HERUTU

Production Process Support Software for Pokayoke Tools

POKAYOKE plus

INSTRUCTION MANUAL V3.10

Please use this Instruction manual correctly on reading well.

Please keep it carefully to be able to read immediately, when required.

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Table of Contents

1．Introduction

1-1．Overview

Explanation of terms

Term	Description
Tool	Tools or safety protectors with POKAYOKE transmitter "TW-800T"," HRF-2402", etc. installed.
Receiver	Our POKAYOKE receiver with LAN connection. A device for receiving the signal wirelessly transmitted from the transmitter attached to the tool and transmitting the signal to the external device being connected via LAN. Compatible models： 　(1) Simple Pokayoke Counter　TW-800R-SCL 　(2) LAN Connection Type Pokayoke Receiver TW-800R-EXL / TW-820R-EXL(hereinafter called "TW-8##R-EXL")
Work	"Work" refers to the content of tasks using one or more tools. For example, you would register the content of a work as "tasks done 10 times with a cordless power tool, 3 times with the Check Pen S, and 1 time with an approval stamp."
Work sequence	Reservation for work executions is called a work sequence. You can reserve executions for up to 8 works as shown below. Work A → Work B → Work C ●●● Currently Running Work　Next Scheduled Work　Subsequent Scheduled Work The number of repetition times (1-99999 times) can be set for each work. Set the number of repetition times according to the number of manufacturing products.
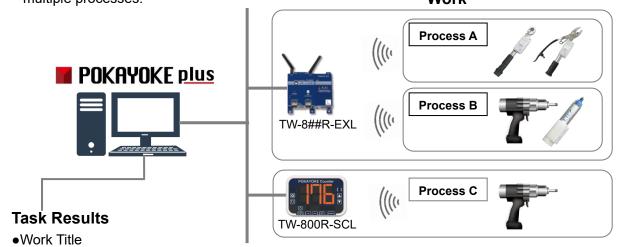
Tools available for POKAYOKE plus

Tool type	Description
Tool	Compatible with various tools used in the production processes. Check Pen S, Cordless Power Tool, Torque Wrench, Pliers Wrench, Approval Stamp, Cable Tie Gun, Riveter, Grease Gun and more
Safety protectors	Can be used with a hard hat. **Wearing status is OK** ・・・ Wearing safety protectors correctly. **Wearing status is NG** ・・・ Wearing safety protectors not correctly. For use with a hard hat, NG wearing status includes: The chin strap comes off. A hard hat is not worn.
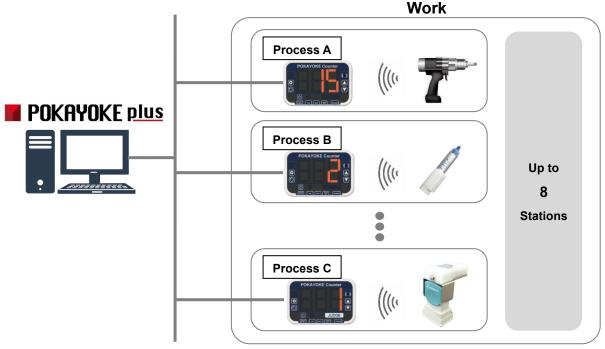
"Production Process Support Software for POKAYOKE tool, POKAYOKE plus" is a Windows- compatible application that can be used with POKAYOKE receivers capable of LAN connection for customers who want to ensure the traceability of "Tasks using tools" or "Wearing safety protectors" by workers at manufacturing plants.

1. You can log and save task results for each work via the TW-800R-SCL or TW-8##R-EXL installed in multiple processes.
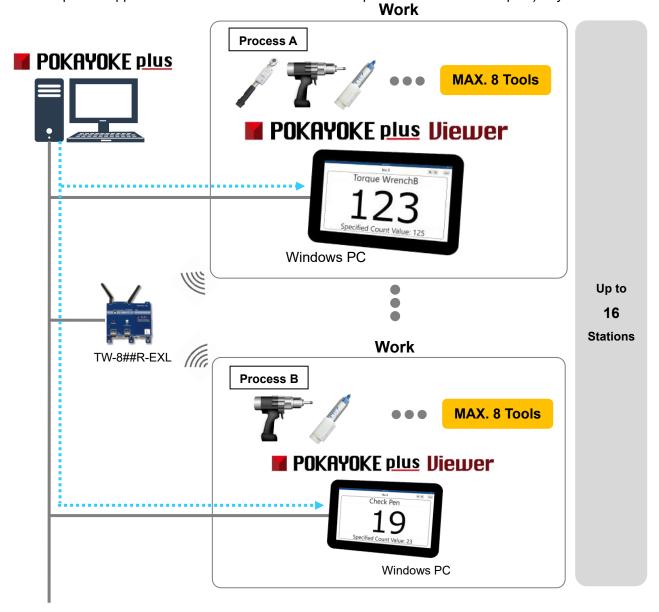
Task Results
- Work Title
- Start Date and Time of Task ● End Date and Time of Task
- Judgment Result ● Cause of FAIL, etc.

2. By using POKAYOKE plus, linked to TW-800R-SCL installed for multiple processes, you can set work execution instructions, counting the number of tasks upwards, etc. Since you can register installed TW-800R-SCL at up to 8 stations for one work, the system can prevent mistakes (pokayoke) for tasks that use up to 8 tools.

3
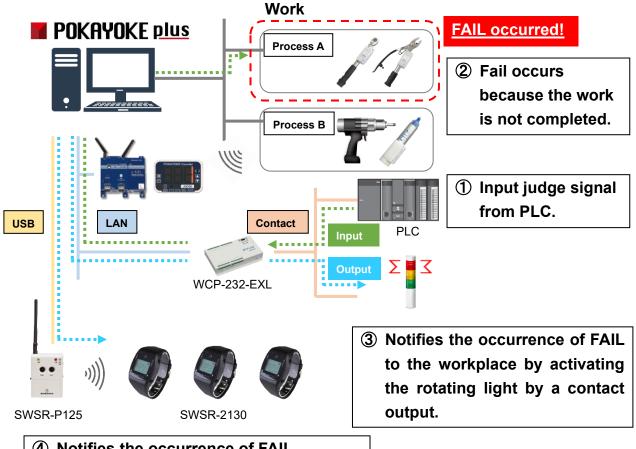
3. By linking the Pokayoke receiver without counter feature TW-8##R-EXL, the count can be displayed at up to 16 stations by locating a Windows computer with "POKAYOKE plus Viewer" (Windows-compatible application with the counter feature excerpted from POKAYOKE plus) at your task site.

*To use POKAYOKE plus Viewer, you need to purchase one license for each POKAYOKE plus Viewer.
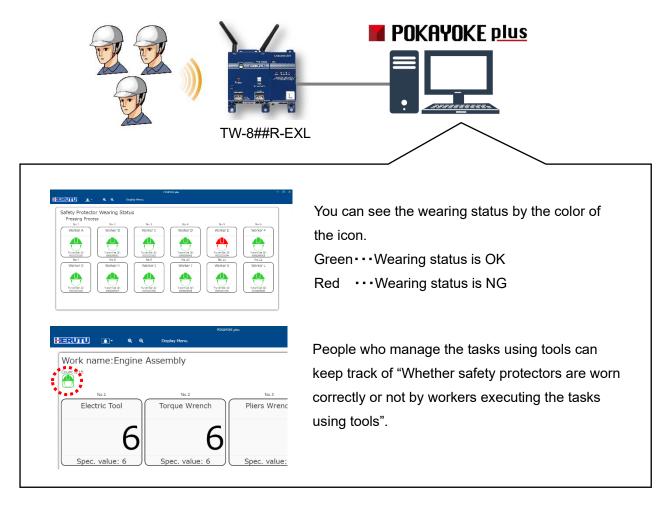
4. By linking works with external devices, you can control other facilities through the I/O port of the I/O unit or call the person in charge in the distance using the two-way Silwatch, upon completion of the work or occurrence of FAIL.

Work

POKAYOKE plus

Process A

FAIL occurred!

② **Fail occurs because the work is not completed.**

Process B

USB

LAN

Contact

Input

PLC

① **Input judge signal from PLC.**

Output

WCP-232-EXL

SWSR-P125

SWSR-2130

③ **Notifies the occurrence of FAIL to the workplace by activating the rotating light by a contact output.**

④ **Notifies the occurrence of FAIL to people at some distance using the *two-way Silwatch system.**

*Two-way Silwatch system can only be used in Japan.

5. Hard-hat-on Sensor ENS-HH01 (*1) is an IoT tool for customers who "Encourage employees to wear hard hats correctly to ensure safety", and supports customers on how to wear hard hats.

TW-8##R-EXL

You can see the wearing status by the color of the icon.

Green･･･Wearing status is OK

Red　･･･Wearing status is NG

People who manage the tasks using tools can keep track of "Whether safety protectors are worn correctly or not by workers executing the tasks using tools".

(*1) Hard-hat-on Sensor ENS-HH01 is an IoT tool for customers who "Encourage employees to wear hard hats correctly to ensure safety", and supports customers on how to wear hard hats.

It senses the hard hat wearing status (whether the chin strap is securely fastened or not) in real time, and communicates with the receiver wirelessly.

For details, refer to "Hard-hat-on Sensor ENS-HH01 Instruction manual".

1-2. System Requirements

The following system requirements are necessary to use POKAYOKE plus.

Supported OS	Windows® 10 32-bit / 64-bit
	Windows® 11 64-bit (*)
CPU	Intel® Core™ 2.3GHz or above (*)
Memory	4GB or above (*)
Screen Resolution	1366×768(FWXGA) or above
Storage free space	1GB (Excluding data / log)
Network Adapter	100Mbps or above(one or more network adapters available)
USB Port	1 port(For connection to the two- way Silwatch transmitter/receiver only.)
.NET Framework	4.6 or later installed

 * For Windows 11, the minimum system requirements of Windows 11 apply additionally.

1-3. Supported Devices

POKAYOKE plus can be used in combination with the devices with the following model.

Pokayoke Transmitter

【Tools】 **Pokayoke Transmitter**

TW-800T/TW-810T/TW-820T/TW-850T/HRF-2402/HCP-2402T-MC/Check Pen S

The transmitter can be mounted on the torque wrench with a limit switch,

the check pen, the pliers wrench, the cordless power tool, etc.,

and a completion signal such as tightening can be wirelessly transmitted

to the receiver.

TW-800T   ENS-HH01

【**Safety protectors**】 Hard-hat-on Sensor **ENS-HH01**

   The device senses the hard hat wearing status in real time and wirelessly transmits the information to

   the receiver. The device can be attached to any hard hat available in the market.

For the transmitter, this instruction manual describes only the contents required for using it with the receiver.

For details, refer to each transmitter manual.

Pokayoke Receiver

Simple Pokayoke Counter TW-800R-SCL

TW-800R-SCL is a receiver with a built-in wireless feature and

a simple counter feature.

It communicates with the transmitter one to one.

For details, refer to "TW-800R-SCL Instruction manual".

TW-800R-SCL

LAN Connection Type Pokayoke Receiver TW-8##R-EXL
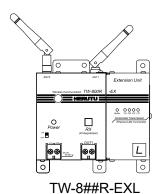
A TW-800 series LAN connection type receiver.

The receiver is capable of communicating with multiple transmitters.

For details, refer to "TW-800R-EXL Instruction manual" or

"TW-820R-EXL Instruction manual".

⚠ TW-820R-EXL can only be used in Japan.

TW-8##R-EXL
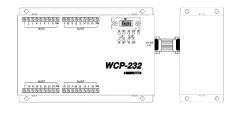
I/O Unit

WCP-232-EXL

LAN connection type I/O unit with 32 contacts

(16 input contacts and 16 output contacts).

To use the device by connecting it to POKAYOKE plus,

it runs according to the specifications below.

・Input: 1-8, 17-24 / Output: 9-16, 25-32

 (input signal must be 500ms or more)

・A-Contact

WCP-232-EXL

Silwatch

⚠ These products can only be used in Japan.

【Silwatch】 Two-way Silwatch Wristwatch type transmitter/receiver SWSR-2130

It receives a signal from the transmitter/receiver and

transmits the information in the form of up to 10 Chinese characters

in text and sound, light or vibrations to the receivers.

【Silwatch】 Two-way Silwatch transmitter/receiver SWSR-P125
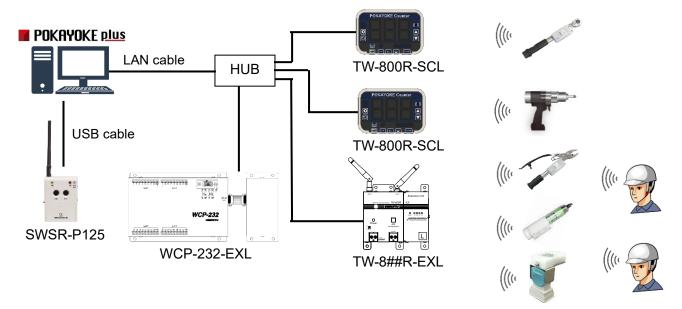
For details, refer to each manual.

SWSR-P125   SWSR-2130

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2. Mouting Method

2-1．Equipment configuration

- Connect the LAN connector of the receiver to the switching hub or the PC's LAN connector with the cable. Please use the cable of the category 5 or higher standard.

- The receiver or I/O unit is not equipped with AutoMDI/MDI-X function to determine the LAN port. To connect the receiver to the PC's LAN port directly, use a cross-wired LAN cable. "

- To connect the PC to the two-way Silwatch transmitter/receiver, install an FTDI driver separately. Download the latest FTDI driver from FTDI's website.

2-2．Network Settings

POKAYOKE plus communicates with the receiver via LAN. To connect the receiver to LAN, configure network settings according to your network environment. For details of the settings, such as IP address, contact the network administrator. For the setting method, refer to "TW-800R-SCL Instruction manual" or "LAN Basic Settings" attached to TW-8##R-EXL.

2-3．Selection of Operating Mode

To use TW-800R-SCL, the operating mode needs to be set.

With the TW-800R-SCL, you can select one of two operating modes: "stamd-alone mode" or "application interlock mode." When using TW-800R-SCL with POKAYOKE plus, select "application interlock mode". For the setting method of the operationg mode, refer to "TW-800R-SCL Instruction manual".

2-4．Setting the receiver data type

There are two types of output data for the receiver "short data" and "long data".

When using in combination with the transmitter ENS-HH01, set to "Long Data".

For details, refer to transmitter manual.
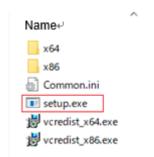
3. POKAYOKE plus

3-1. Installation
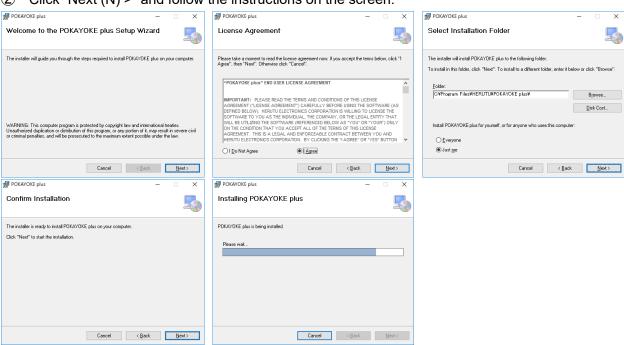
Install the application according to the following procedure.

① Insert the CD-ROM into the PC.
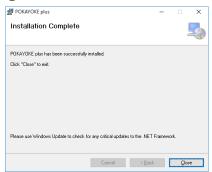
From "Explorer", double click the "setup" file in the Installer folder in the CD-ROM drive.

② Click "Next (N) >" and follow the instructions on the screen.

③ When the "Installation is completed" screen is displayed, installation of "setup" file is completed.

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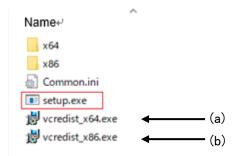
④ Install Visual C++ redistributable runtime packages.

◆When using a 64bit OS.

　Directly double click "vcredist_x64"(a) file in the Installer folder of CD-ROM drive.

◆When using a 32bit OS.

　Directly double click "vcredist_x86"(b) file in the Installer folder of CD-ROM drive.

Name
- x64
- x86
- Common.ini
- setup.exe
- vcredist_x64.exe　←――― (a)
- vcredist_x86.exe　←――― (b)

Installation is now completed.

Software Updates

Customers who purchased POKAYOKE plus / POKAYOKE plus Viewer can download the latest version of the application free of charge from the download page of the website.

Previous Version：V1.0X、V2.00、V3.00

Latest Version　：V3.01

Follow the steps below to update.

① The downloaded file is ZIP compressed, so decompress it.

② Open the Update folder and double-click the "setup" file directly.

③ Click "Next (N) >" and follow the instructions on the screen.

④ When the "Installation is completed" screen is displayed, installation is completed.
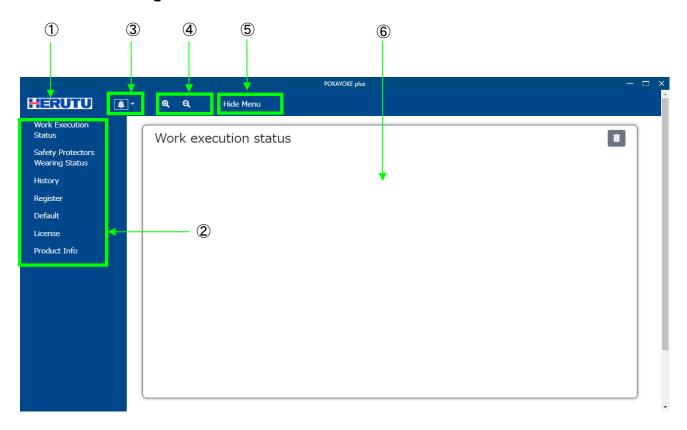
【Cautions for use】

　　The database of POKAYOKE plus is expanded with the addition of functions in V3.01.

