

CSSP Manual

FANUC CRX
Version: 1.00.00



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1 INTRODUCTION

1 Introduction

1.1 About this manual

This manual contains the description of the Camozzi Plugin for FANUC CRX of the pneumatic collaborative gripper CSSP, designed by Camozzi Automation S.p.A.

⚠ Failure to observe the information contained in this manual can result in injury or equipment damage. Please contact Camozzi Automation S.p.A. for technical assistance.

PRODUCT SPECIFICATIONS AND DATA ARE SUBJECTED TO CHANGE WITHOUT NOTICE.

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1.2 Unit overview

The pneumatic collaborative gripper CSSP is composed of a standard gripper, in the NC or NO version, and two integrated valves. CSD-integrated sensors allow to recognize the presence or absence of the gripped piece.

The design and the performance of the gripper make the system suitable for collaborative applications.

1.3 Product specifications

The product specification manual can be download from Camozzi Website.

1.4 Brief plugin description

The Camozzi CSSP Plugin software provides several functions and commands:

- Plugin application with configuration settings
- Commands for the visual program editor
- Function libraries for TP and KAREL programs

The plugin application allows to set different configurations of the CSSP gripper and select the desired one depending on the robot application.

Commands for the visual editor permit to control and receive data from the CSSP gripper in a simple way.

Function libraries for TP and KAREL programs allow to control and receive data from the CSSP gripper in the traditional programming way.

2 PLUGIN INSTALLATION

2 Plugin installation

Preparation

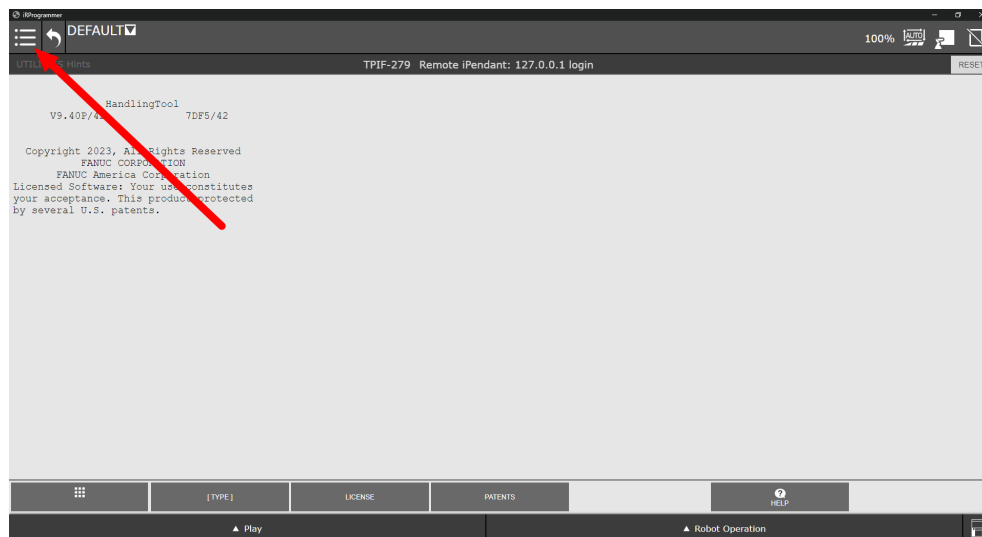
⚠ Camozzi suggests to use USB drive to install the plugin.

⚠ The USB drive should be formatted in FAT format.

⚠ The software version of the robot controller must be upgraded to the latest version prior to installing the plug-in software if the current software version is V9.40P/40 or older.

