able to control the level of output port manually.

If system functions are allocated to the output port, function names also appear. Useful in checking if properly wired after I/O wiring.

## 10.2 Tool

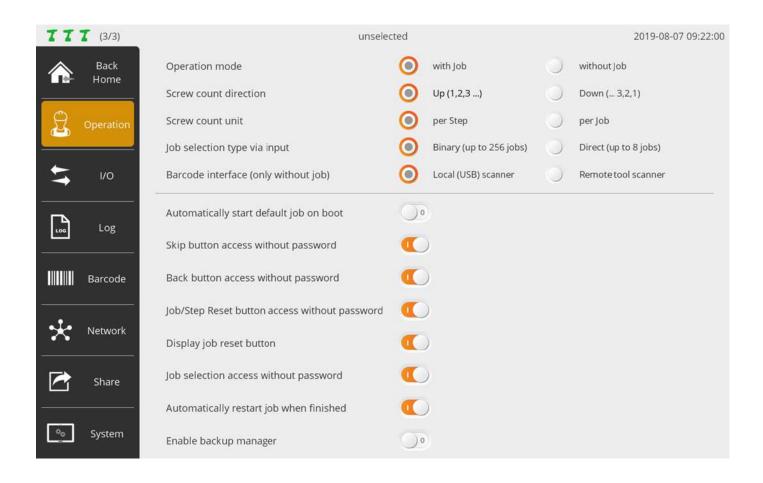
<b>TTT</b> (3/3)						E	3M1909	100001					201	9-08-07 09:22:00
	Pi	reset n	•									Direction	Lo	ck Control
Back Home	0	P1	0	P2	$\bigcirc$	Р3	$\odot$	Ρ4	$\bigcirc$	P5	C	Fastening	0	Unlock
	0	P6	0	Ρ7	$\odot$	P8	0	P9	۲	P10	0	Loosening	0	Fastening
Output	0	P11	0	P12	$\bigcirc$	P13	$\bigcirc$	P14	$\bigcirc$	P15			0	Loosening
7	0	Multi	Sequen	ce-A	0	Multi	Sequen	ce-B						Both
Tool	Q	T	ool initia	alize		(	2	Aları	n reset					Run
	* Presets	can not	be chan	ged in t	he runni	ng state	2.							

#### Able to control a target tool in the distance from ParaMon-Pro X.

Category	Description
Preset	Sets the preset of the target tool.
Direction	Sets a direction for remote control.
Lock control	Able to set the lock by direction if necessary . The tool may not function if locked in the direction settings.
Tool initialize	Reboots the target tool and resets all settings to a default state.
Alarm reset	Able to clear alarm manually.
Run/Stop	Operates/stops a target tool according to preset conditions.

# **11. SETTING**

# 11.1 Operation

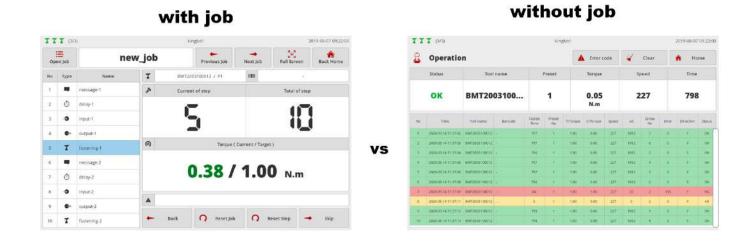


#### A. Operation mode

Whether or not the Assembly Process Control, one of the major features of ParaMon-Pro X, would be enabled is decided.

In ParaMon-Pro X, a single assembly process programmed by a user is called, 'job'.

Depending on if the job is used, the mode is classified into 'With job' and 'Without job'.



Operation mode	With job	Without job
Feature	Uses the Process Control feature and runs according to the procedures programmed in the job. Visualizes the complicated assembly procedures of diverse products and targets to minimize assembly errors.	Does not uses the process control feature; able to use all tools randomly. Usually used to save fastening data.
Tools	Operates the tools selected in the fastening step only. Locked for all other tool; unable to use multiple tools simultaneously .	No restrictions on the use of tools. Able to use all tools randomly at the same time.
Code Scanner	Able to register a code and set jobs. The preset jobs are automatically loaded if the registered code is scanned.	Able to register a code and presets when the scanner-integrated BM is used. Automatically converted into the preset if the registered code is scanned.

#### B. Screw count direction

Enabled under 'With job' mode only.

Up (1,2,3)	The screw count increases from '0' to total count. The screw count represents the number of fastened news.
Down ( 3,2,1)	The screw count decreases from total count to '0'. The screw count refers to the number of remaining screws.

#### C. Screw count unit

Enabled under 'With job' mode only.

Per step	Displays the screw count in 'Fastening step' unit.
Per job	Displays screw count in 'Job' unit.

#### D. Job selection type via input

Enabled under 'With job' mode only. Able to load up to 8 jobs through external input.

Binary (up to 256 jobs)	<ul><li>Handles job input (8 jobs in total), using the binary scale.</li><li>Job select 1 refers to the least significant bit (LSB) while Job select 8 represents the most significant bit (MSB).</li><li>It ranges from 1 to 255, and the job for the Job No. is loaded.</li></ul>
Direct (up to 8 jobs)	Job select 1-8 is matched with job No. 1 in a one-to-one manner.

#### E. Barcode interface (only without job)

Enabled under 'Without Job' mode only.

In ParaMon-Pro X, the barcode scanner is divided into two different types depending on a connection method.

Local scanner	Represents a scanner directly connected to ParaMon-Pro X through USB Ignores 'Remote Scanner' if 'Local Scanner' is selected.
Remote scanner	Refers to the scanner integrated with the BM. Ignores 'Local scanner' if 'Remote scanner' is selected.

#### F. Automatically start default job on boot

Enabled under 'With job' mode only.

Able to set the system to make certain jobs executed automatically when ParaMon-ProX is reset.

#### G. Skip button access without password

Enabled under 'With job' mode only.

Able to set if a password would be asked when the SKIP button is pressed during job execution.

On	A password not asked.
Off	A password asked.

#### H. Back button access without password

Enabled under 'With job' mode only.

Able to set if a password would be asked when the BACK button is pressed during job execution.

On	A password not asked.
Off	A password asked.

#### I. Job/Step reset button access without password

Enabled under 'With job' mode only.

Able to set if a password would be asked when the RESET JOB or RESET STEP button is pressed during job execution.

On	A password not asked.
Off	A password asked.

#### J. Display job reset button

Enabled under 'With job' mode only. Able to set if the RESET JOB button would appear on the job screen.

On	Displays the 'Reset job' button.
Off	Does not display the 'Reset job' button.

#### K. Job selection access without password

Enabled under 'With job' mode only.

Able to set if a password would be asked at job selection when a user touches the screen in person; job loading by external input (input, scanner, etc.) not applicable.

On	A password not asked.
Off	A password asked.

#### L. Automatically restart job when finished

Enabled under 'With job' mode only.

Able to set if the job would be automatically restarted when all job procedures are done.

On	Automatically restarts at the end of job process.
Off	Does not automatically restart at the end of job process.

#### M. Enable backup manager

The BM has 'Backup memory' to back up event data.

ParaMon-Pro X gets events from the BM's backup memory in realtime.

First, ParaMon-Pro X checks the status of backup memory before enabling the realtime event transfer of the BM.

If the backup memory is empty, realtime transfer is immediately enabled.

If data already exist in the backup memory, however, it is needed to decide if they would be received.

Off	Empties backup memory and enables realtime event transfer regardless of the existence of data.
On	Enables the backup manager if data already exist. The backup manager decides if they would be received by tool. Enables realtime event transfer after completing the process depending on settings.

#### 11.2 I/O

<b>TTT</b> (3/3)	unse	elected	2019-08-07 09:22:00
Back Home	Input		Output
	Job select.1	1	Fastening OK
Operation	Job select.2	2	Fastening NG
	Job select.3	3	Step OK
الا 🛬	Job select.4	4	Step NG
	Job select.5	5	Job OK
<b></b>	Job select.6	6	Job NG
Log	Job select.7	7	Ready
	Job select.8	8	Alarm
Barcode	Skip	9	
	Back	10	
	Reset step	11	
Network	Reset job	12	
·	Next job	13	
🚰 Share	Previous job	14	
	Alarm reset	15	
System		16	

ParaMon-Pro X provides a total of 32 I/O ports (16 ports each) for the purpose of interlocking with external devices. Able to allocate system functions pre-defined in input and output in 'Setting  $\rightarrow$  I/O'.

Unable to use the ports allocated to the system function in input and output steps during job programming.