　　Therefore, if you upgrade from V1.0X or V2.00 to V3.01, you cannot revert to the original version.
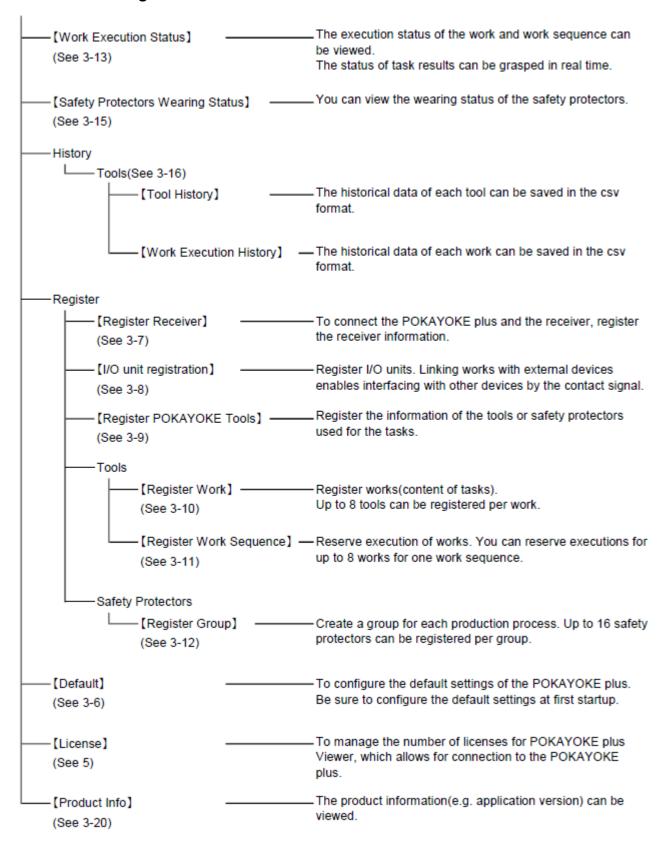
　　The registration information of V1.0X or V2.00 can be used as it is in V3.01.

3-2. Screen Configuration
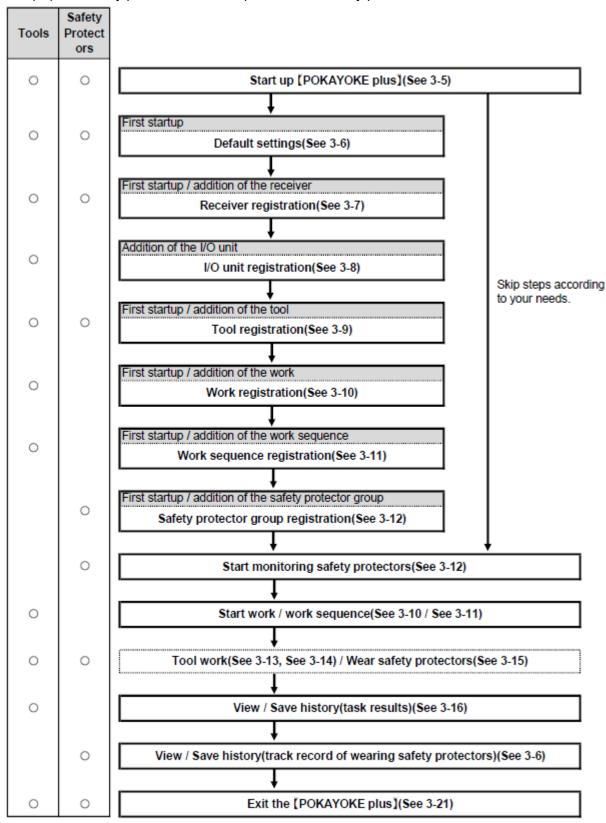
Item name	Description
①HERUTU logo	Click this to display the "Work execution status" screen.
②Menu	Select a menu item.
③Notifications	Messages, such as error information, are displayed. When a notification occurs, the number of messages is displayed on the top left of the bell icon. Click this to check the details of the notifications. For details of the messages, refer to "6. Troubleshooting".
④Zooming	To zoom in or out the screen.
⑤Display/hide menu	To hide or display the menu.
⑥Main screen	This is a main screen.

3-3. Menu Configuration

【Work Execution Status】 ──────── The execution status of the work and work sequence can
(See 3-13) be viewed.
The status of task results can be grasped in real time.

【Safety Protectors Wearing Status】 ──── You can view the wearing status of the safety protectors.
(See 3-15)

History
└── Tools(See 3-16)
    ├── 【Tool History】 ──────── The historical data of each tool can be saved in the csv
    │ format.
    │
    └── 【Work Execution History】 ── The historical data of each work can be saved in the csv
      format.

Register
├── 【Register Receiver】 ──────── To connect the POKAYOKE plus and the receiver, register
│ (See 3-7) the receiver information.
│
├── 【I/O unit registration】 ──────── Register I/O units. Linking works with external devices
│ (See 3-8) enables interfacing with other devices by the contact signal.
│
├── 【Register POKAYOKE Tools】 ──── Register the information of the tools or safety protectors
│ (See 3-9) used for the tasks.
│
├── Tools
│   ├── 【Register Work】 ──────── Register works(content of tasks).
│   │ (See 3-10) Up to 8 tools can be registered per work.
│   │
│   └── 【Register Work Sequence】 ── Reserve execution of works. You can reserve executions for
│   (See 3-11) up to 8 works for one work sequence.
│
└── Safety Protectors
    └── 【Register Group】 ──────── Create a group for each production process. Up to 16 safety
      (See 3-12) protectors can be registered per group.

【Default】 ──────── To configure the default settings of the POKAYOKE plus.
(See 3-6) Be sure to configure the default settings at first startup.

【License】 ──────── To manage the number of licenses for POKAYOKE plus
(See 5) Viewer, which allows for connection to the POKAYOKE
plus.

【Product Info】 ──────── The product information(e.g. application version) can be
(See 3-20) viewed.

3-4. Flow of setting and operating POKAYOKE plus

Items marked with a circle(○) in "Tools" are required for the tools with POKAYOKE.Items marked with a circle(○) in "Safety protectors" are required for the safety protectors with POKAYOKE.

Tools	Safety Protectors	Flow
○	○	**Start up [POKAYOKE plus](See 3-5)**
○	○	First startup — **Default settings(See 3-6)**
○	○	First startup / addition of the receiver — **Receiver registration(See 3-7)**
○		Addition of the I/O unit — **I/O unit registration(See 3-8)**
○	○	First startup / addition of the tool — **Tool registration(See 3-9)**
○		First startup / addition of the work — **Work registration(See 3-10)**
○		First startup / addition of the work sequence — **Work sequence registration(See 3-11)**
	○	First startup / addition of the safety protector group — **Safety protector group registration(See 3-12)**
	○	**Start monitoring safety protectors(See 3-12)**
○		**Start work / work sequence(See 3-10 / See 3-11)**
○	○	**Tool work(See 3-13, See 3-14) / Wear safety protectors(See 3-15)**
○		**View / Save history(task results)(See 3-16)**
	○	**View / Save history(track record of wearing safety protectors)(See 3-6)**
○	○	**Exit the [POKAYOKE plus](See 3-21)**

Skip steps according to your needs.

3-5. POKAYOKE plus Start up

When the installation is completed, start up POKAYOKE plus from the icon on the desktop or from Program.
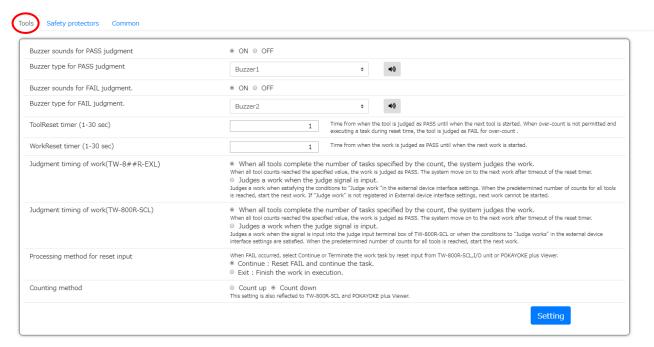
3-6. Default Settings

Click [Default] in the menu to display the default settings screen.

◆Tools

Click the "Tools" tab.

To save the settings in this screen, click the Setting button on the bottom right of the screen.
When moving to another screen without clicking the Setting button, the entries made on the Default settings screen will be lost.
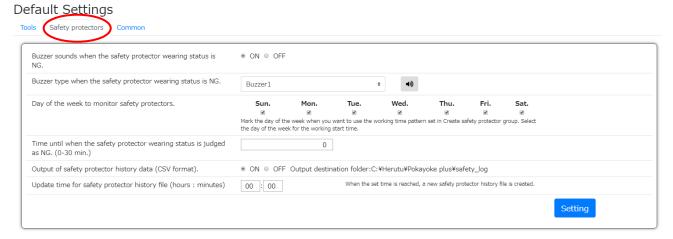
Item	Description	Setting value
Buzzer sounds for PASS judgment	When the number of tasks completed reaches a specified count, a "PASS" is assigned. Set whether or not to sound the buzzer from the PC equipped with the POKAYOKE plus.	ON (default) OFF
Buzzer type for PASS judgment	Set the buzzer sound for notification of PASS result. Select a buzzer sound from five types. You can hear the buzzer sounds after clicking	Buzzer1 (default) Buzzer2 Buzzer3

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		Buzzer4 Buzzer5
Buzzer sounds for FAIL judgment	When tasks are not executed according to the execution instructions set in work registration, or when there are remaining counts at the input of the judgment signal, the work is judged as FAIL. Set whether or not to sound the buzzer from the PC equipped with thePOKAYOKE plus.	ON (default) OFF
Buzzer type for FAIL judgment	Set the buzzer sound for notification of FAIL result. Select a buzzer sound from five types. You can hear the buzzer sounds after clicking ◀)) displayed on the right.	Buzzer1 Buzzer2 (default) Buzzer3 Buzzer4 Buzzer5
ToolReset timer (1-30 sec)	Time from when the tool is judged as PASS until when the next tool is started. When over-count is not permitted, by execution of task while the reset timer is running, the next tool(s) and work are judged as FAIL for overcounting.	1 sec. (default) – 30 sec. (Set at one second interval)
WorkReset timer (1-30 sec)	Time from when the work is judged as PASS until when the next work is started.	1 sec. (default) – 30 sec. (Set at one second interval)
Judgment timing of work (TW-8##R-EXL)	Choose from one of the following: ・When all tools complete the number of tasks specified by the count, the system judges the work. (When all tool counts reached the specified value, the work is judged as PASS. The system move on to the next work after timeout of the reset timer.) ・Judges a work when the judge signal is input. (Judges a work when satisfying the conditions to "Judge work "in the external device interface settings. When the predetermined number of counts for all tools is reached, start the next work. If "Judge work" is not registered in External device interface settings, next work	・When all tools complete the number of tasks specified by the count, the system judges the work. (default) ・Judges a work when the judge signal is input.

	cannot be started.)	
Judgment timing of work (TW-800R-SCL)	Choose from one of the following: ・When all tools complete the number of tasks specified by the count, the system judges the work. (When all tool counts reached the specified value, the work is judged as PASS. The system move on to the next work after timeout of the reset timer.) ・Judges a work when the judge signal is input. (Judges a work when the signal is input into the judge input terminal box of TW-800R-SCL or when the conditions to "Judge works" in the external device interface settings are satisfied. When the predetermined number of counts for all tools is reached, start the next work.)	・When all tools complete the number of tasks specified by the count, the system judges the work. (default) ・Judges a work when the judge signal is input.
Processing method for reset input	During occurrence of FAIL, select Terminate the work by reset input from TW-800R-SCL, I/O unit or POKAYOKE plus Viewer, or select Continue the work. ・Continue : Reset FAIL and continue the task. ・Exit : Finish the work in execution.	Continue (default) Exit
Counting method	Set a counting method on the work execution screen of the application. This setting is also reflected to TW-800R-SCL and POKAYOKE plus Viewer.	Count up Count down (default)

◆Safety protectors

Click the "Safety protectors" tab.

Default Settings

Tools　Safety protectors　Common

Buzzer sounds when the safety protector wearing status is NG.	● ON ○ OFF
Buzzer type when the safety protector wearing status is NG.	Buzzer1 ▾ 🔊
Day of the week to monitor safety protectors.	**Sun.** **Mon.** **Tue.** **Wed.** **Thu.** **Fri.** **Sat.** ☑ ☑ ☑ ☑ ☑ ☑ ☑ Mark the day of the week when you want to use the working time pattern set in Create safety protector group. Select the day of the week for the working start time.
Time until when the safety protector wearing status is judged as NG. (0-30 min.)	0
Output of safety protector history data (CSV format).	● ON ○ OFF　Output destination folder:C:¥Herutu¥Pokayoke plus¥safety_log
Update time for safety protector history file (hours : minutes)	00 : 00　　　When the set time is reached, a new safety protector history file is created.
	Setting

To save the settings in this screen, click the Setting button on the bottom right of the screen.

When moving to another screen without clicking the Setting button, the entries made on the Default settings screen will be lost.

Item	Description	Setting value
Buzzer sounds when the safety protector wearing status is NG	Set whether or not to sound the buzzer when safety protectors are not worn correctly from the PC with POKAYOKE plus installed.	ON (default) OFF
Buzzer type when the safety protector wearing status is NG	Set the buzzer sound for when safety protectors are not worn correctly. Select a buzzer sound from five types. You can hear the buzzer sounds after clicking 🔊 displayed on the right.	Buzzer1 (default) Buzzer2 Buzzer3 Buzzer4 Buzzer5
Day of the week to monitor safety protectors	Put a checkmark on the days to which the working hour pattern to be set in Create a safety protector group applies. Set the day for the start time of the working hours. Even when the day changes to the next during working hours, the monitoring continues. Example) When working from 17：00 on Monday to 2：00 on Tuesday, put a checkmark on Monday.	Sun, Mon, Tue, Wed, Thu, Fri, Sat (default：Checked every day of the week)
Time until when the safety protector wearing status is judged as NG	Time from when the wearing status actually becomes NG (e.g. the hard hat chinstrap comes off) until when "Alert generated" is	0 min. (default) – 30 min. (Set at one minute

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(0-30 min)	notified. If you want to know the NG state immediately, set the time to 0 minute. To accept the wearing NG state for a certain period of time, such as a bathroom break, set any desired time.	interval)
Output of safety protector history data (CSV format)	The wearing status sent from the safety protectors is automatically saved in CSV format in the order received(*2). Output when the wearing status changes.	ON (default) OFF
	[Output destination folder] 　C:/HERUTU¥POKAYOKE plus/safety_log [File name] 　safety_log_yyyyMMdd.csv (y: year, M: month, d: day) When the time set in "Update time for safety protector history file (hours : minutes)" below has reached, a new file is created automatically once a day. *Do not open the file while executing POKAYOKE plus. When opening the file while executing POKAYOKE plus, the receiver fails to write from POKAYOKE plus. Exit POKAYOKE plus, and then open the file.	
Update time for safety protector history file (hours : minutes)	Time to create a new safety protector wearing history file.	00:00(default)
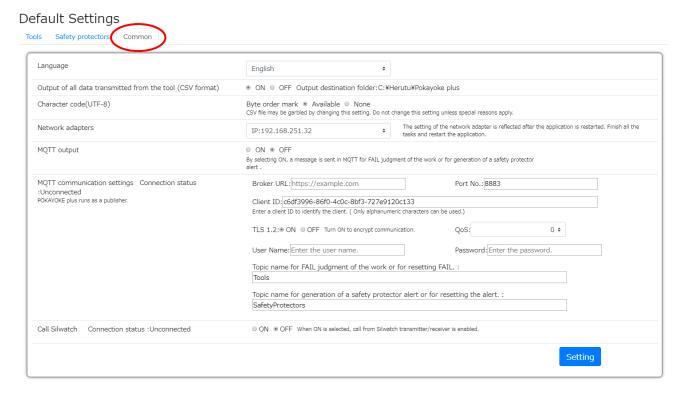
(*2) The output contents are as follows.

Item	Description	Example
Transmitter ID	Transmitter ID of safety protector.	010800002F
Tool name	Tool name registered in register POKAYOKE Tools.	Worker A
Tool model	Tool model registered in register POKAYOKE Tools.	ENS-HH01
Safety protector types	safety protector type registered in register POKAYOKE Tools.	Helmet
Wearing status	OK・・・Wearing safety protectors correctly. NG・・・Wearing safety protectors not correctly.	OK
Date and time	Date and time when the wearing status changed.	2019/4/10 12:00:00
Safety protector group name	Group name registered in register group.	Pressing Process G

*To view a wearing history and also to avoid garbling, it is recommended to open the file by following the procedure in "◆How to open History (in CSV file) ".

◆Common

Click the "Common" tab.

Default Settings

Tools   Safety protectors   Common

Language	English ⬍
Output of all data transmitted from the tool (CSV format)	◉ ON ○ OFF Output destination folder:C:¥Herutu¥Pokayoke plus
Character code(UTF-8)	Byte order mark ◉ Available ○ None CSV file may be garbled by changing this setting. Do not change this setting unless special reasons apply.
Network adapters	IP:192.168.251.32 ⬍ The setting of the network adapter is reflected after the application is restarted. Finish all the tasks and restart the application.
MQTT output	○ ON ◉ OFF By selecting ON, a message is sent in MQTT for FAIL judgment of the work or for generation of a safety protector alert .
MQTT communication settings Connection status :Unconnected POKAYOKE plus runs as a publisher.	Broker URL: https://example.com Port No.: 8883 Client ID: c6df3996-86f0-4c0c-8bf3-727e9120c133 Enter a client ID to identify the client. (Only alphanumeric characters can be used.) TLS 1.2:◉ ON ○ OFF Turn ON to encrypt communication. QoS: 0 ⬍ User Name: Enter the user name. Password: Enter the password. Topic name for FAIL judgment of the work or for resetting FAIL. : Tools Topic name for generation of a safety protector alert or for resetting the alert. : SafetyProtectors
Call Silwatch Connection status :Unconnected	○ ON ◉ OFF When ON is selected, call from Silwatch transmitter/receiver is enabled.

Setting

To save the settings in this screen, click the Setting button on the bottom right of the screen.

When moving to another screen without clicking the Setting button, the entries made on the Default settings screen will be lost.

