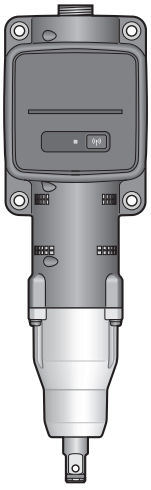
Operating Instructions
Instructions d’utilisation
Manual de instrucciones

Panasonic

Mechanical Pulse Endeffector
Effecteur final à impulsion mécanique
Efector final de pulso mecánico

Model No.: EYFCA1WC



IMPORTANT Read and follow the safety and operating instructions before using this product.
Do not use the wireless function outside the country where you purchased the product.
Doing so may violate the local laws and regulations.

IMPORTANT Lisez et suivez les instructions d’utilisation et de sécurité avant d’utiliser ce produit.
N’utilisez pas la fonction sans fil en dehors du pays où vous avez acheté le produit.
Cela pourrait enfreindre les lois et réglementations locales.

IMPORTANTE Lea y siga las instrucciones de seguridad y operación antes de usar este aparato.
No utilice la función inalámbrica fuera del país donde adquirió el producto.
Hacerlo podría infringir las leyes y normativas locales.

Read the installation instructions before using this product.
The installation instructions are available for download from the website:
Lisez les instructions d’installation avant d’utiliser ce produit.
Les instructions d’installation sont disponibles en téléchargement sur le site Web :
Lea las Instrucciones de instalación antes de usar este producto.
Las instrucciones de instalación están disponibles para su descarga desde el sitio web:
https://panasonic.net/electricworks/ecm/powerelctrictools/download/

Table of Contents

Original instructions: English
Translation of the original instructions: Other languages

SAFETY PRECAUTIONS

Below are the instructions you should always adhere to, to prevent human harm and property damage.

■**The severity of harm and damage caused by incorrect use is presented with the following.**

⚠ **WARNING**	May cause death or serious injury.
⚠ **CAUTION**	May cause minor injury or property damage.

■**The content that should be observed is presented with the following symbols. (The following are examples)**

	You MUST NOT do the action.
	You MUST do the action.

⚠ **WARNING**	
 Mandatory	● **Perform daily management of torque.** Failure to observe this may cause loose bolts due to torque fluctuations, resulting in an accident.
	● **Confirm the weight capacity of the robot before installation.** Failure to observe this may cause an accident or trouble.
	● **Use a collaborative mode when using a robot.** Failure to observe this may cause a damaged power wire or signal wire or a tool failure, resulting in an accident or trouble.
	● **Confirm that no buried object exists in the operating area, such as a power, water, or gas pipe.** Contact with a buried object may cause an accident such as an electric shock, electric leakage, or fire.
	● **Wear ear protectors such as earplugs or earmuffs in noisy work environments.** Failure to observe this may adversely affect hearing.
	● **Use protective glasses during work. In addition, wear a dust mask during dusty work.** Failure to observe this may cause injury to the eyes or throat.
	● **Insert the power plug all the way seated.** Incomplete insertion may cause electric shock or heat generation resulting in fire. Do not use a damaged plug or loose socket.

SAFETY PRECAUTIONS

⚠ WARNING

- **Clean dust off the power plug routinely.**
  Accumulated dust on the plug may absorb moisture and cause poor insulation resulting in fire.
  Disconnect the power plug and wipe it with dry cloth.
- **Use the specified accessories and attachments.**
  Failure to observe this may cause injury.
- **Keep the workplace sufficiently bright.**
  Poor visibility in a dark workplace may lead to an accident or injury.
- **Use a pointed tool (socket, extension bar, etc.) for power tools only.**
  Using a pointed tool for manually operated tools may cause it to break and fly, resulting in an accident. Be sure to use a pointed tool for power tools with this product.
- **Avoid failing to inspect the pointed tool, etc.**
  Always inspect the pointed tool and the pointed tool insertion part of the product to check for wear and damage. Request replacement or repair if necessary. Do not use them particularly if a large backlash exists between the socket and the socket insertion part, as this may cause breakage resulting in injury.
- **Fix the workpiece firmly.**
  Failure to observe this may cause unexpected movement, resulting in injury. For safety, use clamps or vices for fixing it.
- **If the tool malfunctions or makes abnormal noises during use, immediately turn the trigger signal off, turn the power switch off, and stop using it.**
  Consult your dealer or Panasonic Customer Support Centre. Using it as is may result in injury.
- **Following the Operating Instructions, attach tools including a pointed tool and accessories securely.**
  Failure to securely attach them may cause detachment, resulting in injury.
- **Before use, remove a key, wrench, and other tools used for adjustment.**
  Failure to observe this may cause unexpected detachment, resulting in injury.
- **Work in proper attire.**
  - Do not wear baggy clothing or accessories such as a necklace, because they may get caught in rotating parts.
  - Cover long hair with a cap or a hair cover.

SAFETY PRECAUTIONS

⚠ WARNING

- **Do not block the vent of the tool.**
  Doing so may cause burns or fire due to abnormal heat.

- **Do not expose your skin directly to hot air from the vent of the tool.**
- **Immediately after work, do not touch the pointed tool such as a socket, screws, or chips.**
  They are hot and may cause burns.

- **Do not use the tool for any other purpose than intended.**
  Failure to observe this may cause injury.

- **Do not use the LED light as a torch.**
  Doing so may cause an accident since the light is not bright enough to move in the dark.

- **Do not expose your eyes to the LED light directly.**
  Keeping your eyes exposed to the LED light may damage them.

- **Do not use the tool with oil or other foreign material attached to it.**
  Otherwise an accident may occur if the tool falls.
  Also, such oil or other foreign material may enter the inside, resulting in generation of heat, fire, or burst.

- **While using the product, keep your body and a part of your body away from the rotating parts and chips.**
  You may be injured when unexpectedly detached or damaged rotating parts or chips hit you. Replace the pointed tool periodically.

- **Do not use the product to drill a hole in a metal object.**
  The metalworking drill bit may become chipped due to high torque, resulting in injury.

- **Do not use the tool in an environment where asbestos exists nearby (including an environment where asbestos is being removed).**
  Doing so may adversely affect health.
  Great care should be given to asbestos, because this substance causes lung cancer or other serious health damage.

- **The product is intended for use with a robot. Do not use it as a manually operated tool.**
  Doing so may cause injury.

SAFETY PRECAUTIONS

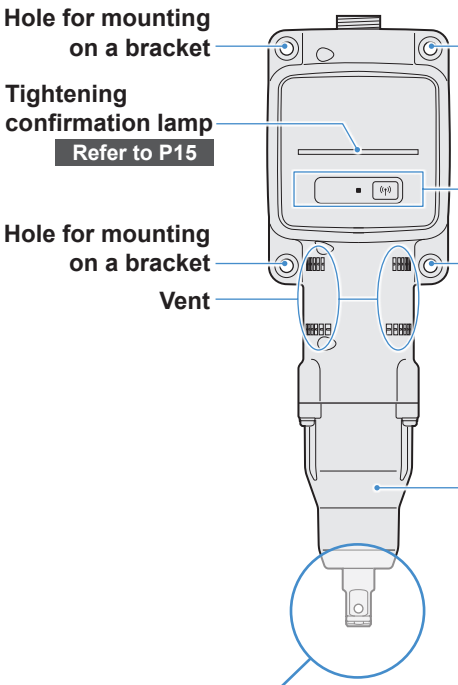
⚠ WARNING	
 Prohibited	● **Disconnect the power plug between uses.** Failure to observe this may cause poor insulation resulting in electric shock or fire from electric leakage.
 No disassembly	● **Do not modify the tool. Do not disassemble or repair the tool.** Doing so may cause fire, electric shock, or injury. For repair, consult your dealer or our customer support team.
 Keep dry	**Avoid the following use of tools.** ● **Do not use or leave them exposed to rain or moisture.** ● **Do not use them immersed under water.** Failure to observe this may cause smoke, fire, or burst.
 No wet hand	● **Do not use a wet hand to connect or disconnect the power plug to or from the outlet.** Failure to observe this may cause electric shock.

SAFETY PRECAUTIONS

⚠ CAUTION	
Prohibited	● **Do not put the tool in a place accessible by a child.** Failure to observe this may cause an accident or trouble.
	● **Do not store the main body in a place where the temperature may rise to 50 °C (122 °F) or higher.** Failure to observe this may lead to abnormal operation.
	● **Do not use the tool in such a forceful manner that causes the motor to lock.** Failure to observe this may cause smoke or fire. In order to work safely and efficiently, work at a speed that matches the ability.
	● **Do not use the tool when you are tired.** Failure to observe this may cause an accident or injury.
	● **Do not allow a child or any other person who is not an operator to come near the workplace or touch the tool.** Doing so may cause injury.
Mandatory	● **If the tool becomes hot, interrupt the work and wait for it to cool down before use.** Failure to observe this may cause burns.
	● **To disconnect the power plug, always hold the power plug without pulling the cord.** Pulling the cord may cause electric shock or short circuit.
	● **Before use, check the tool, pointed tool, and other parts for any damage and confirm their normal operation.** ● **Before use, confirm that no flaw or crack exists on the tool.** Failure to observe this may cause damage, resulting in injury.
	● **Keep the workplace clean.** A disordered workplace or work table may lead to an accident.
	● **Consider well how to handle and work, pay attention to the surrounding environment, and use common sense during work.** Failure to observe this may cause an accident or injury.

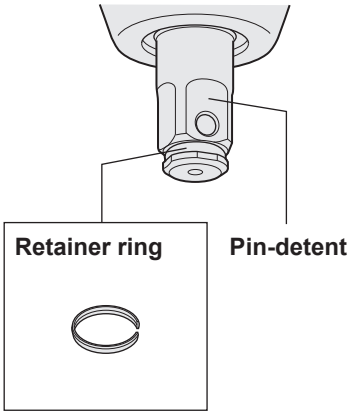
Tool

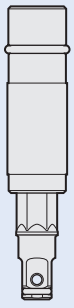
Front



Note

- The QR code on the lower part of the sensor block is our manufacturing identification mark.





Extendable socket

Use the supplied extendable socket to mitigate the impact on the robot while ensuring the fastening torque accuracy.

* **Recommended time to replace the extendable socket**
Replace the extendable socket when the total number of fastenings has reached approximately 250,000. It may wear and deteriorate earlier depending on the use conditions. Perform periodical inspections.

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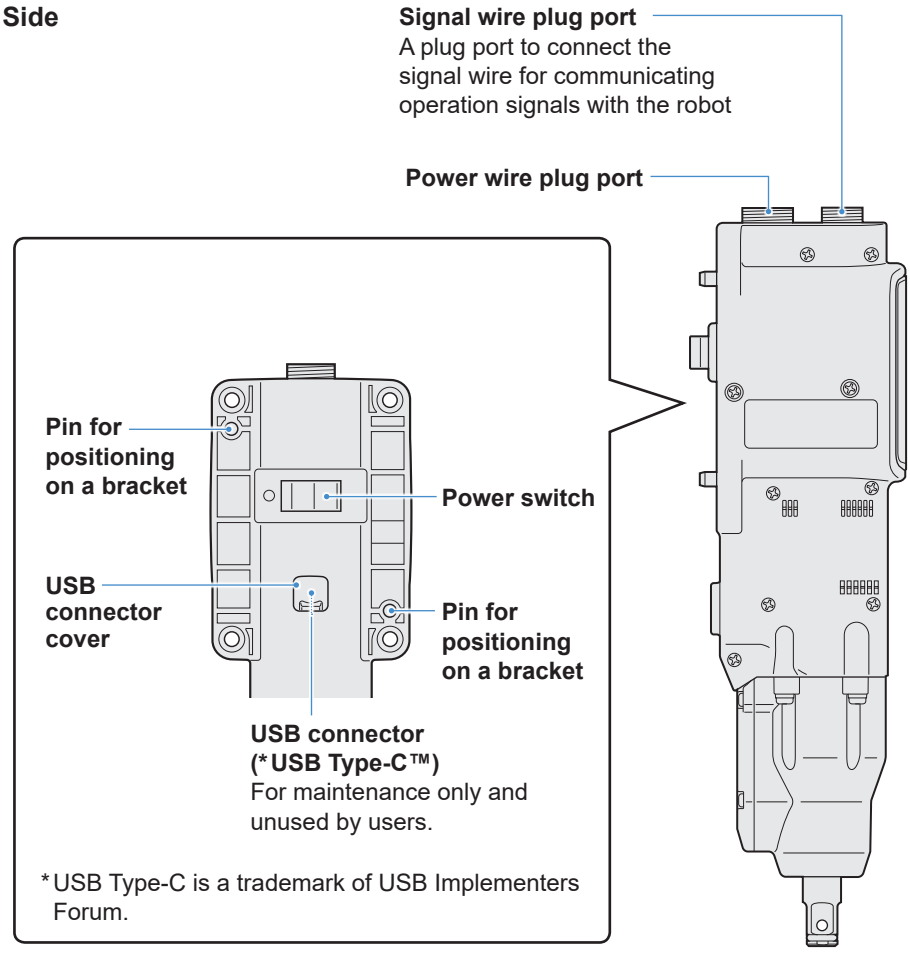
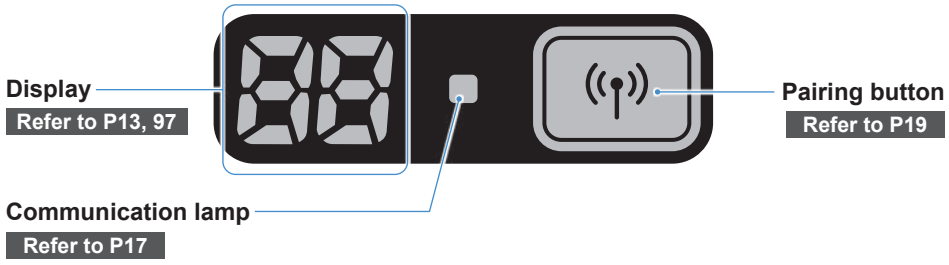
FUNCTIONAL DESCRIPTION

Side

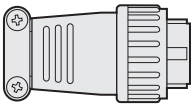


Control panel Refer to P8

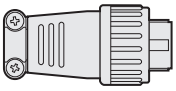


Accessories and Separately Sold Items

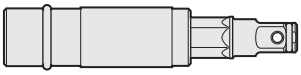
Power plug (EYFCA1WF711)



Signal wire plug (EYFCA1WF721)



Extendable socket (EYFCA1WF701)



* Refer to the Installation Instructions for details on the accessories and separately sold items.
* They are available as replacement parts.

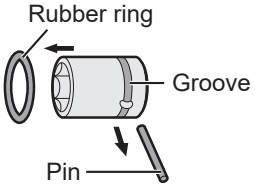
Installation and Use Location

Use the product in a location meeting the following conditions:

(1) Indoors
(2) No direct sunlight or spill of water or rain
(3) No corrosive or flammable gas
(4) No oil mist, dust, water, salt, iron powder, or organic solvent
(5) Ambient temperature: 0 °C (32 °F) to 40 °C (104 °F)

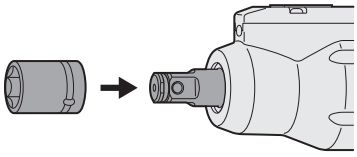
Attaching a Socket

1 Remove a rubber ring and a pin from the socket.



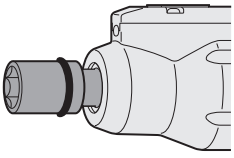
2 Insert the socket into the tool.