NO.	Category	Description
1	Input clear all	Clears all input port settings.
2	Output clear all	Clears all output port settings.

#### 11.2.1 Input

+	System Input-6					
0	Disable					
1	Job selection					
۲	1 🌒 2 🌑	з 🌘	4 🙆 5	6	0708	
1	Operation interfa	ace				
$\bigcirc$	Skip	$\bigcirc$	Reset job	0	Alarm reset	
$\bigcirc$	Back	$\bigcirc$	Next job			
$\odot$	Reset step	$\bigcirc$	Previous job			
				Canc	е) ОК	

Unlike output, input is not able to allocate system functions in a redundant manner. The system functions already allocated to other parts are enabled as shown in the figure.

NO.	Category	Description
1	Job selection 1-8	Able to load jobs through external input under the 'With job' mode. For more information, refer to '11.1 Operation $\rightarrow$ D. Job selection type via input'.
2	Skip	Able to skip the next screw or move to the next step if necessary during job execution.
3	Back	Able to return back to the previous screw if necessary during job execution. Valid in the fastening step only; unable to return back to the previous step.
4	Reset step	Resets the current step.
5	Reset job	Resets the current job.
6	Next job	Executes the next job if it exists on the job list.
7	Previous job	Executes the previous job if it exists on the job list.
8	Alarm reset	Clears ParaMon-Pro X alarm.

# 11.2.2 Output

+	System Output	-9				
0	Disable					
۹	Operation					
0	Fastening OK	Ó	Step OK	0	Job OK	
0	Fastening NG	0	Step NG	0	Job NG	
1	System					
0	Ready	0	Alarm			
				Ca	ncel	ок

Unlike input, output is able to allocate system functions in a redundant manner.

NO.	Category	Description
1	Fastening OK	Appears if the fastening results meet preset conditions.
2	Fastening NG	Appears if the fastening results do not meet preset conditions.
3	Step OK	Appears if the fastening procedures/results of all screws set in the fastening step are OK.
4	Step NG	Appears if the fastening procedures/results of the screws set in the fastening step are NG
5	Job OK	Appears if all fastening steps comprising jobs are OK.
6	Job NG	Appears if a fastening step comprising jobs is NG.
7	Ready	Appears in 'ready-to-execute-job' state.
8	Alarm	Appears when ParaMon-Pro X alarm goes off.

# 11.3 Log

<b>TTT</b> (3/3)	ĩ	unselec	ted	2019-08-07 09:	22:00
Back Home	Storage location	Internal storage			
Operation		O Micro SD			
<b>\$</b> 1/0	Select Data Field	Select All	Release All		
		🚫 Tool name	🕗 Barcode	Sasten time	
Log		O Preset no	O Target toruqe	O Converted torque	
Barcode		Speed	) A1	) A2	
		Ø A3	Screw no	🕗 Error	
Network		O Direction	🕗 Status	Snug	
Share Share					
System					

#### A. Storage location

Sets a log file storage position.

#### B. Select data field

Enabled under 'Without job' mode only. Able to select data which appear on the screen. Saves all data in the log file regardless of settings.

No	Time	Tool name	Barcode	Fasten Time	Preset No	T/Torque	C/Torque	Speed	A1	A2	A3	Screw No	Error	Direction	Status	Snug
21	2020-05-28 14:16:08	BM1909100001	-	561	-1	10.00	0.31	333	999	13	1012	1	0	F	ОК	0
2	2020-05-28 14:16:10	BM1909100001	-	76	1	10.00	10.44	333	6	11	17	1	335	£	NG	0
3	2020-05-28 14:19:28	BM1909100001	-	0	1	10.00	0.00	900	0	0	0	5	0	L	FL	0
No	Time	Tool name		ten me	Prese No	t i	C/Torque	S	peed	ł	3	Screv No	v	Error	S	itatus
No 1		Tool name BM1909100001	<sup>e</sup> Ti	me		t (	C/Torque 0.31		peed 333	1	3 112		v	Error 0		itatus OK
No 1 2			е ті 1 5	me		t (	uccontrace			10	с. 		v			

# 11.4 Barcode - without job & BM integrated scanner

TT	7 (3/3)			BMT19071001	21			2019-08-07 09:22:00					
	Back	- Total : 4											
Ĩ.	Home	No	Code			From	То	Preset no					
g	Orecenter	1	8806011615408			*		P.1					
<u>ل</u> ع	Operation	2	8806002001845			*	1.00	P.2					
-	1/0	3	23090/69RJ08296			-		P.3					
<b>→</b>		4	99001330863956			•	•	P.4					
E.	Log												
	Barcode												
*	Network												
	Share												
<u></u>	System	t Up	Down Top	Lend → Ad		Edi		ect Select All Cancel					

Enabled under 'Without job' mode only.

Able to register a code for a change to certain preset by tool.

Available in the scanner-integrated BM only.



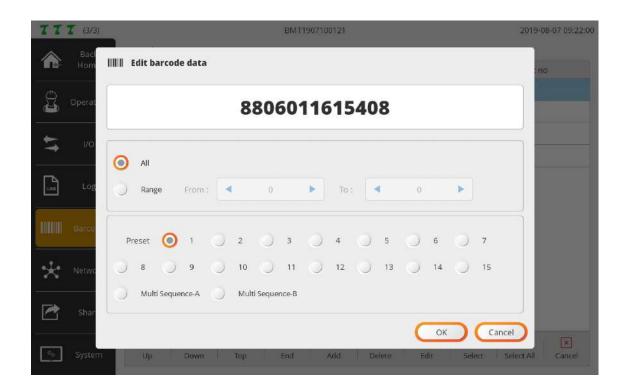
#### A. Code input

Select target tools for registration.

A scanner is enabled if the trigger is executed twice in a row.

If a code is scanned, the registration page along with the scanned code pops up.

If necessary, press [Add] and enter the code in person.



#### B. Valid code region settings

If 'All' is chosen, the code should be perfectly matched for change into the preset.

If 'Range' is selected, the region appears in red on the code.

If the region is partially matched, it changes to the preset.

Therefore, in the RANGE setting, even though the registered code and scanned code are not matched in terms of total length, it changes to the preset as long as the digit of the valid region is matched with the code.

#### C. Preset settings

Selects target preset in which the valid regions of registered and scanned codes are matched.

#### D. Add to all tools (optional)

Check the ADD TO ALL TOOLS checkbox and register a code to all tools in ParaMon-Pro X.

	11.	5 Netwo	ork					
TT	7 (3/3)				BMT1907100121			2019-08-07 09:22:00
	Back Home	ŝΝ	/i-Fi AP	SSID :	paramon		max 32	
				Password :	12345678		min 8 ~ max 32	Apply
J.	Operation			Band :	0 2.4 GHz	5 GHz	Advanced	
<b>*</b>	1/0	Real Provide P	hernet		Dbtain an IP address aut	omatically)		
106	Log			Static (U	Ise the following IP addr	ess):		
				IP add	ress :	].		
	Barcode			Subne	: mask :	].		Apply
4.	Network			Defaul	t gateway :	].[_].[		
	Share							
00	System							

## A.WiFi

Setting to run WiFi AP in ParaMon-Pro X. After editing the settings, press [Apply].

SSID	Enters the AP's SSID Up to 32 letters
Password	Enters the password of AP At least 8 characters long; able to enter up to 32 characters
Band	Selects the operating frequency of AP
Advanced	Able to set the AP frequency channels Recommended to use default settings

## **B.Ethernet**

After editing settings, press [Apply].

DHCP	Automatically gets IP address from the server.
Static	Manually sets IP address. Reckless address settings cause network failure including abnormal operation. Ensure to contact the network manager before setting.

	11.6 Share						
TT	7 (3/3)				BMT1907100121	2019-08-07 09:22:00	
	Back Home	ම	FTP Server	Enable	Disable		
<u> </u>	Operation			User name :	paramon	Apply	
త ——				Password :	prox		
1	I/O	-				î	
			Backup data	forwarding	Enable Disable		
106	Log		Ser	ver IP address :	192 . 168 . 0 . 223	Apply	
	Barcode			Port :	7762		
*	Network						
	Share						
°0	System						

## A. FTP Server

After editing settings, press [Apply].

Enable/Disable	Sets if the FTP server is enabled or disabled.
Username	Sets the username to be used in logging into the FTP server.
Password	Sets the password to be used in logging into the FTP server.

Able to check the IP address needed to get access to the FTP server in 'System  $\rightarrow$  Network'. For a method to log into the FTP server, refer to '16. FTP Server'.

### B. Backup data forwarding

The backup data received from member tool is transferred to a separate external server connected via Ethernet.