Item	Description	Setting value
Language	Select a language to be displayed in POKAYOKE plus.	Japanese English (default)
Output of all data transmitted from the tool (CSV format)	All task data is automatically saved in the CSV format in order of receiving the data from the tools(*3).	ON OFF(default)

	[Output destination folder]
	   C:¥HERUTU¥POKAYOKE plus
	[File name]]
	   raw_yyyyMMdd.csv (y: year, M: month, d: day)
	
	A new csv file is created each day.
	When the date changes while executing POKAYOKE plus, a new file is automatically created.
	*Do not open the file while executing POKAYOKE plus. When opening the file while executing POKAYOKE plus, the receiver fails to	

	write from POKAYOKE plus. Exit POKAYOKE plus, and then open the file.	
Character code(UTF-8)	Byte order mark CSV file may be garbled by changing this setting. Do not change this setting unless special reasons apply.	Available (default) None
Network adapters	Select a network adapter to communicate with POKAYOKE plus Viewer. For details, contact the network administrator.	Your IP address is displayed in the selection list.
MQTT output	By being linked to the IoT environment that supports MQTT, when an error occurs, it can be informed to the mobile terminal of the administrator, etc. by email or SMS. When an error occurs while working with a tool or while wearing safety protectors, the error information is transmitted via the IoT standard protocol MQTT.	ON OFF(default)
MQTT communication settings *For specifications, refer to "3-17. real time.".	POKAYOKE plus runs as a publisher. Transmission of error information to smartphones or other devices in	
Broker URL	Enter the broker URL.	empty(default)
Port No.	Enter the MQTT connection port number. Possible values：1883, 8883 and 49152 - 65535	8883(default)
Client ID	Enter a client ID to identify the client. (Only alphanumeric characters can be used.)	GUID(default)
TLS 1.2	Turn ON to encrypt communication.	ON(default) OFF
QoS	QoS setting that guarantees the arrival between the publisher and the broker. Select from "QoS 0 (At least once)", "QoS 1 (At least once)", or "QoS 2 (Exactly once)".	0 (default) 1 2
User Name	ID for authentication. Enter according to the broker settings.	empty(default)
Password	Password for authentication. Enter according to the broker settings.	empty(default)
Topic name for FAIL judgment of the work or for resetting	Enter the topic name when publishing with MQTT.	Tools (default)

FAIL		
Topic name for generation of a safety protector alert or for resetting the alert	Enter the topic name when publishing with MQTT.	SafetyProtectors (default)
Call Silwatch	Set this to ON to call two-way Silwatch wristwatch type transmitter/receiver when the conditions for setting "Call Silwatch" in external device interface settings are met. When this is set to OFF, the call is not executed even when the conditions for setting "Call Silwatch" are met.	ON OFF(default)
Transmitter /receiver connection port	Select a COM port that is connected to the two-way Silwatch transmitter/receiver and that is recognized by the PC.	COM port existing in PC is displayed in the selection.
Transmission interval	Select a time interval (seconds) of the call from the two-way Silwatch transmitter/receiver.	15 30(default) 45

(*3) The output contents are as follows.

Item	Description	Example
Received date	Date receiving the transmitter ID from the receiver.	2019/04/10
Received time	Time receiving the transmitter ID from the receiver.	12:00:00
Transmitter ID	Tool or safety protector transmitter ID	010100002F
Transmitter information(*4)	Transmission type, battery information, safety protector wearing status, error information …etc	[short data] 2byte 01 [long data] 26byte 01010000000000000000 00000

(*4) There are two types of output data for the receiver "short data" and "long data". The data size of the transmitter information varies depending on the data type setting.

When using in combination with the transmitter ENS-HH01, set to "Long Data". When used in combination with the transmitter TW-800T, both "short data" and "long data" will work.

【Transmitter information detail】

Ex)
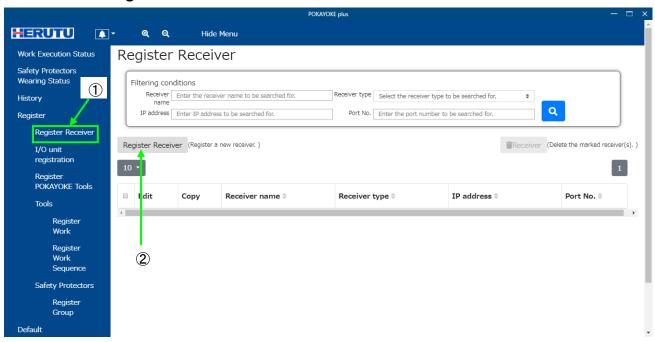
Transmission type, Battery information	Safety protector wearing status	Error information	System area
01	01	00	0000000000000000000

Data name	Description	Number of bytes
Transmission type, Battery information [short data]/[long data]	Normal transmission "01" Test transmission(battery capacity is normal) "02" Test transmission(battery capacity is low) "12"	2
Safety protector wearing status [long data]	Wearing status is NG "00" Wearing status is OK "01"	2
Error information [long data]	No error "00" Error No. in sequential order from "01"	2
System area [long data]	Contains system specific data. When using the output data in your environment, read and discard the data in the system area.	20

Output data example
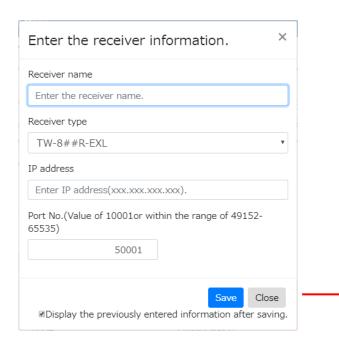
[short data] "2019/04/10","12:00:00","010100002F","01"

[long data] "2019/04/10","12:00:00","010800000A","01010000000000000000000000"

3-7. Receiver Registration

Click "Registration" on the menu, and "Receiver registration" (①) is displayed. Click "Receiver registration" to display the receiver registration screen.

Click "Receiver registration" button (②), and the information entry screen to enter a new receiver is displayed.
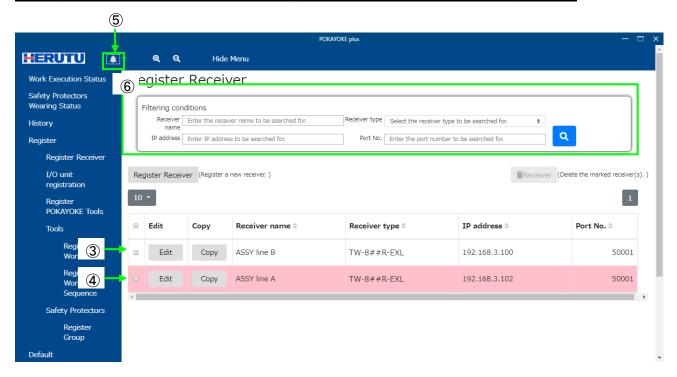
Enter each information and click "Save" to save the information. If you click "Close" before clicking "Save", the entered information will be lost.

If you put a check in the box next to "Display the previously entered information after saving.", the entered data remains on the screen after clicking "Save". If you remove the check, after clicking "Save", the entered data will be cleared from the screen.

Item	Description	Input example:
Receiver name	Enter the receiver name. (Maximum 16 characters)	ASSY line A
Receiver type	Select the receiver type. TW-8##R-EXL / TW-800R-SCL	TW-8##R-EXL(default)
IP address	Enter the IP address of the receiver.	192.168.100.105
Port No.	Enter the port number of the receiver. The possible setting range is 10001 and 49152 – 65535. Default value is 50001.	50001(default)

Edit registration information / Copy the registered information to make a registration

When the receiver is registered, the application starts connecting to the receiver automatically. The connected receiver is displayed in white background (③) and the unconnected receiver is displayed in pink background (④). Soon after registration of the receiver, the connected receiver may remain displayed in pink background. Display the receiver registration screen again after moving to another screen, and the latest status is displayed. When the connection fails, the user is notified by notifications (⑤).

The possible cause of the connection failure is as below:

・The receiver is not turned on or the power cable is not connected.

・The LAN cable is disconnected.

・The receiver's IP address/Port No. is not correctly set.

Button	Description
Edit	The receiver name can be edited. The receiver type, IP address or Port No. cannot be edited.
Copy	The registered receiver information can be copied and then newly registered. When the receiver with the same IP address and Port No. is already registered, a message asking if you want to overwrite with newly entered data is displayed. **Confirm** × Receiver with the same IP address and port No. already exists.Do you want to overwrite it? Overwrite Cancel
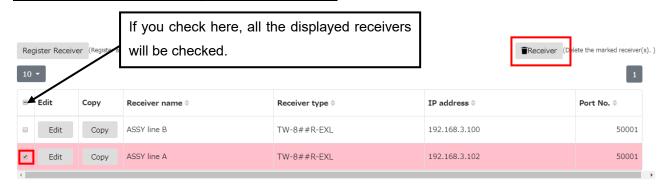
Narrowing down of the receivers (registered information)

Enter the filtering conditions (⑥) and click 🔍 , and the receivers satisfying the conditions are selected and displayed.

You can enter any string in receiver name, IP address and port number. Receivers that match the entered string exactly or partially will be extracted. You can select either TW-8##R-EXL or TW-800R-SCL as the receiver type, and the matching receiver will be extracted.
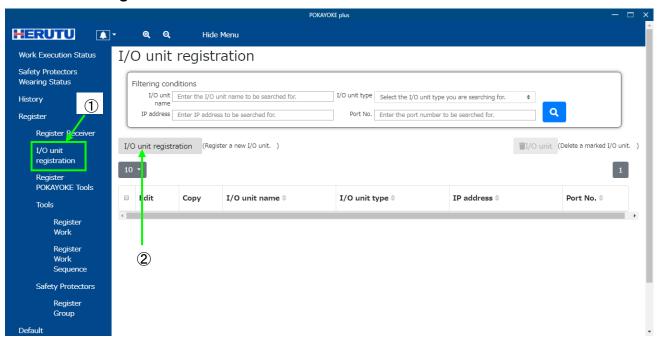
When several conditions are entered, the receivers that match all conditions are extracted.

Deletion of the receivers (registered information)

If you check here, all the displayed receivers will be checked.

	Edit	Copy	Receiver name ⇕	Receiver type ⇕	IP address ⇕	Port No. ⇕
☐	Edit	Copy	ASSY line B	TW-8##R-EXL	192.168.3.100	50001
☑	Edit	Copy	ASSY line A	TW-8##R-EXL	192.168.3.102	50001

Register Receiver (Register...)   🗑Receiver (Delete the marked receiver(s).)
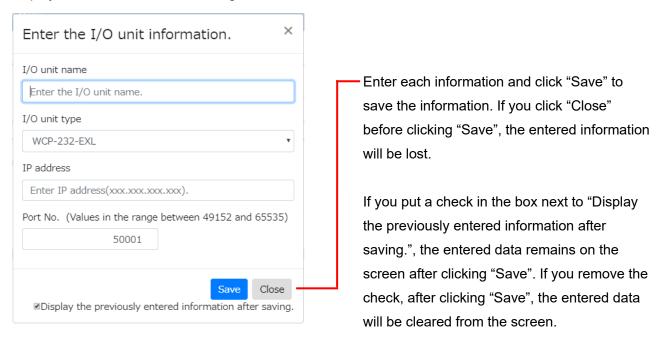
Put a check in the box for the receiver you want to delete and click 🗑Receiver . The registered information will be deleted.

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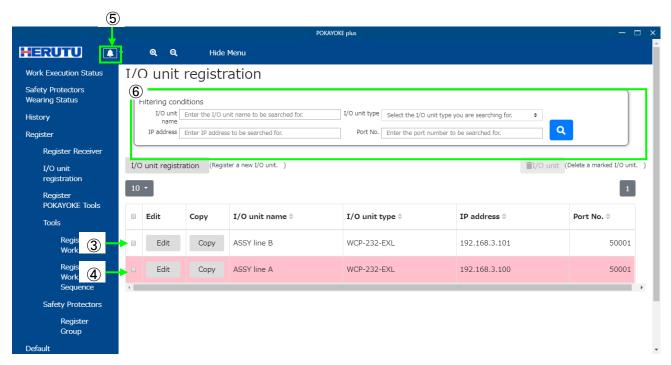## 3-8. I/O unit Registration

Click "Register" on the menu, and "I/O unit registration" (①) is displayed. Click "I/O unit registration" to display the I/O unit registration screen.

Click "I/O unit registration" button (②), and the information entry screen to enter a new I/O unit is displayed. 16 of I/O units can be registered.

Enter each information and click "Save" to save the information. If you click "Close" before clicking "Save", the entered information will be lost.

If you put a check in the box next to "Display the previously entered information after saving.", the entered data remains on the screen after clicking "Save". If you remove the check, after clicking "Save", the entered data will be cleared from the screen.

Item	Description	Input example:
I/O unit name	Enter the I/O unit name. (Maximum 16 characters)	ASSY line A
I/O unit type	Select the I/O unit type. Default value is WCP-232-EXL.	WCP-232-EXL(default)
IP address	Enter the IP address of the I/O unit.	192.168.100.105
Port No.	Enter the port number of the I/O unit. The possible setting range is 49152 – 65535. Default value is 50001.	50001(default)

Edit registration information / Copy the registered information to make a registration

When the I/O unit is registered, the application starts connecting to the I/O unit automatically.

The connected I/O unit is displayed in white background (③) and the unconnected I/O unit is displayed in pink background (④). Soon after registration of the I/O unit, the connected I/O unit may remain displayed in pink background. Display the I/O unit registration screen again after moving to another screen, and the latest status is displayed. When the connection fails, the user is notified by notifications (⑤).

When the connection fails, the following causes are possible.

・The I/O unit and LAN conversion unit are not connected.

・The I/O unit is not turned on or the power cable is not connected.

・The LAN cable is disconnected.

・The I/O unit's IP address/Port No. is not correctly set.

Button	Description
Edit	The I/O unit name can be edited. The I/O unit type, IP address or Port No. cannot be edited.
Copy	The registered I/O unit information can be copied and then newly registered. When the I/O unit with the same IP address and Port No. is already registered, a message asking if you want to overwrite with newly entered data is displayed. Confirm ✕ I/O unit with the same IP address and port No. already exists.Do you want to overwrite it? Overwrite Cancel
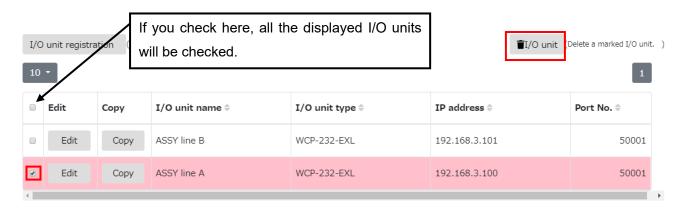
Narrowing down of the I/O units (registered information)

Enter the filtering conditions (⑥) and click 🔍, and the receivers satisfying the conditions are selected and displayed.

You can enter any string in I/O unit name, IP address and port number. I/O units that match the entered string exactly or partially will be extracted.

When several conditions are entered, the I/O units that match all conditions are extracted.
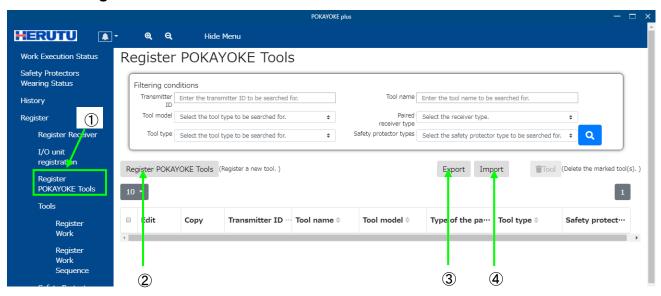
Deletion of the I/O units(registered information)

If you check here, all the displayed I/O units will be checked.

I/O unit registration					
10 ▾					1
☐ Edit	Copy	I/O unit name ⇕	I/O unit type ⇕	IP address ⇕	Port No. ⇕
☐ Edit	Copy	ASSY line B	WCP-232-EXL	192.168.3.101	50001
☑ Edit	Copy	ASSY line A	WCP-232-EXL	192.168.3.100	50001

🗑I/O unit (Delete a marked I/O unit.)

Put a check in the box for the I/O unit you want to delete and click 🗑I/O unit . The registered information will be deleted.
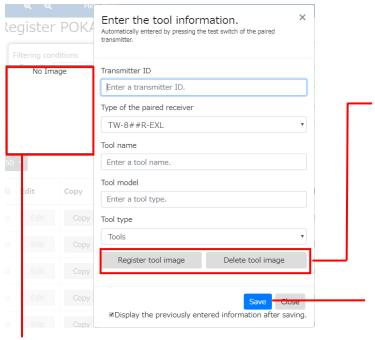
When the selected I/O unit is set to the external devices, the settings of the I/O unit are deleted from all works using the I/O unit. Accordingly, some of the external device interface settings may not be executed.

The I/O units used in the work or work sequence in progress cannot be deleted.

3-9. Tool Registration

Click "Registration" button on the menu, and "Tool registration" (①) is displayed. Click "Tool registration" to display the tool registration screen.

Click "Tool registration" button (②), and the information entry screen to enter a new tool is displayed. Unlimited number of tools can be registered.

When "Tool" is selected from the tool type, the tool image can be registered. The registered image is displayed on the background of the count display on the work execution screen.

Supported image format:
・Bitmap(*.bmp)
・JPEG(*.jpeg, *.jpg)
・GIF(*.gif)
・PNG(*.png)
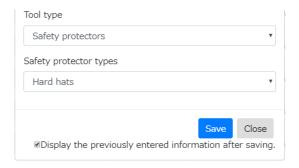
When registering an image with a large file size, the registration process may take some time.

Enter each information and click "Save" to save the information. If you click "Close" before clicking "Save", the entered information will be lost.

A preview of the tool image is displayed.

If there is no image to display, it will be "No Image".

It is not displayed when the tool type is other than "Tool".

If you put a check in the box next to "Display the previously entered information after saving.", the entered data remains on the screen after clicking "Save". If you remove the check, after clicking "Save", the entered data will be cleared from the screen.

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The tool type can be selected from "tool" or "safety protector". If you select "Safety protectors", "Safety protector types" will be displayed.

Item	Description	Input example
Transmitter ID	Enter the 10-digit serial number indicated on the transmitter. Press the test switch of the transmitter <u>paired with the receiver</u> while the entry screen is displayed, and the serial number is automatically entered. Please note that long pressing the test switch will reset the pairing. Test switch	010100002F
Type of the paired receiver	Select the type of the paired receiver. TW-8##R-EXL / TW-800R-SCL	TW-8##R-EXL
Tool name	Enter the tool name. (Maximum 16 characters)	PliersWrenchR01
Tool model	Enter the tool model. (Maximum 20 characters)	P200Y2
Tool type	Select the tool type. Tools / Safety protectors	Tools
Safety protector types	Select the safety protector type. This item is displayed when "Safety protectors" is selected for the tool type.	Hard hats
Tool image	Register and delete the tool image. It is displayed only when "Tool" is selected for the tool type.	none(default)

＊If a tool with the same transmitter ID has already been registered, you cannot additionally register with that transmitter ID. Delete the existing tool and try again.

Export / import of tool (tool, safety protector) information

Capture the tool information*1 from the file in CSV format and save the registered tool information in CSV format. You can register or edit multiple transmitters at the same time. It can also be used to transfer data to POKAYOKE plus running on another PC.

*1 Tool images are not subject to export / import.

◆Export

Click the "Export" button (③) and save it in any folder. When the export is completed, the message "Tool export is completed." is displayed.