Align their hole positions.



3 Reversing the procedure 1, attach the pin and the rubber ring.

Be sure to put the rubber ring so that the pin will not come out.



- The retainer ring (C-ring) is for temporary fixing. Be sure to use the pin and the rubber ring to fix the socket.
- If you use a socket that is worn or deformed, an anvil of the retainer ring (C-ring) type may not be inserted.

WIRING DIAGRAM

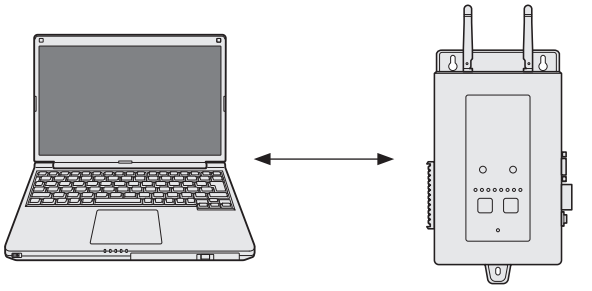
The tool can be used by being connected to external devices as shown in the connection diagram below.

Operating environment

Compatible OS	Windows 10 or later (supporting any of the web browsers below)
Web browser	Microsoft Edge version 102 or later or Google Chrome version 102 or later

Connection example

PC for configuration **Controller (EYFRW2)**



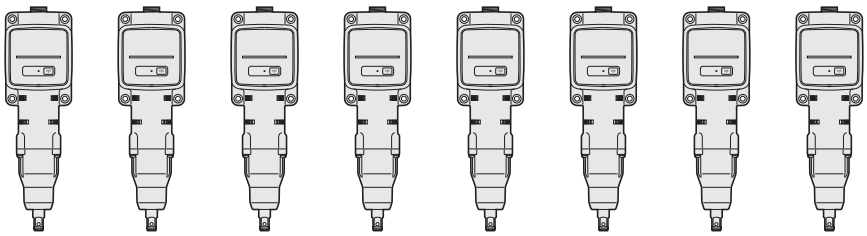
For details on the controller, see the Operating Instructions supplied with it.

Wireless communication

Wired communication, direct connection

This unit

Maximum number of connected devices: 8



*USB Type-C is a trademark of USB Implementers Forum.

OPERATION MODE OF THE TOOL

The tool operates in one of the following modes.
The mode in which it is used now is shown on the display of the control panel.

Display	Mode name	Mode details
	**Wireless Communication Mode**	This is a mode in which the tool is controlled via wireless communication. The tool communicates with the controller to send the history log data and receive the configured parameters.
	**Operation Disable Mode**	The tool has been locked by an operation prohibition signal from the controller in the wireless communication mode. It will be unlocked by a release signal from the controller.
	**Pairing Mode**	This is a mode to check the pairing status. It can also be done on the controller. **Refer to P19**
	**Minimum Output Mode**	This is a mode in which to check whether torque control is available when the target torque is low. The tool is shut off at the minimum number of pulses.
	**Offset Mode**	This is a mode in which to correct the calculated torque of the tool for the actual torque. **Refer to P42**
	**Factory Default Mode**	This is a mode in which the tool is in the factory default status. **Refer to P27**

TORQUE CONTROL FUNCTION

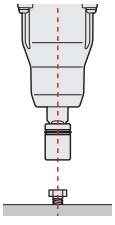
The tightening torque for the work target is calculated by the torque sensor of the tool. When the calculated torque value reaches the preset target value, the tool is supposed to stop (shut off) automatically.
(For how to set the Shut-Off Torque, Refer to P49)

⚠ WARNING

Make a daily management of torque performance.
Otherwise, bolts will be loosened by torque change, causing an accident.

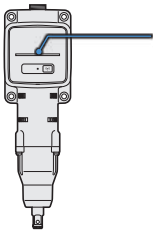
CAUTION

- At work where a load on the way is higher than the target torque, bolts may not be tightened up because the load on the way is judged to be the target torque.
- At work where members vary, the tightening torque may vary even at the same set torque.
- If you tighten the same bolt twice, overtightening may cause the bolt to break or the bolted member to deform.
- The tightening torque varies with the work conditions. Adjust it in the actual work.
- The bolt tightening torque might change according to the following factors.

Bolt	Bolt diameter (generally, as the diameter becomes large, the tightening torque will increase), torque coefficient (shown by the bolt manufacturer), grade, length, washer presence and type, etc.
Socket	Length, quality of material, deterioration degree, use of universal joint, use of socket adapter, use of extension socket, etc.
Condition of member to tighten	Quality of material, bearing surface finish, etc.
Working method	How you put the tool to a bolt, force that holds the tool, how you align the centre lines of the tool and the bolt, etc. (see the figure below) 

TIGHTENING CONFIRMATION LAMP

You can check the tightening result by seeing the LED lamp on the tool.



Lamp display

Lamp display		Meaning of display	Details
Green	Lit for 2 s + Buzzer (depending on the setting)	Work judged OK	The tightening work reached the set shut-off torque successfully.
Red	Lit for 2 s + Buzzer (depending on the setting)	Work judged NOK	The tightening work did not reach the set shut-off torque. Refer to P99
		Tool error	If any error is shown on the control panel display, take action according to the error description. Refer to P97
Red	Lit continuously + Buzzer	Motor high temperature	The motor of the tool may be hot.
		Torque sensor error Torque sensor protection	Abnormality, failure, etc. was detected in the torque sensor.
		Maintenance Interval Alarm Lock Mode	The tool is locked because it reached the maintenance timing that was set in [Maintenance Interval Alarm]. Also check that the setting value (1 to 99) and “0” are shown alternately on the control panel display. Refer to P25

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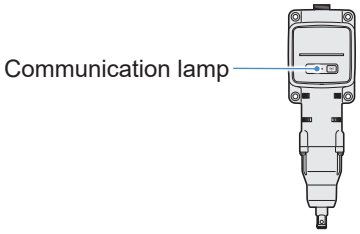
TIGHTENING CONFIRMATION LAMP

Lamp display		Meaning of display	Details
Yellow	Blinking (1 s cycle) + buzzer	Communication error	Cannot communicate with the controller.
		Parameter error	An invalid parameter was detected.
		Memory error	The memory usage has reached the upper limit.
		Undervoltage	An input voltage lower than specified was detected.
		Overvoltage	An input voltage higher than specified was detected.
		Time-out error	Operation continued for more than 5 minutes.
		Emergency stop error	The controller issued an emergency stop command (as specified in the setting).

COMMUNICATION LAMP

You can check the communication status by seeing the LED lamp on the tool.



Lamp display

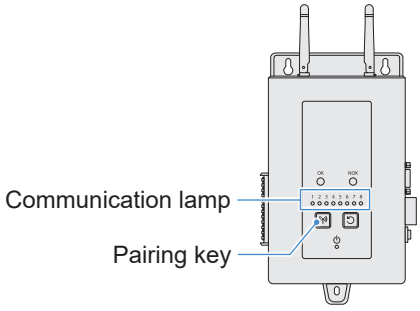
Lamp display		Meaning of display	Details
Blue	Blinking fast (0.2 s cycle)	Communicating	Communicating with the controller.
Blue	Blinking fast (0.2 s cycle)	Pairing in progress	The communication lamp blinks fast while pairing is in progress.
Blue	Blinking slowly (1 s cycle)	Reconnection in progress	The communication lamp blinks slowly while reconnection is in progress.
Blue	Blinking (0.2 s cycle) + buzzer	Pairing completed	The communication lamp starts blinking slowly (0.5 s cycle) after pairing is completed. After pairing is completed, the tool enters a “Waiting for a wireless signal” or a “Wireless operation prohibited” state at a command from the controller.
Blue	Blinking slowly (1 s cycle)	Waiting for a wireless signal	The communication lamp blinks slowly while the tool is in the wireless communication mode.
–	Off	Wireless operation prohibited	The tool’s operation is disabled by an operation prohibition signal from the controller.

PAIRING WITH THE CONTROLLER

Enabling Pairing

Use the Pairing key on the controller unit (EYFRW2).
Select the communication lamp of the number with no registration (lamp off) and hold the Pairing key down to enter the pairing mode.
During 2 minutes of the pairing mode, start the pairing mode on a tool within the coverage to automatically establish pairing.
If pairing is not established within the time, the pairing mode will end.

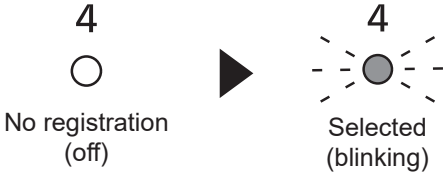
• After you attempt to start pairing, it may take some time until the controller enters the pairing mode.



■ To register Tool No. 4

1 Press the Pairing key on the controller 4 times to select Tool No. 4.

Communication lamp No. 4 blinks.



2 While No. 4 is selected, hold down the Pairing key on the controller to enter the pairing mode of Tool No. 4.

In the pairing mode, Communication lamp No. 4 starts blinking rapidly.

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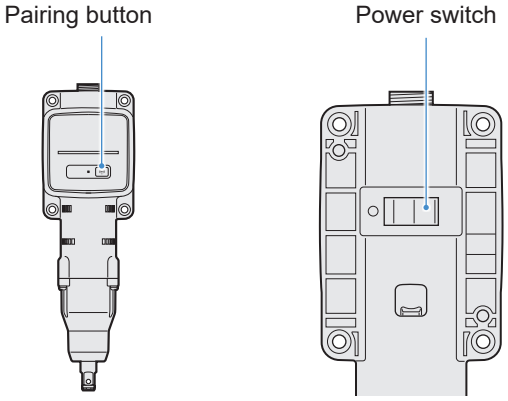
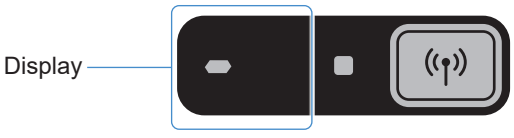
PAIRING WITH THE CONTROLLER

3 On the tool (this product), while holding down the Pairing button, turn ON the power switch.

The tool enters the pairing mode.



When the tool enters pairing mode, Display on Control panel indicates the pairing mode.



Wireless communication is automatically established and pairing registration is completed.
When pairing registration is completed, Communication lamp No. 4 on the controller stays lit.

• If pairing fails, cancel pairing on the controller and then try again.

Pairing mode (rapid blinking) ▶ Registered (on)

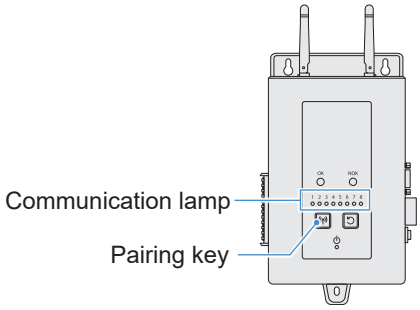
Note

- You can enable pairing by setting in the setting screen in addition to using the key on the unit.
- For how to enable pairing in the setting screen and details on operation of the controller, see the Operating Instructions supplied with the controller.

PAIRING WITH THE CONTROLLER

Cancelling Pairing

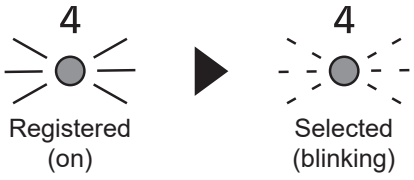
Use the Pairing key on the controller unit (EYFRW2).
Select the communication lamp of the tool number you want to cancel registration (lamp on) and hold the pairing key down to cancel pairing registration.



■ To cancel Tool No. 4

1 Press the Pairing key on the controller 4 times to select Tool No. 4.

Communication lamp No. 4 blinks.



2 While No. 4 is selected, hold down the Pairing key on the controller to cancel pairing registration of Tool No. 4.

When pairing is cancelled, Communication lamp No. 4 stops blinking and turns off.

Note

- You can cancel pairing by setting in the setting screen in addition to using the key on the unit.
- For how to cancel pairing in the setting screen and details on operation of the controller, see the Operating Instructions supplied with the controller.

SETTING VIA A WEB BROWSER

DISPLAYING THE SETTING SCREEN

1 Displaying the Top Page

Refer to “Displaying the Setting Screen” to “Connecting via Network” in “PREPARATION BEFORE USE” of the Operating Instructions of the controller (EYFRW2) and make settings via a web browser to display the top page.

2 Displaying the Tool Screen

① In the top page (the initial page of the setting screen), click [Settings] on the top and select the “Connected tool” tab.
② In the “Connected tool” screen, click the desired tool number.
The screen for the tool number is displayed.

DISPLAYING THE SETTING SCREEN

3 Displaying the Setting Screen

From the “Parameter”, “Batch”, “Job”, and “Device settings” tabs in the screen for the tool number, make settings of Parameter, Batch, Job, and Device settings.
* To switch the tool, select the desired one from the tool list.

Setting Parameters Refer to P28

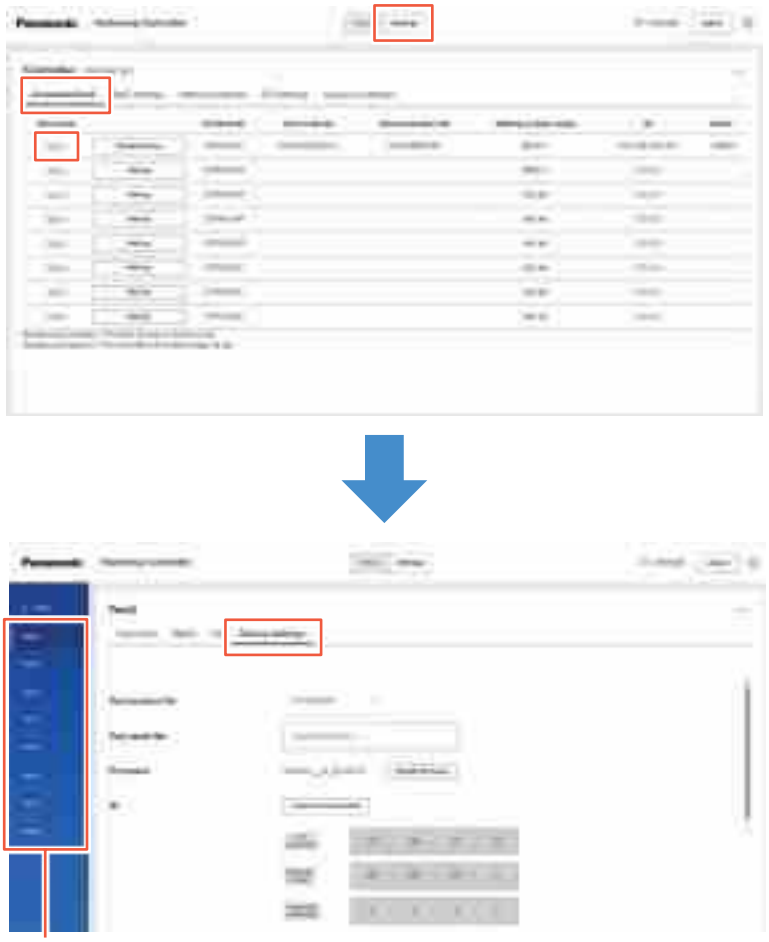
Setting a Batch Refer to P73

Setting a Job Refer to P74

Setting a Tool Refer to P23

DISPLAYING THE TOOL SETTING SCREEN

In the top page (the initial page of the setting screen), click [Settings] on the top and select the “Connected tool” tab.
In the “Connected tool” screen, click the desired tool number.
From the “Device settings” tab in the screen for the tool number, you can make basic settings of the tool and enter common parameters.
* To switch the tool, select the desired one from the tool list.