After changing the settings, changed settings are updated only by pressing the button "Apply".

Enable/Disable	Set enable to mirror backup data on ethernet port.
Server IP address	Set the IP address of the server to receive the backup data.
Port	Set the TCP port number of the server to receive backup data.

Please refer to section [ 20.Backup data forwarding ] for data format passed to the server.

11.7 System TTT (3/3) BMT1907100121 2019-08-07 09:22:00 Back Password Current password : Apply Home New password : 9 Operation Confirm password : 1/0 Language 6 English Spanish French German LOG Log Mandarin Portuguese Czech Italian Barcode 82:05-09-28 12:27:58 System time Change Network P2P Copy data (setting, job, barcode ... ) between Pro X. P2P Share C Factory reset All settings are returned to the factory settings. Apply

## A. Password

Sets a password for ADMIN mode; the default setting is '0'.

### B. Language

Currently supports 'English' only; other languages to be supported.

#### C. System time

Sets system time; able to set 'min'; 'sec' is set to '0'.

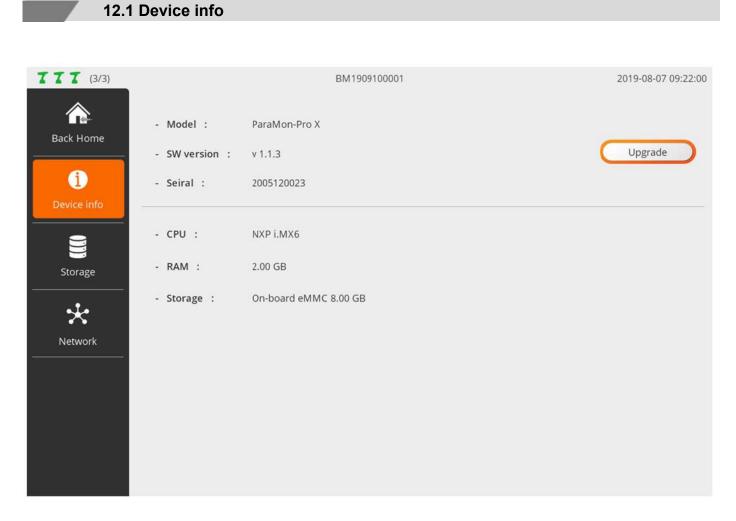
#### D. P2P (Pro X to Pro X)

Able to back up current settings in ParaMon-Pro X and apply them to the other ParaMon-Pro X. Able to return back to the former settings if necessary after backing up all current settings. For more information, refer to '16. Backup & restore'.

### E. Factory reset

Reset to a default state after all files in the repository are deleted.

# 12. SYSTEM



Able to check brief information of ParaMon-Pro X.

Able to check serial number and software version and includes a software upgrade feature.

# 12.2 Storage

<b>TTT</b> (3/3)	BM1909100001	2019-08-07 09:22:00
Back Home	Internal storage	
Device info	- Capacity : 6.5 GB ( 6620 MB ) - Free space : 6.3 GB ( 6469 MB ) - Used space : 0.1 GB ( 151 MB )	
Network	Micro SD	
	- Capacity : 7.2 GB (7366 MB ) - Free space : 7.2 GB (7344 MB ) - Used space : 0.0 GB (22 MB )	

Internal storage	Able to check the space used and free space.
Micro SD	Able to examine if micro SD card is inserted and check the space used and free space.

# 12.3 Network

777 (3/3)		BM1909100001	2019-08-07 09:22:00
Back Home	5 Ethernet		
i	- IP address :	192.168.0.17	
Device info	- Netmask :	255.255.255.0	
	- Gateway :	192.168.0.1	
Storage	- MAC :	fc-c2-3d-2a-bc-11	
Retwork	Wi-Fi		
	- IP address :	192.168.131.1	
	- Netmask :	255.255.255.0	
	- MAC :	d0-37-45-75-79-78	

Ethernet	Displays the wired ethernet address.	
WiFi	Displays wireless ethernet (WiFi) address.	

# **13. JOB MANAGER**

No	Job Name	Steps	Screws
1	sample job1	0	0
2	sample job2	0	0
3	sample job3	0	0
4	sample job4	0	0
5	sample job5	0	0

NO.	Category	Description
1	Down	Moves the selected job to the bottom by one column
2	Up	Moves the selected job to the top by one column
3	New	Creates a new job
4	Delete	Deletes the selected job
5	Сору	Copes the selected job and adds it as a new job
6	Edit	Edits the selected job
7	Rename	Renames the selected job
8	Barcode	Moves to the barcode registration page for job interlocking

# 13.1 Edit job & step

(3/3)		unselected	2019-0	8-07 09:22:
		sample job1	× Cancel	Save
T	fastening-1	(		
-0	input-1			
<b>C</b> +	output-1			
Ō	delay-1			
-	message-1			
T	fastening-2	3		
-0	input-2	-		
<b>e</b> .	output-2			
Ō	delay-2			
	message-2			
		L		
		Input     Output     Output     Delay     Message       T     fastening-1	Input Output Delay Message     Imput-1     Imput-2     Imput-3	Input         Output         Delay         Message         sample job1         Cancel           1         fastening-1         Imput-1         Imput-1<

The biggest unit constituting the assembly process control is expressed by multiple sequential steps. Supports up to 1,000 jobs and able to add up to 255 steps per job.

# 1. Add step

Category	Description	
Fastening	Adds a fastening procedure, using a member tool	
Input	Enables various extensions, using a total of 16 input ports	
Output	Enables various extensions, using a total of 16 output ports	
Delay	Able to add delay time between steps under diverse methods	
Message	Able to deliver instructions and cautions to operators	

## 2. Edit step list

Category	Description
Down	Moves the selected step to the bottom by one column
Up	Moves the selected step to the top by one column
Delete	Deletes the selected step
Сору	Copies the selected step and adds it as a new step
Rename	Renames the selected step

# 3. Edit step data

Displays the setting page according to the type of the selected step on the step list.

### 13.1.1 Fastening step

<b>TTT</b> (3/3)		unselected			2019-08-0	7 09:22:00
1 7 Output	Oelay         Message	sample job2			× Cancel	✓ Save
1 <b>T</b> fastening-1		- Select Tool	: 3	BMT200310	0022	
		- Number of Screws	: 4	10ea		
		- Select Preset	a (5)	7		
Down Up Delete	Copy Rename		Touch to regis	ter the position of the screw	N.	

Fastening step supports up to 99 screws:

1. Press [Fastening].

Then, a fastening step is added to the bottom of the step list. Then, a setup page appears on the right.

- 2. If necessary, press [Rename] and edit the step name.
- 3. Select a tool for fastening among the member tools.
- 4. Enter the number of screws to be fastened.
- 5. Select the preset to be used for fastening.
- If necessary, register an image and specify the position of the screw.
   If the area is touched, a screw-positioning page pops up as follows:

	Move the screen to the left
	Move per pixel
	Image file
5	Screw index 1 +Append +Insert -Delete
6	Radius         25
7	(i) Width 5
8	🕥 Color 🐵 🖲 Default 📃 R255, G255, B0 🔤
	ОК 🔽 R0, G255, B0
	🔿 NG: 📕 R255, G0, B0 🛄
	Cancel OK

No.	Description
1	If necessary, moves the screen to the left or right
2	Hides the screen to the bottom and views the entire image
3	Able to adjust a pixel unit at registration of screw position
4	Loads an image to be used in screw positioning
5	Sets the index number of the screws to be positioned +Append: adds a new screw to the end +Insert: adds a new screw to the current index position -Delete: deletes a screw in a current index position
6	Able to adjust the size of a circle which shows a screw position
7	Able to adjust the thickness of a circle which reveals a screw position
8	Able to change the color of a circle which shows a screw position Default: sets the color which is displayed in a hold state OK: sets the color which appears when normally fastened NG: sets the color which appears when abnormally fastened

	Move the screen to the left
	Move per pixel
$\bullet \bullet \bullet \bullet$	Image file ./files/image/screw pad.jpg
	Screw index 11 +Append +Insert -Delete
	Radius 25
	O Width 5
0 0 0	O Color O Default R255, G255, B0
	О ОК 🗖 R0, G255, B0
	O NG: R255, G0, B0
	Cancel

## 13.1.2 Input step

T	0	• •					×	~
astenin		put Output Dela		sample job2			Cancel	Save
1	T	fastening-1	(	Input No				
2	-0	input-1		1. 🌑	Job select.1	9. 🔾	Logical in	
				2-	Job select.2	10- 🔵	Logical in	
				3-	Job select.3	11- 🔘	Logical in	
				4-	Job select.4	12- )	Logical in	
				5- 🕑	Logical in	13- 🔵	Logical in	
				6- ⊘	Logical in	14- 🔵	Logical in	
				7- 🔾	Logical in	15- 🔵	Logical in	
				8- 🔾	Logical in	16- 🔵	Logical in	
				Input settin	ng 🥂	1		
•		× D	/ 2	Active	High 🔵 Active Lo	ow Status	High 🔿 St	atus Low

1. Press [Input].

Then, an input step is added to the bottom of the step list. Then, a setup page appears on the right.