Character encoding   :   UTF-8(with Byte order mark)

Line feed code   :   CRLF

＊**Cautions for editing or saving the exported file**

・Use a text editor (eg Notepad) to edit.

・The header is inserted on the first line. Enter from the second line according to the order of the items in the header.

・Enclose each item in double quotation marks (").

・Insert a comma (,) between items. Continue to enter data without placing space before or after comma.

・When registering multiple tools, enter a new line.

・When saving the data, specify "UTF-8" as the character code.

Setting item
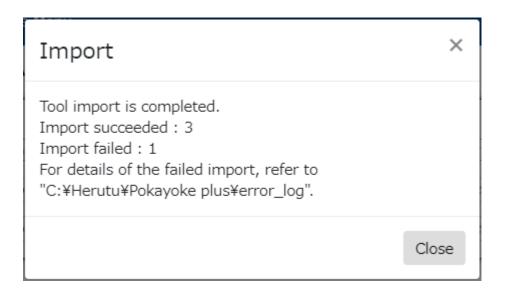
| Item	Description	Example
Transmitter ID	Transmitter ID	0101000001
Tool name	Tool name(Maximum 16 characters)	Check Pen S
Tool model	Tool model(Maximum 20 characters)	CP-02S
Type of paired receiver (1:TW-8##R-EXL、2:TW-800R-SCL)	Enter 1 or 2. 1・・・TW-8##R-EXL / 2・・・TW-800R-SCL	1
Tool type (0:tool、1:safety protector)	Enter 0 or 1. 0・・・Tool / 1・・・Safety protector	0
Safety tool type (0:other、1:hard hat)	Enter 0 or 1. 0・・・Tool / 1・・・Hard hat	0

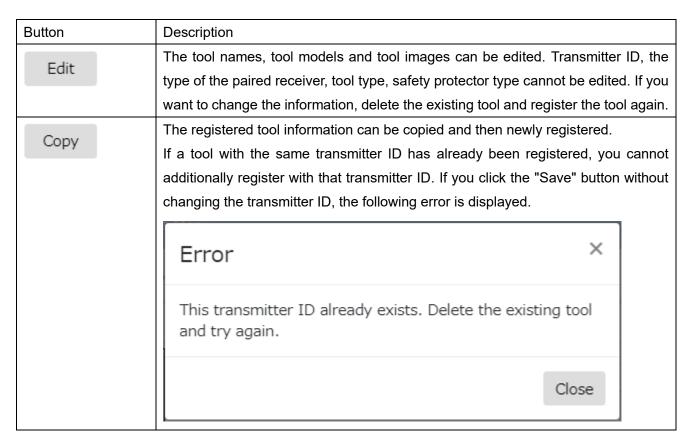**Example**
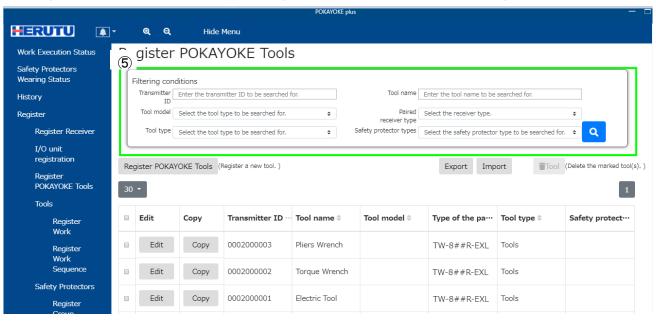
"010100350A","Check Pen S","CP-02S","1","0","0"

"0201000007","Worker A","ENS-HH01","1","1","1"

◆Click the "Import" button (4) and select the file to import. A message appears when the import is complete. You can see the tools that were successfully imported and the number of tools that were unsuccessfully imported. For the reason for the import failure, check the content of the file output in " C:/HERUTU/Pokayoke plus/error_log". It lists the number of rows that failed and the reason.

Import   ×

Tool import is completed.
Import succeeded : 3
Import failed : 1
For details of the failed import, refer to
"C:¥Herutu¥Pokayoke plus¥error_log".

Close

Edit registration information / Copy the registered information to make a registration

Button	Description
Edit	The tool names, tool models and tool images can be edited. Transmitter ID, the type of the paired receiver, tool type, safety protector type cannot be edited. If you want to change the information, delete the existing tool and register the tool again.
Copy	The registered tool information can be copied and then newly registered. If a tool with the same transmitter ID has already been registered, you cannot additionally register with that transmitter ID. If you click the "Save" button without changing the transmitter ID, the following error is displayed.

Narrowing down of the tools (registered information)

Enter the filtering conditions (⑤) and click [🔍], and the receivers satisfying the conditions are selected and displayed. You can enter any string in transmitter ID, tool name. Tools that match the entered string exactly or partially will be extracted. Select the tool model, the paired receiver type, tool type and the type of safety protectors from the displayed selection information. The tools matching the conditions are extracted. When several conditions are entered, the tools that match all conditions are extracted.

Deletion of the tools(registered information)

If you check here, all the displayed tools will be checked.

| Register POKAYOKE T... | | | | | Export Import | 🗑Tool (Delete the marked tool(s).) | |

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☐	Edit	Copy	Transmitter ID ⇅	Tool name ⇅	Tool model ⇅	Type of the pa···	Tool type ⇅	Safety protect···
☐	Edit	Copy	0002000003	Pliers Wrench		TW-8##R-EXL	Tools	
☑	Edit	Copy	0002000002	Torque Wrench		TW-8##R-EXL	Tools	
☐	Edit	Copy	0002000001	Electric Tool		TW-8##R-EXL	Tools	
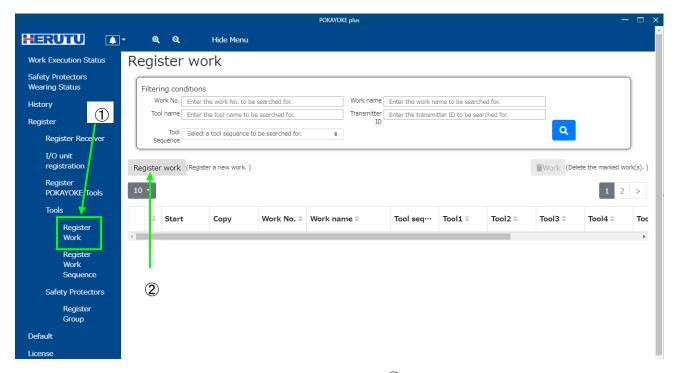
Put a check in the box for the tool you want to delete and click [🗑Tool]. The registered information will be deleted. The work and work sequence using the selected tool are also deleted.
The tools used in the work or work sequence in progress cannot be deleted.
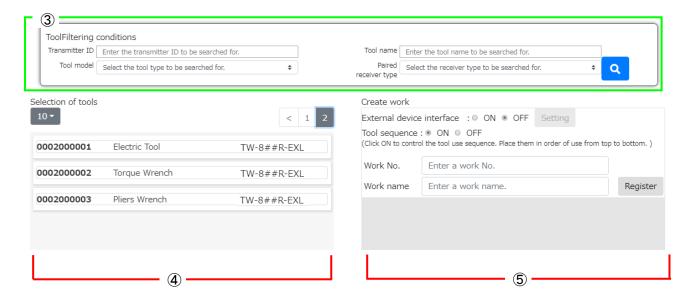
3-10. **Work Registration and Start**

Work refers to the contents of tasks using one or more tools. For example, you would register the content of a work as "task done 10 times with a cordless power tool, 3 times with the Check Pen S, and 1 time with an approval stamp".

Click "Registration" on the menu, and "Work registration" (①) is displayed. Click "Work registration" to display the work registration screen.

Click "Work registration" button (②), and the screen for newly creating a work is displayed. Unlimited number of works can be registered.

Narrowing down of the tools (registered information)

Enter the tool filtering conditions (③) and click [🔍], and the tools satisfying the conditions are selected and displayed.

You can enter any string in transmitter ID, tool name. Tools that match the entered string exactly or partially will be extracted. Select the tool model, the paired receiver type and tool type from the displayed selection information. The tools matching the conditions are extracted. When several conditions are entered, the tools that match all conditions are extracted.

Work creation

1. Enter work information in "Create work" (⑤) on the right.

Item	Description	Input example
external device interface	Turn it ON to interface the work with the devices, such as I/O unit or Silwatch, according to the settings. For detailed setting method, please refer to "External device interface setting" described later. ・ON ・OFF(default)	OFF
Tool sequence	Click ON to control the tool use sequence. Place them in order of use from top to bottom. ・ON(default) ・OFF	ON
Work No.	Enter a desired work No. (Maximum 8 characters)	LU201-A
Work name	Enter a desired work name. (Maximum 20 characters)	Large unit AD ASSY
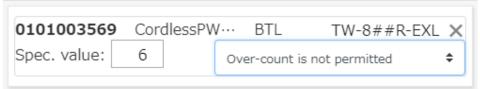
2. Drag the tool in "Selection of tools" (④) on the left and drop it in the gray area of "Create work" (⑤) on the right. You can drag and drop up to 8 tools.
   You can drag the tools moved to the right side and move them up and down. When the tool sequence is "ON", arrange the tools in order of task from top to bottom.

   To create works, follow the rules below.
   ・ A work cannot contain both the tools paired with TW-800R-SCL and the tools paired with TW-8##R-EXL.
   ・ When Tool sequence is "ON", the same tool can be registered repeatedly in the same work.
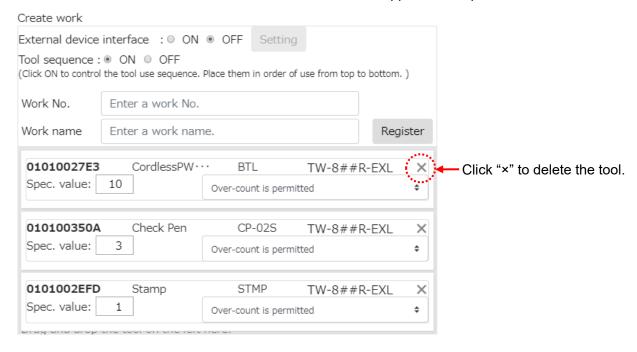
3. Set the contents of task with the tool.

| Item	Description	Input example
Spec. value (Specified Count Value)	Enter the task count. Range of the values that can be entered: 1 – 999	6
Over-count	Over-count refers to execution of tasks more than the specified count. When over-count is permitted, executing the task more than the specified count will not be judged as FAIL. When over-count is not permitted, executing the task more than the specified count will be judged as FAIL.	Over-count is not permitted
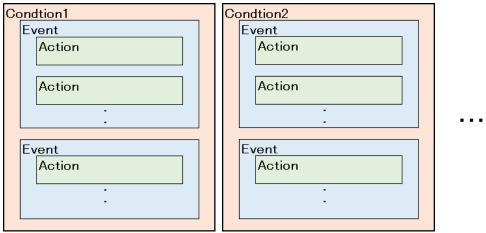
Example) When the contents of a work are "Task done 10 times with a cordless power tool", "Task done 3 times with the Check Pen S", and "Task done 1 time with an approval stamp".

4. Click "Registration" button and work creation is completed.
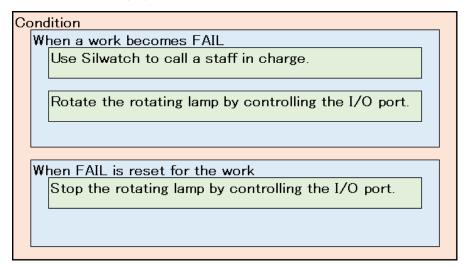
External device interface settings

To interface the work with external devices (e.g. I/O unit, Silwatch), settings need to be executed for each work before start of the work. The external device interface settings consist of conditions, events and actions.
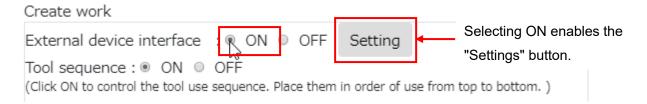
Item	Description
Condition	The condition is a set of two events. An event selected by a user and the event to remove the event are included. Conditions with exactly the same events cannot be set for a work.
Event	Event means "Became a particular state". For example, "Work became PASS" and "Work became FAIL" represent one event each. An event has one or more actions associated with it.
Action	Actions are associated with an event, and indicate "What to do" when the event is satisfied. For example, "Judge work" and "Call Silwatch" each represent one action.

Example) When a work becomes FAIL, call a staff in charge using Silwatch, and inform people in all work area by the rotating light. When the FAIL state is cleared, stop the rotating light.
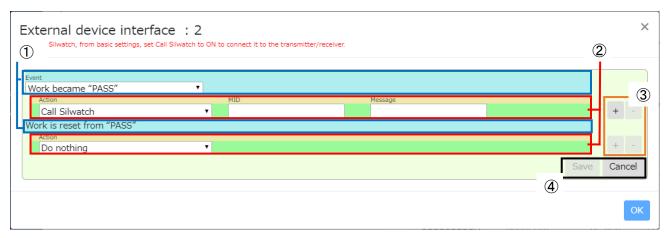
To perform external device interface settings, set External device interface settings to ON at the time of work registration. From the "Settings" button, open the Settings dialog to perform the settings.

Selecting ON enables the "Settings" button.

Click the "Set" button, the following external device interface setting dialog is displayed.
Click the "Add condition" button to add a new condition.

Click the "Add condition" button, and the "Add condition" button disappears and the display enters the edit mode for the conditions as shown below. Set the event and the action you want to perform.

	Description	Input example
①	Set the event. The event to be paired with the other event is automatically set. The events that can be set are as follows. ・Work became "PASS" ・Work became "FAIL" ・I/O port is turned ON *1 ・I/O port is turned OFF *1	Work became "PASS"(default)
②	Set the actions to be associated with the event. The actions that can be	Call Silwatch

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	set vary depending on the event type. The actions that can be set are as follows. ・Do nothing *3 ・Call Silwatch ・Set I/O port to ON *1 ・Set I/O port to OFF *1 ・Judge work *2 ・Reset work *2	
③	A button that adds a new action below the position where the button exists or deletes an action that exists at the position of the button. Click the "+" button to add a new action below the button position. Click the "-" button to remove the action at the button position. If it cannot be used, it will be automatically disabled.	-
④	This button saves or discards the edited condition. Click Save to save the condition and exit edit mode. Click Cancel to cancel the edit mode in which all the edited contents are discarded. If it cannot be used, it will be automatically disabled.	-

*1 Selectable only when one or more I / O units are registered.

*2 Selectable only when the event is "I/O port is turned on" or "I/O port is turned off".

*3 It can be selected only in the event paired with the selected event.

The selectable events and the occurrence timing of the events are as described below.

Event	Timing of the event occurring
Work became "PASS"	The work is completed properly and becomes PASS.
Work became "FAIL"	The work becomes FAIL. After the work became PASS, it becomes FAIL due to overcounting or other reasons.
I/O port is turned ON	A specific I/O port of a specific I/O unit changes from OFF to ON.
I/O port is turned OFF	A specific I/O port of a specific I/O unit changes from ON to OFF.

When setting an event, items for which additional settings are needed are as below.

Event	Additional setting items
Work became "PASS"	None
Work became "FAIL"	None
I/O port is turned ON	The target I/O unit (mandatory and selective)
	The I/O port of the target I/O unit (mandatory and selective)
I/O port is turned OFF	The target I/O unit (mandatory and selective)
	The I/O port of the target I/O unit (mandatory and selective)

The selectable event, the event to be paired with the selected event and the occurrence timing are as below.

Event	Event to be paired	Timing of the event to be paired occurring
Work became "PASS"	Work is reset from "PASS"	・PASS for the work is reset and the next work is ready to be started. ・The work becomes FAIL immediately after becoming PASS. ・The work is finished.
Work became "FAIL"	Work is reset from "FAIL"	The work continue to FAIL. or FAIL is reset as the work is finished.
I/O port is turned ON	I/O port is turned OFF	A specific I/O port of a specific I/O unit changes from ON to OFF.
I/O port is turned OFF	I/O port is turned ON	A specific I/O port of a specific I/O unit changes from OFF to ON.

When setting actions, the items to be additionally set are as below.

Action	Additional setting items
Call Silwatch	MID(Message ID, Required, Text input) *1
	Message (Text input, Maximum of 20 characters (single or double byte)) *2
Set I/O port to ON	The target I/O unit (mandatory and selective)
	The I/O port of the target I/O unit (mandatory and selective)
Set I/O port to OFF	The target I/O unit (mandatory and selective)
	The I/O port of the target I/O unit (mandatory and selective)
Judge work	None
Reset work	None
Do nothing	None

*1) Enter the registered MID to two-way Silwatch wristwatch type transmitter/receiver to be called.
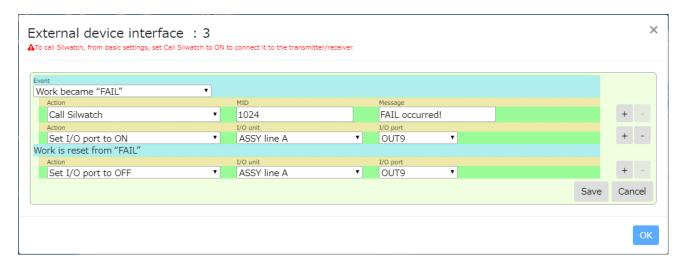
   To check or change the settings of two-way Silwatch wristwatch type transmitter/receiver, use the two-

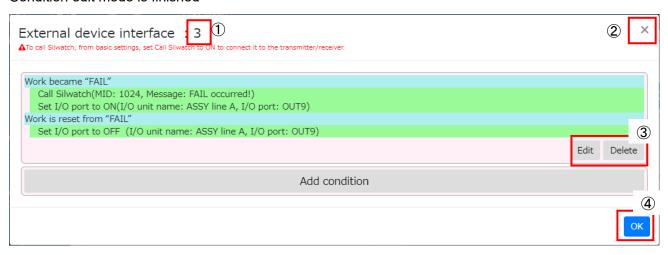way Silwatch Settings application (Optional) or contact our Sales Department.

*2) The message can be displayed on two-way Silwatch wristwatch type transmitter/receiver at a time is up to 20 single- byte characters or 10 double- byte characters. If this is exceeded, the message will be displayed only in the visible part from the beginning.