Tool list

TOOL SETTING ITEMS LIST

Tool product No

Select the tool product number.

[Default] Blank
[Setting range] Selectable from the pull-down menu

* Automatically selected if you establish pairing beforehand.
* The tool product number cannot be changed after pairing. Cancel pairing and then change it.

Tool serial No

You can set and display the tool's unit identification.

[Default] 5-digit model ID + 8-digit serial number (2-digit manufacturing year + 2-digit month + 4-digit production lot)
[Setting range] 13 to 16 alphanumeric characters

* The model number may not be recognised correctly if the information is changed. Do not change it unless required by the management rule.

Firmware

The firmware version of the tool communication part on the controller (EYFRW2) is displayed.
Click [Update firmware] to update the firmware.
For how to update, see "Updating the Firmware" in the Operating Instructions of the controller.

Tool's clock

The tool's clock is displayed. Click [Adjust to controller] to adjust the time.

Timing to send waveform data

You can set whether to send the waveform data per task.

[Default] OFF
[Setting range] OFF or per task

TOOL SETTING ITEMS LIST

Maintenance Interval Alarm (Pulse Time)
[Functional overview] This is an alarm that counts the pulsing time that has been accumulated since the tool started to be used, and reminds you of maintenance timing. When you have 1 hour or less to go before the set time, the control panel display will give you a warning. If the set time is reached, the control panel display will remind you of that, and the tool's motor will be locked (stopped). Initializing the tool will reset the accumulated pulsing time, and also unlock the tool's motor. **CAUTION** • When the tool is initialized, the other parameters will also return to the factory defaults. If you initialize the tool, be sure to reconfigure parameters before using it again. Warning display (changing every 0.5 seconds): Setting value (1 to 99) → -1 → Operation mode (A or C) Stop display (changing every 0.5 seconds): Setting value (1 to 99) → 0
[Default] *0 hours
[Setting value] *0 hours to 99 hours

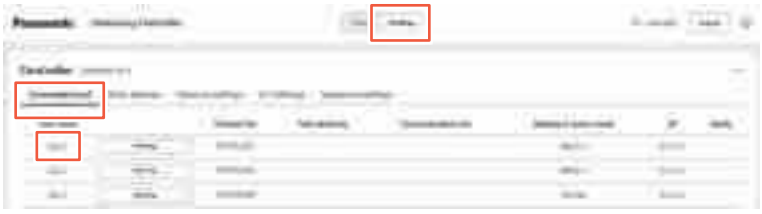
Entering the value with (*) will disable the function.

DELETING THE REGISTRATION INFORMATION

To stop use of a tool or pair a tool with a different product number, delete the pairing information.
* Cancel pairing beforehand.

1 **In the top page (the initial page of the setting screen), click [Settings] on the top and select the “Connected tool” tab.**
The “Connected tool” screen is displayed.

2 **In the “Connected tool” screen, click the desired tool number.**
The screen for the tool number is displayed.



3 **Click ··· (tool option key) and then [Delete tool settings].**
The “Delete tool settings” screen is displayed.

4 **In the “Delete tool settings” screen, click [OK].**

RESETTING TO FACTORY SETTINGS

You can reset a tool to its factory settings.
* Resetting cancels pairing.

1 **In the top page (the initial page of the setting screen), click [Settings] on the top and select the “Connected tool” tab.**
The “Connected tool” screen is displayed.

2 **In the “Connected tool” screen, click the desired tool number.**
The screen for the tool number is displayed.

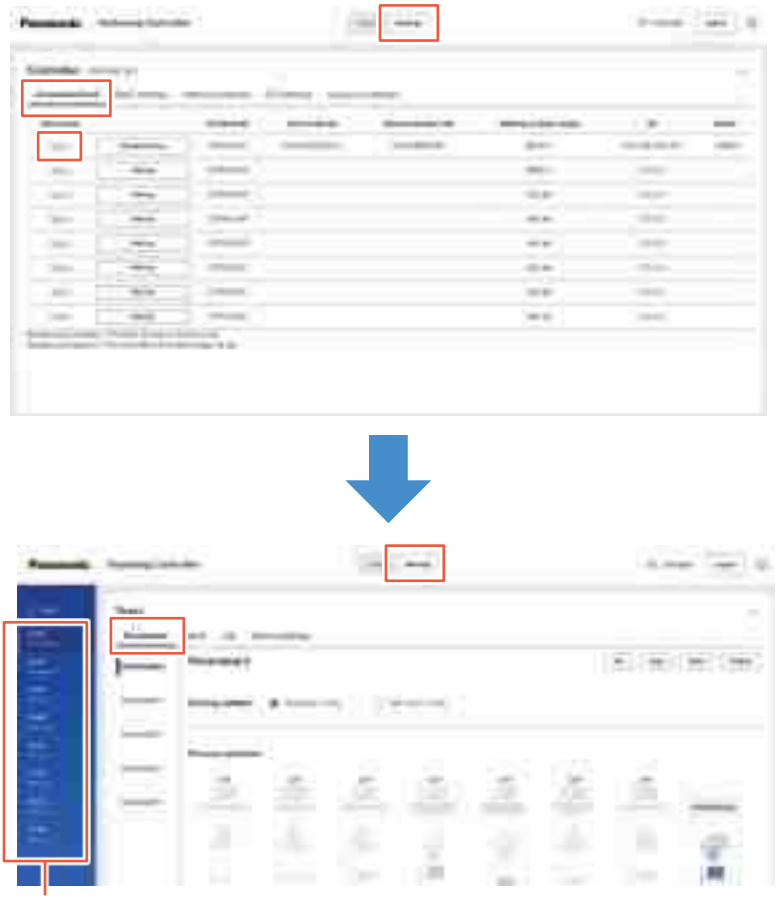
3 **Click ··· (tool option key) and then [Initialize settings].**
The “Initialize settings” screen is displayed.

4 **In the “Initialize settings” screen, click [OK].**

SETTING FASTENING PARAMETERS

DISPLAYING THE PARAMETER SETTING SCREEN

In the top page (the initial page of the setting screen), click [Settings] on the top and select the “Connected tool” tab.
In the “Connected tool” screen, click the desired tool number.
In the screen for the tool number, select the “Parameter” tab to make settings.
You can set five parameters (Parameter 1 to 5) for each tool.
* To switch the tool, select the desired one from the tool list.



SETTING FASTENING PARAMETERS

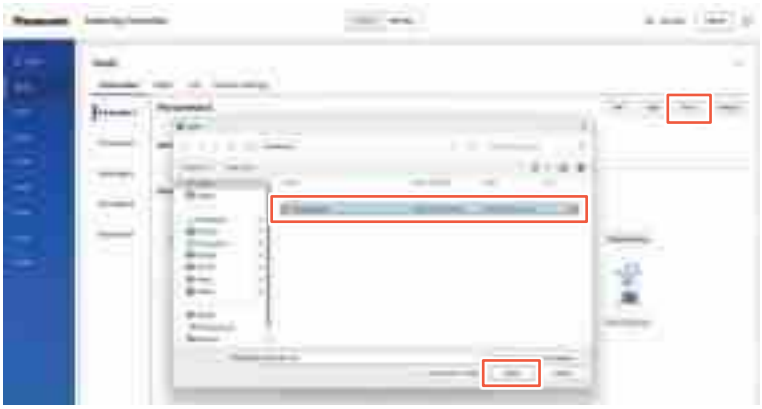
COPYING PARAMETERS

You can copy the set parameter to create a new parameter from it or use it on another tool. In the “Parameter” tab in the screen for the tool number, click [Copy] to display the screen for copying the parameter. In the screen, select the destination and click [Copy]. Copying parameters is allowed only between tools of the same product number.

SETTING FASTENING PARAMETERS

LOADING PARAMETERS

You can register a parameter by loading a parameter file saved in the PC for configuration into the controller.
From the “Parameter” tab in the screen for the tool number, click [Read] and open the parameter file.



EXPORTING PARAMETERS

You can export the created parameter to the PC for configuration.

You can use the exported file as a backup, to copy it to another controller, or to move it to another PC for configuration.

From the “Parameter” tab in the screen for the tool number, click [Output] and save the parameter file.

Do not edit the exported parameter file.
Otherwise it may not be read correctly.

REGISTERING PARAMETERS

Register a parameter to use it to control a tool in “Free mode” of the controller’s running mode.

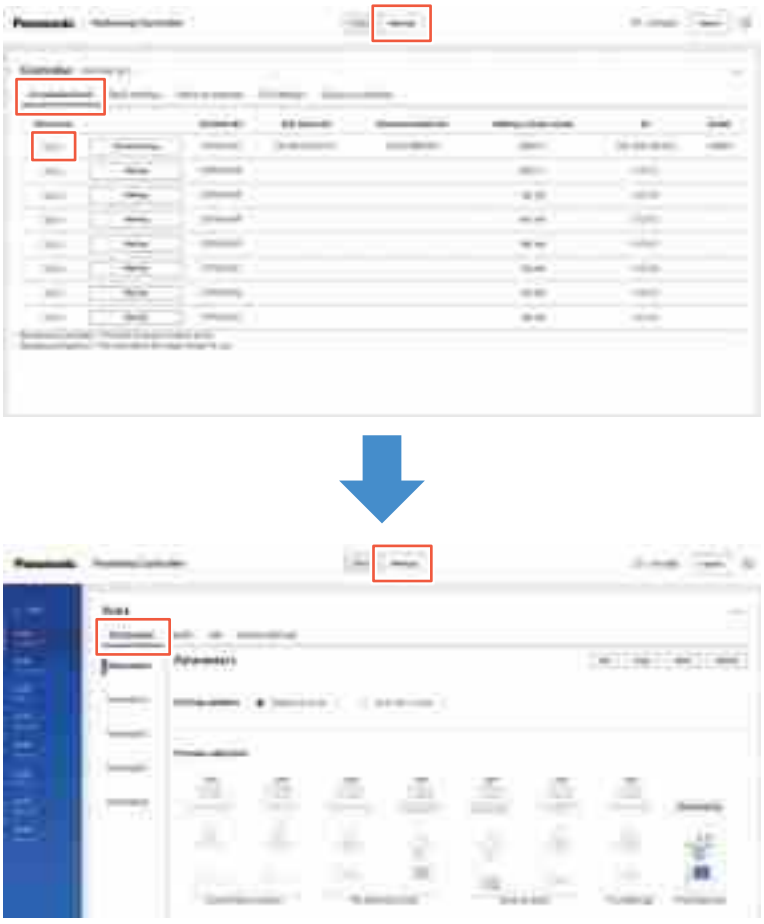
* It is not used in “Repeat mode” and “External control mode”.
  (For “Free mode”, “Repeat mode”, and “External control mode”, see “SETTING THE RUNNING MODE ON THE CONTROLLER”. Refer to P68)

From the “Parameter” tab in the screen for the tool number, click [Set].

SETTING FASTENING PARAMETERS

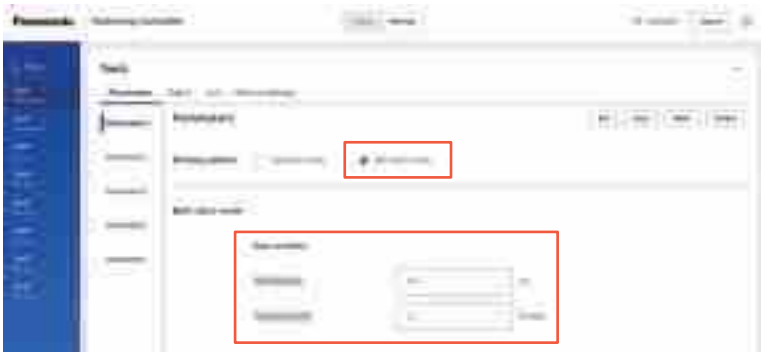
SETTING BASIC PARAMETERS

In the top page (the initial page of the setting screen), click [Settings] on the top and select the “Connected tool” tab.
In the “Connected tool” screen, click the desired tool number.
In the screen for the tool number, select the “Parameter” tab to make settings.



SETTING THE BOLT CATCH MODE

The “Bolt catch mode” drives the tool at a low speed to allow the socket to smoothly catch a bolt to be fastened.
Selecting “Bolt catch mode” in the driving pattern displays the input screen to set “Stop condition”.



CAUTION

- This setting works with individual process settings set in the fastening mode. Note that the content of this mode is synchronized with the fastening mode setting.
- The tool does not operate if the operating time and stop conditions are invalid.
- The fastening history in this mode is not recorded in the controller or tool or communicated to an external device.
- This mode can be included in a batch setting but the fastening in this mode is not taken into account as part of the progress.
- The speed cannot be changed in this mode.
- The maximum operating time in this mode is 6 seconds. If the operating time is blank, operation stops in the time.

SETTING THE BOLT CATCH MODE

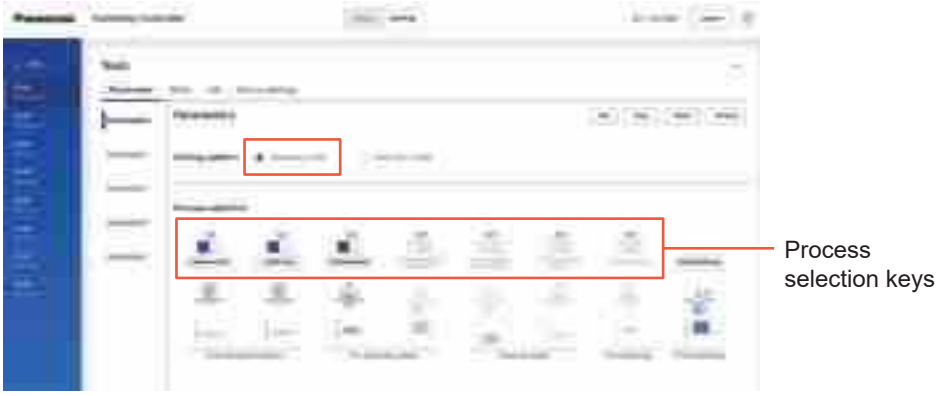
● **Stop condition**

Driving time
[Description] Set the time to operate the tool in the Bolt catch mode.
[Default] *0 s
[Setting range] *0.0 s to 5 s
Impact counts
[Description] Set the number of pulses before stopping the tool operated in the Bolt catch mode.
[Default] *0 times
[Setting range] *0 times to 20 times

Entering the value with (*) will disable the function.

SETTING THE FASTENING MODE

The “Fastening mode” provides the settings to reduce bolt galling and conduct pre fastening and pre fastening reverse.
Selecting the “Fastening mode” in the driving pattern displays the input screen.
Set the process selection keys to ON or OFF to turn the processes on or off.