- 2. If necessary, press [Rename] and edit the step name.
- Select the port to get signals.
   The ports with system functions are disabled and not selectable.
   If multiple ports are chosen, AND conditions apply.
- Sets changes in input signal levels.
   Level change settings commonly apply to all ports.
   Settings by port are not supported.

Category	Description
Active High	Detects a level change from '0 (low)' to '1 (high)'
Active Low	Detects a level change from '1 (high)' to '0 (low)'
Status High	Checks 'level 1 (high)'
Status Low	Checks 'level 0 (low)'

## 13.1.3 Output step

TI	(3/3)	1	BM1909100001		201	9-08-07 09:22
<b>T</b> astening	; Inp	put Output Delay Message	sample job2		Cancel	Save
1	T	fastening-1	Output No	-		ЛГ
2	-0	input-1	1 - 📕 Fastening OK	9- ⊘	Logical out	00
3	•	output-1	2 - 📕 Fastening NG	10- ⊘	Logical out	ି 🧿
			3 - 🕚 Step OK	11- 🔘	Logical out	
			4- 🌒 Step NG	12- 🔵	Logical out	
			5 - 🔵 Job OK	13- 🔾	Logical out	
			6 - 🔵 Job NG	14- 🔘	Logical out	
			7 - 🔵 Ready	15- 🔵	Logical out	
			8 - 🔵 Alarm	16- 🔵	Logical out	
			Output setting			
▼ Down		p Delete Copy Rename	Impulse signal duration (ms) :	100	4	

1. Press [Output].

Then, an output step is added to the bottom of the step list. Then, a setup page appears on the right.

- 2. If necessary, press [Rename] and edit the step name.
- 3. Select the port to generate signals.

The ports with system functions are disabled and not selectable.

It is able to select the output type of a signal by port.

Category	Description
Impulse Generates pulse signals up to the time preset in (4)	
Continuous ON	Displays level 1 (high) signal Adds a separate output step and disables the port to alter the output to '0 (low)'

4. Set 'hold-up time' at level 1 (high) at pulse generation (0-5,000ms).

# 13.1.4 Delay step

<b>T</b> stenin	g Inp	put Output Delay Messa;	sample job2	Cancel Save
1	T	fastening-1	Time	
2	-0	input-1	Value : ┥ 10 🕨 🎯	sec ms
3	<b>e</b> +	output-1		
4	Ō	delay-1	Message —	
			Line.1 :	
			Line.2 :	
			Line3 :	
			Barcode	
			Code :	
		× D /	2 O All Range 🖌 0 🕨 ~	• • •

1. Press [Delay].

Then a delay step is added to the bottom of the step list. Then a setup page appears on the right.

- 2. If necessary press [Rename] and edit the step name.
- 3. Select a delay type.

Category	Description
Time	Stops the step process for a certain period of time; able to set up to 999 sec.
Message	Able to deliver a simple message to an operator. Moves to the next step if the operator reads the message and presses the OK button.
Barcode	<ul> <li>Able to scan the barcode and move to the next step.</li> <li>Select and scan the barcode. Then it automatically appears on the top code.</li> <li>If necessary, select a text box and enter in person.</li> <li>Moves to the next step when the code is perfectly matched if 'All' is chosen.</li> <li>Moves to the next step when the region (From – To) is matched if 'Range' is selected.</li> <li>Moves to the next step if the number of digits and code values in a valid area are matched even through registered and scanned codes differ in terms of total length.</li> </ul>

### 13.1.5 Message step

III	(3/3)		unselected	2019-0	8-07 09:22:0
<b>T</b> Fastenin	ng Inj	out Output Delay Message	sample job2	× Cancel	Save
1	T	fastening-1	Simple message can be delivered to the operator.		×
2	-0	input-1	Add time delay step to keep the message for a period o	f time.	3) ×
3	<b>C</b> +	output-1	Using image is more efficient.		×
4	Ō	delay-1			
5		message-1	Create your own ima You can deliver messages mo		y.
			ATTENTION Substance accountions of a substance a		
				I.,	
•		× D /			4
Down	U	Ip Delete Copy Rename			

1. Press [Message].

Then a message step is added to the bottom of the step list. Then a setup page appears on the right.

- 2. If necessary press [Rename] and edit the step name.
- 3. If necessary enter texts and send a simple message to an operator.
- Able to register an image and send a more efficient message if necessary.
   If both image and text are registered, the image appears in full screen while the text is not visible.
   In terms of an image format JPG and PNG are supported.

It supports resolutions up to 4096 x 4096.

For optimization, however, '1280 x 800 (16:10)' or '1280 x 720 (16:9)' is recommended.

In general the message step should be programmed to display a message for a certain period of time by adding a barcode or timer delay step.

Without such delay step the message appears very shortly.

13.2 Barcode

No       Code       From       To       Job name         1       8806012810314		(3/3)	elected		2019-08-07 09:2
1       8806012810314        sample job1         2       8806002001845       5       10       sample job2         3       23090/69RJ08296         sample job3		Barcode			+ Back
2         8806002001845         5         10         sample job2           3         23090/69RJ08296          -         -	No	Code	From	То	Job name
3         23090/69RJ08296         -         -         sample job3	1	8806012810314	2	-	sample job1
	2	8806 <mark>002001</mark> 845	5	10	sample job2
4 6941059621997 4 10 sample job4	3	23090/69RJ08296	-	-	sample job3
	4	6941 <mark>059621</mark> 997	4	10	sample job4
				10006	

Registers a code and sets jobs to have them automatically loaded through code scanning. Able to register the same code redundantly but executes items with small No. according to priority. Able to load jobs through code scanning in the event that current jobs are absent. Changes code information recorded in the log when code scanning is done during job execution.

Up	Moves the selected item to the top by one column
Down	Moves the selected item to the bottom by one column
Тор	Moves the selected item to the top
End	Moves the selected item to the bottom
Add	Registers a new code
Delete	Deletes selected items

Edit	Edits selected items
Select	Changes a mode to select multiple items
Select all	Selects all items
Cancel	Ends a multiple item selection mode

1. If a code is scanned through USB Scanner or BM built-in scanner, the edit page appears as shown in the figure.

If necessary press the ADD button, select a text box and annually enter in person.

TTT	3/3) unselected 2019-0	8-07 09:22:00
	Barcode	Back
No	Edit barcode data	
a	8	
2	880 <mark>6012</mark> 810314	
3	2	
4	6 All	
	O         Range         From :         4         ▶         To :         7         ▶	
	Job selection : sample job5	
	OK Cancel	
1		×
Up	Down Top End Add Delete Edit Select Select All	Cancel

- If 'All' is selected, jobs are loaded when codes are perfectly matched.
   If 'Range' is chosen, jobs are loaded when the region (From To) is matched.
   Jobs are loaded if the number of digits and code values in a valid area are matched even through registered and scanned codes differ in terms of total length.
- 3. Able to set a job to be loaded when a code is scanned at 'Job selection'.



