



Operation Manual

PRODUCT NAME

Air Gripper for Collaborative Robots

MODEL / Series / Product Number

RMH* Series

—Soft ware(YASKAWA Plug & Play Kit)—

SMC Corporation

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1. How to Download Software

Various software can be downloaded from SMC's website (<http://www.smcworld.com>). Search for the product part number (RMHZ, RMHS, etc.) on the TOP page and proceed to the detail page to download the software.

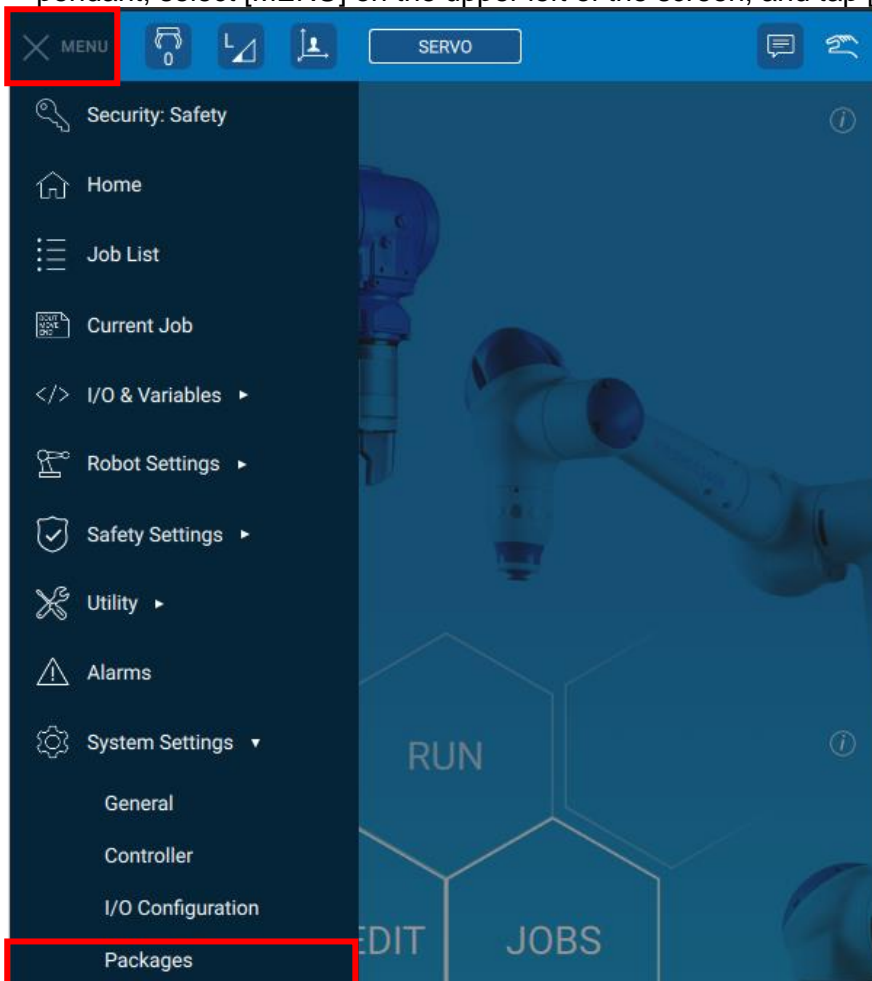
2. YASKAWA Plug & Play kit

The YASKAWA Plug & Play Kit allows you to easily connect the air gripper to the robot and operate it.