Processes List

① **Reverse start**
[Description] The tool starts inserting a bolt with reverse rotation to reduce thread galling.
② **Soft start**
[Description] The tool starts inserting a bolt at a low speed to reduce thread galling.
③, ⑦ **Pre fastening**
[Description] Galling is detected when the set number of pulses is reached before the bolt is unconditionally fastened snug-tight.

Continued to the next page ▶▶

SETTING THE FASTENING MODE

④ **Pre fastening snug point**
[Description] The bolt is considered to be fastened snug-tight when the set number of pulses is reached, and the next process starts.
⑤ **Pre fastening reverse judge**
[Description] Galling is detected when the set number of pulses is exceeded while the bolt fastened snug-tight is reverse-rotated.
⑥ **Pre fastening reverse**
[Description] Galling is detected when the set number of pulses is exceeded while the bolt is reverse-rotated.
⑧ **Final fastening**
[Description] The bolt is fastened until the target torque is reached.

SETTING THE FASTENING MODE

Process Setting

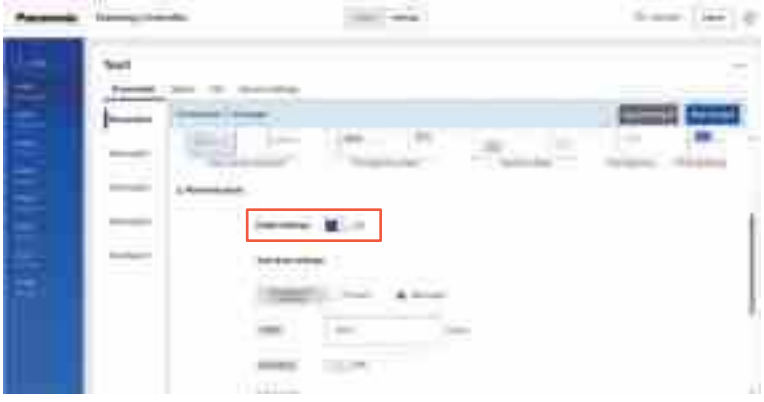
Turning the process on with the process selection key and clicking the process image displays the process setting screen.
Set the tool driving and the condition to transfer to the next process.

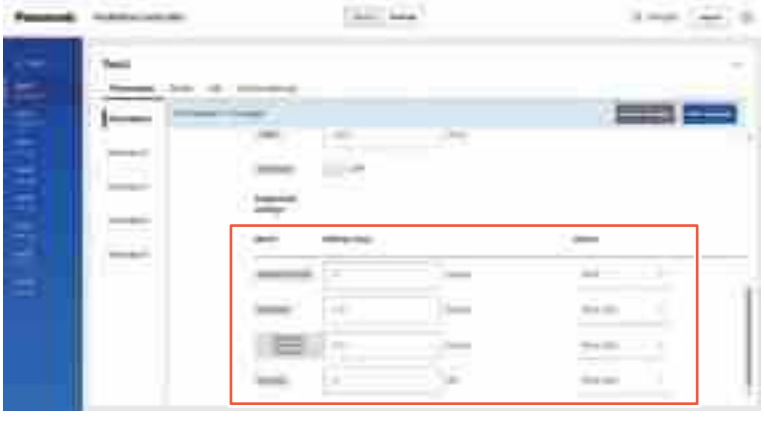
Continued to the next page ▶▶

SETTING THE FASTENING MODE

Process Details Setting

Turning “Detail settings” on in the process setting screen allows setting more details of the driving and the judgement condition to transfer to the next process.





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SETTING THE FASTENING MODE

● **Tool drive settings**

Direction of rotation
[Description] Set the fastening direction.
[Setting range] Forward: Clockwise Reverse: Anticlockwise
RPM
[Description] Set the number of rotations per minute.
[Setting value] 150 rpm to 2300 rpm
Soft start
[Description] Set the number of rotations per minute.
[Setting range] ON: Enabled OFF: Disabled

Continued to the next page ▶▶

SETTING THE FASTENING MODE

● **Judgement settings**

Impact counts
[Description] Select the operation when the set number of impact counts is reached.
[Judgement setting value] 0 times to 255 times [Resulting operation] Next slot (Operation continues) / NOK (Operation stops)
Rotation
[Description] Select the operation when the set number of rotations is reached.
[Judgement setting value] 0.0 times to 6553.5 times [Resulting operation] Next slot (Operation continues) / NOK (Operation stops)
Rotation between impacts
[Description] Select the operation when the set number of rotations between impacts is reached.
[Judgement setting value] 0.0 times to 655.3 times [Resulting operation] Next slot (Operation continues) / NOK (Operation stops)
Current
[Description] Select the operation when the set current is reached.
[Judgement setting value] 0.0 A to 25.5 A [Resulting operation] Next slot (Operation continues) / NOK (Operation stops)

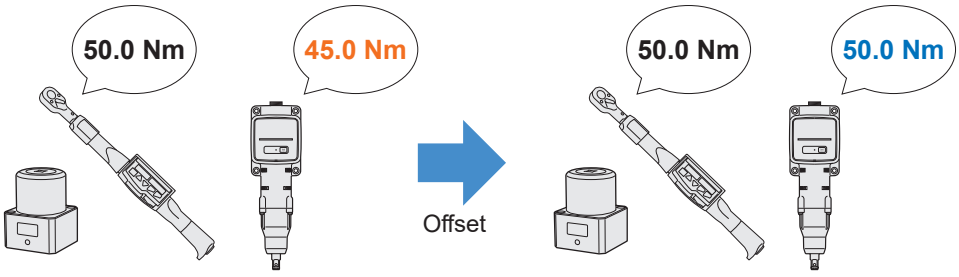
SETTING FASTENING PARAMETERS

SET OFFSETS

Selecting “Fastening mode” and clicking “⑧Final fastening” in the process selection displays the final fastening process setting screen.
Make the setting from “Offset” in the process setting screen.

SET OFFSETS

The torque value shown by the tool and the actual torque on the fastener may differ depending on the damping caused by the socket and/or the joint condition.
In that case, the torque value shown by the tool can be adjusted by Offset setting.



- For the first application, select [Simulate] (①) in Offset on the configured parameter input screen to calculate offset values automatically.
- If the offset values that were previously set for the tool used for work already exist, you can set the same torque performance to the tool by entering those values in [Slope] and [Intercept] (②) on the configured parameter input screen.
  (For details of [Slope] and [Intercept], Refer to P50)

SETTING FASTENING PARAMETERS

SET OFFSETS

Selecting [Simulate] displays the offset setting screen.
Perform the following procedure to set offsets.

CAUTION

- With offsets set, the fastening mode processes ① to ⑦ are inactive and only the final fastening mode is active.

1 **Select a [Socket length] (①) to use from the pulldown menu.**
(If the length that matches the socket to use is not found, select the nearest length.)

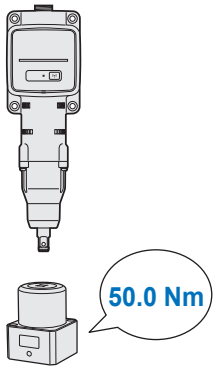
2 **Enter a numerical value that represents [Shut-off Torque] (②).**

3 **Select [Apply(Continue)] (③) to register the settings to the tool.**

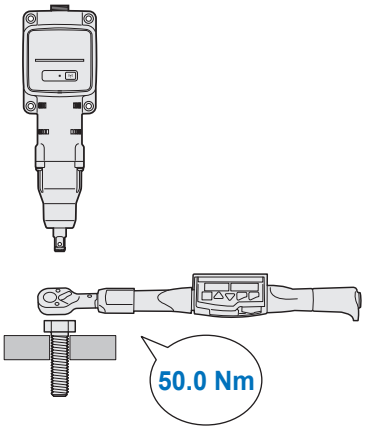
SET OFFSETS

4 **Using a torque tester or a bolt actually used for tightening, do tightening once.**

5 **Check the torque result shown by the torque tester or the torque wrench which retightened the actual bolt (Audit Torque Value).**



Torque tester



SET OFFSETS

6 **Select [Torque result] (④) to import the torque value measured by the tool.**

The imported value is shown in the [Torque result] column (⑤) in the upper display window.

7 **Enter the [Actual torque] (⑥) checked with the torque tester or the torque wrench.**

8 **Select [Calculate] (⑦) to calculate new offset values.**

(At this point, the newly calculated offset values have not been registered in the tool yet.)

9 **Check by % (⑨) the difference between the [Torque result] (⑤) measured by the tool and the [Actual torque] (⑧) in the upper display window.**

10 **If the above difference is small enough, select [Close(End)] (⑩) to end the offset setting.**

If the above difference is still large, select [Apply(Continue)] (⑪) to set the new offset values to the tool and repeat steps 4 to 10 until the difference becomes small enough.

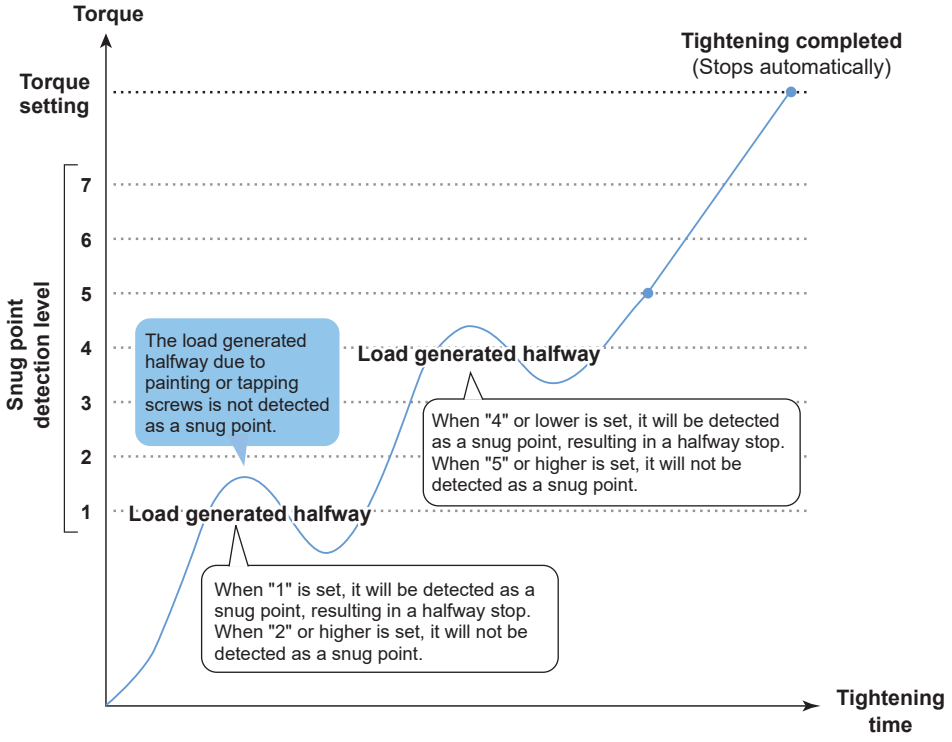
SETTING FASTENING PARAMETERS

SET A SNUG POINT DETECTION LEVEL

Selecting “Fastening mode” and clicking “⑧Final fastening” in the process selection displays the final fastening process setting screen.
Make the setting from “Snug point detection level” in the process setting screen.

SET A SNUG POINT DETECTION LEVEL

The snug point detection level setting is used in the following cases.



Can be set in 7 levels	7: Set for the work with a high load generated halfway 〜 1: Set for the work with a low load generated halfway 0: Snug point detection level function OFF

CAUTION

- Set a snug point detection level from “1”. Setting a snug point detection level from “2–7” may result in cracking or deformation of the target material because of high tightening torque.
- If the tool stops before the snug point at a snug point detection level of “1”, set the snug point detection level to “2–7”.

SETTING FASTENING PARAMETERS

PARAMETER LIST

Shut-Off Torque
[Functional overview] When the tightening torque reaches the set value of shut-off torque, the tool will stop running automatically. Ensure that it is in the range, Torque Upper Limit ≥ Shut-Off Torque ≥ Torque Lower Limit.
[Default value] 20.0 Nm/177.0 In.lbs/14.7 Ft.lbs
[Setting value] 10.0 Nm to 70.0 Nm/88.5 In.lbs to 619.5 In.lbs/7.4 Ft.lbs to 51.6 Ft.lbs **Note** • The range where this tool usage is recommended is as follows: 20.0 Nm to 60.0 Nm/177.0 In.lbs to 531.0 In.lbs/14.7 Ft.lbs to 44.2 Ft.lbs
Torque Upper Limit
[Functional overview] Set the upper limit of torque for judging work OK or NOK. Ensure that it is in the range, Torque Upper Limit ≥ Shut-Off Torque ≥ Torque Lower Limit.
[Default value] *999.9 Nm/*8848.7 In.lbs/*737.4 Ft.lbs
[Setting value] 10.0 Nm to *999.9 Nm/88.5 In.lbs to *8848.7 In.lbs/7.4 Ft.lbs to *737.4 Ft.lbs
Torque Lower Limit
[Functional overview] Set the lower limit of torque for judging work OK or NOK. Ensure that it is in the range, Torque Upper Limit ≥ Shut-Off Torque ≥ Torque Lower Limit.
[Default value] *0 Nm/*0 In.lbs/*0 Ft.lbs
[Setting value] *0 Nm to 70.0 Nm/*0 In.lbs to 619.5 In.lbs/*0 Ft.lbs to 51.6 Ft.lbs

Entering the value with (*) will disable the function.

PARAMETER LIST

Offset_Slope
[Functional overview] This is a coefficient that adjusts the slope of the output torque curve of the tool to the torque curve on the simulated actual workpiece. For setting, you are recommended to use the automatic offset calculation function. (How to set, Refer to P42)
[Default value] 25.00
[Setting value] 0.10 to 500.00
Offset_Intercept
[Functional overview] This is a coefficient that adjusts the intercept of the output torque curve of the tool to the torque curve on the simulated actual workpiece. For setting, you are recommended to use the automatic offset calculation function. (How to set, Refer to P42) **Note** The value of offset (intercept) is the lower limit that the torque sensor can measure with accuracy. Ensure that the set value of “Shut-Off Torque” and/or “Torque Lower Limit” is not less than the value of offset (intercept).
[Default value] 5.00
[Setting value] -1000.00 to 1000.00
Angle Before Snug Upper Limit
[Functional overview] Set the upper limit of the accumulated angle from the start point of the final fastening to a snug point, for judging work OK or NOK. The snug point detection method can be selected from snug point setting.
[Default value] *99999°
[Setting value] 0° to *99999°

Entering the value with (*) will disable the function.

PARAMETER LIST

Angle Before Snug Lower Limit
[Functional overview] Set the lower limit of the accumulated angle from the start point of the final fastening to a snug point, for judging work OK or NOK. The snug point detection method can be selected from snug point setting.
[Default value] *0°
[Setting value] *0° to 99999°
Angle After Snug Upper Limit
[Functional overview] Set the upper limit of the accumulated angle from a snug point during the final fastening to the running stop point, for judging work OK or NOK. The snug point detection method can be selected from snug point setting.
[Default value] *9999°
[Setting value] 0° to *9999°
Angle After Snug Lower Limit
[Functional overview] Set the lower limit of the accumulated angle from a snug point during the final fastening to the running stop point, for judging work OK or NOK. The snug point detection method can be selected from snug point setting.
[Default value] *0°
[Setting value] *0° to 9999°

Entering the value with (*) will disable the function.