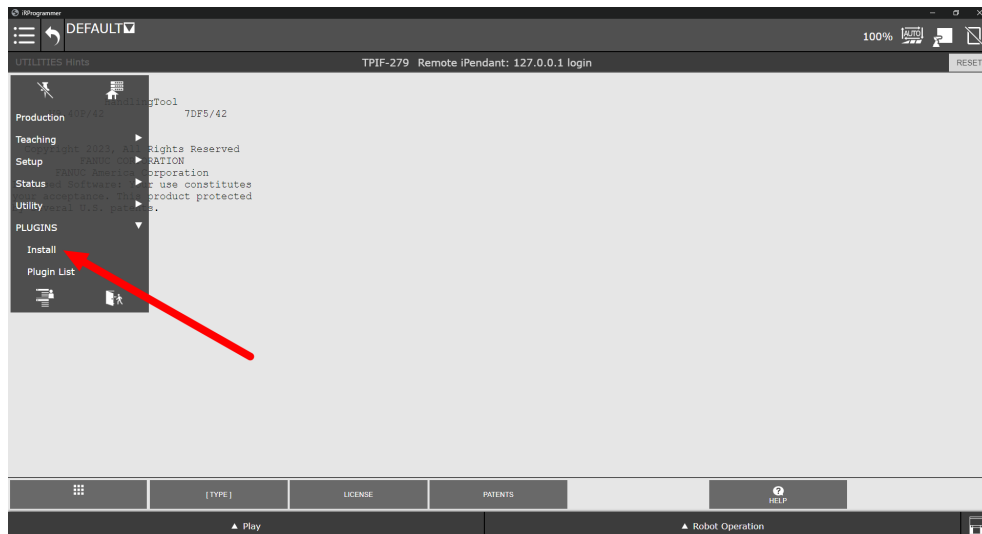
Installation

1. Download the last version of the Camozzi CSSP plugin from Camozzi Website and load it to the USB drive.
2. Connect the USB drive to the USB port on the robot controller (⚠ do not use the USB port on the tablet Teach Pendant)
3. Select the hamburger menu button of the Teach Pendant.