# **14. OPERATION**

VS

The operation page appears differently depending on operation mode settings ('With job' or 'Without job').

with job TTT GO 2019-08-07 09:22:0 Open Job Next job Full Screen Back Home new\_job dot zuoiv Pre τ EMT2003100012 / P1 181 NI. Type Total of step Current of step mestage Þ Ō delay-1 5 . input-1 . output-0 Torque ( Current / Target ) T fastening message-2 0.38 / 1.00 N.m Õ delay-2 • input-2 A . output-2 🕥 Reset.job 🕥 Reset.Step 🛥 Skip + Back T fastening-2

8	Operatio	n					Error c	ode	4	Clear		n Ho	me
	Status	Toel	name	1	Preset		Torque		- 9	peed		Time	
	ок	BMT20	03100		1		0.05 N.m		2	27		798	Į
NC.	Time	tool name	Barcode	Taston Time	Ryesat. Non	1/Torque	Crisione	speed	Ad	Scrow No	Enor	Descreo	300
1	2009 05 04 11 EP 12	SMERONAL COLL		82	1	100	8.00	mit)	1012	T	.11		. 77
2	2424-05-14-11-57109	BAF72058109012		292	Ť.	1.00	11.000	2251	1012	e	-11		- 28
3	2020-05/14 11:31:04	SARTING TOOLS		156	4	1.00	8.00	228	1012	3	0	- F	
	2020-05-14 11:27:25	61412808100012		197	42	1.00	0.00	227	1012	1241			120
a .	2023-05/44 t1:00:00	0473000100013		202	(1)	1.00	0.00	322	1012	1.00	10	×	100
4	2020-05-14 11:07:08	BM23508100013		794		1.00	0.00	-827	1012	- 1			100
12	2020/05/1411/07/09	045260100012		84	20	19,005	19,000	(ART)	м	(2)	335	(e)	-CN
	2020-05-14 11:87:11	BMT2000100012			12	1.00	0.00	227	.0.	[(#)]			14
3	100465-1411-012	INTERIOR INTERIOR		711	5.	:1011	3.00	227	1012	31	н	*	- 12
-	2020-05-14 11-21114			715	7	1.00	5.00	227	1012		a		9

# without job

Operation Mode	With Job	Without Job
Feature	Uses process control and is operated according to the procedures programmed to a job. Used for the purpose of minimizing an assembly error by visualizing the complicated assembly procedures of diverse products.	Does not use process control and is able to utilize all tools randomly. Mostly used to save fastening data.
Tools	Operates the tools selected in the fastening step only; locked in all other tools; unable to use multiple tools simultaneously.	No restriction in using tools. Able to use all tools randomly at the same time.
Code scanner	Able to register a code and set jobs. Loads jobs automatically if the registered code is scanned.	Able to register a code and set the reset when a scanner-integrated BM is used. Automatically altered into the preset if the registered code is scanned.

# 14.1 With job mode

<b>TTT</b> (3/3)			unselec	2019-08-07 09:22:0			
Dpen Job				Previous Job	Next Job	تربي Full Screen	A Back Home
No Туре	Name	7					
		and the second second	Current of	step		Total of step	
		ଭ		Torque (	Current / Target	)	
		-	Back	<b>Q</b> Reset Job	<b>Q</b> R	eset Step 🔫	Skip

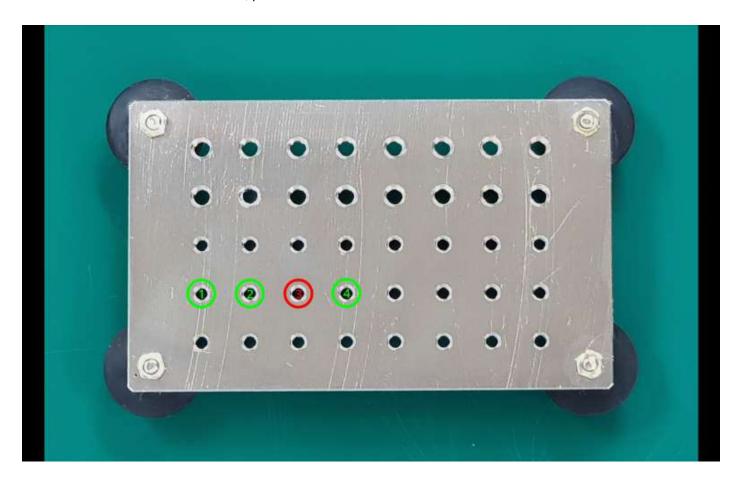
Category	Description					
Open job	Selects a job from the job list and loads.					
Previous job	Loads the previous job according to the sequence of the job list No.					
Next job	Loads the next job according to the sequence of the job list No.					
Full screen	Enables the full screen mode in the fastening or message step.					
Back home	Moves back to HOME.					
Back	Returns back to the previous screw in the fastening step; does not support the movement of the step.					
Reset job	Resets current jobs.					
Reset step	Resets current steps.					
Skip	Moves to the next screw in the fastening step. Press the SKIP button on the last screw and move to the next step.					

# 14.1.1 Fastening step

11	7 (3/3	3)		BM1909100001		2	019-08-07 09:22:
	n Job	sam	ple job1	Previous Job	Full Screen Back Home		
No	Туре	Name	7	BM1909100001 / P1		8806012810	0314
1	T	fastening-1	10 <sup>2</sup>	Current of step		Total of step	16
2	-0	input-1	3		4		
3	<b>C</b> +	output-1		$\rightarrow$			
4	Ō	delay-1		•			
5		message-1	ଭ	Torque (	Current / Target	:)	
			5 ▲ 6 ► Bac	<b>10.12 /</b> <b>Reset Job</b>		<b>O</b> Kgf.c	Skip

No.	Description
1	Displays the tool name and preset information in the fastening step.
2	Reveals the last scanned code information; the code is actually recorded in the log.
3	Shows a screw count according to the screw count direction settings.
4	Reveals a total number of screws according to the screw count unit settings.
5	Shows torque in 'actual torque' or 'target torque' format.
6	Displays an error code and error details in the event of 'NG'.

If an image is registered in the fastening step, it is generated in full screen. In terms of a fastening state, 'OK' or 'NG' is displayed by color depending on settings. If touched in the full screen mode, it is turned off temporarily and switched to the count page. To return back to the full screen mode, press the 'Full screen' button.



## 14.1.2 Input step

TT	7 (3/3	3)	BM	11909100001		1	2019-08-07 09:22:00
	en Job	sam	ple job1	Previous Job	Next Job	Full Screen	Back Home
No	Туре	Name	- Type of input	Avtive high			
1	T	fastening-1					
2	-0	input-1		:1-	- 9	):	
3	<b>e</b> +	output-1		: 2 -	- 10		
4	Ō	delay-1		: 3 -		1: Logical in	
5		message-1		: 4 - : 5 -		2: Logical in 3: Logical in	
				:6-	_	4: Logical in	
				:7-	- 1	5:	
				: 8 -	- 10	6:	
			+ Back	<b>Q</b> Reset Job		eset Step 🚽	Skip

The above page appears when four inputs were programmed to 'Active high' in the input step.

LED light is turned on four enabled ports only.

LED light is turned on in input-sensed ports such as No.11 and No.12.

LED light is off in non-input ports such as No.13 and No.14.

# 14.1.3 Output step

<b>TTT</b> (3/3)			ι	unselected			2019-08-07 09:22:0	
Dpen Job		sam	ple job1	Previous Job	Ant Job	Full Screen	A Back Home	
No	Туре	Name	● Duration	5000 ms				
1	T	fastening-1						
2	-0	input-1		:1-	- 9	:		
3	e.	output-1		: 2 -	- 10			
4	Ō	delay-1		: 3 -		I: Logical out (imp		
5		message-1	-	:4-		2: Logical out (imp		
	-	inessage i		: 5 -		3: Logical out (imp		
				:6-	9 - 14	: Logical out (imp	oulse)	
				: 7 -	- 15	5:		
				: 8 -	- 16	5:		
			+ Back	<b>Q</b> Reset Job		eset Step	Skip	

The above page appears when four inputs were programmed to 'Impulse' in the output step. LED light is turned on four enabled ports only.

## 14.1.4 Delay step

<b>TTT</b> (3/3)			u	inselected		2	019-08-07 09:22:0
	en Job	sam	ple job1	Previous Job		Full Screen Back Home	
No	Туре	Name	🖑 Type of delay	Time ( 5 sec )			
1	T	fastening-1					
2	-0	input-1			_		
3	e-	output-1			T		
4	Ō	delay-1		(	$\odot$		
5	-	message-1					
				3.6	/ 5.	0	
			+ Back	O Reset Job	Q R	teset Step 🔫	Skip

The above page reveals the delay step set by the timer (5 sec.).

It is displayed in 'elapsed / set time' format.

Once the timer reaches the preset time, the page moves to the next step.

If the previous step is 'Message step', the timer is executed in the background, and the screen keeps displaying a message.

<b>T T T</b> (3/3)			1	unselected			2019-08-07 09:22:00	
	Dpen Job		ple job1	ple job1		Full Screen	Back Home	
No	Туре	Name	🖑 Type of delay	Message				
1	T	fastening-1		Simple message can be delivered to the operator.				
2	-0	input-1	51	mple message can	be delivered	to the operator.	•	
3	<b>e</b> .	output-1	After checking message, press OK to go next step.					
4	Ŏ	delay-1						
5	-	message-1						
					ОК			
			- Back		0	teset Step	Skip	

The above page shows the delay step set by the message.

Check the message and press [OK].

Then, it moves to the next step.