PARAMETER LIST

Angle Error Shut-Off
[Functional overview] With this function ON, if the set upper-limit angle is exceeded during tightening work, the tool will stop operating automatically. To use this function, you need to set the upper-limit angle.
[Default value] OFF
[Setting value] ON, OFF
No Load Speed
[Functional overview] Set the anvil rotation speed from the start of the final fastening to the tool pulsing start in 100 rpm steps.
[Default value] 2300 rpm
[Setting value] 1500 rpm to 2300 rpm
Snug Point
[Functional overview] Select a detection method for the snug point. The snug point is used as a reference point to divide angle results into the one before snug and the one after snug. When Pulsing Starts: The point in time when the tool started pulsing is regarded as a snug point. Snug Torque: The point in time when tightening reached the set torque is regarded as a snug point. Select From Graph: Select a desired snug point from the torque waveform data.
[Default value] When Pulsing Starts
[Setting value] When Pulsing Starts, Snug Torque, Select From Graph

PARAMETER LIST

Detection Threshold (Snug Torque)
[Functional overview] The point in time when the tightening torque reached this threshold is judged to be the snug point. This parameter is enabled only when the snug point setting is “Snug Torque.” **Note** • Snug point detection by “Snug Torque” may be less accurate if the absolute value of “Offset_Intercept” is high.
[Default value] 0.0 Nm
[Setting value] 0.0 Nm to 999.9 Nm / 0.0 In.lbs to 8848.7 In.lbs / 0.0 Ft.lbs to 737.4 Ft.lbs
Detection Threshold (Select From Graph)
[Functional overview] The point in time when the tightening torque for a tightening angle of 1° reached not less than this threshold is judged to be the snug point. The value is automatically set by selecting one section on the graph. This parameter is enabled only when the snug point setting is “Select From Graph.” **Note** • If this threshold is set too high, snug point detection might not be made depending on work.
[Default value] 0.0 Nm/1°
[Setting value] 0.0 Nm/1° to 999.9 Nm/1° / 0.0 In.lbs/1° to 8848.7 In.lbs/1° / 0.0 Ft.lbs/1° to 737.4 Ft.lbs/1°
Detection Start Angle (Select From Graph)
[Functional overview] Unless the accumulated tightening angle reaches this value, snug point detection does not start. This parameter is enabled only when the snug point setting is “Select From Graph.”
[Default value] 0°
[Setting value] 0° to 99999°

PARAMETER LIST

Snug Point Detection Level
[Functional overview] This setting changes the load level for bolt snug point detection. Increasing the snug point detection level can prevent the tool from stopping before a bolt reaches the snug point because of a high load during tightening. (Depending on the work, even if the snug point detection level is increased, the tool might stop before the snug point.)
[Default value] *0
[Setting value] *0 to 7
Rundown Error Detection
[Functional overview] If the tool shuts off before the set time passes from the start of the final fastening, the fastening will be judged as NOK.
[Default value] *0.0 s
[Setting value] *0.0 s to 3.0 s
Ignore Rundown Result Before Snug
[Functional overview] When this function is ON, if the fastening is interrupted with the trigger signal turned off before the snug point, the history log will not be recorded. From the “Snug Point” parameter, set the method for determining the snug point.
[Default value] OFF
[Setting value] ON, OFF

Entering the value with (*) will disable the function.

PARAMETER LIST

Snug Torque Detection Delay
[Functional overview] The tool will not shut off even if a load temporarily exceeds the set shut-off torque before the set time passes from the start of the final fastening.
[Default value] *0.0 s
[Setting value] *0.0 s to 3.0 s
Buzzer
[Functional overview] This is a condition option for sounding a buzzer when work is complete. OFF: A buzzer is not set off after work is complete. Buzzer OK: After work is complete, a buzzer is set off when the result is OK. Buzzer NOK: After work is complete, a buzzer is set off when the result is NOK.
[Default value] OFF
[Setting value] OFF, Buzzer OK, Buzzer NOK
Bolt catch mode
[Functional overview] The mode allows the socket to smoothly catch a bolt to be fastened.
[Default value] Driving time: *0.0 s Impact counts: *0 times
[Setting value] Driving time: *0.0 s to 5.0 s Impact counts: *0 times to 20 times

Entering the value with (*) will disable the function.

PARAMETER LIST

Reverse start
[Functional overview] The tool starts inserting a bolt with reverse rotation to reduce thread galling.
[Default value] No-load speed: 2300 rpm Number of rotations: *0.0 times Number of pulses: *0 times
[Setting value] No-load speed: 500 rpm to 2300 rpm
[Transfer judgement condition] Number of rotations: *0.0 times to 6553.5 times
[NOK judgement condition] Number of pulses: *0 times to 255 times
Soft start
[Functional overview] The tool starts inserting a bolt at a low speed to reduce thread galling.
[Default value] No-load speed: 350 rpm Number of rotations: *0.0 times Number of pulses: *0 times
[Setting value] No-load speed: 150 rpm to 350 rpm
[Transfer judgement condition] Number of rotations: *0.0 times to 6553.5 times
[NOK judgement condition] Number of pulses: *0 times to 255 times

Entering the value with (*) will disable the function.

PARAMETER LIST

Pre fastening
[Functional overview] Galling is detected when the set number of pulses is reached before the bolt is unconditionally fastened snug-tight.
[Default value] No-load speed: 2300 rpm Number of rotations: *0.0 times Number of pulses: *0 times
[Setting value] No-load speed: 500 rpm to 2300 rpm
[Transfer judgement condition] Number of rotations: *0.0 times to 6553.5 times
[NOK judgement condition] Number of pulses: *0 times to 255 times
Pre fastening snug point
[Functional overview] The bolt is considered to be fastened snug-tight when the set number of pulses is reached, and the next process starts.
[Default value] No-load speed: 2300 rpm Number of pulses: *0 times Number of rotations: *0.0 times
[Setting value] No-load speed: 500 rpm to 2300 rpm
[Transfer judgement condition] Number of pulses: *0 times to 255 times
[NOK judgement condition] Number of rotations: *0.0 times to 6553.5 times

Entering the value with (*) will disable the function.

PARAMETER LIST

Pre fastening reverse judge
[Functional overview] Galling is detected when the set number of pulses is exceeded while the bolt fastened snug-tight is reverse-rotated.
[Default value] No-load speed: 2300 rpm Number of rotations between impacts: *0.0 times Number of pulses: *0 times
[Setting value] No-load speed: 500 rpm to 2300 rpm
[Transfer judgement condition] Number of rotations between impacts: *0.0 times to 655.3 times
[NOK judgement condition] Number of pulses: *0 times to 255 times
Pre fastening reverse
[Functional overview] Galling is detected when the set number of pulses is exceeded while the bolt is reverse-rotated.
[Default value] No-load speed: 2300 rpm Number of rotations: *0.0 times Number of pulses: *0 times
[Setting value] No-load speed: 500 rpm to 2300 rpm
[Transfer judgement condition] Number of rotations: *0.0 times to 6553.5 times
[NOK judgement condition] Number of pulses: *0 times to 255 times

Entering the value with (*) will disable the function.

PARAMETER LIST

Below are the detailed settings and judgement conditions of the fastening mode processes ① to ⑦.

Tool drive settings	
[Functional overview] Detailed driving settings can be set.	
[Default value] Direction of rotation: RPM: Soft start:	 Forward Default speed of each process Disable
[Setting value] Direction of rotation: RPM: Soft start:	 Forward/Reverse 150 rpm to 2300 rpm Enable/Disable
Judgement settings	
[Functional overview] Resulting operation is decided based on the set judgement setting values.	
[Default value] Number of pulses: Number of rotations: Number of rotations between impacts: Current: Resulting operation:	 *0 times *0.0 times *0.0 times *0.0 A Next slot
[Setting value] Number of pulses: Number of rotations: Number of rotations between impacts: Current: Resulting operation:	 *0 times to 255 times *0.0 times to 6553.5 times *0.0 times to 655.3 times *0.0 A to 25.5 A Next slot, NOK

Entering the value with (*) will disable the function.

CHECKING THE FASTENING HISTORY DATA

DISPLAYING THE FASTENING HISTORY DATA

In the top page (the initial page of the setting screen), click [History] on the top and select the “Fastening history” tab.
You can view the fastening history data sent from tools to the controller.
To display the data, select the desired controller and tools from the tool list on the left and click [Get data] on the upper right.
The fastening history logs are displayed from newest to oldest.

Tool list

DISPLAYING THE FASTENING HISTORY DATA

Extracting the Fastening History Logs by Time Period

Click [Filter] and specify the time period to narrow down the fastening history logs to display.

Setting Items to Display

To change the displayed items, click [Show Items] and select the desired items.

CHECKING THE FASTENING HISTORY DATA

FASTENING HISTORY DATA ITEMS

Count
[Display overview] A number counts up in the order that work was done.
Date
[Display overview] This shows the date when work was done.
Time
[Display overview] This shows the time when work was done.
Work Result
[Display overview] The result of work is judged OK or NOK. The OK/NOK judgment criteria are as follows. OK: A shut-off stop made successfully without any error, NOK: A shut-off stop incomplete, or made with an error
NOK Message
[Display overview] When the work result is NOK, the reason for NOK is displayed in the Torque, Angle, or Error category. If the reason for NOK is classified as Error, the error details will be displayed in the error message on the last line of the fastening history log.
Shut-off Torque
[Display overview] This shows the configured parameter of torque that makes the tool shut off.
Upper Torque Limit
[Display overview] This shows the configured parameter of the upper limit of torque for judging the work result OK.
Lower Torque Limit
[Display overview] This shows the configured parameter of the lower limit of torque for judging the work result OK.
Torque Result
[Display overview] This shows the result value of torque that the tool output at the work concerned.

FASTENING HISTORY DATA ITEMS

Upper Angle Limit (Before Snug)
[Display overview] This shows the configured parameter of the upper limit of angle before snug for judging the work result OK. The angle before snug is an anvil turning angle from the start point of the final fastening to the snug point set by the snug point parameter.
Lower Angle Limit (Before Snug)
[Display overview] This shows the configured parameter of the lower limit of angle before snug for judging the work result OK. The angle before snug is an anvil turning angle from the start point of the final fastening to the snug point set by the snug point parameter.
Angle (Before Snug)
[Display overview] This shows the result value of the angle before snug of the work concerned. The angle before snug is an anvil turning angle from the start point of the final fastening to the snug point set by the snug point parameter.
Upper Angle Limit (After Snug)
[Display overview] This shows the configured parameter of the upper limit of angle after snug for judging the work result OK. The angle after snug is an anvil turning angle from the snug point set by the snug point parameter to the end of work.
Lower Angle Limit (After Snug)
[Display overview] This shows the configured parameter of the lower limit of angle after snug for judging the work result OK. The angle after snug is an anvil turning angle from the snug point set by the snug point parameter to the end of work.
Angle (After Snug)
[Display overview] This shows the result value of the angle after snug of the work concerned. The angle after snug is an anvil turning angle from the snug point set by the snug point parameter to the end of work.
Number of Pulse
[Display overview] This shows the number of pulses that the tool emitted at the work concerned.

CHECKING THE FASTENING HISTORY DATA

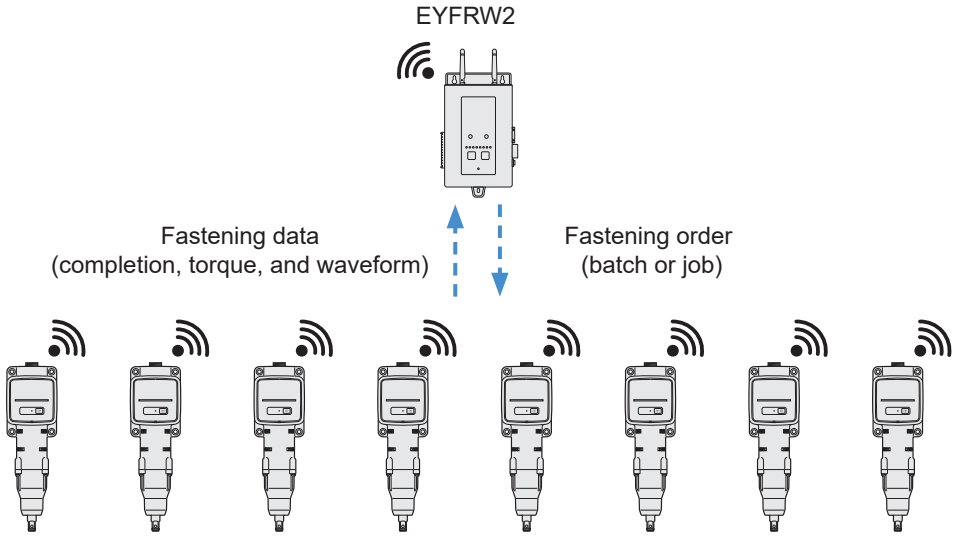
FASTENING HISTORY DATA ITEMS

Fastening Time
[Display overview] This shows the time from the start to the end of the final fastening.
Battery Level
[Display overview] Not used. This is left blank.
Offset Slope
[Display overview] This shows the configured parameter of the coefficient for converting the output voltage of the torque sensor into torque.
Offset Intercept
[Display overview] This shows the configured parameter of the coefficient for converting the output voltage of the torque sensor into torque.
Snug Point Detection Level
[Display overview] This shows the snug point detection level set from the transient load level.
NOK Slot Information
[Display overview] This shows the process number with an error if an error occurs in the processes ① to ⑦.
Error Message
[Display overview] When the reason for NOK, the work result displayed on the NOK message, is classified as Error, details of the error are displayed. (For details of error messages, Refer to P99)
External Input Information
[Display overview] This shows the information input to the controller by a barcode reader, etc.

FASTENING CONTROL FROM THE CONTROLLER

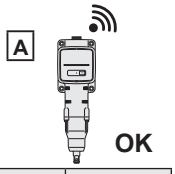
Fastening with up to 8 units can be controlled by connecting them to the controller.
The controller receives the fastening data per task to count the fastened bolts.

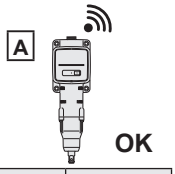
Maximum number of connected devices: 8



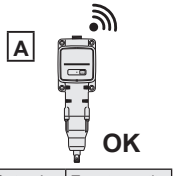
TYPICAL FASTENING CONTROL COMBINATIONS ON THE CONTROLLER

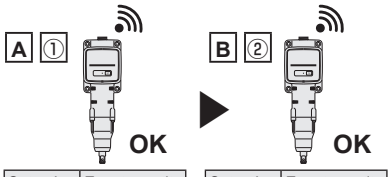
You can create different combinations of fastening control settings. See typical combinations as below.