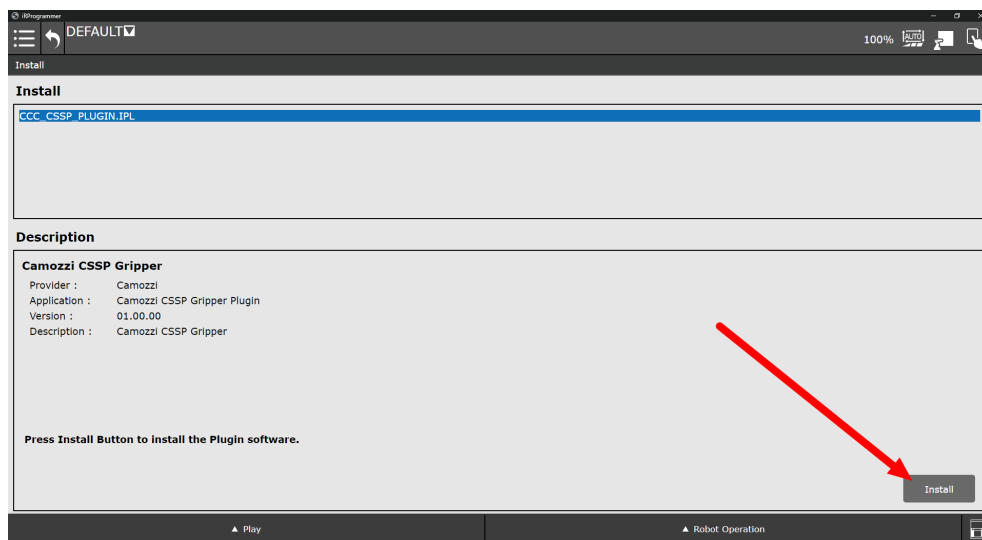


4. Select "PLUGIN - Install" from the menu.

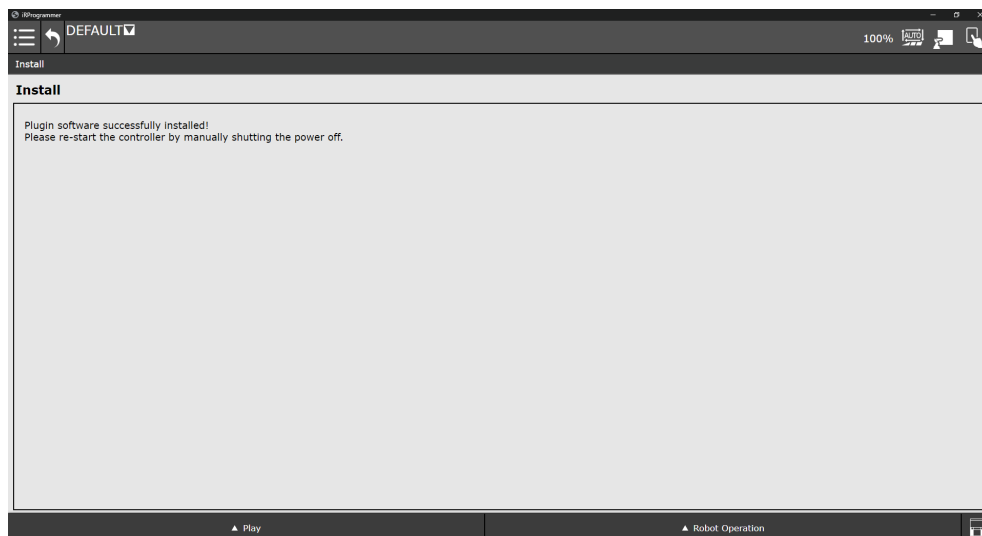
2 PLUGIN INSTALLATION



5. Select "CCC_CSSP_PLUGIN.IPL" and select the "Install" button.



6. Once the installation is complete, restart the robot controller.

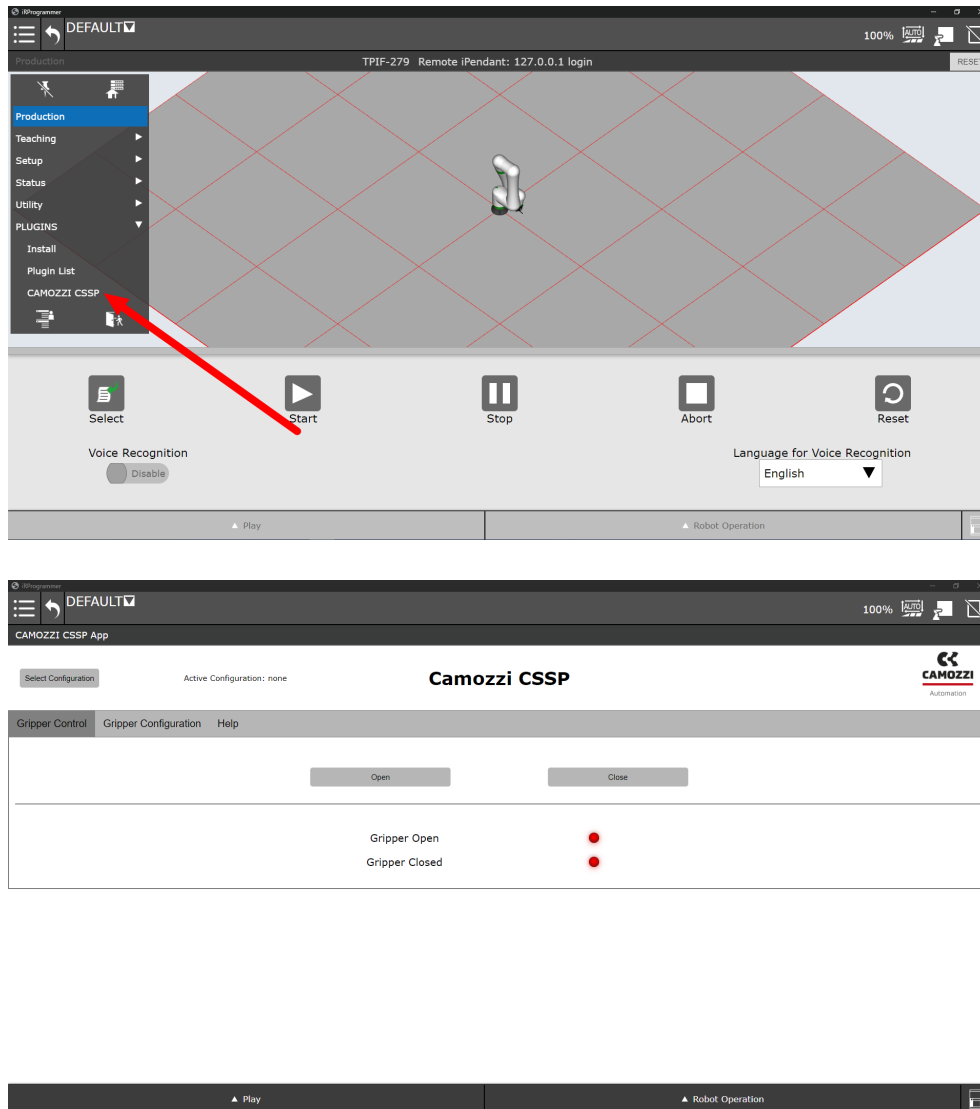


3 PLUGIN APPLICATION

3 Plugin application

3.1 Application

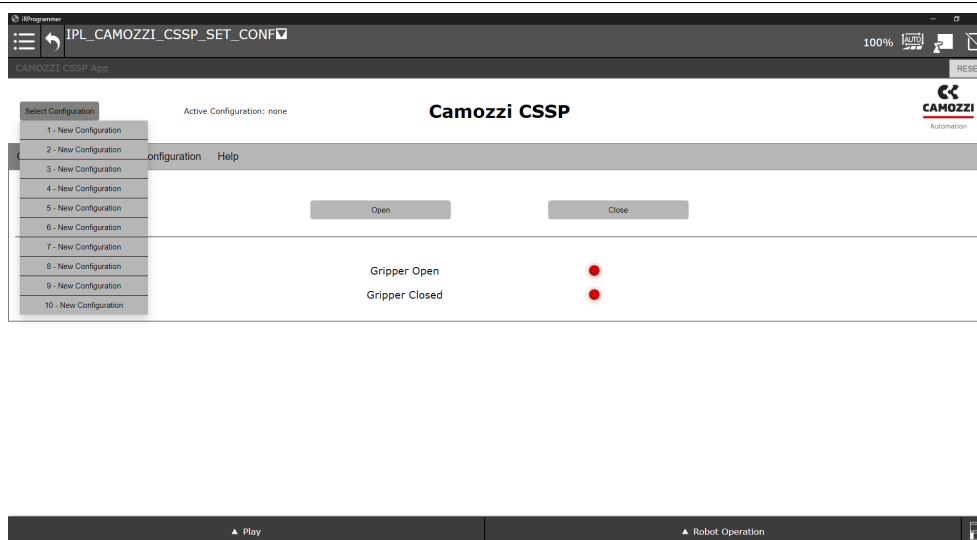
After the installation of the plugin, it is possible to run the plugin application "CAMOZZI CSSP".



First of all, it is necessary to select the configuration to be modified. A maximum of 10 different configurations can be selected.

After installation, each configuration is not active and results as "New Configuration".

3 PLUGIN APPLICATION



⚠ The configuration data are persistently stored in the controller memory. They are defined in the compiled KAREL program "IPL_CAMOZZI_CSSP_CFG". Do not modify directly these data.

Once a configuration is selected, it becomes the current active configuration.

From the "Gripper Configuration" tab it is possible to modify the configuration parameters of the active one:

- Configuration Name: the name of the configuration
- Finger Length: the length of the fingers
- Finger Weight: the weight of the fingers
- Gripper Weight: the weight of the gripper
- Center Of Mass: the center of mass of the gripper
- Tool Center Point: the tool center point of the gripper