Example) When the work FAILs, call a person in charge using Silwatch and notify the whole work area with a rotating light at the same time. When FAIL is reset, stop the rotating light.
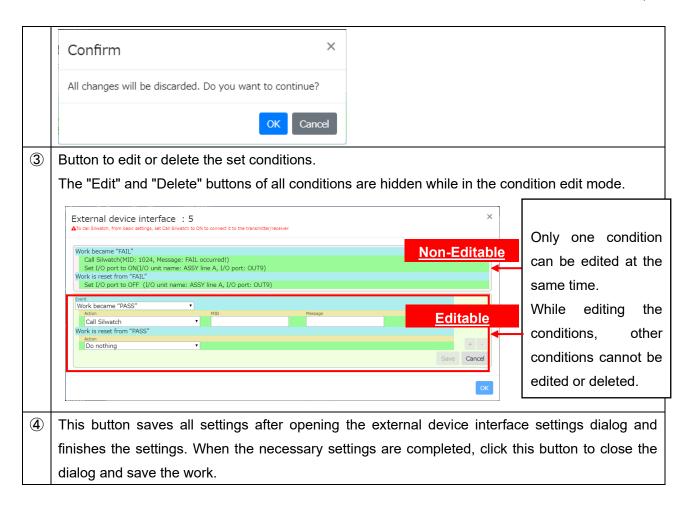
(Assume rotating light is connected to I/O port 9)

When editing the condition is completed, click the "Save" button, and the edited condition is confirmed and Condition edit mode is finished

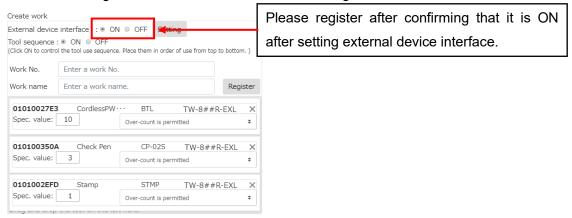|	Description
①	The total number of actions set for the work.
	If 10 or more actions are set in each work, new conditions or actions cannot be added.
②	This button discards all settings made after the external device interface settings screen is opened and ends the settings. Click to display the following confirmation message, and click the "OK" button to discard the settings and close the dialog.

③	Button to edit or delete the set conditions. The "Edit" and "Delete" buttons of all conditions are hidden while in the condition edit mode.
④	This button saves all settings after opening the external device interface settings dialog and finishes the settings. When the necessary settings are completed, click this button to close the dialog and save the work.

When the external device interface setting is completed, close the dialog and register the work.

At this time, make sure that the external device interface is turned on before registering.

If it is OFF, it will not work even if external device interface is set.
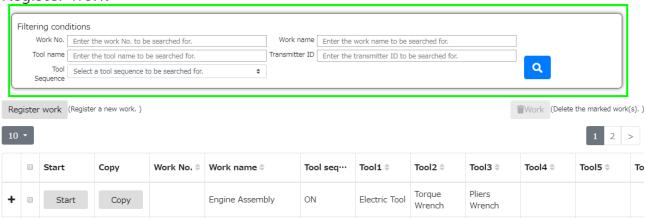
After registration of the work, start the work linked with the external devices to interface it with the external devices according to the external device interface settings.
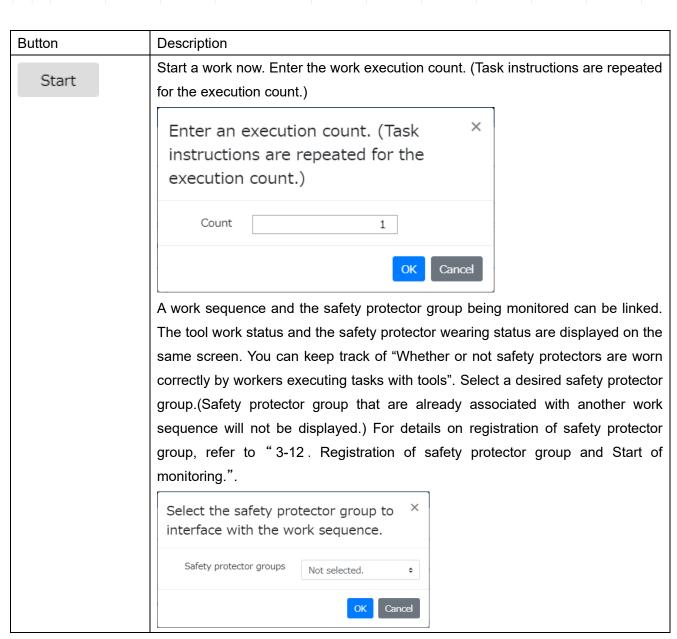

For specifications of the device controlled by external device interface, refer to "3-18. Specifications for external device interface".

Start work / Copy the registered information to make a registration

Register work

		Start	Copy	Work No. ⇕	Work name ⇕	Tool seq···	Tool1 ⇕	Tool2 ⇕	Tool3 ⇕	Tool4 ⇕	Tool5 ⇕	To
✚	☐	Start	Copy		Engine Assembly	ON	Electric Tool	Torque Wrench	Pliers Wrench			

Button	Description
Start	Start a work now. Enter the work execution count. (Task instructions are repeated for the execution count.) Enter an execution count. (Task instructions are repeated for the execution count.) Count 1 OK Cancel A work sequence and the safety protector group being monitored can be linked. The tool work status and the safety protector wearing status are displayed on the same screen. You can keep track of "Whether or not safety protectors are worn correctly by workers executing tasks with tools". Select a desired safety protector group.(Safety protector group that are already associated with another work sequence will not be displayed.) For details on registration of safety protector group, refer to "3-12. Registration of safety protector group and Start of monitoring.". Select the safety protector group to interface with the work sequence. Safety protector groups Not selected. OK Cancel

		Start	Copy	Work No. ⇕	Work name ⇕	Tool seq⋯	Too
✚	☐	Start	Copy		Engine Assembly	ON	Ele

Up to 16 works and work sequences in total can be started at the same time.

Once you click the Start button, you cannot click it until the work is completed.

When starting a work, the work is registered as a work sequence.

When starting a work, the work is registered as a work sequence.

When the tool contained in the work you want to start is used in the work or work sequence in progress, you cannot start the work.

Example) When using the same tool in "Large unit AD ASSY" and "Mid unit AK ASSY".

When clicking the Start button of "Large unit AD ASSY", the Start button of "Mid unit AK ASSY" is automatically disabled.

		Start	Copy	Work No. ⇕	Work name ⇕	Tool
✚	☐	Start	Copy	LU221-D	Small Unit AK ASSY	ON
✚	☐	Start	Copy	LU201-A	Large Unit AD ASSY	ON

Copy	The registered work information can be copied and then newly registered.

Narrowing down of the works (registered information)

Enter the filtering conditions (⑥) and click 🔍 , and the works satisfying the conditions are selected and displayed.

You can enter any string in work No., work name, tool name, transmitter ID. Works that match the entered string exactly or partially will be extracted. Select the tool sequence from the displayed selection information. The works matching the conditions are extracted. When several conditions are entered, the works that match all conditions are extracted.

Deletion of the works (registered information)

If you check here, all the displayed works will be checked.

		Start	Copy	Work No. ⇕	Work name ⇕	Tool seq…	Tool1 ⇕	Tool2 ⇕	Tool3 ⇕	Tool4 ⇕	Tool5 ⇕	To
＋	☑	Start	Copy		Engine Assembly	ON	Electric Tool	Torque Wrench	Pliers Wrench			
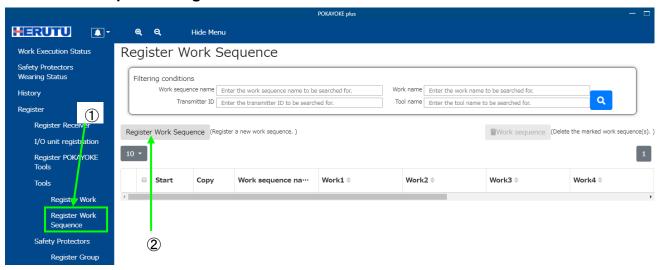
Put a check in the box for the work you want to delete and click ▮Work . The registered information will be deleted.
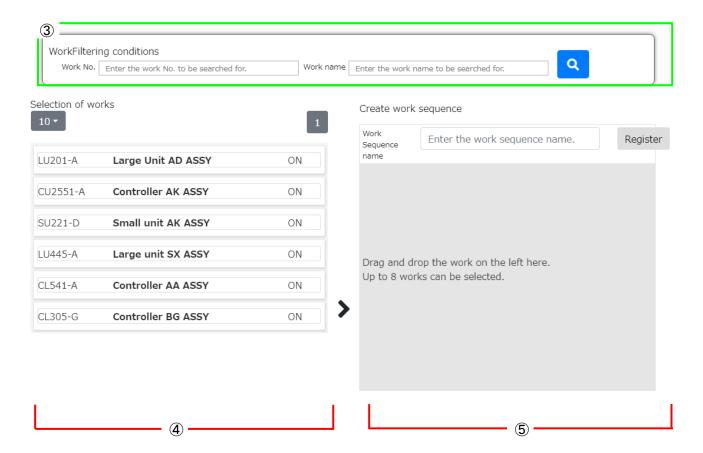
The work in progress cannot be deleted. The work sequence containing the work you want to delete will also be deleted.

3-11. Work Sequence Registration and Start

Click "Registration" on the menu, and "Work sequence registration" (①) is displayed. Click "Work sequence registration" to display the work sequence registration screen.

Click "Work sequence registration" button (②), and the screen for newly creating a work sequence is displayed. Unlimited number of Work sequences can be registered.

Narrowing down of the works (registered information)

Enter the work filtering conditions (③) and click [🔍], and the works satisfying the conditions are selected and displayed.

You can enter any string in work No., work name. Works that match the entered string exactly or partially will be extracted. When several conditions are entered, the works that match all conditions are extracted.

Work sequence creation

1. Enter a work sequence name.
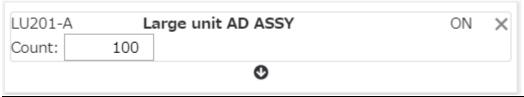
Item	Description	Input example
Work sequence name	Enter a desired work sequence name. (Maximum 20 characters)	Display C

2. Drag the work in "Selection of works" (④) on the left and drop it in the gray area of "Create work sequence" (⑤) on the right. You can drag and drop up to 8 tools.
   You can drag the works moved to the right side and move them up and down. Arrange the tools in order of execute from top to bottom.
   The work using TW-800R-SCL and the work using TW-8##R-EXL cannot be contained in the same work sequence.
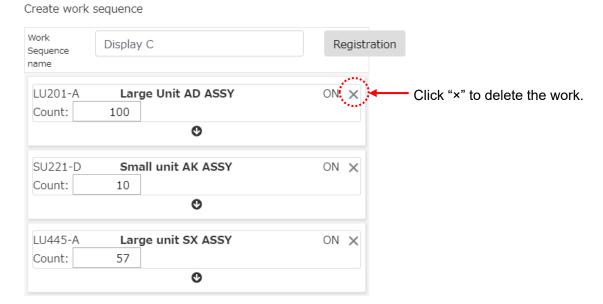
3. Set the number of work execution count. (The task instructions are repeated as much as the execution count.)

Item	Description	Input example
Count	Enter the execution count. Range of the values that can be entered: 1 - 99999	100
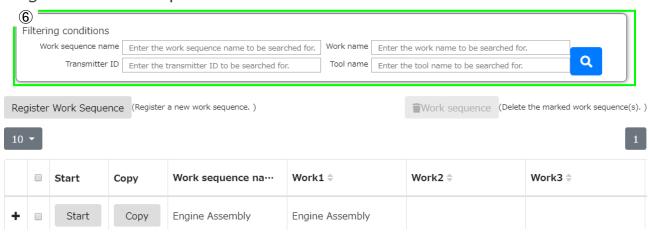
Example) When executing tasks in order from "100 units of large unit AD assembly" -> "10 units of midrange unit AK assembly" -> "57 units of large unit RT assembly".

Create work sequence

| Work Sequence name | Display C | | Registration |

LU201-A   **Large Unit AD ASSY**   ON ×   ← Click "×" to delete the work.
Count: 100
⊙

SU221-D   **Small unit AK ASSY**   ON ×
Count: 10
⊙

LU445-A   **Large unit SX ASSY**   ON ×
Count: 57
⊙

4. Click "Registration" button and work sequence creation is completed.
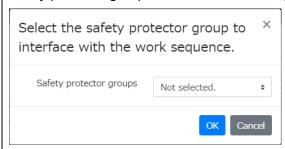
Start work sequence / Copy the registered information to make a registration

Register Work Sequence

⑥
Filtering conditions

| Work sequence name | Enter the work sequence name to be searched for. | Work name | Enter the work name to be searched for. |
| Transmitter ID | Enter the transmitter ID to be searched for. | Tool name | Enter the tool name to be searched for. | 🔍 |

Register Work Sequence (Register a new work sequence.)   🗑Work sequence (Delete the marked work sequence(s).)

10 ▾   1

		Start	Copy	Work sequence na···	Work1 ⇕	Work2 ⇕	Work3 ⇕
✚	☐	Start	Copy	Engine Assembly	Engine Assembly		

Button	Description
Start	Start a work sequence now. Up to 16 works and work sequences in total can be started at the same time. A work sequence and the safety protector group being monitored can be linked. The tool work status and the safety protector wearing status are displayed on the same screen. Select a desired safety protector group.(Safety protector group that are already associated with another work sequence will not be displayed.) For details on registration of safety protector group, refer to "3-12. Registration of

safety protector group and Start of monitoring.".

Select the safety protector group to ✕
interface with the work sequence.

Safety protector groups   Not selected. ⬍

OK   Cancel

Once the Start button is clicked, it cannot be clicked until the work sequence is completed.

		Start	Copy	Work sequence na···	Work1 ⬍	Work2 ⬍
✚	☐	Start	Copy	DisplayASSYLine G	Large unit SX ASSY	Small unit

When the tool contained in the work sequence you want to start is used in the work or work sequence in progress, you cannot start the work.
Example) When using the same tool in "DisplayASSYLine J" and "DisplayASSYLine G".
When clicking the Start button of "DisplayASSYLine J", the Start button of "DisplayASSYLine G" is automatically disabled.

		Start	Copy	Work sequence na···	Work1 ⬍	Work2 ⬍
✚	☐	Start	Copy	DisplayASSYLine J	Large Unit AD ASSY	Small uni
✚	☐	Start	Copy	DisplayASSYLine G	Large unit SX ASSY	Small uni

When the work contained in the work sequence you want to start is used in the work sequence in progress, you cannot start the work.

When the work is started, execution instructions are sent to TW-800R-SCL or POKAYOKE plus Viewer.

Copy	The registered work sequence information can be copied and then newly registered.

Narrowing down of the work sequences (registered information)

Enter the filtering conditions (⑥) and click [🔍] , and the work sequences satisfying the conditions are selected and displayed.

You can enter any string in work sequence name., work name, transmitter ID, tool name. Work sequences that match the entered string exactly or partially will be extracted. When several conditions are entered, the works that match all conditions are extracted.

Deletion of the work sequences (registered information)

Put a check in the box for the work sequence you want to delete and click [🗑Work sequence] .
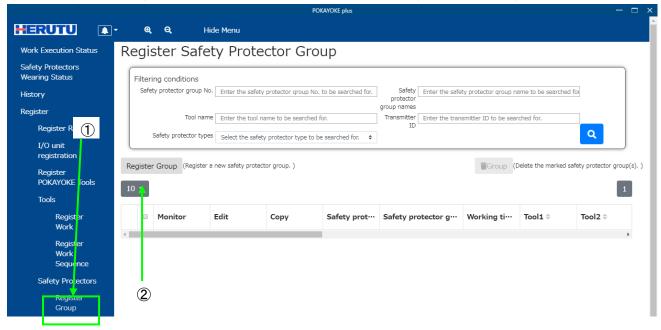
The registered information will be deleted.

The work sequence in progress cannot be deleted.
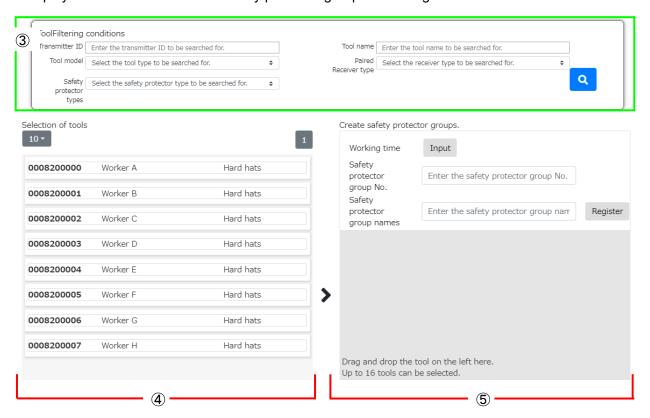
3-12. **Registration of safety protector group and Start of monitoring**

POKAYOKE plus can monitor up to 16 safety protector groups in parallel. Up to 16 safety protectors in each safety protector group. Unlimited number of safety protector group can be registered.

Click "Register" on the menu, and "Register Group" (①) is displayed. Click "Register Group" to display the safety protector group registration screen.

Click "Register Group" button (②), and the information entry screen to enter a new safety protector group is displayed. Unlimited number of Safety protector group can be registered.
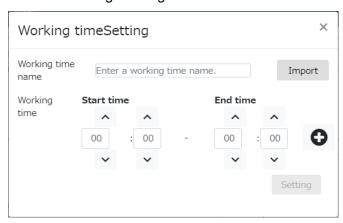
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Narrowing down of the tools (registered information)

Enter the tool filtering conditions (③) and click ![search], and the tools satisfying the conditions are selected and displayed.

You can enter any string in transmitter ID, tool name. Tools that match the entered string exactly or partially will be extracted. Select the tool model, the paired receiver type and safety protector type from the displayed selection information. The tools matching the conditions are extracted. When several conditions are entered, the tools that match all conditions are extracted.

Create safety protector group

1. Enter the working time. Click the "Input" button to display the working time setting screen. Working time can be set for each safety protector group. The wearing status of the safety protectors is monitored during working hours.

Item	Description	Input example
Working time name	Enter a desired working time name. (Maximum 16 characters) Working time can be set for each safety protector group.	ASSY line A_day shift
Start time	Enter the work start time.	08：00
End time	Enter the work end time.	10：00
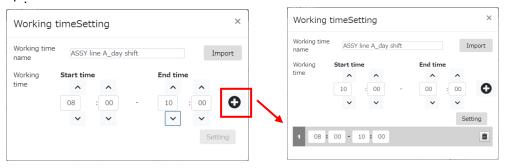
*Working hours exceeding 24 hours cannot be set.