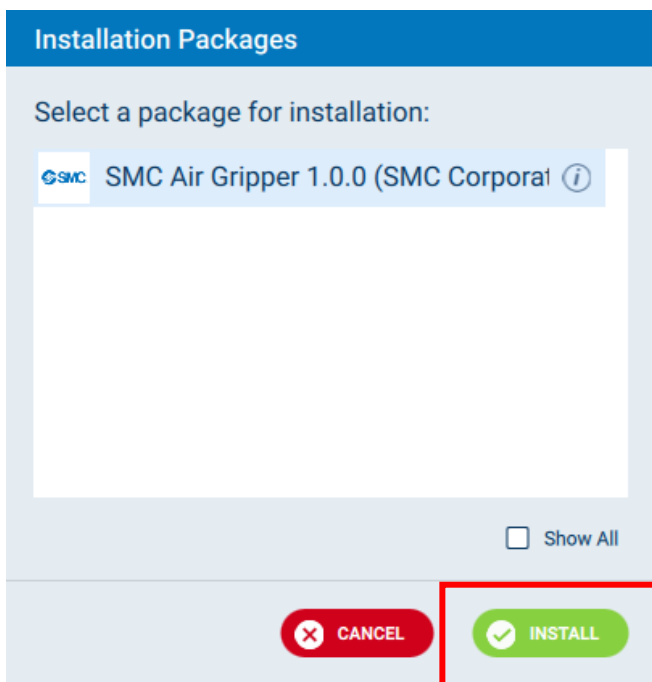
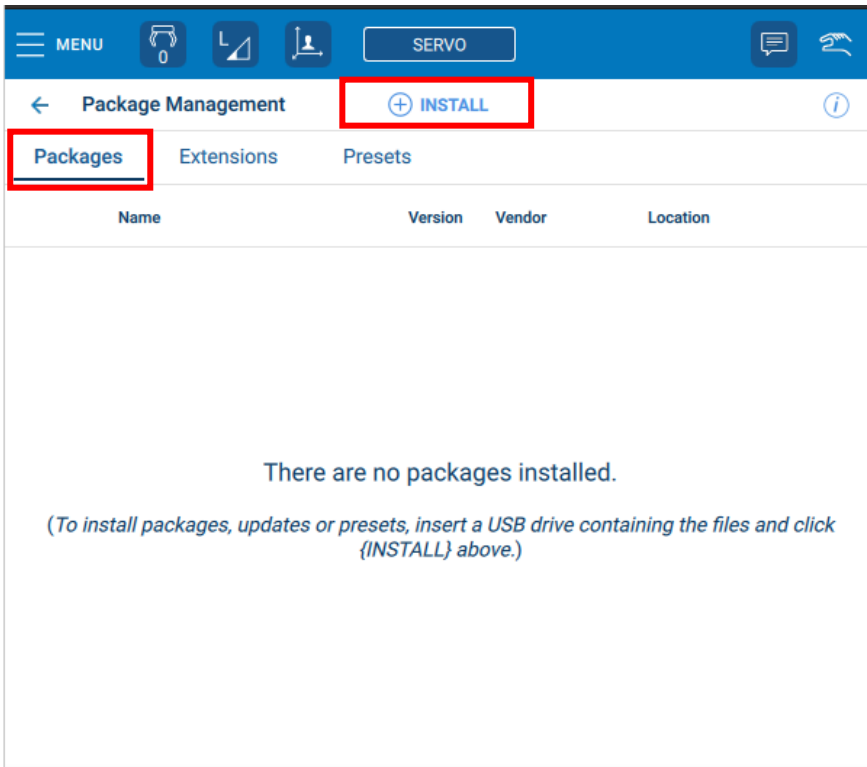
2-1. Installing YASKAWA Plug & Play Kit

The YASKAWA Plug & Play Kit is installed by means of the YASKAWA Installation Packages(.yip) file.
* Set the security access level to the administration level.