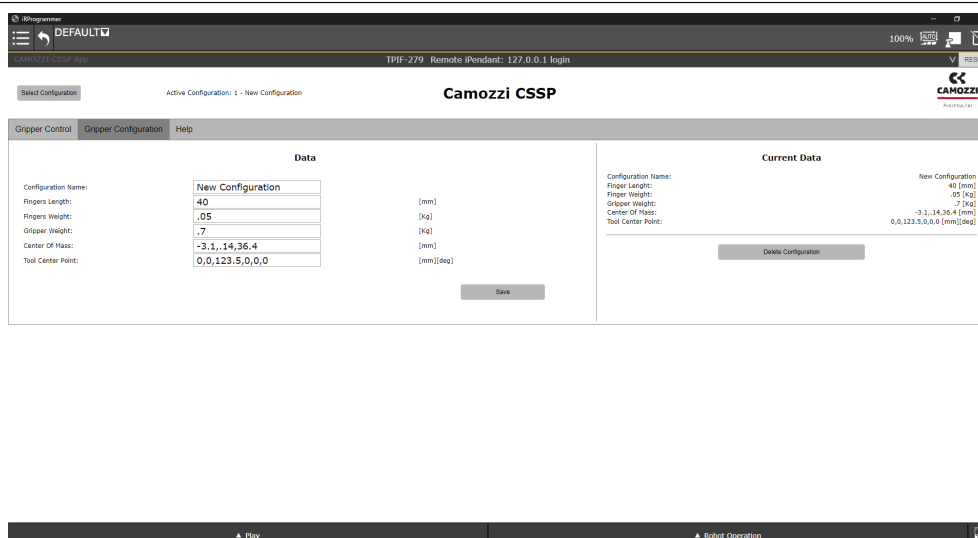
All data are configured by default according to the CSSP gripper equipped with robot flange and standard fingertips. Please refers to technical documentation of the gripper for further details.

The "Save" button saves the modified parameters of the current active configuration and activates it (only the first time).

The "Delete Configuration" button resets the current active configuration data and deactivate it.

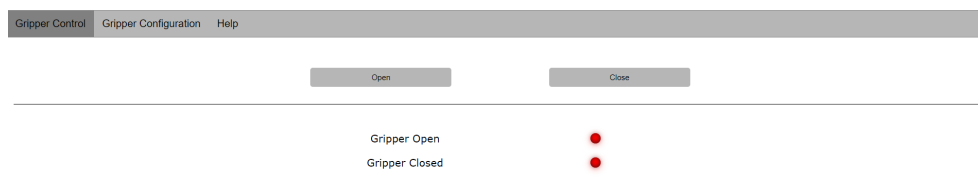
When pressing the "Save" or "Delete Configuration" buttons the message "SYST-212 Need to apply to DCS param" appears, which requires to apply DCS parameter since the payload configuration changes.

3 PLUGIN APPLICATION



Once the desired current active configuration is selected, from the "Gripper Control" tab it is possible to:

- Open gripper
- Close gripper
- Verify if the gripper is totally open (green) or totally closed (red) through the two available led icons



3.2 Payloads and Tool Frame

Once the plugin is installed, the "CAMOZZI_CSSP" tool frame is defined as the tool number 1.

The tool frame data does not change when the user selects the configuration (current active configuration) in the plugin application. As it will be presented in the following section, the tool data can be set through the visual program editor and/or from the KAREL programs.

3 PLUGIN APPLICATION

Tool	Frame	/ Direct Entry		
	X	Y	Z	Comment
1	0.0	0.0	0.0	[CAMOZZI_CSSP>]
2	0.0	0.0	0.0	[Eoat2]
3	0.0	0.0	0.0	[Eoat3]
4	0.0	0.0	0.0	[Eoat4]
5	0.0	0.0	0.0	[Eoat5]
6	0.0	0.0	0.0	[Eoat6]
7	0.0	0.0	0.0	[Eoat7]
8	0.0	0.0	0.0	[Eoat8]
9	0.0	0.0	0.0	[Eoat9]
10	0.0	0.0	0.0	[Eoat10]

Payloads of each activated configuration is set to the corresponding payload number. For example, the configuration number 3 sets the payload number 3 in the controller. The name of the corresponding payload is "CSSP_" +(configuration number).

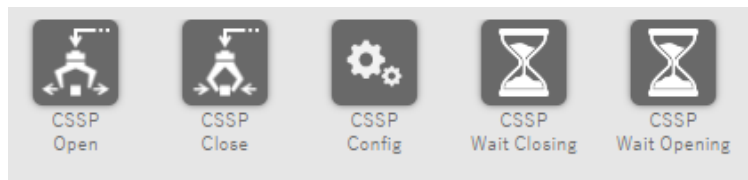
4 PROGRAMMING

4 Programming

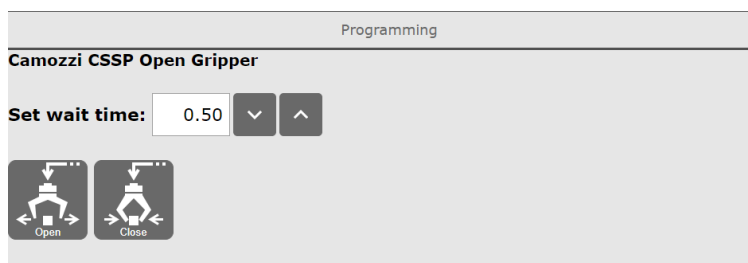
4.1 Visual editor

The plugin provides 5 program blocks:

1. CSSP Open
2. CSSP Close
3. CSSP Set Config
4. CSSP Wait Closing
5. CSSP Wait Opening

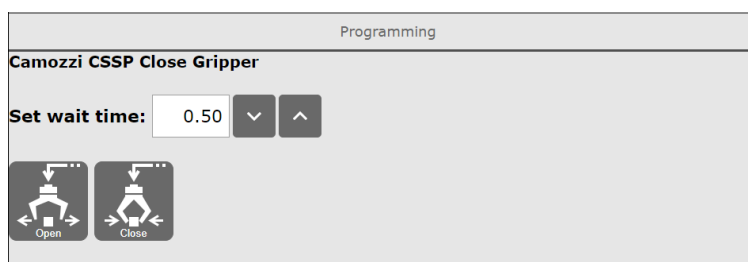


CSSP Open:



The CSSP Open block allows to open the gripper and set a wait time in seconds (default 0.5s) after the command execution. It is also possible to open and close the gripper through the Open and Close buttons.

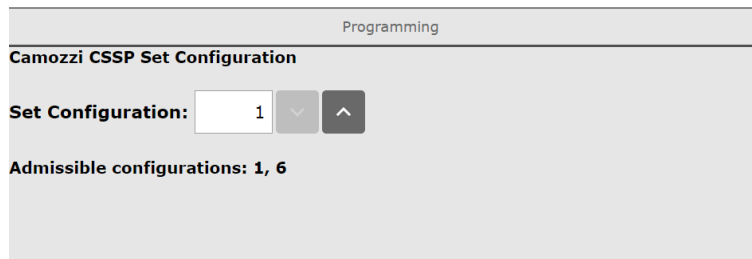
CSSP Close:



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The CSSP Close block allows to close the gripper and set a wait time in seconds (default 0.5s) after the command execution. It is also possible to open and close the gripper through the Open and Close buttons.

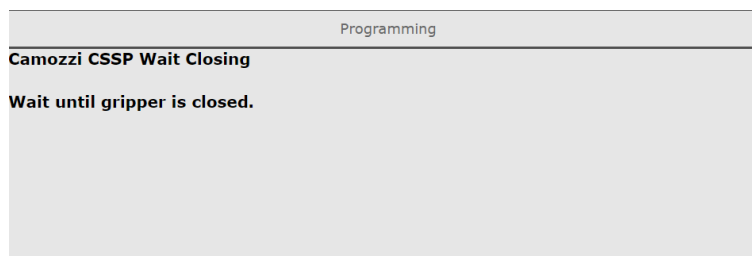
CSSP Set Config:



The CSSP Set Config button allows to set the desired configuration of the gripper in terms of payload and tool frame. The admissible configurations are listed and represent those configurations that are previously activated.

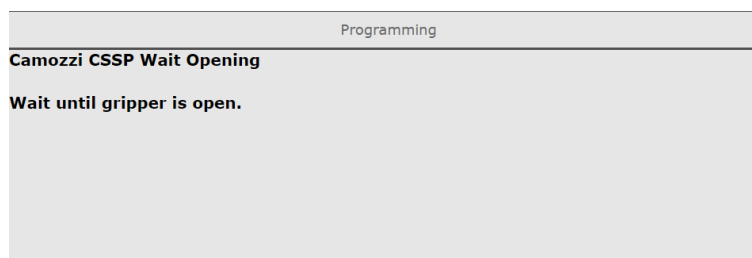
⚠ The Configuration block must be updated if configuration data are modified after the program definition. To do that, it is sufficient to click on the block or set again the configuration.