Example) Settings for the following working hours

Start 8:00 ----- 10:00 ・・・ 10:10 ----- 12:00 ・・・ 12:40 ----- 15:00 ・・・ 15:10 ----- 17:00 End
            Work   Break   Work   Break   Work   Break   Work
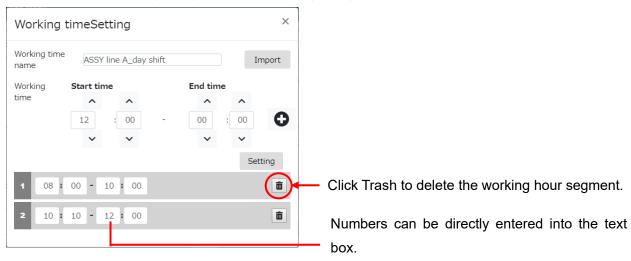
① Enter the working time name, start time (8:00) and the end time (10:00) after the break, and click plus "+".

Click the to add the working hour segment.

② Enter the start time (10:10) and the end time (12:00) after the break, and click plus "+".

Click Trash to delete the working hour segment.

Numbers can be directly entered into the text box.

③ Add all working hour segments and click the "Settings" button, and the settings for working hours are completed.
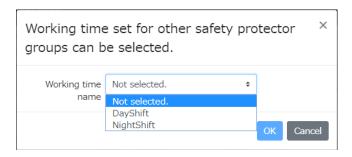
*Please note that the entered information will be discarded if you click the "×" in the upper right of the screen without pressing the "Setting" button.

A maximum of 20 working hour segments can be added.

◆In addition to the above methods, there is also a method of setting working times by using the import function.

Click the "Import" button to copy the working hours set in the registered safety protector group and register the working hours.

Working timeSetting   ×

Working time name   [ASSY line A_day]   Import

Working time set for other safety protector groups can be selected.   ×

Working time name   [Not selected. ⇕]
Not selected.
DayShift
NightShift
   OK   Cancel
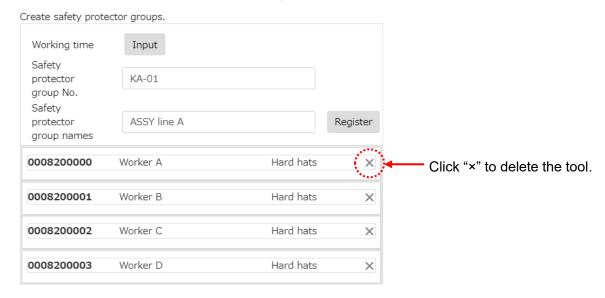
1. Enter the safety protector group No. and safety protector group name.

Item	Description	Input example
Safety protector group No.	Enter a desired safety protector group No.. (Maximum 8 characters)	KA-01
Safety protector group names	Enter a desired safety protector group name. (Maximum 20 characters)	ASSY line A

2. Drag the tool in "Selection of tools" (④) on the left and drop it in the gray area of "Create safety protector groups." (⑤) on the right. You can drag and drop up to 16 tools.
   You can drag the tools moved to the right side and move them up and down.

Create safety protector groups.

Working time   [Input]

Safety protector group No.   [KA-01]

Safety protector group names   [ASSY line A]   Register

0008200000	Worker A	Hard hats	×
0008200001	Worker B	Hard hats	×
0008200002	Worker C	Hard hats	×
0008200003	Worker D	Hard hats	×

⟵ Click "×" to delete the tool.
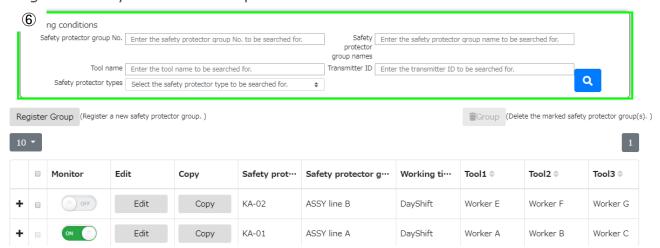
3. Click "Register" button and safety protector group creation is completed.

Start monitoring / Copy the registered information to make a registration

Register Safety Protector Group

⑥
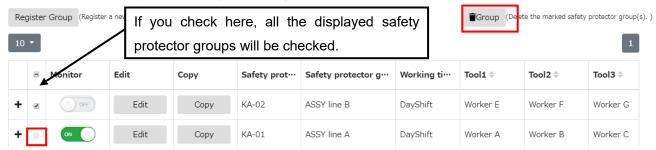
Button	Description
Monitoring	Click to switch monitoring ON / OFF. From the moment when switching from OFF to ON during working hours, monitoring of the wearing status is started. When switching from OFF to ON during non- working hours, monitoring of the wearing status is started when the working hours start. The monitoring can be switched between ON/OFF anytime during working hours.
Edit	Edits the information of the registered safety protector groups. Changes the working hours, or adds/deletes tools. Edit is possible even during monitoring.
Copy	The registered safety protector group information can be copied and then newly registered.

Narrowing down safety protector groups (registration information)

Enter the safety protector group filtering conditions (⑥) and click   , and the safety protector groups satisfying the conditions are selected and displayed.

You can enter any string in safety protector group No., safety protector group name, tool name, transmitter ID. Safety protector groups that match the entered string exactly or partially will be extracted. Select the safety protector type from the displayed selection information. The safety protector type matching the conditions are extracted. When several conditions are entered, the safety protector groups that match all conditions are extracted.

Deletion of the safety protector groups(registered information)

Register Group (Register a ne...

| If you check here, all the displayed safety protector groups will be checked. |

🗑Group (Delete the marked safety protector group(s).)

10 ▼

1

	☐	Monitor	Edit	Copy	Safety prot⋯	Safety protector g⋯	Working ti⋯	Tool1 ⇕	Tool2 ⇕	Tool3 ⇕
➕	☑	OFF	Edit	Copy	KA-02	ASSY line B	DayShift	Worker E	Worker F	Worker G
➕	☐	ON	Edit	Copy	KA-01	ASSY line A	DayShift	Worker A	Worker B	Worker C
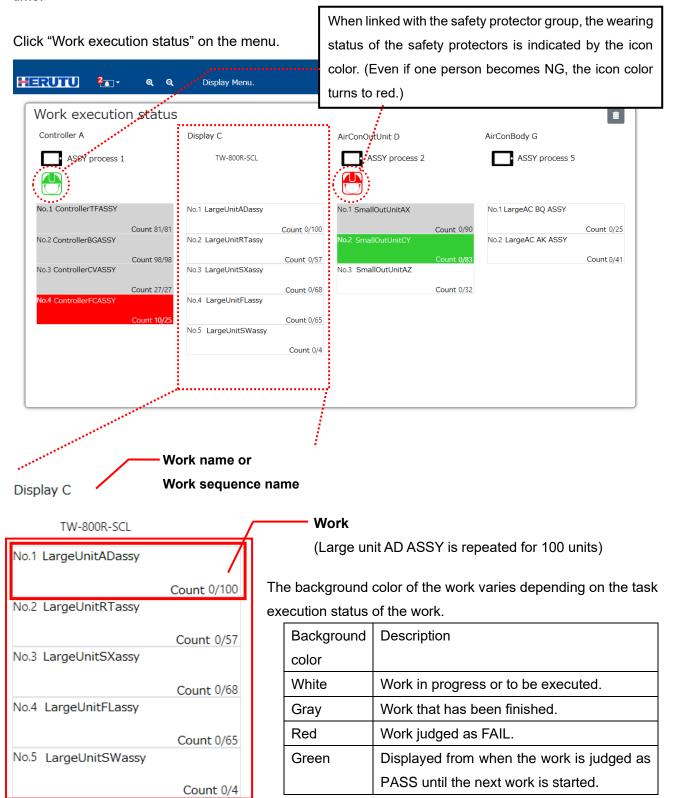
Put a check in the box for the safety protector group you want to delete and click. 🗑Group
The registered information will be deleted.

When Monitoring is set to ON, the groups cannot be deleted. Change the Monitoring setting to OFF to delete the groups.
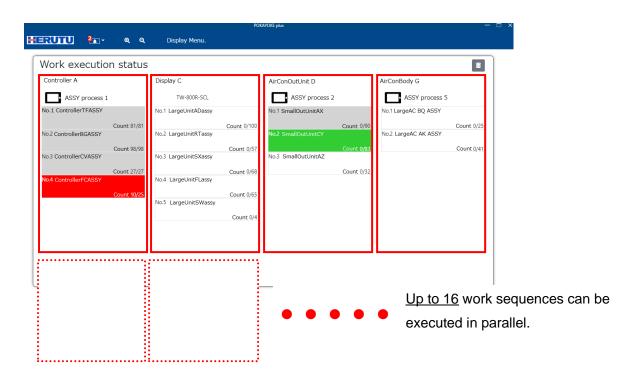
3-13. Work Execution Status Screen

The work and work sequence in progress are listed below. You can check the task execution status in real time.

Click "Work execution status" on the menu.

When linked with the safety protector group, the wearing status of the safety protectors is indicated by the icon color. (Even if one person becomes NG, the icon color turns to red.)

Display C

Work name or Work sequence name

TW-800R-SCL

Work

(Large unit AD ASSY is repeated for 100 units)

The background color of the work varies depending on the task execution status of the work.

Background color	Description
White	Work in progress or to be executed.
Gray	Work that has been finished.
Red	Work judged as FAIL.
Green	Displayed from when the work is judged as PASS until the next work is started.

Work sequence

Up to 8 works can be set and they are executed from top to bottom. When all works are completed, they automatically disappear from the Work execution status screen.

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Up to 16 work sequences can be executed in parallel.

Select POKAYOKE plus Viewer

- 【For use of the receiver TW-8##R-EXL】

  The display icon (▭) is displayed below the work sequence name.
  Click the icon and all of the connected POKAYOKE plus Viewer are displayed. Select your desired POKAYOKE plus Viewer.
  To use this function, POKAYOKE plus and POKAYOKE plus Viewer must be connected beforehand.
  For details of POKAYOKE plus Viewer, refer to "POKAYOKE plus Viewer Instruction manual".
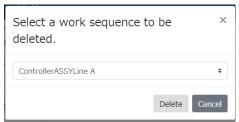
- 【For use of the receiver TW-800R-SCL】

  "TW-800R-SCL" is displayed.
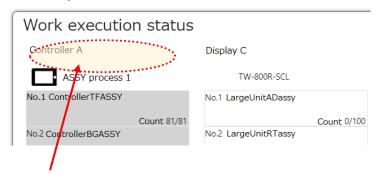
Delete work sequence

Click [trash icon] on the top right of the Work execution status screen, and the following message is displayed.

Select a work sequence to be deleted. ×

ControllerASSYLine A ÷

Delete Cancel

Select the work sequence you want to delete and click "Delete" button.

Work sequence details screen
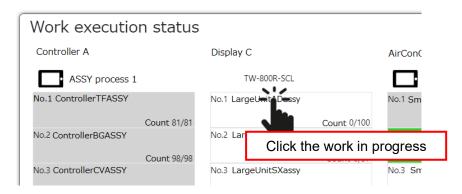
Click this area to display details of the work sequence (task contents of each work).
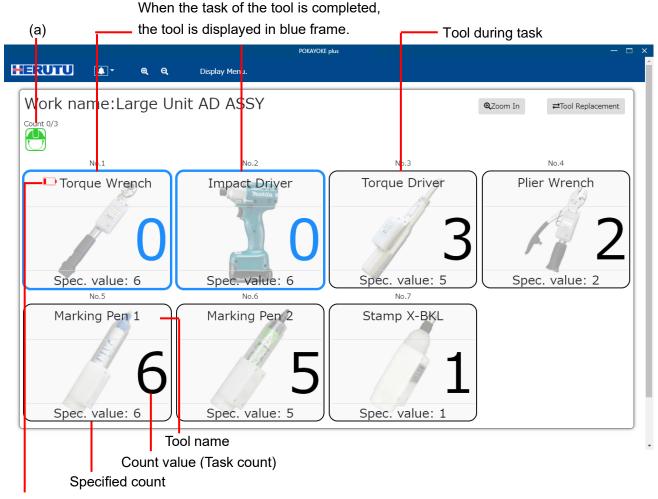
	Item	Description
①	Work name	Name of the work.
②	POKAYOKE plus Viewer or receiver name	When POKAYOKE plus Viewer is specified, POKAYOKE plus Viewer name is displayed. When the receiver is TW-800R-SCL, the receiver name registered in receiver registration is displayed.
③	Tool name	Name of the tool.
④	Transmitter ID	ID of the transmitter.
⑤	Specified count	Task count of the tool.

3-14. **Work Execution Screen**

Click the work in progress, and the Work execution screen is displayed.

(a)

When the task of the tool is completed, the tool is displayed in blue frame.

Tool during task

Tool name

Count value (Task count)

Specified count

Indication of low battery
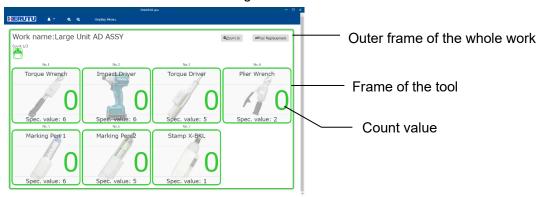
– Indicated when using the tool equipped with a transmitter with low battery detection and the battery is lower than a set value. Replace the battery with a good one and use a tool to disable the indication.

(a) "Production number / set execution count" is displayed. The work order is repeated until the set number of times is reached.

*The production number is the number of works whose judgment result is PASS. If "Finish the work in execution." is selected when FAIL occurs, it will not be counted.

When Tool sequence is ON, execute the tasks in increasing order from No. 1. When Tool sequence is OFF, No. is not displayed. Each time a task is executed, "Count value" counts up or down.
When the task is executed as much as the specified count, the task is judged as PASS and the frame of the tool and the count value (task count) turn blue.

Task is completed (PASS)
When all tasks are completed and they are judged as PASS, the frame of each tool, the count value and the outer frame of the whole work turn green.

Outer frame of the whole work

Frame of the tool

Count value
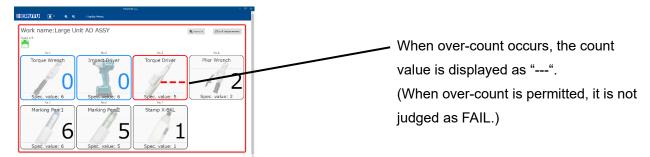
FAIL occurs
When FAIL occurs, the frame of the tool during task execution, the count value and the outer frame of the whole work turn red.
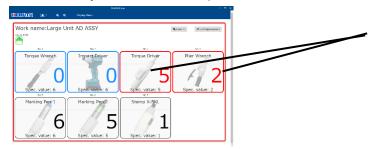
【FAIL factors】
●Over-count: Occurs when the task is executed more than the specified count.

When over-count occurs, the count value is displayed as "---".
(When over-count is permitted, it is not judged as FAIL.)

●Tool sequence error: Occurs when the tasks of the tools are executed in the wrong sequence.
*It occurs only when the tool sequence is ON.
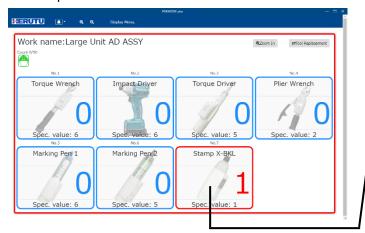
Example) When executing the task with No.4 "Plier Wrench" without executing the task with No.3 "Torque Driver".

When the tasks are executed in the wrong sequence, the frames of the target tools and the count values turn red.

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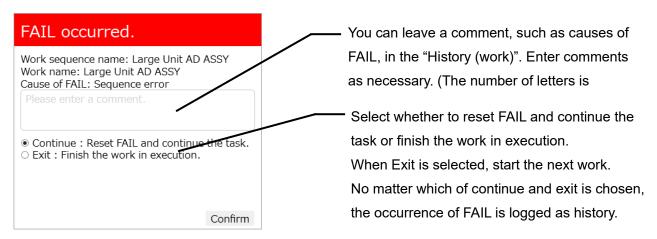
●Remaining count error: Occurs when a judgment input is provided when the task is not executed as much as the specified count.

Example）Judged and entered when the task with No.6 "Marking Pen 2" is completed (remaining task is left)

The tools used for the tasks that are not completed will be displayed in red.

When FAIL occurs, the following message is displayed and the task is temporarily interrupted.
Enter a comment (optionally), select either "Continue" or "Exit" and click the Confirm button.

You can leave a comment, such as causes of FAIL, in the "History (work)". Enter comments as necessary. (The number of letters is

Select whether to reset FAIL and continue the task or finish the work in execution.
When Exit is selected, start the next work.
No matter which of continue and exit is chosen, the occurrence of FAIL is logged as history.

FAIL can be reset also by the reset input from TW-800R-SCL, I/O unit or POKAYOKE plus Viewer located at the task site. Set whether to exit the work by the reset input from TW-800R-SCL, I/O unit or POKAYOKE plus Viewer or continue the work according to "Processing method for reset input" in [Default settings]/[Tools].

Enlarge the tool in operation

When Tool sequence for the work is set to "ON", clicking [⊕Zoom In] will display only the tool in operation in enlarged form. Use this function to display the count values larger at the task site.

* When Tool sequence for the work is set to "OFF", this function cannot be used.
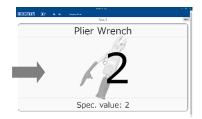
Click "Return" button to return to the original screen.

Click "Hide menu" to display the count in the full screen.

For multiple tools are used for one work, when the task with each tool is completed, the outer frame and the count value turn blue. After the reset timer has elapsed, the counter display changes to the count for the next tool.
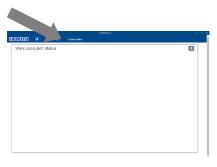
Task is completed (PASS)

When PASS judgment is made, the outer frame and the count value turn green.
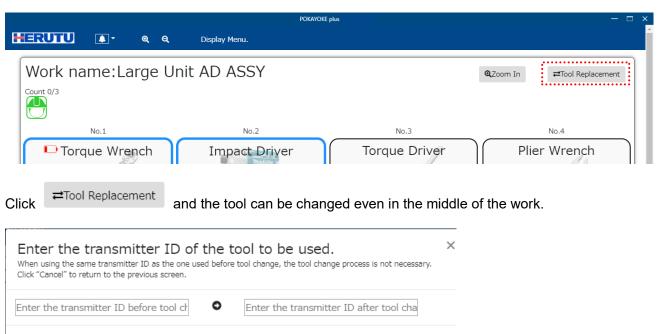
When the next work is set to be executed, after the reset timer has elapsed, the counter display changes to the count for the next work.

If there is no more work to be executed, after the reset timer has elapsed, the screen is switched to the Work execution status screen.

FAIL occurs

When FAIL occurs, the outer frame and the count value turn red.

Tool Replacement

Click and the tool can be changed even in the middle of the work.

Enter the transmitter IDs (10 digits) before and after the tool change and click the Change button.

Use this function for the following.