<table>
<tr><th rowspan="2">Mode</th><th rowspan="2">[Free mode]</th><th colspan="2">[Repeat mode]</th></tr>
<tr><th>[Basic mode]</th><th>[Sequence mode]</th></tr>
<tr><td>Pass criterion</td><td>–
(The quantity is not specified)</td><td>Fastening the target quantity is completed</td><td>Tools complete fastening the respective target quantities in the specified order</td></tr>
<tr><td>[Batch] “Single set value” (Fastening in the same condition) * Single type of workpiece</td><td> 

<table><tr><th>Set value</th><th>Target quantity</th></tr><tr><td>10 Nm</td><td>∞</td></tr></table>
Parameter</td><td> 

<table><tr><th>Set value</th><th>Target quantity</th></tr><tr><td>10 Nm</td><td>10</td></tr></table>
Batch</td><td> 

<table><tr><th>Set value</th><th>Target quantity</th></tr><tr><td>10 Nm</td><td>10</td></tr></table>
<table><tr><th>Set value</th><th>Target quantity</th></tr><tr><td>20 Nm</td><td>5</td></tr></table>
Batch and Sequence</td></tr>
<tr><td>[Job] Multiple set values (Fastening in different conditions) * Multiple types of workpiece</td><td></td><td> 

<table><tr><th>Set value</th><th>Target quantity</th></tr><tr><td>10 Nm</td><td>2</td></tr><tr><td>20 Nm</td><td>3</td></tr><tr><td>30 Nm</td><td>5</td></tr></table>
Job</td><td> 

<table><tr><th>Set value</th><th>Target quantity</th></tr><tr><td>10 Nm</td><td>2</td></tr><tr><td>20 Nm</td><td>3</td></tr><tr><td>30 Nm</td><td>5</td></tr></table>
<table><tr><th>Set value</th><th>Target quantity</th></tr><tr><td>20 Nm</td><td>5</td></tr><tr><td>30 Nm</td><td>10</td></tr></table>
Job and Sequence</td></tr>
<tr><td>Remark</td><td>–</td><td>* A job can contain up to 10 steps.</td><td>* A sequence can contain up to 10 steps.</td></tr>
</table>

NUMBER OF COMBINATIONS THAT CAN BE REGISTERED ON THE CONTROLLER

See the number of combinations that can be registered in the controller as below.

Controller's mode		Tool's setting	Number of combinations that can be registered
Free mode		Parameter	○ 5 combinations per tool
Repeat mode	Basic mode (Independent control)	Batch	○ 5 combinations per tool
		Job	○ 5 combinations per tool
	Sequence mode (Sequential control)	Batch/Job	○ 5 combinations
External control mode		–	○

SETTING THE RUNNING MODE ON THE CONTROLLER

Set the running mode of the controller as below.

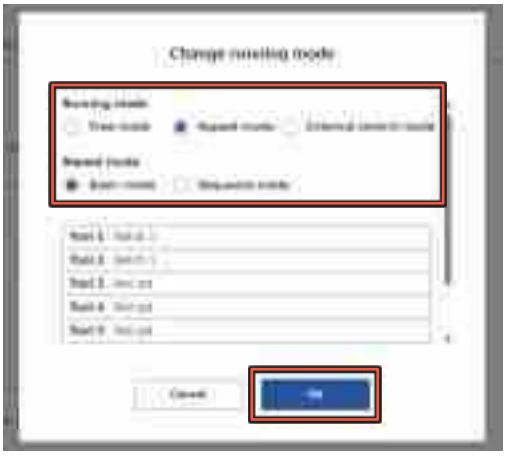
1 **In the top page (the initial page of the setting screen), click [Settings] on the top and select the “Basic settings” tab.**

2 **In the “Basic settings” tab, click [Change running mode].**

The “Change running mode” screen is displayed.

3 **Select a “Running mode” and click [OK].**

The running mode is set.
Select a running mode from “Free mode”, “Repeat mode”, and “External control mode”.
For “Repeat mode”, select “Basic mode” or “Sequence mode”.
Refer to P69 to 72

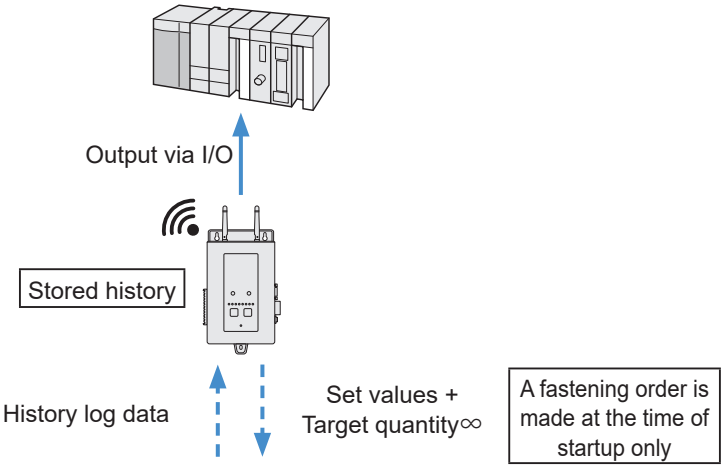


* Register “Parameter” before setting to “Free mode”.
* Register a “Batch/Job” before setting to “Repeat mode”.

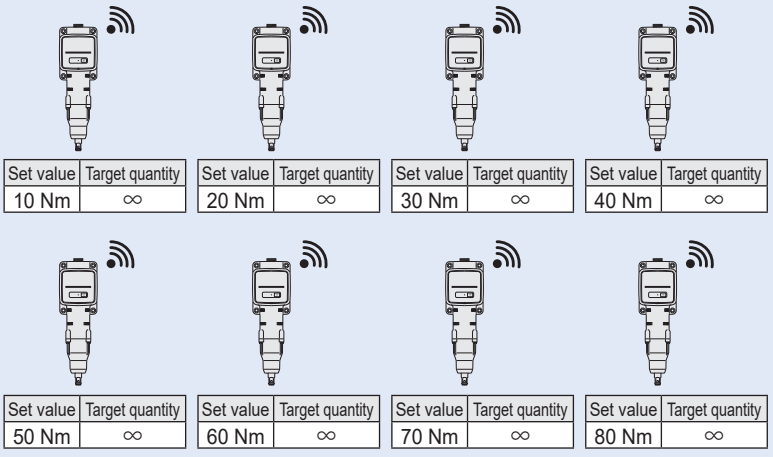
SETTING THE RUNNING MODE ON THE CONTROLLER

Free Mode

This mode allows for unconditional fastening without specifying the quantity to fasten.
Tools use pre-registered parameters for fastening.
Up to 8 tools can conduct independent operation.
The output settings via I/O on the controller are enabled.
* Use the mode when the fastened quantity is counted by an external device.



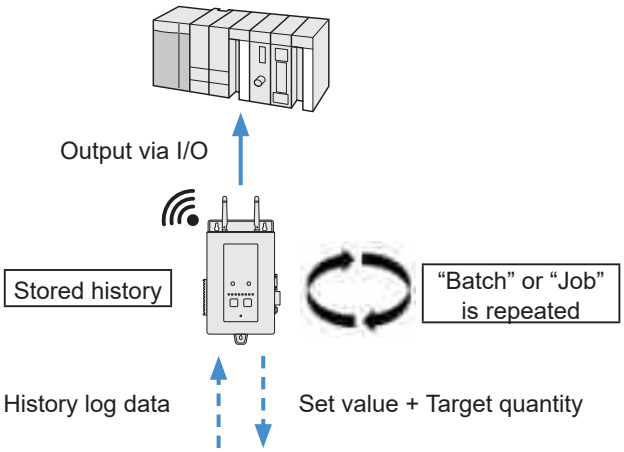
Up to 8 tools can be controlled at the same time



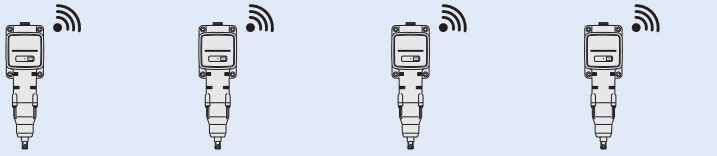
SETTING THE RUNNING MODE ON THE CONTROLLER

Repeat Mode (Basic Mode)

This mode repeats a “Batch” or “Job” process.
Tools use pre-registered “Batch” or “Job” settings for fastening.
Up to 8 tools can conduct independent operation.
The output settings via I/O on the controller are enabled.



Up to 8 tools can be controlled at the same time

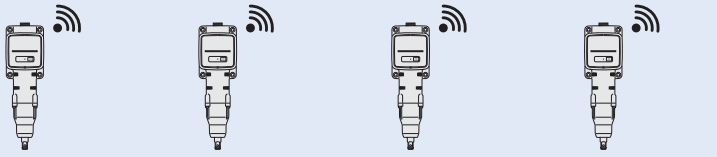


Set value	Target quantity
10 Nm	10

Set value	Target quantity
20 Nm	10

Set value	Target quantity
30 Nm	10

Set value	Target quantity
40 Nm	10



Set value	Target quantity
50 Nm	10
60 Nm	5
70 Nm	5

Set value	Target quantity
60 Nm	10
70 Nm	5
80 Nm	5

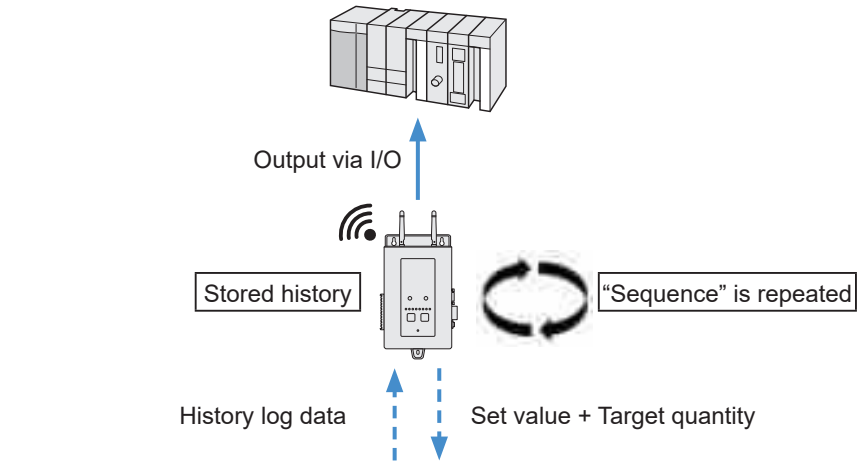
Set value	Target quantity
70 Nm	10
80 Nm	5
90 Nm	5

Set value	Target quantity
80 Nm	10
90 Nm	5
10 Nm	5

SETTING THE RUNNING MODE ON THE CONTROLLER

Repeat Mode (Sequence Mode)

This mode repeats a “Sequence” process where available tools are controlled in order.
Tools use pre-registered “Sequence” settings for sequential fastening.
Up to 10 steps can be set. A sequence supports up to 8 tools but allows only one tool to operate at a time.
The output settings via I/O on the controller are enabled.



① Set value	Target quantity
10 Nm	10

② Set value	Target quantity
20 Nm	10

③ Set value	Target quantity
30 Nm	10

④ Set value	Target quantity
40 Nm	10

⑤ Set value	Target quantity
50 Nm	10
60 Nm	5
70 Nm	5

⑥ Set value	Target quantity
60 Nm	10
70 Nm	5
80 Nm	5

⑦ Set value	Target quantity
70 Nm	10
80 Nm	5
90 Nm	5

⑧ Set value	Target quantity
80 Nm	10
90 Nm	5
10 Nm	5

SETTING THE RUNNING MODE ON THE CONTROLLER

External Control Mode

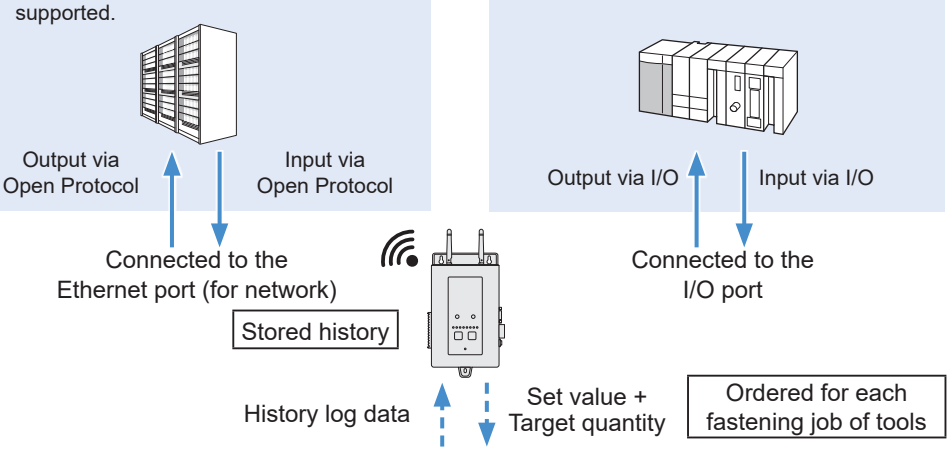
This mode allows for fastening control as ordered by an external device (host system).
The following 2 types of control are supported.

● Control via Open Protocol (with Open Protocol enabled)

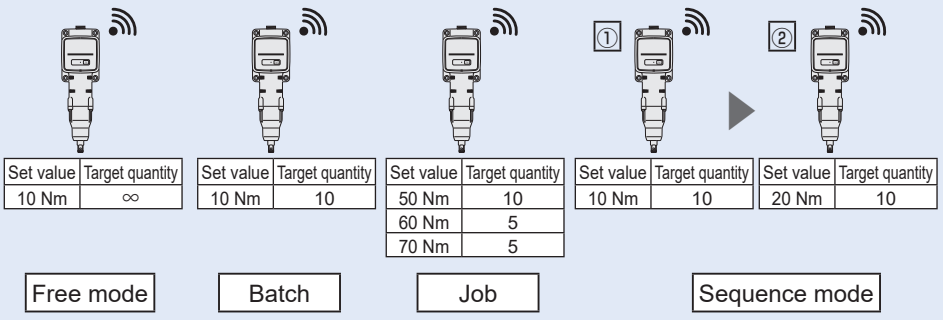
Fastening is controlled via Open Protocol by a host system.
Up to 8 tools can be controlled independently.
* Job and sequence controls are not supported.

● Control via I/O (with Open Protocol disabled)

Fastening is controlled by inputs via the I/O port from an external device.
Up to 8 tools can be controlled independently or sequentially.