- 1.Download YASKAWA Installation Packages “SmcAirGripperExt.yip” from the SMC website.
- 2.Copy the downloaded file to a USB memory stick, insert the stick to the USB port of the smart pendant, select [MENU] on the upper left of the screen, and tap [System settings] -> [Packages].

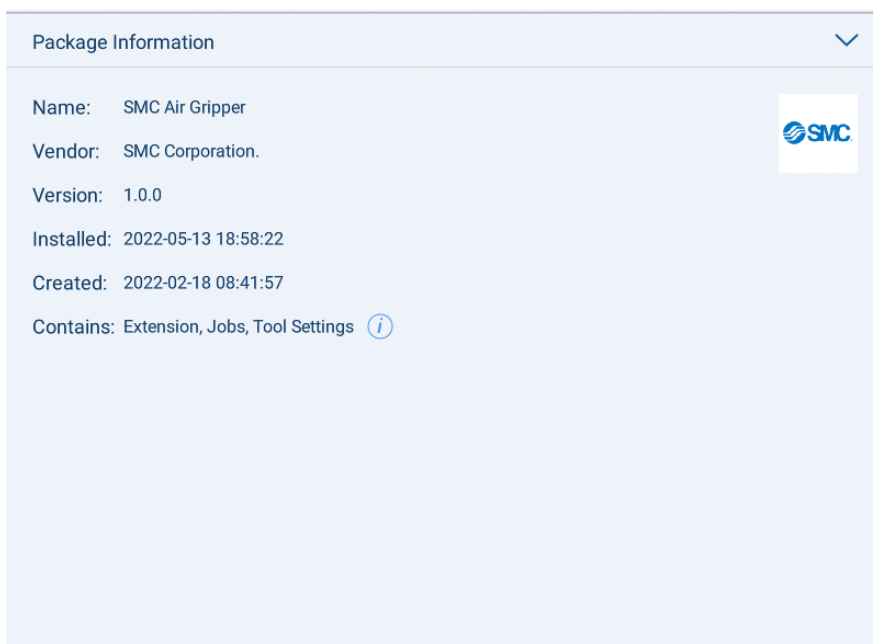
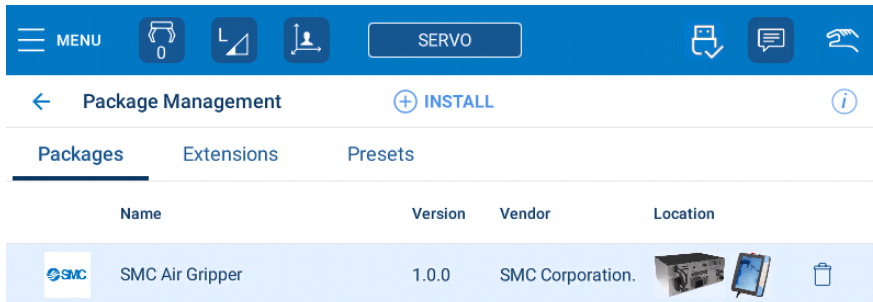