<b>T T T</b> (3/3)			1	unselected		2	2019-08-07 09:22:0
	en Job	sam	ple job1	Previous Job		Full Screen Back Home	
No	Туре	Name	🖑 Type of delay	Barcode			
1	T	fastening-1					
2	-0	input-1					
3	<b>C</b> +	output-1		1			
4	Ō	delay-1					
5	-	message-1					
				88060	0020018	45	
			+ Back	<b>Q</b> Reset Job	<b>0</b> F	teset Step 🚽	Skip

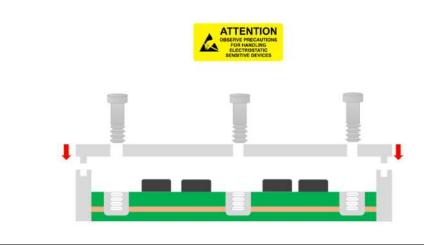
The above page reveals the delay step set by the barcode.

Once the code is scanned in USB scanner or BM built-in scanner, the page moves to the next step.

If the previous step is 'Message step', the delay is executed in the background, and the screen keeps displaying a message.

### 14.1.5 Message step

# Create your own images. You can deliver messages more efficiently.



When setting the message step, if an image is already registered, it is displayed in full screen.

If touched in the full screen mode, it is turned off temporarily.

To return back to the full screen mode press the 'Full screen' button.

TI	7 (3/	3)		unselected		2	2019-08-07 09:22:00
	Sampl		mple job1	Previous Job		Full Screen	A Back Home
No	Туре	Name		Simple message ca	n be delivered to	the operator.	
1	T	fastening-1	A	dd time delay step to ke	ep the message f	or a period of time.	
2	-0	input-1		Using image is more efficient.			
3	<b>C</b> -	output-1			our own ima		
4	Ō	delay-1	Ŷ	ou can deliver m		ore efficiently	•
5	-	message-1			ATTENTION Monthline frieddauthing Activity of the second and and an anti- a		
6	Õ	delay-2		T	Τ	T	
			- Back	Reset Job		teset Step	Skip

# **15. FILE BROWSER**

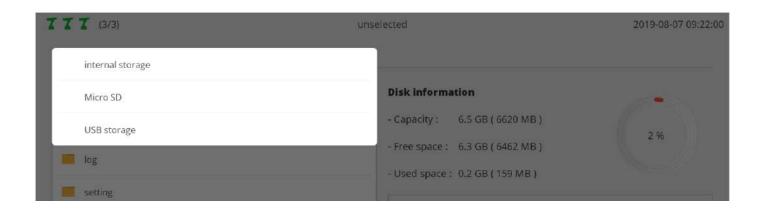
(3/3)	unselected	2019-08-07 09:22:0
➤ internal storage		
image	Disk information - Capacity : 6.5 GB ( 6620 MB )	-
job log	- Free space : 6.3 GB ( 6462 MB )	2 %
setting	- Used space : 0.2 GB ( 159 MB )	
tools		
	image pre	view
🕇 Up 🕞 New	✓ Select	Close

Offers simple file browser features.

Available in various situations such as log file backup image file insertion and file move.

Supports external storage devices such as USB memory and Micro SD and able to select a storage device if the arrow is pressed.

Offers a preview feature at the right bottom if a JPG or PNG image file is selected.



The structure and purposes of the top-level internal storage folder are as follows:

Category	Description
Image	Stores image files used in fastening and message step.
Job	Stores job files programmed by a user.
Log	A space where log files are stored; owns a sub folder in order of year, month and day.
Setting	Stores preset files.
Tools	A folder is created by the name of the registered tool; stores related information .

The menu provided by the file browser is as follows:

Category	Description			
Up	Moves to the upper folder.			
New	Creates a new folder in current position.			
Select	Switches to the SELECT FILE mode.			
Select all	Selects all files and folders in current position.			
Cancel	Closes the SELECT FILE mode.			
Delete	Deletes the selected files and folders.			
Сору	Copies the selected files and folders.			
Move	Moves the selected files and folders.			
Rename	Renames the selected files and folders. Disabled if multiple files and folders are selected.			
Paste	Pastes the files and folders chosen in copy/move.			

# **16. FTP SERVER**

This section describes how to get access to the FTP server.

For the FTP client needed to get access to the FTP server, there are various types of programs.

This section uses the most widely used freeware 'Filezilla client'.

http://filezilla-project.org/



#### Home

#### FileZilla

Features Screenshots Download Documentation FileZilla Pro

FileZilla Server Download

#### Community

Forum Project page Wiki

#### General

FAQ Support Contact License Privacy Policy Trademark Policy

#### Development

Source code Nightly builds Translations Version history Changelog Issue tracker

Other projects libfilezilla Octochess

Sponsors:

# Overview

Welcome to the homepage of FileZilla®, the free FTP solution. The *FileZilla Client* not only supports FTP, but also FTP over TLS (FTPS) and SFTP. It is open source software distributed free of charge under the terms of the GNU General Public License.

We are also offering <u>FileZilla Pro</u>, with additional protocol support for WebDAV, Amazon S3, Backblaze B2, Dropbox, Microsoft OneDrive, Google Drive, Microsoft Azure Blob and File Storage, and Google Cloud Storage.

Last but not least, FileZilla Server is a free open source FTP and FTPS Server.

Support is available through our forums, the wiki and the bug and feature request trackers.

In addition, you will find documentation on how to compile FileZilla and nightly builds for multiple platforms in the development section.

# Quick download links



Download FileZilla Server

Pick the client if you want to transfer files. Get the server if you want to make files available for others.

### 💊 News 🛄

#### Q 2020-05-19 - FileZilla Client 3.48.1 released

#### **Bugfixes and minor changes:**

 If FileZilla is configured to restore open tabs on startup, the directory trees no longer shrink in size

#### 🛇 2020-05-12 - FileZilla Client 3.48.1-rc1 released

#### Fixed vulnerabilities:

OMSW: The settings directory is now initially created with tight



# 16.1 Connection via WiFi

E paramon@192.168.131				- [	- X
	Server Bookmarks Help				
	O 18 O 1, 1/	E Q 🍳 🦚			
Host 192.168.131.1	Username: paramon	Password:	Port: Quickconnect -		
Status: L3d in	4	5	6		^
Status: Retrieving direct Status: Directory listing	ory listing of "/" successful				
	tory listing of "/"				
	of "/" successful				
	tory listing of "/"				
Status: Directory listing	of "/" successful				~
Local site: ₩			Remote site: /		~
🖃 📃 Desktop					
Documents			? image ? job		
			? tools		
Filename		Filesize Filetype	Filename	Filesize	Filetype ^
····· F:		File folder			1.1.1
🕳 E:		File folder	job		File fold
🔐 D:		File folder	🛄 image		File fold
<b>L</b> C:		File folder	tools		File fold
			setting		File fold
<					File fold
4 directories			5 directories		
Server/Local file	Directi Remote file		Size Priority Status		
	Longergergel and specific the		Vincatorias (20.1990/01899) 17997001129		
Queued files Failed tran	sfers Successful transfers				
			🗘 🙆 Queue	empty	
					- 44

- 1. Connect to ParaMon-Pro X AP in WiFi-connected PC.
- 2. Start the Filezilla Client.
- Enter the WiFi IP address into the host.
   ParaMon-Pro X's WiFi always has '192.168.131.1' for address.
- 4. Enter the FTP server's username from 'Setting  $\rightarrow$  Network'. The default value is 'paramon'.
- 5. Enter the FTP server's password from 'Setting  $\rightarrow$  Network'. The default value is 'prox'.
- 6. Press [Quickconnect] and log into the FTP server.
- 7. Check ParaMon-Pro X's file system.

## 16.2 Connection via ethernet

paramon@192.168.0.17 - FileZilla File Edit View Iransfer Server Bookma	rks <u>H</u> elp		– 🗆 X
H - E - C # 8 :	🗼 🗊 🏋 🔍 🎘		
Host 192.168.0.17 Username: param	on Pass <u>w</u> ord:	Port: Quickconnect	•
Status: 22 cting to 192.168.0.17:21 Status: Connection established, waiting for Status: Insecure server, it does not support Status: Server does not support non-ASCII Status: Logged in	FTP over TLS.	4 5	,
Status: Retrieving directory listing			
Status: Directory listing of "/" successful			
Local site: ₩		Remote site: /	
Desktop     Documents     This PC     D:     D:     D:     F:		<ul> <li>☐ /</li> <li>? image</li> <li>? job</li> <li>? log</li> <li>? setting</li> <li>? tools</li> </ul>	6
Filename	Filesize Filetype	Filename	Filesize Filetype
🛶 F:	Local Disk		
- E:	Local Disk	jee	File fold
🔐 D: 🏪 C:	Local Disk	ininge	File fold
ing C.	Local Disk		File fold File fold
		setting	File fold
<		> <	>
4 directories		5 directories	
Server/Local file Directi Re	mote file	Size Priority Status	
Queued files Failed transfers Successfu	l transfers		

- 1. Start the Filezilla Client.
- 2. Enter the ethernet IP address into the host.
  - Check the ethernet IP address in 'System  $\rightarrow$  Network'.