*** More than one tool can be controlled at the same time (except for "Sequence")**



Set value	Target quantity
10 Nm	∞

Free mode

Set value	Target quantity
10 Nm	10

Batch

Set value	Target quantity
50 Nm	10
60 Nm	5
70 Nm	5

Job

Set value	Target quantity
10 Nm	10

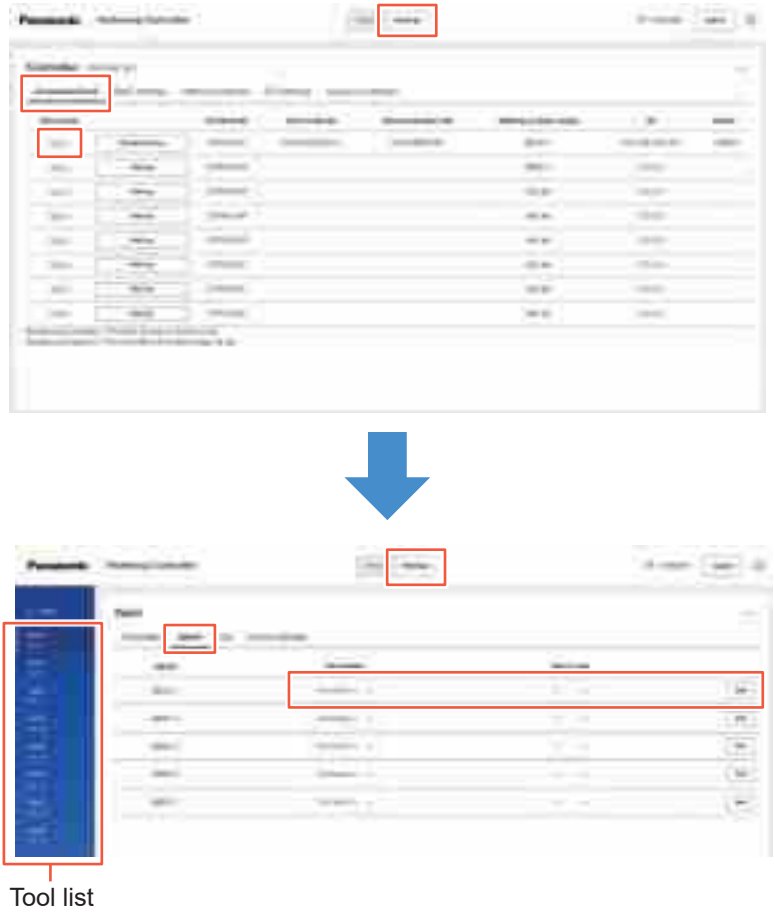
Set value	Target quantity
20 Nm	10

Sequence mode

* If the controller turns off during fastening, fastening does not resume after the controller turns on. Fastening starts again when ordered by an external device.
* The I/O output settings are enabled.

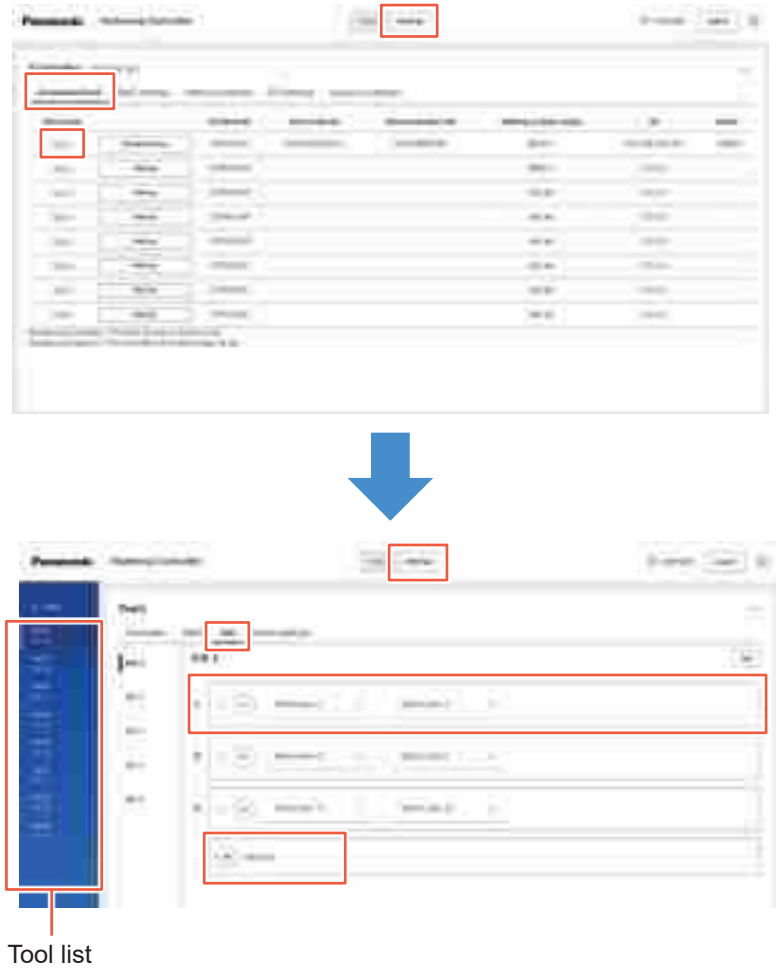
CREATING (SETTING) A BATCH

In the top page (the initial page of the setting screen), click [Settings] on the top and select the “Connected tool” tab. In the “Connected tool” screen, click the desired tool number.
In the screen for the tool number, select the “Batch” tab and make settings.
Select a parameter from the “Parameter” pull-down menu and set “Batch size” (quantity to fasten, up to 99). Click [Set] to set the values for “Repeat mode (Basic mode)”.
* To switch the tool, select the desired one from the tool list.
* Up to 5 batches can be registered.



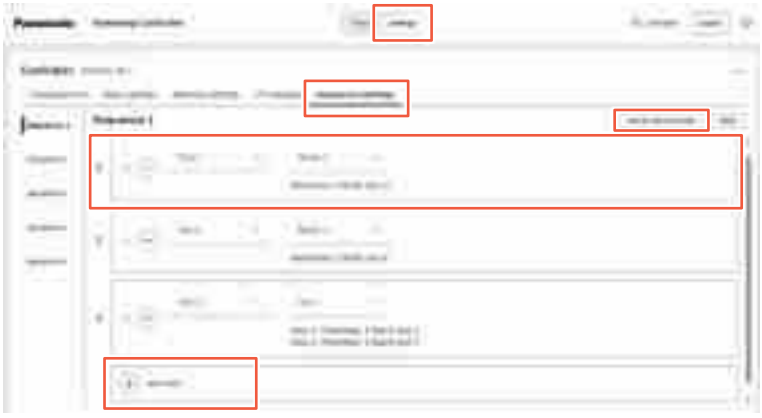
CREATING (SETTING) A JOB

In the top page (the initial page of the setting screen), click [Settings] on the top and select the “Connected tool” tab. In the “Connected tool” screen, click the desired tool number.
In the screen for the tool number, select the “Job” tab and make settings.
Select a parameter from the “Parameter” pull-down menu and set “Batch size” (quantity to fasten, up to 99). Click [Set] to set the values for “Repeat mode (Basic mode)”.
* Up to 5 jobs can be registered.
* Up to 10 steps can be registered per job.
* To switch the tool, select the desired one from the tool list.



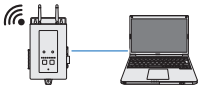
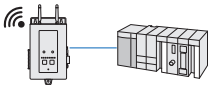
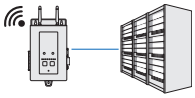
CREATING (SETTING) A SEQUENCE

In the top page (the initial page of the setting screen), click [Settings] on the top and select the “Sequence settings” tab.
In the “Sequence settings” screen, select a tool from the “Tool” pull-down menu and set “Batch” or “Job”.
Click [Set as running mode] to set the values for “Repeat mode (Sequence mode)”.
* Up to 5 sequences can be registered.
* Up to 10 steps can be registered per sequence.
* The same tool can be used more than once in a sequence.



SUPPORTED TYPES OF EXTERNAL DEVICES

The controller supports the following types of external devices.
For details, refer to the Operating Instructions of the controller (EYFRW2).

Feature	PC for Configuration	PLC	Customer's Host System
Illustration			
Communication method	Ethernet	I/O	Ethernet
Communication protocol	http/https	— (ON/OFF signal only)	Open Protocol
Main use	• Viewing and storing the history log • Changing the settings	• Outputting completion and failure signals • Switching the fastening order	• Exporting the history log • Switching the fastening order
Data that can be exported	• Serial numbers of tools • Time • Completion and failure results • Torque values, angles, fastening time lengths • Waveform data	• Completion and failure results • Batch/job/sequence complete • Batch/job/sequence selected • Tool active	• Serial numbers of tools • Time • Completion and failure results • Torque values, angles, fastening time lengths
Switching the fastening order	—	• Batch/job/sequence selected	• Parameter/batch selected
Other	Displayed in a web browser. Microsoft Edge is recommended.	8 ports each for input and output	For supported commands, see "Commands Compatible with Open Protocol". Refer to P88 Control sequences should be reviewed respectively.

CONNECTING TO THE PC FOR CONFIGURATION IN A REMOTE LOCATION

The PC for configuration with the certificate installed can remotely connect to controllers.
Note that only one access to the configuration function is accepted at a time.
To connect, access the URL below on a web browser.
URL : https://xxx.xxx.xxx.xxx/controller
* For xxx.xxx.xxx.xxx, insert the IP address set in “IP” on the controller.

SETTING I/O

In the top page (the initial page of the setting screen), click [Settings] on the top and select the “I/O settings” tab.

* It is possible to assign a behaviour or event not registered yet. (Except for job selection and sequence selection)

COMMANDS ASSIGNED TO INPUT PORTS

Below are the commands that can be assigned to the input ports.
When a signal from an external device is input to one of the ports, the assigned command is executed.

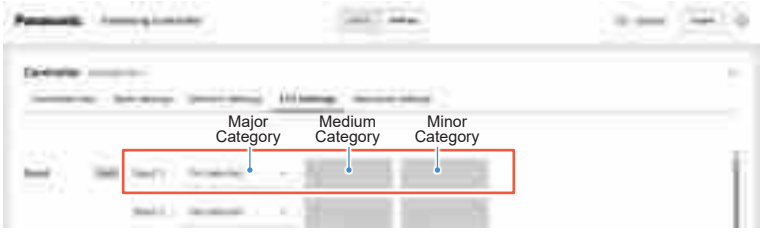
Major Category (Behaviour)	Medium Category (Tool)	Minor Category (Batch No., Etc.)
Batch	Tool 1 to 8	1-5
Job	Tool 1 to 8	1-5
Sequence	–	1-5
Suspend tool*1	Tool 1 to 8	–
Suspend controller*1	–	–
Batch reset	Tool 1 to 8	–
Reset	–	–
Emergency stop*1	Tool 1 to 8	–

*1 Enabled only while the input signal is held.

Notes when the “Suspend tool” or “Suspend controller” command is input

- While “Suspend controller” is active, no fastening order is accepted.
- For the tool number with “Suspend tool” active, no “Batch” or “Job” fastening order is accepted.
- For other tool numbers than that with “Suspend tool” active, a “Batch” or “Job” fastening order is accepted.
- While “Suspend tool” is active, no “Sequence” fastening order is accepted.
  At the time, the process continues until it reaches the tool with “Suspend tool” active.
- “Batch reset” and “Reset” are treated in the same manner as a fastening order.
- “Emergency stop” is a “Suspend tool” command that can be executed regardless of the controller’s running mode.

After selecting a behaviour in the major category, select a tool and then a number (e.g., batch number) as necessary.



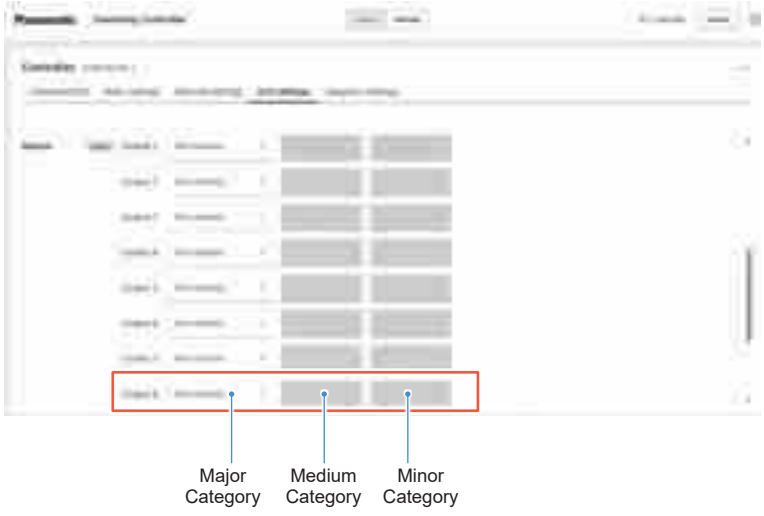
* No action is conducted if an unassigned signal is input. (No error occurs)

COMMANDS ASSIGNED TO OUTPUT PORTS

Below are the commands that can be assigned to the output ports.
When a relevant event has occurred, the controller outputs a signal from the corresponding port to an external device as specified by the assigned command.

Major Category (Event)	Medium Category (Tool)	Minor Category (Batch No., Etc.)
OK	Tool 1 to 8	–
NOK	Tool 1 to 8	–
Batch complete	Tool 1 to 8	1-5
Job complete	Tool 1 to 8	1-5
Sequence complete	–	1-5
Tool active	Tool 1 to 8	–
Batch selected	Tool 1 to 8	1-5
Job selected	Tool 1 to 8	1-5
Sequence selected	–	1-5

After selecting an event in the major category, select a tool and then a number (e.g., batch number) as necessary.



* If the controller turns off while executing an output command, the process does not resume after the controller turns on. (Note that history log data are saved.)

OTHER SETTINGS

You can set other I/O related settings as below.

Relay output time (OK)
Select the time length until a fastening completion signal is output by the relay. [Default] 0.5 s [Setting range] 0.01 s to 10 s
Relay output time (NOK)
Select the time length until a fastening failure signal is output by the relay. [Default] 0.5 s [Setting range] 0.01 s to 10 s

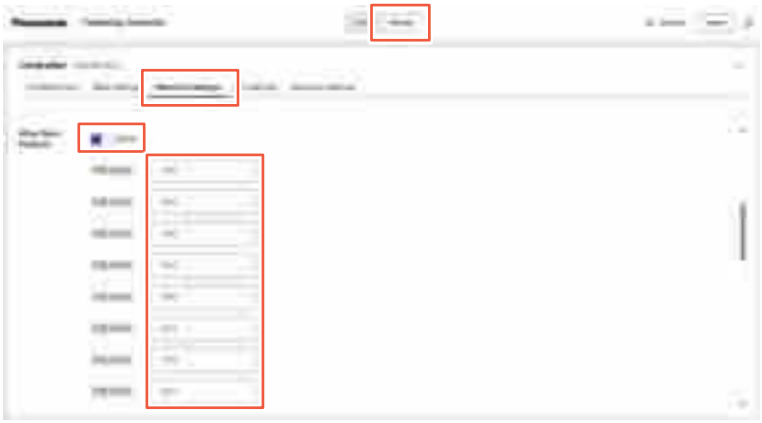
OTHER SETTINGS

Relay output time (Others)
Select the time length until any other signal than fastening completion and failure signals is output by the relay. [Default] 0.5 s [Setting range] 0.01 s to 10 s
Input interval time
Select the time length when the successive input signals are not counted (accepted). Set it to prevent double-counting caused by noise, etc. [Default] 0.1 s [Setting range] 0.01 s to 10 s

CONNECTING VIA OPEN PROTOCOL COMMUNICATION

In the top page (the initial page of the setting screen), click [Settings] on the top and select the “Network settings” tab.

Enable “Atlas Open Protocol”.
Set port numbers to the tools used respectively.



Tool port
Assign a port number for Open Protocol communication to each tool. [Default] Tool 1 - 4545, Tool 2 to 8 - 5001 to 5007 [Setting range] Tool 1 to 8 - 1024 to 49151

OTHER SETTINGS

Set other items as necessary.