- To replace the tool due to damage.
- To replace the transmitter (TW-800T, TW-850T) attached to the tool due to the damage of the transmitter.
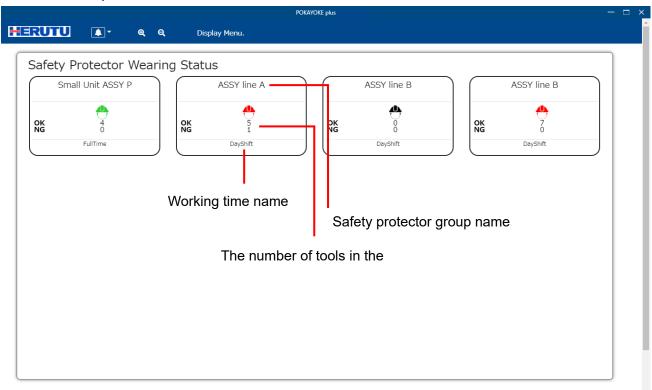
3-15. Safety protectors wearing status screen

The safety protector group being monitored are listed. You can keep track of the wearing status of the safety protector in real time.

Click "Safety Protector Wearing Status" button on the menu. A maximum of 16 safety protector groups can be monitored in parallel.

Working time name

Safety protector group name

The number of tools in the

【Explanation of terms】

Wearing status is OK ・・・ Wearing safety protectors correctly.
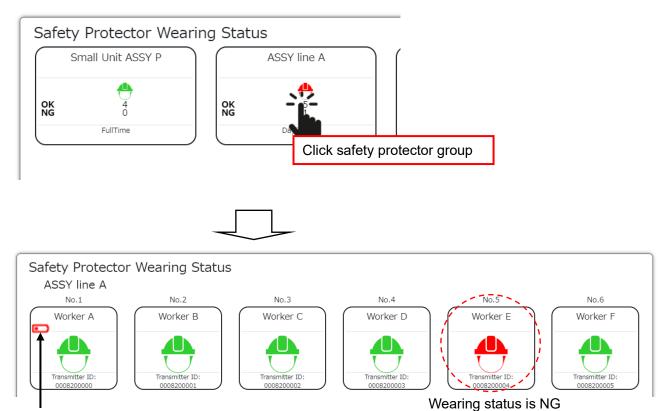
Wearing status is NG ・・・ Wearing safety protectors not correctly.

During non-working hours, the number of tools in the OK/NG wearing state is reset to 0.

The wearing status can be checked for each safety protector group. Each frame shows one safety protector group. The color of the icon changes depending on the wearing status.

Color	Status
Black	Ready(off hours)
Green	Wearing status is OK
Red	Wearing status is NG
Gray	All tools in the safety protector group are temporarily stopped. (*5)

Click a safety protector group to check the detailed wearing status of the safety protector group.

Click safety protector group

Wearing status is NG

When the battery of the transmitter ENS-HH01 is getting low,

the icon indicating low battery level is displayed.
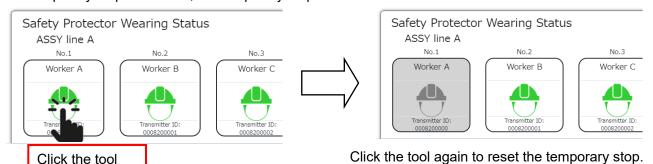
When the wearing status changes from OK to NG, it is indicated by a message and sound.

The alert is not cleared until the wearing status changes from NG to OK.

Alert

Safety protector group names
ASSY line A
Transmitter ID
0008200000
Tool name
Worker A
Tool model

Safety protector types
Hard hats
Wearing status
NG
Date and time of occurrence
2020年5月26日 14:49:34

(*5) Click any tool to change the background color of the frame and the icon color to gray. This status is called a temporary stopping state.

Monitoring is not performed in a temporary stop state even during the working hours, and the wearing history is not recorded. An alert is not generated even after change of the wearing status from OK to NG. The temporary stop state is maintained even after restarting POKAYOKE plus. Click the tool again to reset the temporary stop. Until then, the temporary stop state continues.

Click the tool

Click the tool again to reset the temporary stop.

The transmitter (ENS-HH01) mounted on the hard hat transmits the wearing status to the receiver at the timing described below.

① A wireless signal is transmitted to indicate the wearing status each time the chin strap is fastened or removed.

② The signal is transmitted every 5 minutes from when hard hat wearing was detected, and the wearing status at that point is notified. When the chin strap is not securely fastened or not worn for 30 minutes, the transmitter stops transmitting a signal at regular time intervals.

◆**Cautions for display of the wearing status of the safety protectors**

● When wearing safety protectors at the start of the working hours, an alert is generated. It may take up to 5 minutes until the alert is cleared.

The reasons are as follows.
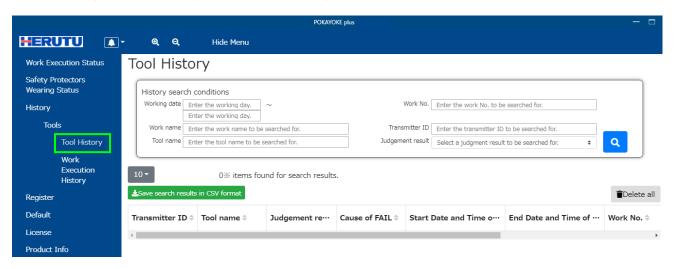
POKAYOKE plus ignores signals received during non-working times. Therefore, when workers are wearing safety protectors at the start of working hours, the wearing status becomes NG and an alert is generated. The transmitter transmits a signal every 5 minutes. When a signal is regularly transmitted, POKAYOKE plus updates the display to the actual wearing status.

● If workers enter an area where a wireless signal cannot reach the receiver while wearing safety protectors, the display of POKAYOKE plus is not updated even after change of the actual wearing status.
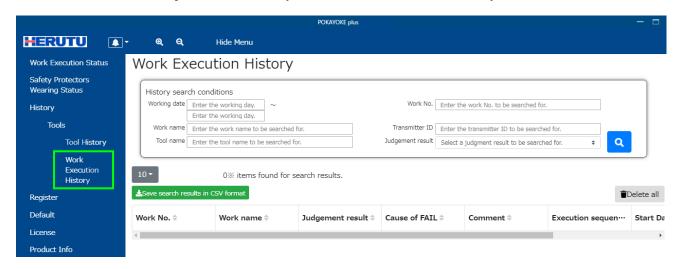
3-16. History

Two types of historical data are available. "Tool History" displays the task history for each tool. "Work Execution History" displays the task history for each work. The historical data of each type can be saved in the csv format.

●**Tool History**　　Click "History"/"Tools"/"Tool History" button on the menu.

●**Work Execution History**　　Click "History"/"Tools"/"Work Execution History" button on the menu.

Search history

●Common to tool history and work execution history

Enter a desired information in "History search conditions" and click [🔍] .

Click [🔍] while leaving the History search conditions field blank, and all of the stored data is displayed.

Search conditions are as below:

Item	Description	Input example
Working date	Enter the date the work was executed. Search the historical data whose Start Date and Time of Task is within the range of the specified Date of Task. The search range should be from 00:00:00 on the search start date to 23:59:59 on the search end date.	2018/8/1 ～ 2018/9/1
Work name	Enter a work name.	Large unit AD ASSY
Tool name	Enter a tool name.	Torque Wrench
Work No.	Enter a work No.	LU0101_AD
Transmitter ID	Enter the transmitter ID (10 digits).	000100002F
Judgement result	Select judge result (PASS or FAIL).	FAIL

View history

●The items of Tool History are listed below:

Item	Description	Display example
Transmitter ID	ID (10 digits) of the transmitter.	000100002F
Tool name	Name of the tool.	Torque Wrench
Judgement result	Judgment result (PASS or FAIL).	FAIL
Cause of FAIL	FAIL factors (Over-count, tool sequence error and count remaining error).	Over-count
Start Date and Time of Task	Date and time when the task with the target tool was started.	2018/9/1 08:30:00
End Date and Time of Task	Date and time when the task with the target tool was completed.	2018/9/1 17:30:00
Work No.	Number of the work.	LU0101_AD
Work name	Name of the work.	Large unit AD ASSY
Working sequence of tool	Sequence of the target tools used in a work.	2
Spec. value	Specified count of the task.	6

●The items of Work Execution History are listed below:

Item	Description	Display example
Work No.	Number of the work.	LU0101_AD
Work name	Name of the work.	Large unit AD ASSY
Judgement result	Judgment result (PASS or FAIL).	FAIL
Cause of FAIL	FAIL factors (Over-count, tool sequence error and count remaining error).	Over-count
Comment	A comment entered when FAIL occurred.	Continue work because there is no problem.
Execution sequence of work	Set the number of work repetitions when the work is started or a work sequence is created. Displays the number of times out of the specified repetition count that the task was executed.	3
Start Date and Time of Task	Date and time when the task was started.	2018/9/1 08:30:00
End Date and Time of Task	Date and time when the task was completed.	2018/9/1 17:30:00

Historical data size

For example, when manufacturing 100 units using 4 tools, 400 tool historical data items and 100 work historical data items will be stored. In this case, the total data size of work history and tool history is approx. 150KB.

Maximum number of data items to be stored in history

Approx. 11,000,000 data items of tool history and work history can be stored in total.

Save history in the CSV format.

Click "Save search results in CSV format" button and the displayed history can be saved to any destination in the CSV format. It cannot be saved in the CSV format during work execution. Execute saving after all works are completed.

(Work execution refers to the situation where one or more work sequences are displayed on the Work execution status screen.)

A maximum number of output per file is 1 million. To save more than 1 million historical data, divide the data into data sets of 1million and generate file output.

In this case, insert "_(n)" after the last digit (immediately before the extension) of the file name.
Example： tool_20180524_154122_1.csv, tool_20180524_154122_2.csv

The header indicating the item name of each information is not written to the file.

　●History (tool)
　　File name: tool_yyyyMMdd_HHmmss.csv　　　　Example: tool_20180901_083000.csv
　　(Year: yyyy,　Month: MM,　Date: dd,　Hour(s): HH,　Minute(s): mm,　Second(s): ss)

　　　The items are displayed in order from left to right: "Transmitter ID", "Tool name", "Judgment result", "Cause of FAIL", "Start Date and Time of Task", "End Date and Time of Task", "Work No.", "Work name", "Working sequence of tool" and "Specified count".

　●History (work)
　　File name: work_yyyyMMdd_HHmmss.csv　　　　Example: work_20180901_083000.csv
　　(Year: yyyy,　Month: MM,　Date: dd,　Hour(s): HH,　Minute(s): mm,　Second(s): ss)
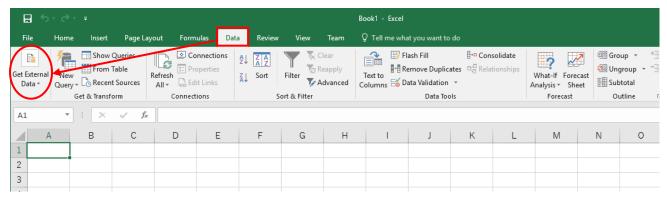
　　　The items are displayed in order from left to right: "Work No.", "Work name", "Judgment result", "Cause of FAIL", "Comment", "Execution sequence of work", "Start Date and Time of Task", "End Date and Time of Task".
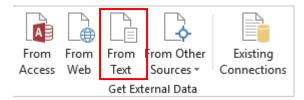
◆How to open history(CSV file)

When opening history (CSV file) in Excel, in order to avoid garbling, it is recommended to open the file following the steps below.
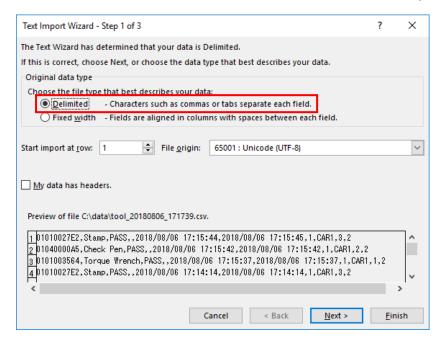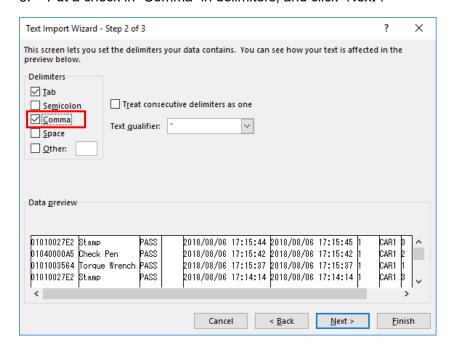1.　Start excel.
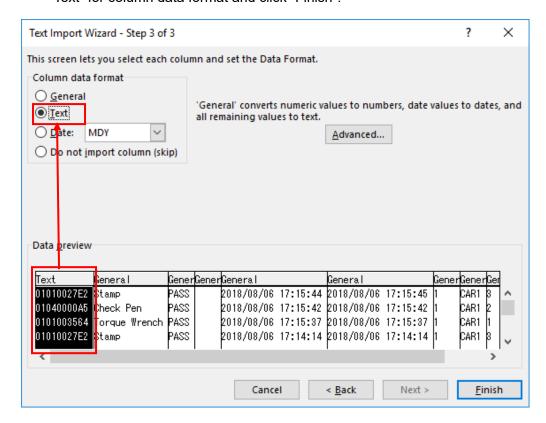2.　Select "Data" tab　→　"Get External Data".

3. Select "From Text".

4. Select the target CSV file and import it.

5. Select "Delimited -Characters such as commas or tabs separate each field." and click "Next".
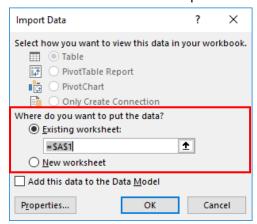

6. Put a check in "Comma" in delimiters, and click "Next".

7. Select a row containing the transmitter ID (10 digit character string) from data preview, and then select "Text" for column data format and click "Finish".
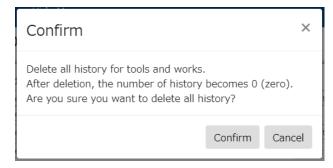

8. Select the destination to put the data to and click "OK".

Delete history

Click "Deleted all history" button and a confirmation message is displayed.

To delete all history, click "Confirm" button.

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All historical data of tools and works recorded in POKAYOKE plus as well as the history displayed on the screen will be deleted. Click the button on the "History (tool)" screen or the button on the "History (work)" screen, and all historical data of tools and works are deleted collectively.

Deleted history cannot be restored. Before deleting history, save data in the CSV format as necessary.

History cannot be deleted during work execution. Execute deletion after all works are completed.

Work execution refers to the situation where one or more work sequences are displayed on the Work execution status screen.

Maximum capacity of historical data

・　When the historical data size approaches the maximum, the following message is displayed. In this situation, works or work sequences can be started. However, please note once the maximum capacity of historical data is reached, works or work sequences cannot be started.

"Historical data capacity is close to the maximum.

When the historical data capacity reaches the maximum, execution of works or work sequence cannot be started.

Delete history and clear the historical data area."

・　When the maximum capacity of historical data is reached, works or work sequences cannot be started. When the following message is displayed upon clicking the Start button for the work or work sequence, delete historical data before starting the work or work sequence.

"The amount of history data has reached the maximum.

Cannot execute Work or work sequence, as no more history data cannot be written.

To start a work or work sequence, delete the history."

3-17. **Transmission of error information to smartphones or other devices in real time(MQTT output)**

When an error occurs while working with tools or wearing safety protectors, the error information is transmitted via IoT standard protocol MQTT in a real time. By linking POKAYOKE Plus with the IoT environment that supports MQTT, error information can be sent to the mobile terminal of the administrator, etc. by email or SMS at occurrence of an error.

POKAYOKE plus becomes MQTT publisher and sends messages to brokers.

*To use this function, enter the information required for communication in the default settings.

  For details, refer to "3-6. Default Settings".

MQTT specification	Value
Version	3.11
Keep Alive	45 sec
Connection Timeout	30 sec

When encrypting communication (TLS1.2), save the certificate file in the following folder. When using a current mainstream public cloud service, due to the requirements of encryption in many cases, receive a certificate from the cloud service or obtain an access token.

Item	Setting value
CA certificate	ca.pem
Client certificate	client.pem
Key of client certificate	client_key.pem
Save destination folder	C:/HERUTU/POKAYOKE plus/safety_cert

When "MQTT output" of the default setting ("Common") is set to ON, when you start POKAYOKE plus, the connection to the broker is automatically started. You can check the connection status in "Connection status" of MQTT communication settings in [Default Settings] / [Common]. The client ID used in MQTT is the "Client ID" set in the default settings ("Common").

MQTT output specification

◆Tools	
Transmission timing	When FAIL occurs during work execution, or when FAIL is released.
Topic	"Tools" (Set in default settings)

Payload	FAIL information (JSON format)
	
	{
	    "topic":"Tools",
	    "work_sequence_name":{Work sequence name},
	    "work_name":{Work name},
	    "failure_factor":{Cause of FAIL},
	    "status":{FAIL occurred("1") / Reset FAIL ("0")},
	    "datetime":{Date and time of occurrence(UTC)(yyyy-MM-dd HH:mm:ss)},
	    "utc_offset":{Difference between local time and UTC time}
	}

◆Safety protectors	
Transmission timing	The wearing status changes to NG or the wearing status changes to OK.
Topic	"SafetyProtectors" (Set in default settings)

Payload	Alert information (JSON format)
	
	{
	    "topic":"SafetyProtectors",
	    "transmitter_id":{Transmitter ID},
	    "tool_name":{Tool name},
	    "tool_model":{Tool model},
	    "tool_category":{Safety protector types},
	    "status":{Wearing status is OK("1") / Wearing status is NG("0")},
	    "datetime":{Date and time of occurrence(UTC) (yyyy-MM-dd HH:mm:ss)},
	    "utc_offset":{Difference between local time and UTC time}
	    "safety_group_name":{Safety protector group name}
	}

3-18. Specifications for external device interface

The following explains about specifications for control of each device according to the external device interface settings for the works.

I/O Unit

− **The timing of the event occurring, which is triggered by the I/O port status**

The I/O port and POKAYOKE plus are connected via TCP and controlled by a software. Actions in the unit of milliseconds (ms) or faster are not guaranteed. In our ideal environment *1, it is confirmed that an event occurs within 500ms after the port changed the status. However, the same level of performance is not guaranteed in all environments.

− **The default status of the I/O port and status of the I/O port after work**

All contacts of the I/O port are Form A, and the default state of the contacts is OFF (0).

When the work is finished, the status of the output I/O port controlled by the external device interface settings of the work is not maintained.