3. Open the “Packages” tab and tap [+INSTALL] at the upper part of the screen. A pop-up dialog box showing the installable packages will appear. From the package list, select “SMC Air Gripper” and install it.
Normally, when the installation has completed, the packages, extension, and tool presets are added to the appropriate list.

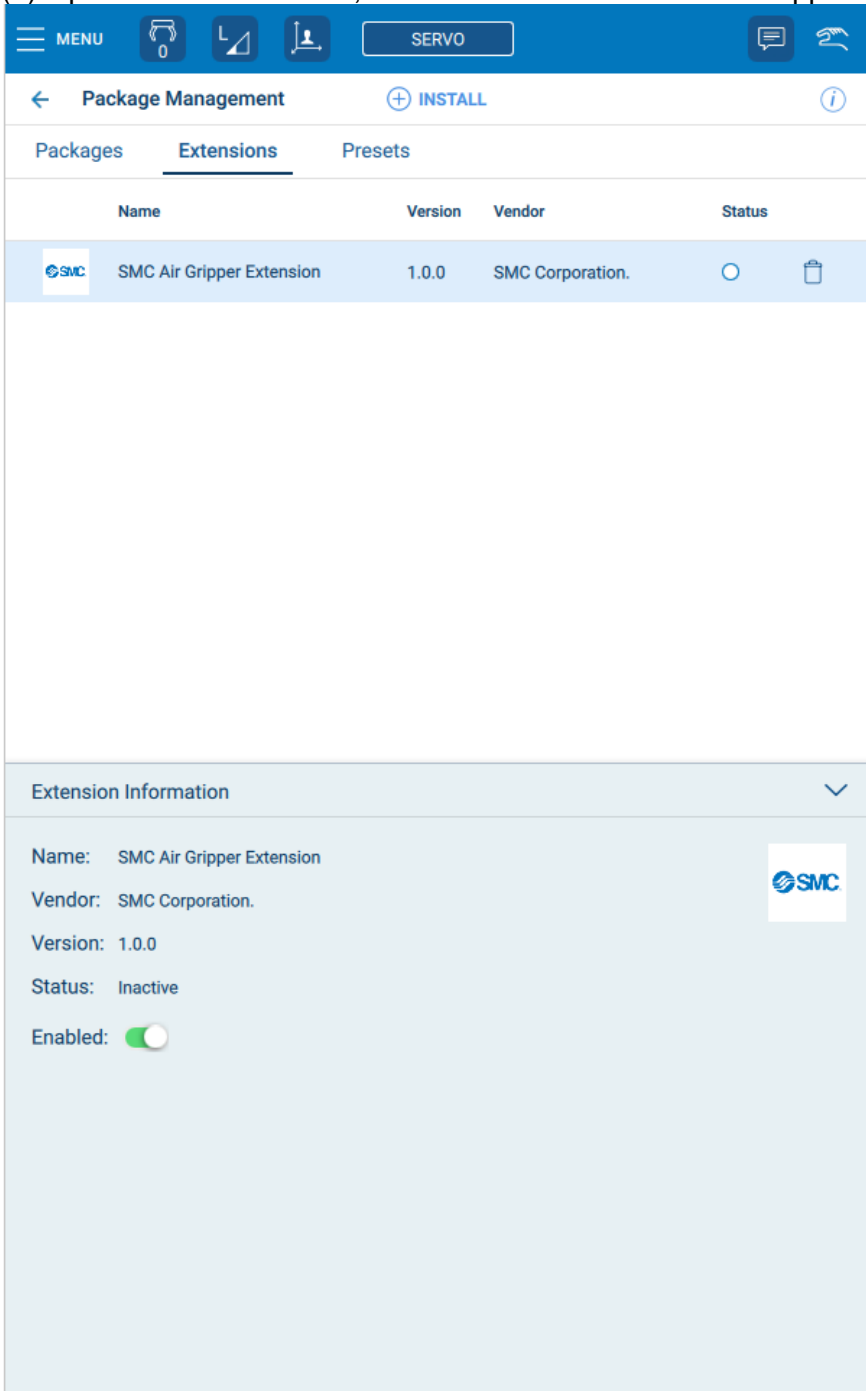


4. On the package administration screen, confirm that the installation has completed.

(1) Tap the “Packages” tab, and confirm that SMC Air Gripper is added to the list.




(2) Tap the “Extensions” tab, and confirm that the SMC Air Gripper is added to the list.



(3) Tap the “Presets” tab, and confirm that SMC Air Gripper is added to the list.

The screenshot shows a mobile application interface for Package Management. At the top, there is a blue header with a 'MENU' icon, a 'SERVO' button, and a '0' indicator. Below the header, the title 'Package Management' is displayed with an 'INSTALL' button and an information icon. The interface has three tabs: 'Packages', 'Extensions', and 'Presets', with 'Presets' being the active tab. A table lists the installed presets:

Name	Version	Vendor	Type
 SMC Air Gripper	1.0.0	SMC Corpor...	Tool

Below the table, there is a 'Preset Information' section with a dropdown arrow. The information displayed is:

- Name: SMC Air Gripper
- Type: Tool
- ID: com.smc.gripper.air.mhz.tools
- Vendor: SMC Corporation.
- Version: 1.0.0

An 'EXPORT' button is located at the bottom left of the information section.

2-2. Tool Presets

Select the gripper preset to be used from the list of installed tool presets. The tool properties of the gripper are copied to the currently selected tool. The tool properties can be edited manually before saving.

Tool #1: CTool1
Select preset to apply: ▼

General
Interference

Name: **CTool1** Block I/O: **Not Assigned**

Tool Center Point (TCP)

X_F R_X

Y_F R_Y

Z_F R_Z

Orientation ⚙️ ESTIMATE

Weight ⚠️ ⚙️ ESTIMATE

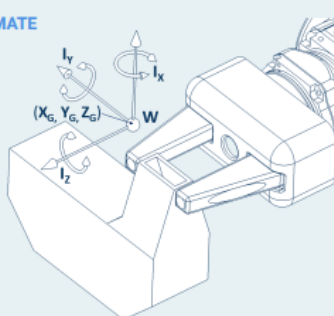
W

Center of Gravity ⚠️

X_G I_X

Y_G I_Y

Z_G I_Z



Tool #0: SMC Gripper RMHZ
📄 PRESETS

General
Interference

Name: **SMC Gripper RMHZ** Block I/O: **Not Assigned** 3D i

Tool Center Point (TCP)