Cell ID
Set the cell ID. [Default] 0 [Setting range] 0 to 9999
Channel ID
Set the channel ID. [Default] 0 [Setting range] 0 to 99
ACK timeout
Set the time length to wait for a response to a request message from the controller. [Default] 3000 ms [Setting range] 100 ms to 30000 ms

OTHER SETTINGS

Retries
Set the number of times to repeat sending a request message from the controller. [Default] 0 times [Setting range] Not selectable (Fixed)
Keep alive timeout
Set the time length to determine occurrence of disconnection after the last communication with a host system. [Default] 15 s [Setting range] 1 s to 60 s
Mode
Set the running mode. Mode 1: Unconditional fastening with pre-registered parameters Mode 2: Fastening with parameters ordered by a host system [Default] Mode 1 [Setting range] Mode 1 / Mode 2

ASSIGNING FASTENING PARAMETERS (MODE 1)

“Mode 1” (without parameters ordered) requires fastening parameters pre-registered to tools.
Select a parameter from the pull-down menu as below.

ASSIGNING FASTENING PARAMETERS (MODE 2)

Fastening can be ordered with a MID 0018 command by an external device.
You can specify “Parameter” or “Batch” in a fastening order.

To Specify “Parameter” in a Fastening Order

Put “0” in the hundreds digit of ID.
The tens and ones digits show a parameter number.

Example: Parameter 1’s ID: 001
Parameter 5’s ID: 005

To Specify “Batch” in a Fastening Order

Put “1” in the hundreds digit of ID.
The tens and ones digits show a batch number.

Example: Batch 1’s ID: 101
Batch 5’s ID: 105

* “Job” and “Sequence” are not supported.

ASSIGNING FASTENING PARAMETERS (MODE 2)

Commands Compatible with Open Protocol

The controller supports the following commands.
For details of commands, see the Open Protocol Specification.

MID 0001 Application communication start
Revision 1 is supported. [Content] Communication start
MID 0002 Application communication start acknowledge
Revision 1 is supported. [Content] Communication acknowledgement
MID 0004 Application command error
Revision 1 is supported. [Content] Command error
MID 0005 Application command accepted
Revision 1 is supported. [Content] Command acceptance
MID 0018 Select parameter set, Dynamic Job included
Revision 1 is supported. For how to assign, see “ASSIGNING FASTENING PARAMETERS (MODE 2)”. Refer to P87 [Content] Parameter set order
MID 0042 Disable tool
Revision 1 is supported. [Content] Tool disabled

Continued to the next page ▶▶

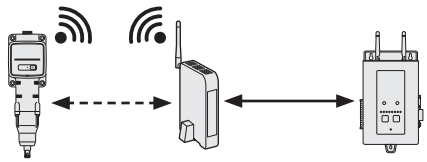
ASSIGNING FASTENING PARAMETERS (MODE 2)

MID 0043 Enable tool
Revision 1 is supported. [Content]　Tool enabled
MID 0050 Vehicle ID number download request
Revision 1 is supported. [Content]　Vehicle ID acquisition request
MID 0060 Last tightening result data subscribe
Revision 1 and 2 are supported. [Content]　Final fastening result data registration
MID 0061 Last tightening result data
Revision 1 and 2 are supported. [Content]　Fastening result upload
MID 0062 Last tightening result data acknowledge
Revision 1 and 2 are supported. [Content]　Fastening result upload acknowledgement
MID 9999 Keep alive message
Revision 1 is supported. [Content]　Availability check

CONNECTING VIA AN EXTERNAL ACCESS POINT

SETUP

The controller can connect to tools via wireless communication using an external access point instead of the built-in access point.
The controller can control tools wherever it is installed.
Connect the access point and the controller to wired LAN.
* The wireless coverage and performance change depending on the access point used.

Connection	Communication Method	Note
	Ethernet	• In the mode selection, select the internal access point or external access point. • Maximum number of connected tools: 8 * For both the internal access point or external access point

* Setting the tool's IP to "Auto (DHCP)" allows the network configuration without the tool's IP address being managed. For details, refer to the Operating Instructions of the controller (EYFRW2).

CONNECTING VIA AN EXTERNAL ACCESS POINT

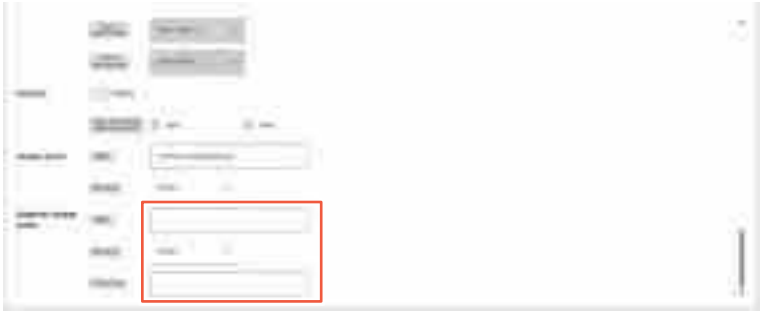
SETTING PROCEDURE

1 **In the top page (the initial page of the setting screen), click [Settings] on the top, select the “Basic settings” tab, and set “External access point” to “ON”.**

* “WLAN mode” is disabled when “External access point” is enabled.

2 **In the top page (the initial page of the setting screen), click [Settings] on the top and select the “Network settings” tab. In “External access point”, set “SSID”, “Security”, and “Password”.**

* You can register only one SSID in the controller. (You cannot register different SSIDs for different tools)
* See the Operating Instructions of your external access point.
* Make this setting before starting pairing registration with tools.
* Set the tool’s IP address before starting pairing registration.



CAPACITY AND SPECIFICATIONS OF THE TOOL

Capacity of the Tool

Model No.	EYFCA1WC
Recommended work (Bolt strength)	M8 (high-strength bolt) M10 (ordinary bolt)
Torque control functioning range	About 20.0 Nm to 60.0 Nm / 177.0 In.lbs to 531.0 In.lbs / 14.7 Ft.lbs to 44.2 Ft.lbs (Setting range: About 10 to 70 Nm / 88.6 In.lbs to 620.0 In.lbs / 7.4 Ft.lbs to 51.7 Ft.lbs)
Fastening torque accuracy (*1)	±15%
Work speed	<M8: 23 Nm / 204 In.lbs / 17 Ft.lbs> About 0.5 s/bolt <M10: 43 Nm / 380.8 In.lbs / 31.7 Ft.lbs> About 0.7 s/bolt

<Measurement conditions> Based on our specified measurement conditions.

*1 Fastening torque and fastening torque accuracy vary depending on the task. Be sure to test them in practice beforehand.

CAPACITY AND SPECIFICATIONS OF THE TOOL

Specifications of the Tool

Model No.		EYFCA1WC
Wrench size		□12.7 mm (1/2″)
Power supply voltage		15 V DC
No-load speed		0 to about 2300 rotations/minute (The maximum speed can be set from about 500 to 2300 rotations/minute.)
Soft start speed		About 150 to 350 rotations/minute (The maximum speed can be set from about 150 to 350 rotations/minute.)
Number of pulses		0 to about 2700 rotations/minute
Dimensions	Overall length	About 306 mm (12-1/16″) (With the extendable socket: About 408 mm (16-1/16″))
	Overall height	About 89 mm (3-1/2″)
	Overall width	About 91 mm (3-19/32″)
Mass (Weight)		About 1.65 kg (3.6 lbs) (With the extendable socket: About 1.95 kg (4.3 lbs))
Wireless Communication Standard (*1)		Wireless LAN (IEEE802.11a/b/g/n) *n: HT20 only
Frequency band		2.412-2.462 GHz / 5.180-5.240 GHz
Number of channels		2.4 GHz: 1 to 11 channels / 5 GHz: 36, 40, 44, 48 channels
Number of tool history logs that can be saved		About 45000 bolts (at 1.2 s work)
Number of tool parameters that can be held		1 parameter
Load capacity of compatible robot		3 kg (6.6 lbs) or more (*2)

*1 About 5 GHz (36, 40, 44, 48 ch) support: The radio equipment supports transmission for indoor use only, except when it communicates with a base station of 5.2 GHz band high power data communication system or a land mobile relay station.

*2 Up to M8 high-strength bolt for a 3 kg (6.6 lbs) capacity robot.

PRECAUTIONS FOR WIRELESS COMMUNICATION

Cautions for using a WLAN device

The device uses a frequency band shared with other types of equipment including industrial, scientific, and medical devices (e.g., a microwave) and radio stations such as a premises radio station (licensed) and low-power radio station (unlicensed) for mobile identification used in factory manufacturing lines and an amateur radio station (licensed).

1. Before using the device, confirm that there is no premises or low-power radio station for mobile identification or no amateur radio station operating in the vicinity.
2. If the device causes harmful interference with a premises radio station for mobile identification, stop use of the band immediately and consult the support centre below for the solution of the interference problem (e.g., installing a partition).
3. If the device causes harmful interference with a premises or low-power radio station for mobile identification or an amateur radio station or such other problems, consult the support centre.

■ There may be noise, shorter radio coverage, or malfunction occurring in the following environmental conditions.

- There is an obstruction (e.g., a metal or reinforced concrete object) that prevents smooth radio propagation between the wireless-enabled tool unit and the controller.
- The antennas of the controller are covered with metal.
- An operator's body is interfering with radio propagation between an operator (the wireless-enabled tool unit) and the controller.
- There is a microwave, PC, or any other device causing noise in the vicinity.
- A cell-phone or PHS phone is used near the wireless-enabled tool unit and the controller.

STATEMENT OF EXPLANATORY TEXT FOR VARIOUS REQUIREMENTS

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Caution: To assume continued compliance, install and use in accordance with provided instructions. Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment has been approved for mobile operation requiring minimum 20 cm (7-7/8") spacing be provided between antenna(s) and all person's body (excluding extremities of hands, wrist and feet) during wireless modes of operation. This equipment may not be collocated or operated with any other antenna or transmitter.

This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment and meets RSS-102 of the ISED radio frequency (RF) Exposure rules. This equipment should be installed and operated keeping the radiator at least 20 cm (7-7/8") or more away from person's body.

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

For indoor use only.

CLEANING AND STORAGE

How to Clean

■ Wiping with Soft Cloth

Do not use wet cloth, thinner, alcohol, benzine, or other volatile liquids.
(Cause of discoloration, deformation, or crack)

■ For Long Life

Request maintenance from the dealer or our consultation service periodically.

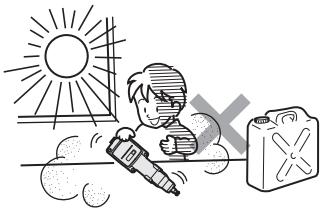
■ Conducting Periodic Inspection

Periodically check for a loose or broken power plug or signal wire plug.

How to Store

Avoid the following conditions during storage.

- Car cabin or other hot places
- Places exposed to direct sunlight
- Places exposed to water or dampness
- Places with a lot of foreign bodies or dust
- Places within reach of children
- Places with gasoline or other flammables
- Places with risk of fall



ERROR CODES

ERROR CODES ON CONTROL PANEL

If the product has an error, an error code blinks on the display of the control panel. Before requesting repair, take the following action. Contact your dealer if there is no improvement even after the following action.

Display	Possible cause	Action
	Abnormality in the tool's internal memory or the communication line, wireless communication, etc.	Turn the power off and on to restart the tool. If the problem persists, perform the initialization. (With "E1" displayed, press and hold the Pairing button for about 10 seconds.) In Wireless Communication Mode, also check the condition of the controller.
	The motor of the tool is hot.	Interrupt work, and wait for the motor temperature to fall before use.
	Abnormality in the tool's internal sensor system	Turn the power off and on to restart the tool.
	Overload, failure in the motor, etc.	Check whether the job suits the capacity of the tool.

CAUTION

- Overload protection (E5) may function if you tighten or loosen the bolt that has been tightened up.

ERROR CODES

ERROR CODES ON CONTROL PANEL

Display	Possible cause	Action
	Abnormality, failure, etc. in the tool's circuit	Turn the power off and on to restart the tool.
	Wireless communication with the controller is disconnected. Refer to P94	• Turn the power off and on within the wireless coverage area to use the tool. • If the problem persists after the power is turned off and on, check the controller and peripheral devices.
	① Abnormality, failure, etc. in the torque sensor ② Excessive work time (Excessive measurement data) ③ Judged NOK	① : Turn the power off and on to restart the tool. ②③ : Check the history log on the controller for the error details. Review the set parameters.
	The button battery inside the tool has run out.	—
	Excessive batch workload in [Wireless Communication Mode] (Excess of the capacity of memory temporarily storing communication data)	Reconsider the workload in a batch. Select a setting other than [After Batch Complete] for Set [Graph Sending/Storing Timing].
	Low input voltage	Check the input voltage and turn the power off and on to restart the tool.
	High voltage is input to the tool.	Check the input voltage and turn the power off and on to restart the tool.
	The input voltage to the tool has dropped during operation.	Turn the power off and on to restart the tool.
	The tool continuously operated for 5 minutes or more.	Turn the power off and on to restart the tool.
	The system activated the emergency stop button.	Remove the cause of the emergency stop on the system including robots and then cancel the emergency stop.

ERROR CODES

FASTENING HISTORY ERROR MESSAGES

If fastening work is not completed successfully, you can check the fastening history for the error details.
(For how to browse the fastening history, Refer to P60.)

Category	Error message	Cause	Action (for unintended cause)
Torque	Torque exceeded	• The measured torque of the tool exceeded the upper-limit torque setting. • The member conditions do not suit the tool.	• Check the settings. • Reconsider the member conditions. • Disable the upper-limit torque setting.
Torque	Torque insufficient	• The measured torque of the tool at the time of work stop is less than the lower-limit torque. • The member conditions do not suit the tool.	• Check the settings. • Reconsider the member conditions. • Disable the lower-limit torque setting.
Angle	Before snug angle exceeded	• The angle before snug in the middle of work exceeded the upper-limit setting.	• Check the settings (including the snug point setting). • Reconsider the member conditions. • Disable the upper-limit setting.
Angle	Before snug angle insufficient	• The angle before snug at the time of work stop is less than the lower-limit setting.	• Check the settings (including the snug point setting). • Reconsider the member conditions. • Disable the lower-limit setting.
Angle	After snug angle exceeded	• The angle after snug in the middle of work exceeded the upper-limit setting.	• Check the settings (including the snug point setting). • Reconsider the member conditions. • Disable the upper-limit setting.
Angle	After snug angle insufficient	• The angle after snug at the time of work stop is less than the lower-limit setting.	• Check the settings (including the snug point setting). • Reconsider the member conditions. • Disable the lower-limit setting.
Error	Rundown error	• A shut-off stop was made within the rundown error time setting.	• Check the settings (shut-off torque and rundown error time setting). • Reconsider the member conditions. (The stop might be caused by an abnormal load.) • Disable the rundown error setting.
Error	Stop before shut off	• Work ended before shut-off. – The user turned off the trigger. – The stop was made by another error.	<If a manual stop was made> • Reconsider the work environment. • Check the member conditions. <If another error appears> • Check the error description and take action.