<b>TTT</b> (3/3)	BM1909100001	2019-08-07 09:22:00
Back Home	Ethernet	
i	- IP address : 192.168.0.17	
Device info	- Netmask : 255.255.255.0	
9	- Gateway ; 192.168.0.1	
Storage	- MAC : fc-c2-3d-2a-bc-11	

- 3. Enter the FTP server's username from 'Setting  $\rightarrow$  Network'. The default value is 'paramon'.
- 4. Enter the FTP server's password from 'Setting  $\rightarrow$  Network'. The default value is 'prox'.
- 5. Press [Quickconnect] and log into the FTP server.
- 6. Check ParaMon-Pro X's file system.

# **17. BACKUP & RESTORE**

This section describes backup/restore procedures under two different categories: ParaMon-Pro X and BM.

## 17.1 ParaMon-Pro X

ParaMon-Pro X's backup and restore features can be available in two types:

- A. After backing up ParaMon-Pro X's current settings, the system can be restored to the current state if necessary. At restoration, the file system is overwritten.
  If a backup file is in the internal repository, it is also deleted. Therefore, copy the backup to a separate external storage device.
- B. After backing up ParaMon-Pro X's current settings, they can be applied to the other ParaMon-Pro X with the same configuration.

Since member tools registered in ParaMon-Pro X are managed with their own ID (MAC address), however, they are not automatically registered despite restoration.

Therefore, member tools should be registered separately.

At job programming, the tools specified during the fastening step are identified by the tool name.

To execute the restored jobs without changes, therefore, member tools should be set under the same tool names at their registration.

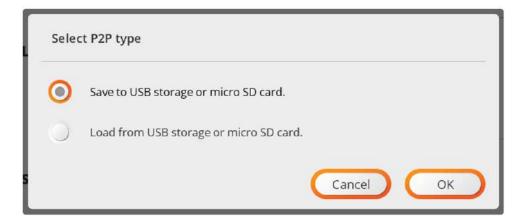
If different ParaMon-Pro X units need to be backed up or restored, it is recommended to specify an easy-to-identify name in person instead of using the default tool name when registering a member tool.

## 17.1.1 Backup

## A. Press [P2P] in 'Setting $\rightarrow$ System'.

<b>TTT</b> (3/3)		BMT1907100121	2019-08-07 09:22:00
Back Home	Password	Current password :	Apply
		New password :	
		Confirm password :	
<b>\$</b> 1/0	💲 Language	English Spanish French	German
Log		O Mandarin O Portuguese O Czech O	Italian
Barcode	🕚 System time	85:020-09-28 12:20:58	Change
Network	P2P	Copy data (setting, job, barcode ) between Pro X.	P2P
o₀ System	<b>Q</b> Factory reset	All settings are returned to the factory settings.	Appiy

B. Select "Save ..." and press [OK].



C. Set the backup storage position and filename and press [OK] for backup. The filename is automatically created in 'ProX\_YYYMMDD.p2p' format. It can be edited if necessary.

If stored by specifying an external storage device folder, it would take a relatively long time for backup. It is recommended to store the backup in the internal repository and copy/move it to an external storage device, using '15. file browser'.

┢ Select	folder
Folder :	./files
Filename :	ProX_20200603.p2p
	Cancel OK

D. Wait until the backup processing is finished.

Processing	
Please wait.	
C	

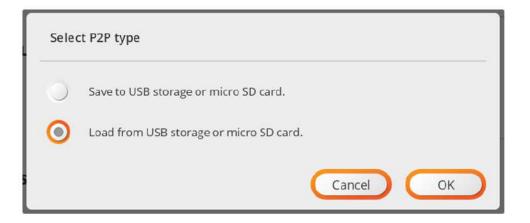
E. If the backup is stored in the internal repository as recommended, copy/move it to an external storage device, using '15. file browser'.

## 17.1.2 Restore

A. Press [P2P] in 'Setting  $\rightarrow$  System'.

<b>TTT</b> (3/3)	,	BMT1907100121	2019-08-07 09:22:00
Back Home	Password	Current password :	Apply
Operation		New password :	
		Confirm password :	
<b>\$</b> 1/0	🔇 Language	English O Spanish O French O	German
Log		🔿 Mandarin 🔿 Portuguese 🔵 Czech 🔵	Italian
Barcode	🕚 System time	85:50-09-58 15:50:58	Change
Network	P2P	Copy data (setting, job, barcode ) between Pro X.	(P2P)
o System	♀ Factory reset	All settings are returned to the factory settings.	Apply

B. Select "Load ..." and press [OK].



C. Select the file and press [OK].

	Select file		
File :	/media/sda1/ProX_20200603.p2p		
		Cancel OK	

D. Press [OK] and restart the system.

Success	
Press OK to restart the system.	
ОК	

# **17.2 BM Parameters**

BM Parameter's backup and restore features can be available in two types:

- A.After backing up BM's current parameter settings, the system can be restored to the current state if necessary. If BM parameter settings are edited frequently according to operating environments, it is able to edit them collectively, using backup/restore features.
- B.If used together with ParaMon-Pro X's backup/restore features, it is possible to perfectly copy all settings of the system comprised of multiple BM and ParaMon-Pro X units.

### 17.2.1 Backup

A. Press the 'Backup' icon of the target tool on the member tool list.

*	Brightness	25 %	) 50 %	75 %	6 🔘 100 %				
<b>4</b> 0	Volume	Mute	25 %	50 %	5 🔿 75 %	0	100 %		
ଚ	Total Connected / Registerd :	: 3/3 ea	Confirm p	iassword :					0
0	Name	S/N	Model	F/W ver	IP address	Port	MAC address	l	Backup
71	BMT2003100022	2003100022	BMT3224	1.0.0	192.168.131.163	5000	88:da:1a:52:2a:4c	24.1	e e
72	BM1909100001	19090001	BM3204	1.11.5	192.168.131.33	5000	88:da:1a:52:21:58	23.7	t t
Тз	BM2002100021	2002100021	BM3201	1.20.1	192.168.131.78	5000	88:da:1a:52:2d:1c	30.5	ė ė
	S S	ystem time	cuc	U-Ub	-03 10	5C		Cicha	nge
	Se O Fr								

B. Set the backup storage position and filename and press [OK] for backup. The filename is automatically created in `Toolname\_Model\_Fwver.csv' format. It can be edited if necessary.

Folder :	/media/sda1	
Filename :	BM1909100001_BM3204_FW1.11.5.csv	

#### 17.2.2 Restore

A. Press the RESTORE icon of the target tool on the member tool list.

*	Brightness	0	25%	50 %	75%	100 %				
<b>4</b> 1)	Volume	0	Mute 🤇	25 %	50%	75%	0	100 %		
<i>Q</i>	Total Connected	/ Registerd :	3 / 3 ea	Confirm r	iassword ;					¢
ଚ	Name		S/N	Model	F/W ver	IP address	Port	MAC address	l	Backup
1	BMT20031000	22	2003100022	BMT3224	1.0.0	192.168.131.163	5000	88:da:1a:52:2a:4c	24.1	<u>ط</u> ط
2	BM190910000	1	19090001	BM3204	1.11.5	192.168.131.33	5000	88:da:1a:52:21:58	23.7	ى بە
3	BM200210002	1	2002100021	BM3201	1.20.1	192.168.131.78	5000	88:da:1a:52:2d:1c	30.5	<u>ط</u> ك
	arcode	() Sys	item time	CUC	U-U6	-03 10	be i		Cha	nge
		Q Fac								

B. Select the file and press [OK].

	C	
File :	/media/sda1/BM1909100001_BM3204_FW1.11.5.csv	

# **18. SOFTWARE UPGRADE**

- A. Log into the system in ADMIN mode.
- B. Select 'System' in the ADMIN menu.
- C. Choose 'Device info' on the left.
- D. Check the current software version and press [Upgrade].
- E. Enter the password again.
- F. Select the target file and press [Upgrade].