X_F R_X

Y_F R_Y

Z_F R_Z

Orientation ⚙️ ESTIMATE Show without tool

Weight ⚙️ ESTIMATE

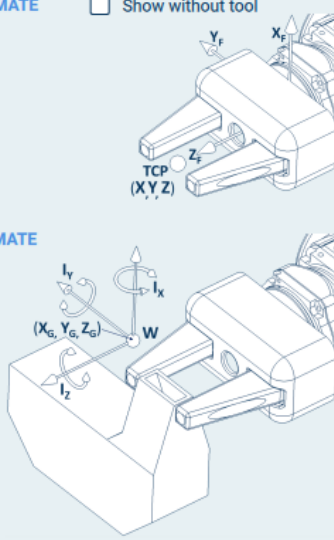
W

Center of Gravity

X_G I_X

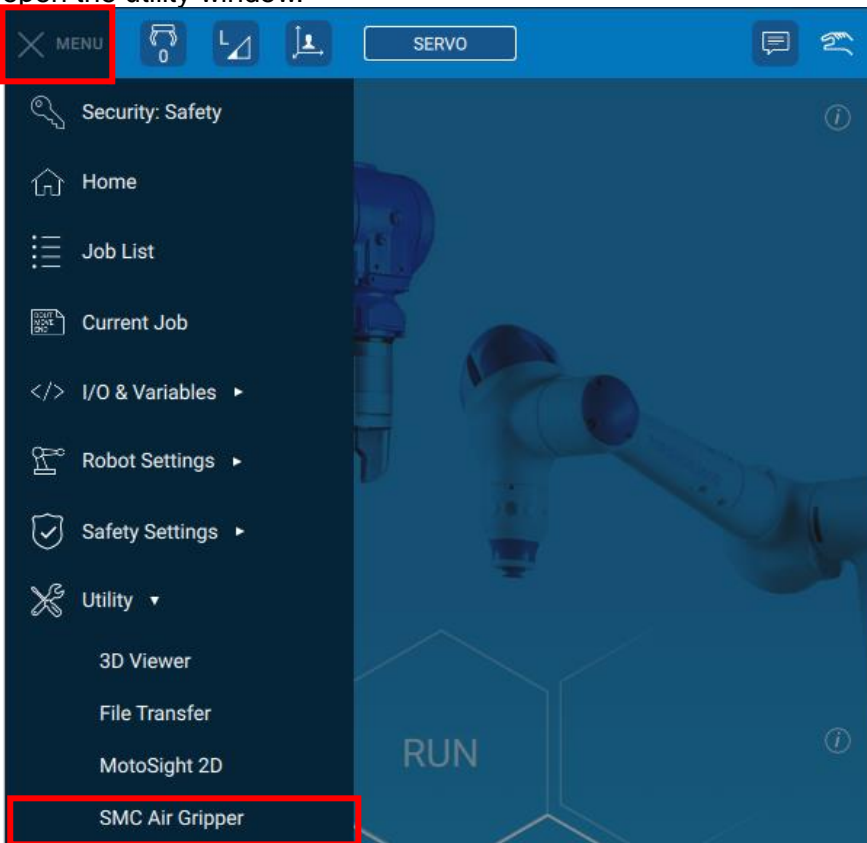
Y_G I_Y

Z_G I_Z



2-3. Utility Window

1. Select [MENU] at the upper left of the screen, tap [Utility] -> [SMC Air Gripper], or tap [JOGGING] on the job contents review screen and then tap the “Air gripper” icon at the lower right of the screen to open the utility window.



2. Utility Window Features

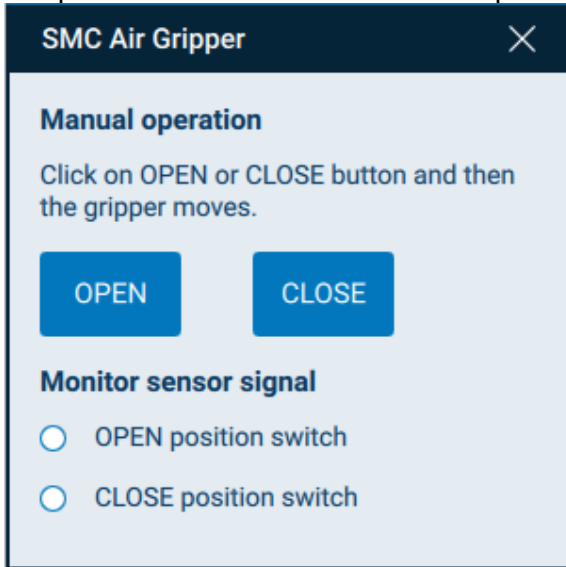
(1) Manual operation

It is possible to check the manual operation of the Air Gripper.

By tapping the OPEN or CLOSE button, it is possible to perform an opening or closing action of the gripper.

(2) Monitor sensor Signal

It is possible to confirm whether the Open or Close position auto switches react.



2-4. Air Gripper Integration Window

1. On the Job Contents review screen, tapping [AIRGRIPPER] on the navigation bar opens the "Air Gripper" Integration Window.



2. Insert Commands Tab

(1) Selection Operation

Select the behaviour of the Open or Close operations.

•OPEN ONLY

Puts the gripper into the “Open state”, recognises it as “Open success” without checking the Open position signal, and proceeds to the next operation.

•OPEN AND CHECK SIGNAL

Puts the gripper into the “Open state” and waits for the Open position signal input before proceeding to the next operation. When the signal is turned on, the software recognises it as “Open success” and proceeds to the next operation.

•CLOSE

Puts the gripper into the “Closed state”, recognises it as “Close success” without checking the Close position signal, and proceeds to the next operation.