CSSP Wait Closing:



The CSSP Wait Closing allows to wait until the gripper is totally closed.

CSSP Wait Opening:



4 PROGRAMMING

The CSSP Wait opening allows to wait until the gripper is totally open.

4.2 KAREL

The plugin provides the following routines that can be used within a KAREL program:

1. CCC_CSSP_SetConf(conf : INTEGER)
2. CCC_CSSP_OpenGripper(wait_time: INTEGER)
3. CCC_CSSP_CloseGripper(wait_time: INTEGER)
4. CCC_CSSP_UpdateStatus : BOOLEAN
5. CCC_CSSP_Is_Opened : BOOLEAN
6. CCC_CSSP_Is_Closed : BOOLEAN
7. CCC_CSSP_Wait_Opening
8. CCC_CSSP_Wait_Closing

CCC_CSSP_SetConf(conf : INTEGER):

This routine allows to set the desired configuration of the gripper in terms of payload and tool frame. If the conf parameter represents a not active configuration the program is aborted.

CCC_CSSP_OpenGripper(wait_time: INTEGER):

This routine allows to open the gripper and wait the desired delay time in milliseconds.

CCC_CSSP_CloseGripper(wait_time: INTEGER):

This routine allows to close the gripper and wait the desired delay time in milliseconds.

CCC_CSSP_UpdateStatus : BOOLEAN:

This routine allows to update two CMOS BOOLEAN variables stored in the "IPL_CAMOZZI_CSSP_base" program. The two variables are:

- CAMOZZI_CSSP_STATUS_OPEN that is true if the gripper is totally open, false otherwise.
- CAMOZZI_CSSP_STATUS_CLOSE that is true if the gripper is totally closed, false otherwise.

CCC_CSSP_Is_Opened : BOOLEAN:

This routine returns TRUE if the gripper is totally open, otherwise returns FALSE.

5 UNINSTALL THE PLUGIN

CCC_CSSP_Is_Closed : BOOLEAN:

This routine returns TRUE if the gripper is totally closed, otherwise returns FALSE.

CCC_CSSP_Wait_Opening:

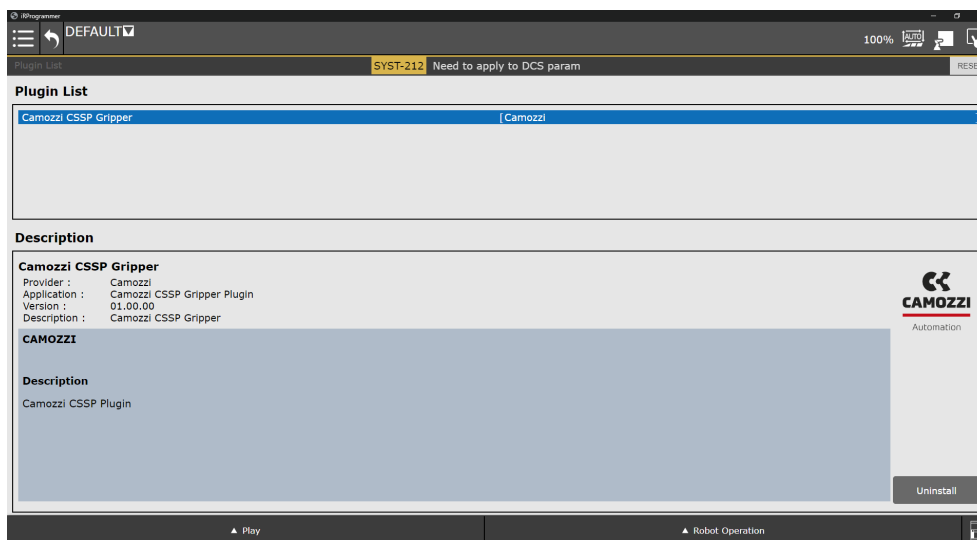
This routine allows to wait until the gripper is totally open.

CCC_CSSP_Wait_Closing:

This routine allows to wait until the gripper is totally close.

5 Uninstall the plugin

The plugin can be removed from the robot by selecting "PLUGINS - Plugin List - Uninstall" in the hamburger menu button of the Teach Pendant.





Automation

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