Junai ,	Software upgrade
Select file :	Paramon-ProX_v1.1.4.hts
	Cancel Upgrade

G. Once the confirmation page pops up, check the target file again and press [OK].

Confirmation
Correct ?
Parmon-ProX_v1.1.4.hts
Cancel OK

H. Wait until the process is completed.

	Software upgrade	
Select file :	Parmon-ProX_v1.1.4.hts	
		36 %

I. Once the upgrade is successfully completed, the restart system message pops up. Press [OK] and restart the system.



- J. Once successfully reset, log into the system in ADMIN mode again.
- K. Select 'System' in the ADMIN menu.
- L. Choose 'Device Info' on the left.
- M. Check if successfully upgraded by checking the software version.

# **19. MAINTENANCE**

#### **19.1 Maintenance**

Periodic cleaning of the screen should be carried out regularly with a clean, soft, dry and lint-free cloth.

### **19.2 Troubleshooting**

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



# Warning

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

Problem	Solution				
Controller is not	Turn off and on the controller.				
booting (black screen)					
USB memory stick or micro	Diagon shock that memory format in EAT22				
SD card not listed	Please check that memory format is FAT32.				
WiEi potwork interrupted	Check that WiFi adapter is well plugged on USB port.				
WiFi network interrupted	Eventually reboot controller.				
Password is lost or	Please contact the DOGA After-Sales Department.				
forgotten					
Screwdriver disconnected	Please check that tool is powered on and is within WiFi signal range.				
Even after verification,					
the controller doesn't	Please contact the DOGA After-Sales Department.				
work correctly	· ·				

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 <u>www.doga.fr</u>, click "Your contacts", then select your specific **After-sales department contact** depending on the device type.

# 19.3 Spare parts

For any spare parts order, contact your DOGA technical sales representative.



#### My client area on www.doga.fr

Go to your client area on <u>www.doga.fr</u>, click "Your contacts", then select your specific **After-sales department contact** depending on the device type.



#### 19.4.1 For any questions about the use of the device

Please contact your Technical Salespeople.



# My client area on www.doga.fr

Go to your client area on <u>www.doga.fr</u>,, click "Your contacts", then select your **Technical Salespeople** depending on the device type.

#### 19.4.2 For any questions 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 specific 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 in order for you to repair it by yourself as much as possible.

### 19.5 After-sales returns

All material must be returned with an 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 reduces the troubleshooting costs. DOGA reserve the right to apply a trade-in discount and to invoice, if applicable, the costs of repairing and

DOGA reserve the right to apply a trade-in discount and to invoice, if applicable, the costs of repairing and packaging.

#### 19.5.1 Download the after-sales return form

You can download the return form by following one of these links:

http://service.doga.fr/syst/dogatech.nsf/liste/00184



#### 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.

#### 19.5.2 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	DOGA - Service SAV
8, avenue Gutenberg - CS 50510	11, rue Lavoisier
78317 Maurepas Cedex	78310 MAUREPAS
FRANCE	FRANCE

# 19.6 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-sales department.



#### My client area on www.doga.fr

Go to your client area on <u>www.doga.fr</u>,, click "Your contacts", then select your specific **After-sales contact** depending on the device type.

Our services will organize the intervention.

#### 19.7 Warranty

DOGA guarantees 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 ParaMon-Pro X must have been used in a professional use and in accordance with the normal conditions of use described in the instruction manual.

- The ParaMon-Pro X must not have suffered any damage from storage, maintenance or improper handling.
- The ParaMon-Pro X must not have been modified or repaired by unqualified persons.

# 20. SAFETY

# 20.1 General provisions



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



# Attention

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.

#### 20.2 Contra-indications

Do not cover. Do not immerse. Do not expose to splashing liquids. Do not use near to a heat source.

# **21. STANDARDS**

# 21.1 Importer details

Importer: DOGA Adresse: ZA Pariwest 8 avenue Gutenberg CS 50510 78317 MAUREPAS CEDEX - FRANCE

#### 21.2 Markings

BM Series Controller	Description			
ParaMon-Pro X	Туре			
S/N MM/YYYY XXXX	Serial number month/year of production			
<b>OOGA</b>	DOGA <sup>®</sup> Name of the equipment manufacturer			
100-230V 0.4A	Power input			
(	Equipment designed and manufactured in accordance with the requirements of			
	European Directives 2014/35/UE and 2014/30/UE.			

## 21.3 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.

# 26.3.1 Transport

Use a suitable container to transport the unit and protect it during shipment.

# 26.3.2 Storage

Respect the following guidelines before each storage:

- Turn off the DPC Touch V2 (unplug the power cable).
- 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.

# 21.4 WEEE recycling and end of service life

X

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:

#### 26.4.1 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 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 <u>www.ecosystem.eco</u>.

#### 26.4.2 Collection points

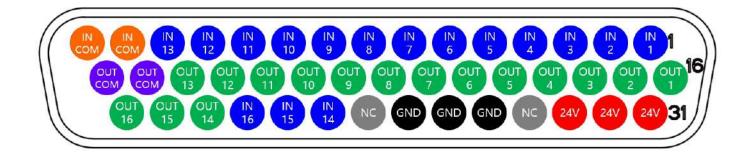
Free collection points for used electric or electronic devices are available near your company. Your local authorities can provide their addresses.

# **22. APPENDICES**

# 22.1 - Declaration of conformity

Description	Lien de téléchargement	QR code		
EU declaration of conformity ParaMon-Pro X	http://service.doga.fr/syst/dogatech.nsf/liste/00283			

# 22.2 - Interface port DB44 pin out



ROW 1 (1~15)		ROW 2 (16~30)		ROW 3 (31~44)	
Pin no	Desc	Pin no	Desc	Pin no	Desc
1	Input 1	16	Output 1	31	+24V
2	Input 2	17	Output 2	32	+24V
3	Input 3	18	Output 3	33	+24V
4	Input 4	19	Output 4	34	NC
5	Input 5	20	Output 5	35	GND
6	Input 6	21	Output 6	36	GND
7	Input 7	22	Output 7	37	GND
8	Input 8	23	Output 8	38	NC
9	Input 9	24	Output 9	39	Input 14
10	Input 10	25	Output 10	40	Input 15
11	Input 11	26	Output 11	41	Input 16
12	Input 12	27	Output 12	42	Output 14
13	Input 13	28	Output 13	43	Output 15
14	Input COM	29	Output COM	44	Output 16
15	Input COM	30	Output COM		

# 22.3 - Backup data forwarding

Please refer to backup data forwarding function setting describe in [<u>11.6. Share</u>] section.

The backup data forwarding function forwards the backup data received from the member tools to the set external server.

The data format is based on the Modbus-TCP standard.

In general Modbus-TCP-based data communication always operates as a pair of request/response, but in backup data forwarding function, only response is unilaterally transmitted, and the data format is as follows.

Num of byte	Data	Descript	Description				
2	Transaction ID		MBAP (ModBus Application Header)				
2	Protocol ID						
2	Length	IVIDAF (IV					
1	Unit ID						
1	Function code	Fixed (0x	04)				
1	Length	Counted	from tool index to the end of the	e message.			
2	Tool index	Member	Member tool index number (0~7)				
2	Event count no	Increased	Increased +1 per tool				
2	Fasten time	Fastening	Fastening time				
2	Preset no	Preset nu	Preset number				
2	Target torque	Target to	Target torque (e.g. 1,000 = 10.00)				
2	Converted torque	Converte	Converted torque (e.g. 997 = 9.97)				
2	Speed	Speed (r	Speed (rpm)				
2	A1	Angle be	Angle before the seating point.				
2	A2	Angle aft	Angle after the seating point.				
2	A3	Total ang	Total angle (A1+A2)				
2	Screw no	Screw nu	Screw number				
2	Error	Error cod	Error code				
2	Direction	0	Fastening				
Ζ.		1	Loosening				
	Status	Code	BM(T)	MD(T)			
		0x00		her			
		0x01	Fastening OK				
		0x02	Fastening NG (E330,332,333,334,335,336,337,338,33				
2		0x03	Fastening/Loosening change				
L		0x04	Preset change				
		0x05	Alarm reset				
		0x06	0x06 Error (except fastening NG)				
		0x07	Barcode scan	-			
		0x08	Screw count -1	-			
2	Snug	Snug tore	Snug torque				
n (0~32)	Barcode	Barcode	Barcode				



Download the ultimate version of this user manual via the link below or via QR code: http://service.doga.fr/syst/dogatech.nsf/liste/60391



We constantly strive to improve our products. As a result, the dimensions and indications in this document may not always correspond to the latest production. By explicit agreement, our sales are subject to a reservation of title (the provisions of the French 05/12/1980 Act are therefore fully applicable).



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