•CLOSE AND CHECK SIGNAL

Puts the gripper into the “Closed state” and waits for the Close position signal input before proceeding to the next operation. When the signal is turned on, the software recognises it as “Close success” and proceeds to the next operation.

(2) INSERT COMMAND

It is possible to add commands for controlling the gripper opening/closing action to the job.

•SMC_OPEN_AIRGRIPPER

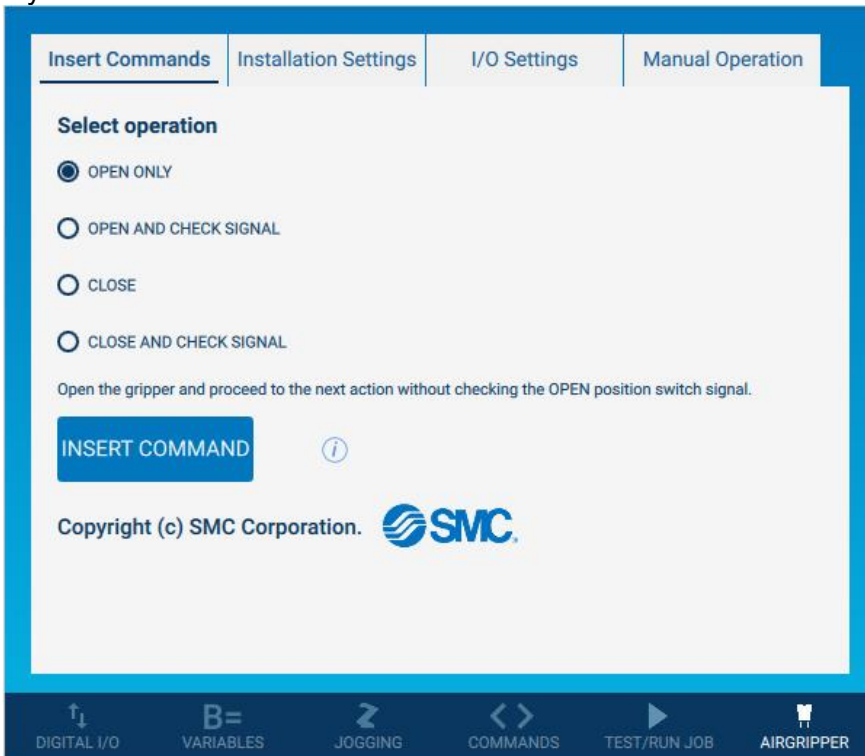
This command is used to make a gripper opening action.

If you select “OPEN ONLY” or “OPEN AND CHECK SIGNAL” this command will be added.

•SMC_CLOSE_AIRGRIPPER

This command is used to make a gripper closing action.

If you select “CLOSE ONLY” or “CLOSE AND CHECK SIGNAL” this command will be added.



3. Installation Settings Tab

* To change the setting, set the security access level to the administration level.

(1) Select a valve option.

Check the product number, and then select a valve option that suits the type of the air gripper you are using.

Nil: no symbol

N.O. : Normally open

N.C. : Normally closed

(2) Gripper operation completion waiting time

This is the set value for the waiting time after the valve is operated for the finger opening/closing action to turn on.

Adjust the opening of the exhaust restrictor and enter an appropriate value according to the gripper finger opening/closing operation time. The default value is 500ms. It can be set in the range of 0 to 1000ms.

(3) Status signal output to digital output port.

Select whether to output a status signal to the digital output port when "Open/Close success" or "Open/Close failure" is detected.

When "Enabled" is selected:

Selection of the digital output port is enabled. If either of "Open/Close success" and "Open/Close failure" is detected, the corresponding digital output port is turned on.

When "Disabled" is selected:

The selection of the digital output port is disabled. Even if either of "Open/Close success" and "Open/Close failure" is detected, no status signal is output.

(4) Select a digital output port

Selected box operation is enabled when "Output status signal to digital output port" is enabled. Select the digital output port to which a status signal is output when "Open/Close success" or "Open/Close failure" is detected.

The screenshot displays the 'Installation Settings' tab within a software interface. At the top, there are four tabs: 'Insert Commands', 'Installation Settings' (which is active), 'I/O Settings', and 'Manual Operation'. Below the tabs, the 'Installation Settings' section contains the following controls:

- 'Select a valve option' with a dropdown menu set to 'Nil'.
- 'Gripper operation completion waiting time' with a text input field containing '0.500 (Sec)'.
- 'Status signal output to digital output port' with two radio buttons: 'Enable' (selected) and 'Disable'.
- 'Select a digital output port :' section with two dropdown menus:
 - 'Output Open/Close success' set to 'Output#(5)'
 - 'Output Open/Close failure' set to 'Output#(6)'

At the bottom of the settings panel, there is a copyright notice: 'Copyright (c) SMC Corporation.' followed by the SMC logo.