− **Control of the same I/O unit and output I/O port used for different works**

For several works, when setting the output I/O port of the same I/O unit to ON (1) or OFF (0),

the final output result is OR (logical sum) of the default state of OFF (0) and all actions.

For example, when Work A and Work B become FAIL, set the I/O port10 of the I/O unit A to ON.

When FAIL for the work is reset, set the I/O port10 of the I/O unit A to OFF.

・If either Work A or Work B is in the FAIL state, the status of the I/O port10 of the I/O unit A is ON (1).

・Otherwise it will be OFF (0).

− **When connection with the I/O unit is cut off during control of the output I/O port**

When connection between the I/O unit and PC is cut off, the status at the time of being disconnected is maintained until they are reconnected. When reconnected, all output I/O ports will be OFF due to device initialization. After the initialization is completed, the control by the external device interface setting is restarted.

Silwatch

- **Timing of call**

  Call Silwatch are stored in memory in order of occurrence (Up to 100 sets of data is stored. When the memory becomes full, new arriving data is discarded.) and transmitted in sequence at the transmission intervals selected in the default settings. Thus, when the action of Call Silwatch is executed, it may take some time to be actually called.

  When several actions of Call Silwatch are executed at the same time, the one call action takes longer than the transmission intervals selected in the default settings until the call is actually executed. This is a function to prevent communication interference and facilitate communication.

- **Specification of call Silwatch**

  Call Silwatch from POKAYOKE plus are always transmitted to all Two-way Silwatch Wristwatch type transmitter/receiver.

  To narrow down the calls to Two-way Silwatch Wristwatch type transmitter/receiver only, settings must be made for Two-way Silwatch Wristwatch type transmitter/receiver.

  To check or change the settings of Two-way Silwatch Wristwatch type transmitter/receiver, use the two-way Silwatch Settings application (Optional) or contact our Sales Department.

- **Guarantee of the call arrival to Two-way Silwatch Wristwatch type transmitter/receiver**
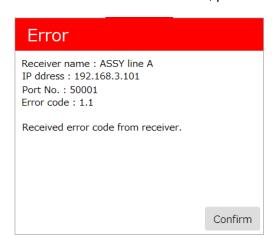
  Even if Call Silwatch is executed, whether the call reaches Two-way Silwatch Wristwatch type transmitter/receiver or not is depending on the environment and the arrival of the call is not always guaranteed.

*1) The environment satisfies the system requirements and is capable of dominating the bandwidth, and where other applications do not start up.

3-19. Error Code

When an error occurs while communicating with TW-800R-SCL, an error code is notified by TW-800R-SCL.

When an error code is received, please contact our sales department.

3-20. Product Information

The application information, including the version information, can be checked.

3-21. Exit POKAYOKE plus

Click "X" on the top right of the screen, and a message **"Do you want to exit?"** is displayed. Click "OK" and the application exits.

When executing a work or work sequence, a message **"Work in execution exists. Do you want to save the interrupted data?"** is displayed.

- When **"Yes"** is clicked

  The work or work sequence in progress is interrupted and the current state is saved. At next startup, the task can be started from the interrupted state.

- When **"No"** is clicked

  The work or work sequence in operation is all abandoned.

(This message uses Windows functions, the language of the "OK", "Yes", "No" and "Cancel" buttons depends on the language set in the OS.)

4. Actions When Receiver TW-800R-SCL Is Used

Before registration of the receiver to POKAYOKE plus

When the receiver is registered to POKAYOKE plus, the communication between the receiver and POKAYOKE plus is started.
The network monitor of TW-800R-SCL blinks until the communication is established. (7 segment LED is OFF.)

Network monitor

After registration of the receiver to POKAYOKE plus

When the receiver is registered to POKAYOKE plus, the standby state is displayed. The network monitor LED changes from blinking to lit.
This status continues until execution instructions from POKAYOKE plus are received.
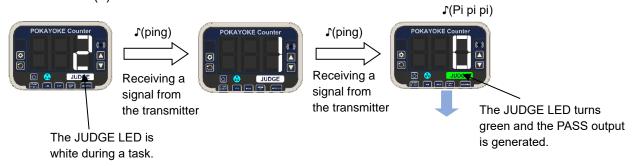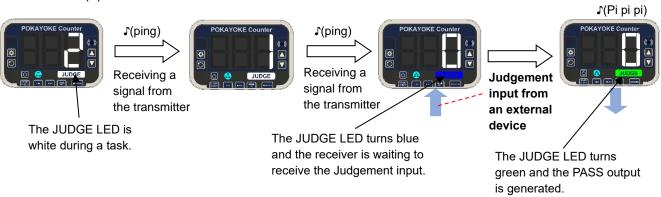
Start work or work sequence with POKAYOKE plus

Select either one of following work judgement timing in the Default settings of POKAYOKE plus.
When the work is judged as PASS, after the reset time is reached, the next work will be automatically started.
(a) When all tools complete the number of tasks specified by the count, the system judges the work.
(b) Judge the work when the judgment signal is input to TW-800R-SCL.

Example: For the work to execute a task 2 times with the Check Pen
Work flow for (a)

♪(Pi pi pi)

♪(ping)
Receiving a signal from the transmitter

♪(ping)
Receiving a signal from the transmitter

The JUDGE LED is white during a task.

The JUDGE LED turns green and the PASS output is generated.

Work flow for (b)

♪(Pi pi pi)

♪(ping)
Receiving a signal from the transmitter

♪(ping)
Receiving a signal from the transmitter

Judgement input from an external device

The JUDGE LED is white during a task.

The JUDGE LED turns blue and the receiver is waiting to receive the Judgement input.

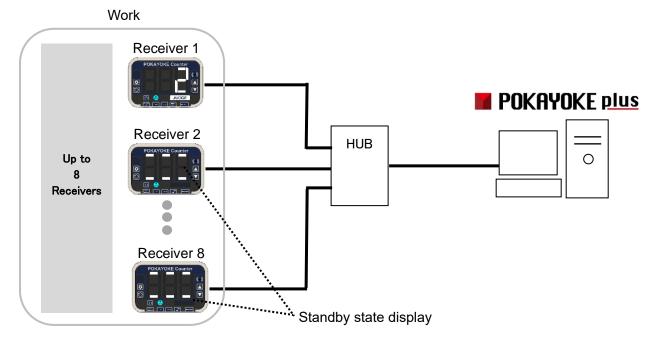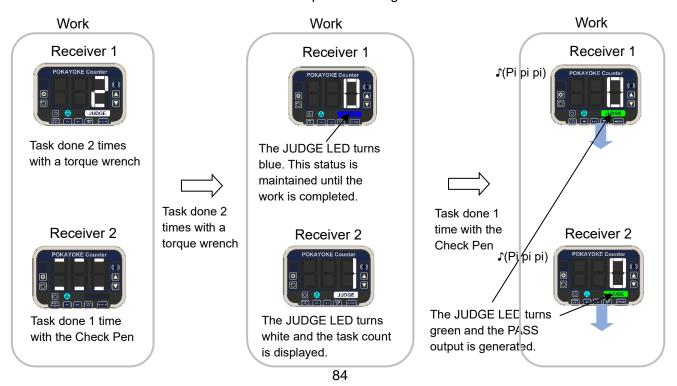The JUDGE LED turns green and the PASS output is generated.

Use multiple receivers for one work

Since you can register up to 8 receivers for one work, the system can prevent mistakes (pokayoke) for tasks that use up to 8 tools.

Standby state display

When Tool sequence is set to ON, the receiver is in the standby state until the task is ready to be executed. When Tool sequence is set to OFF, the count is displayed on all receivers immediately after a work or work sequence is started.

Example: For the work to be executed in order tasks done 2 times with a torque wrench and 1 time with the Check Pen   Tool sequence settings: ON

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External output (PASS/FAIL)

When multiple receivers are used for one work, PASS or FAIL outputs are generated by all receivers.
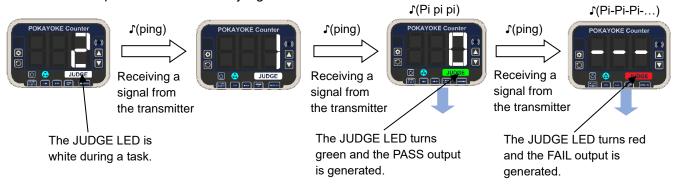
External input (Judge/Reset)

When multiple receivers are used for one work, and even when any receiver receivers an external input, the input signal will be adopted.

FAIL factors

FAIL factors consist of over-count error, remaining count error and tool sequence error. The actions of TW-800R-SCL for these errors are as follows.
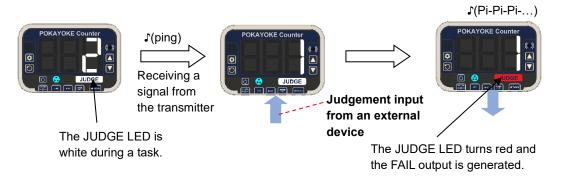
● Over-count error

When creating a work with POKAYOKE plus and selecting "Over-count is not permitted", executing tasks more than the specified count will be judged as Over-count.

The JUDGE LED is white during a task.
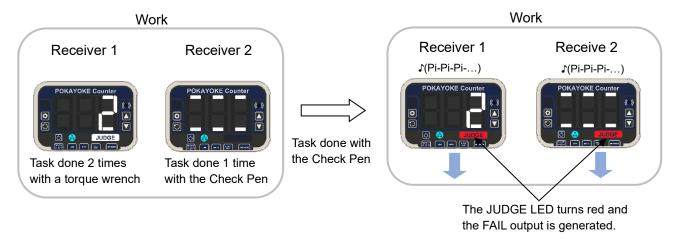
Receiving a signal from the transmitter

The JUDGE LED turns green and the PASS output is generated.

Receiving a signal from the transmitter

The JUDGE LED turns red and the FAIL output is generated.

● Remaining count error

When a judgment input is received during counting, a remaining count error occurs and the FAIL output is generated.

The JUDGE LED is white during a task.

Receiving a signal from the transmitter

Judgement input from an external device

The JUDGE LED turns red and the FAIL output is generated.

● **Tool sequence error**

When Tool sequence is set to ON, executing tasks in the wrong order will cause a tool sequence error.

Example) For the work to be executed in order tasks done 2 times with a torque wrench and 1 time with the Check Pen, when the task with the Check Pen is executed first.
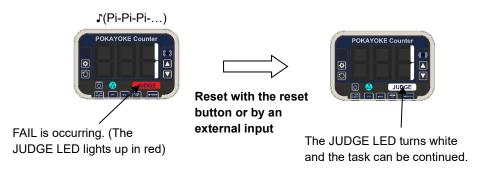

Work

Receiver 1 — Task done 2 times with a torque wrench

Receiver 2 — Task done 1 time with the Check Pen

Task done with the Check Pen

Work

Receiver 1 ♪(Pi-Pi-Pi-…)

Receive 2 ♪(Pi-Pi-Pi-…)

The JUDGE LED turns red and the FAIL output is generated.
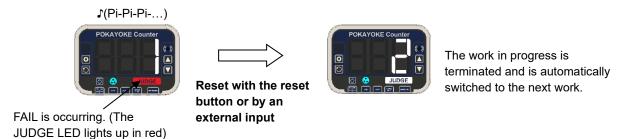
FAIL reset method

Reset FAIL from POKAYOKE plus or the receiver. This section explains how to reset FAIL from the receiver. Select either one of the processing methods for the reset input from TW-800R-SCL in the Default settings of POKAYOKE plus.

(a) Continue: Reset FAIL and continue the task.

(b) Exit: Finish the work in execution.

(a) Continue task

♪(Pi-Pi-Pi-…)

FAIL is occurring. (The JUDGE LED lights up in red)

Reset with the reset button or by an external input

The JUDGE LED turns white and the task can be continued.

(b) Exit task

♪(Pi-Pi-Pi-…)

FAIL is occurring. (The JUDGE LED lights up in red)

Reset with the reset button or by an external input

The work in progress is terminated and is automatically switched to the next work.

Status	JUDGE LED	Buzzer	PASS output	FAIL output
Before the task	OFF	-	-	-
Task in progress	White	Each time a signal is received, the sound "ping" is generated.	-	-
PASS	Blue	Pi pi pi	Time until the reset timer expires	-
FAIL	Red	Pi-Pi-Pi-… Synchronize with JUDGE LED	-	Until FAIL is reset

5. POKAYOKE plus Viewer

By linking to the receiver without counter feature TW-8##R-EXL, the count can be displayed at up to 16 stations by locating a Windows computer with "POKAYOKE plus Viewer" at your task site.

POKAYOKE plus Viewer runs based on work execution instructions from POKAYOKE plus. POKAYOKE plus Viewer cannot accomplish the counter feature on its own. Be sure to use POKAYOKE plus Viewer along with POKAYOKE plus.

In order to use POKAYOKE plus Viewer, you must register a license of POKAYOKE plus Viewer.

The instruction manual describes only license registration for POKAYOKE plus. For details of POKAYOKE plus Viewer, refer to "POKAYOKE plus Viewer Instruction manual".

License registration

POKAYOKE plus manages the license information of POKAYOKE plus Viewer. Registering the license of POKAYOKE plus Viewer to POKAYOKE plus will enable interactive communications.

To use POKAYOKE plus Viewer, you need to purchase one license for each POKAYOKE plus Viewer. When you purchase licenses, a document containing a license key[2] will be issued. Enter the license key described on the document into POKAYOKE plus.

Up to 16 licenses can be registered to one POKAYOKE plus.

When you use POKAYOKE plus Viewer for the first time or when you need to add licenses, be sure to perform license registration.

*2: The document containing a license key is enclosed in the CD-ROM bag. A license key is a character string in the format of "XXXXX-XXXXX-XXXXX-XXXXX-XXXXX".

Click "License" (①) on the menu.

Enter the issued license key in "Current license key" (②) and click "Register" button.

Make sure that the number of the purchased licenses is added to the number of POKAYOKE plus Viewer licenses (③).

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6．Troubleshooting

Error messages or symptoms	Cause and remedy
Cannot know the IP address of the PC on which POKAYOKE plus is running.	Click the Windows Start button, type "cmd", and press the Enter key. At the command prompt screen that opens, type "ipconfig" and press the Enter key. The value displayed in [IPv4 Address] is the IP address of the PC.
Work can not be started.	The possible cause is as below: ・The receiver or I/O unit may not be turned on. Turn ON the power of the receiver. ・The tool and the receiver are not paired. For the pairing method, please refer to the instruction manual for the receiver. ・The receiver or the I/O unit may have been connected with another POKAYOKE plus. Terminate POKAYOKE plus running on a different computer or delete the target receiver from different POKAYOKE plus.
Although workers are wearing safety protectors, the alert is not cleared.	The possible cause is as below: ・The receiver may not be capable of receiving the signal from the transmitter mounted on the safety protector. When the alert is not cleared after changing the wearing status, check the contents of the notification message "The receiver cannot receive a signal from the transmitter". ・The output data type of the receiver may not be set to "long data". To manage the wearing status of the safety protectors, you need to set the output data type to "Long data". For details on how to change the settings, see the instruction manual for the receiver. ・When wearing safety protectors at the start of the working hours, an alert is generated. It may take up to 5 minutes until the alert is cleared. For details, refer to the display of the wearing status of the safety protectors in "3-15. Safety protectors wearing status screen".
Cannot connect to POKAYOKE plus Viewer.	The POKAYOKE plus and POKAYOKE plus Viewer versions may be different. Please use the same version POKAYOKE plus Viewer as POKAYOKE plus. The application version can be displayed by clicking "Product Info" in the menu.

Is one of the following messages displayed in the notification of POKAYOKE plus?

Message	Cause and remedy
Register receiver(s) to start a work.	The message is displayed when no receiver is registered. From menu, select [Register]/ [Register Receiver] and register the receiver. Click the message to display the receiver registration screen. The message is cleared by clicking it.
Register tool(s) to start a work.	The message is displayed when no tool is registered. From menu, select [Register]/ [Register POKAYOKE Tools] and register the tool. Click the message to display the tool registration screen. The message is cleared by clicking it.
Register work(s) to start a work.	The message is displayed when no work is registered. From menu, select [Register]/ [Tools]/[Register Work] and register the work. Click the message to display the work registration screen. The message is cleared by clicking it.
Connection failed. Failed to connect to TW-8##R-EXL (IP address xxx.xxx.xxx.xxx / Port No. xxxxx) (The above is an example when TW-8##R-EXL is used.)	The message is notified when connection with the receiver or I/O unit failed or when the connection with the receiver or I/O unit is cut off. The possible cause is as below: ・The receiver or I/O unit is NOT turned ON. ・The LAN cable is disconnected. ・The receiver's IP address/Port No. is not correctly set. *Set the IP address so that it does not overlap in the network. Click the message to display the receiver registration screen and clear the message.
Connection failed. TW-8##R-EXL (IP address xxx.xxx.xxx.xxx /Port No. xxxxx) is connected to other POKAYOKE plus. (The above is an example when TW-8##R-EXL is used.)	The message is displayed when the receiver is already connected to different POKAYOKE plus. You cannot connect POKAYOKE plus to the receiver being connected to different POKAYOKE plus. Perform the following operation, and you can cut off the communication of the receiver with different POKAYOKE plus and connect the receiver and the target POKAYOKE plus. 1.Delete the target receiver from Receiver registration of different POKAYOKE plus. 2.Turn OFF the power of the receiver and turn it ON.

	Click the message to display the receiver registration screen and clear the message.
Connection failed. TW-800R-SCL (IP address xxx.xxx.xxx.xxx /Port No. 10001) is set to "stand-alone mode". Set TW-800R-SCL to "application interlock mode" when using it in this application.	The message is displayed when TW-800R-SCL is set to stand-alone mode. When linking TW-800R-SCL to POKAYOKE plus, change the operating mode of TW-800R-SCL to application interlock mode. For the setting method of the run mode, refer to "TW-800R-SCL Instruction manual". Click the message to display the receiver registration screen and clear the message.
Cannot receive a signal from the transmitter. Transmitter ID：0108xxxxxx Tool name：xxxxxxxxxxxxxxx Safety protector type：Hard hats	The message is notified when the receiver does not receive a signal from the safety protector for 12 minutes or more. Please check the following contents. ・Transmitter battery may be dead. Check the remaining battery capacity. ・Communication distance may be too long. Install the transmitter and receiver in a location where they can communicate with each other. ・Transmitter and receiver may not be paired. Check if they are paired. ・Transmitter may have failed. Press the switch on the transmitter and check the LED lighting pattern. For lighting patterns, refer to "En-Guard ENS-HH01 Instruction manual". Click the message to clear the message.