Below the settings panel is a navigation bar with icons and labels for: 'DIGITAL I/O', 'VARIABLES', 'JOGGING', 'COMMANDS', 'TEST/RUN JOB', and 'AIRGRIPPER'.

4.I/O Settings Tab

* To change the setting, set the security access level to the administration level.

(1) I/O settings for gripper operation

At the time of installation of the YASKAWA Plug & Play Kit, the I/O assignment is already set. If wiring is made as per the manual, it can be used with the default setting.

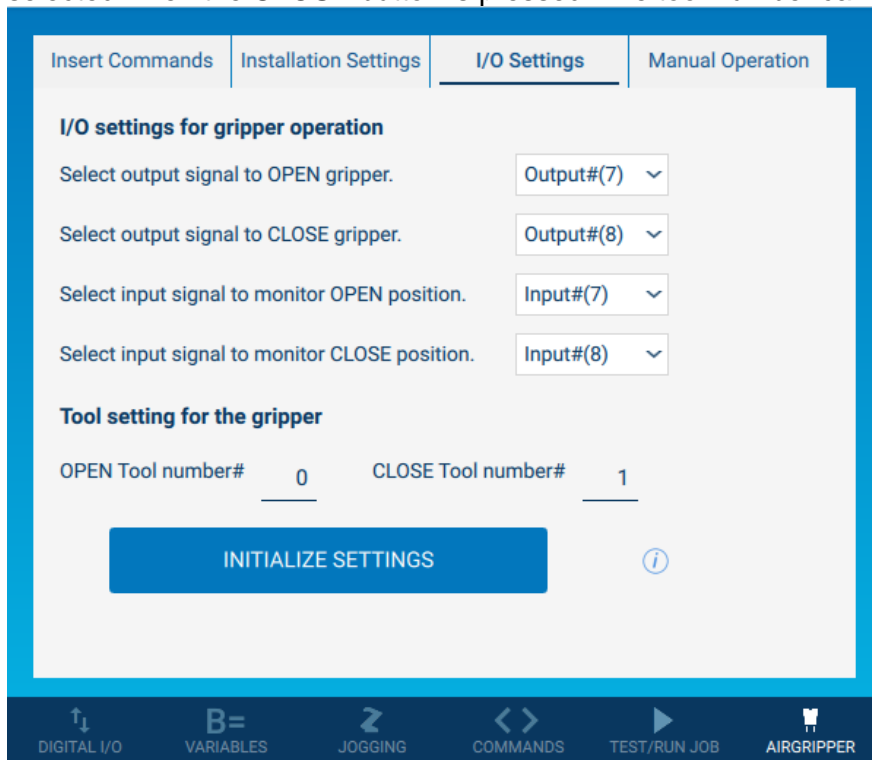
However, if the wiring is changed to connect with another device, it is possible to change the signal setting for gripper operation from this tab.

If you intend to return the I/O setting to the factory default condition, pressing the button at the lower part of the screen can initialize this setting.

(2) Tool setting for the gripper

The collaborative robot calculates the external force by canceling the tool mass. For this purpose, it is necessary to set the tool to be mounted on the manipulator and the masses and the centers of gravity of the tool and workpiece should be set in the tool file.

In the initial setting, the tool number 0 is selected when the OPEN button is pressed. Tool number 1 is selected when the CLOSE button is pressed. The tool number can be changed.



5. Manual Operation tab

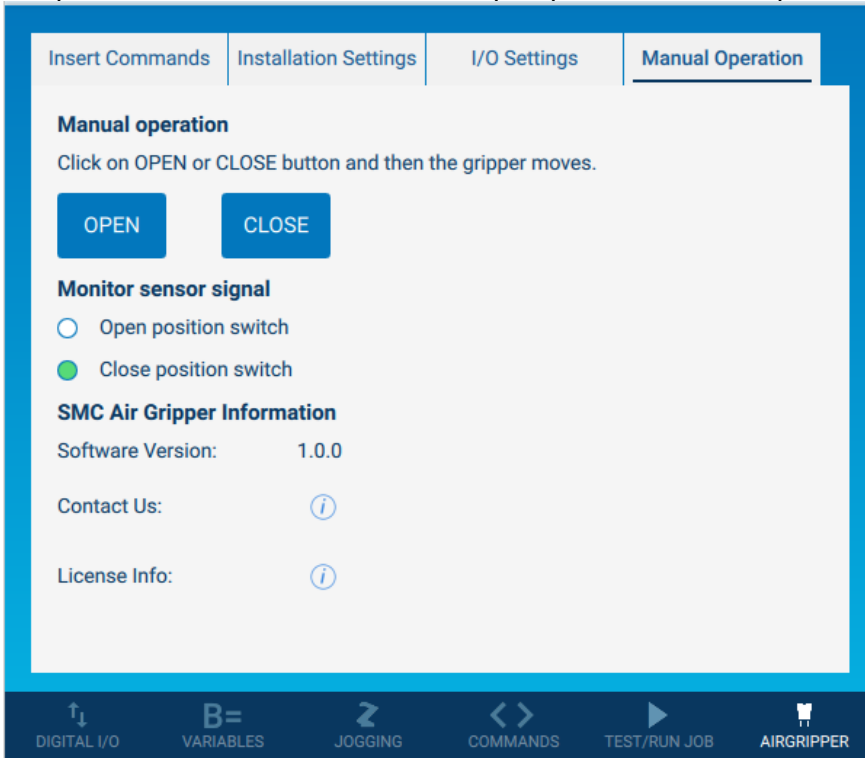
(1) Manual operation

The manual operation of the air gripper can be checked.

By tapping the OPEN or CLOSE button, it is possible to perform an opening or closing action of the gripper.

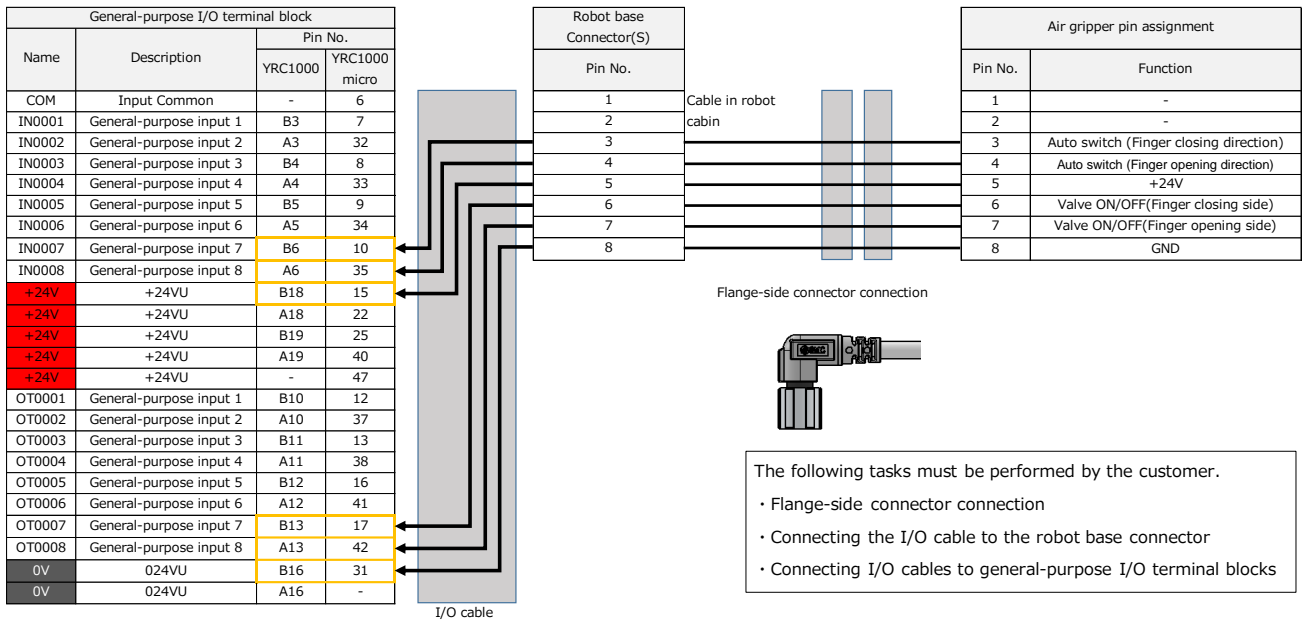
(2) Monitor sensor signal

It is possible to confirm whether the Open position or Close position auto switch reacts.



3. Example of wiring to robot controller

The table below shows wiring examples of I/O cables and general-purpose I/O terminal blocks. Customers are responsible for connecting I/O cables to the general-purpose I/O terminal block. Also, before wiring, be sure to check whether the robot controller has NPN or PNP specifications.



Revision history

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Note: Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.
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