FlexiVision

ORIGINAL INSTRUCTIONS

USER MANUAL

FlexiVision

Release	1.1.5.1
Date of release	05.2025
Notes	0.0

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FOREWORD

ARS s.r.l. is by no means liable for the consequences of incorrect operations performed by the user.

EDITOR'S NOTE

This documentation is expressly addressed to technicians. Therefore, information that can be easily retrieved by reading these texts and analysing the drawings may not be explained further.
The Editor is by no means liable for any information and data provided in this manual: all information included herein has been supplied, controlled and approved by the Manufacturer during review.
The Editor shall by no means be held responsible for the consequences resulting from the user's misuse.

GENERAL REMARKS

All operating instructions and recommendations described in this manual must be respected.
The training of the personnel in charge of using this software is of the utmost importance, both as regards the use and maintenance of the connected devices and the monitoring of all operating procedures and of all safety standards listed in the relevant instruction manuals.

WARNING

The software, object of this manual, has been developed as PC-based vision software for robot guidance, optionally supplied to FlexiBowl® systems (generation 2.0, models 200, 350, 500, 650, 800, 1200).
During application, the user shall therefore take into account overall dimensions, movements and/or unexpected situations that may arise.
ARS s.r.l. shall not be held, in any way, responsible for any damage to people and/or things that may occur as a result of the movement of machines and/or systems connected to the FLEXIVISION software.

Revision: *1.2*
Edition: *06.2025*

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1 IDENTIFICATION

1.1 Software developer identification

Developer	ARS s.r.l.
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Address (operational headquarters)	Via Aretina Nord, 157 52041 Civitella in Val di Chiana (AR) - Italia Tel. +39 0575 398611 - Fax +39 0575 398620 info@arsautomation.com - www.arsautomation.com

1.2 Software identification

Model	FLEXIVISION
Release	1.1.5.1
Date of release	05/2025

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2 PRELIMINARY INFORMATION

2.1 Addressees

This manual is destined to operators in charge of dealing with the software in all the phases of its technical life. It also contains the subjects regarding the proper use of the software, in order to maintain its functional and qualitative features unaltered over time.
All information and warnings for proper safe use are also reported.
The manual is an integral part of the software and must always accompany it in every displacement or property transfer. Once the software has been installed, the user must keep this documentation intact and make it available for consultation during the entire lifespan of the connected devices.

2.2 Supply and preservation

The manual is supplied in **electronic format.**
The manual is an integral part for the purpose of use and safety, therefore:

- **it must be kept intact** (in all its parts). Should this manual get damaged or spoilt, request a copy immediately.
- **It must always accompany the software** (even if moved, sold, leased, rented, etc.).

ARS s.r.l. shall not be held liable for software misuse and/or damages resulting from operations not indicated on the technical documents.

2.3 Updates

Should the software require functional modifications on request of the User, ARS s.r.l. shall revise or update the manual.
The user is also responsible for ensuring that, should this document be modified by ARS s.r.l., only the updated manual versions are effectively present in the points of use.

2.4 Language

The original manual has been written in **English.**
Any translations into other languages must be done from the original instructions.
ARS s.r.l. shall be responsible for the information contained in the original instructions; translations into different languages cannot be fully verified, hence should an inconsistency be detected, the text in the original language must be referred to or contact our Technical Assistance Department.

2.5 Skills and qualification required

Type	Definition
Trained Person	Person informed, educated and trained on the work and on any dangers deriving from an improper use. Also knows the importance of the safety devices, the accident-prevention standards and the safe work conditions.

2.6 Symbols used in the manual

Symbol	Definition
	Symbol used to identify important warnings for the safety of the operator and/or machine.
	Symbol used to identify particularly important information inside the manual. The information also regards the safety of personnel involved in use of both the software and the connected devices.
	Obligation to read the external instruction manuals/booklets.

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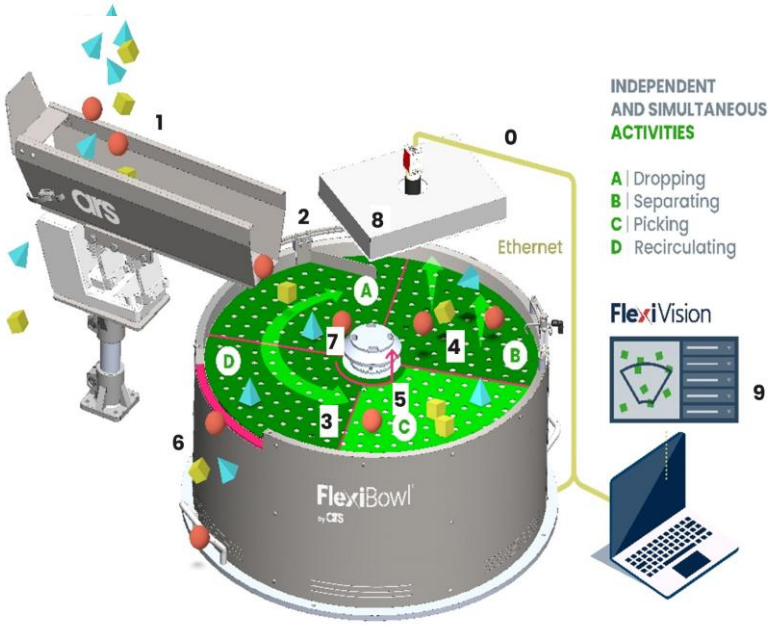
3 GENERAL DESCRIPTION

3.1 What is FlexiVision®

FlexiVision® is a PC-based vision software for robot guidance, optionally supplied to FlexiBowl® systems: thanks to this software, bulk parts can be downloaded to the feeder surface, separated, recognized and picked up.



Position	Element/section	Description
0	Connectivity	Digital I/0, TCP/IP, UDP, Ethernet-IP
1	Linear Hopper (Flow feeder)	Drops components and rear emptying
2	Diverter/ Blow Unit	Diverts components from the ring
3	Rotary Disc	Custom Discs upon request
4	Flip Unit	Separates components
5	Backlight	
6	Quick Emptying	Automatic Product Changeover
7	Quick Release	Quick Disc Change
8	Toplight	

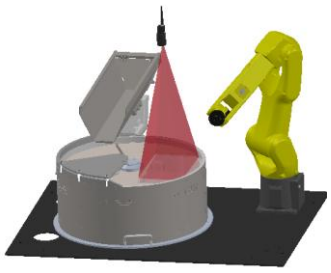
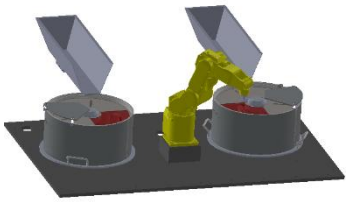
Position	Element/section	Description
9	FlexiVision System	Sends parts coordinates to the robot. Controls feeder movements and manages the parts flow from the hopper. Parts database manager
a	Dropping sector	
b	Separating sector	
c	Picking sector	
d	Recirculating sector	

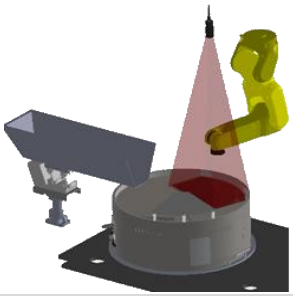
FlexiVision, developed on Cognex vision libraries, supports multiple cameras and offers a wide flexibility of use.

The camera is usually placed at the centre of the picking area.
The height is based on the FlexiBowl® dimensions and the desired resolution.

The system is compatible with a large variety of industrial robots and allows rapid development of automated cells with FlexiBowl®.

3.1.1 Typical configuration examples

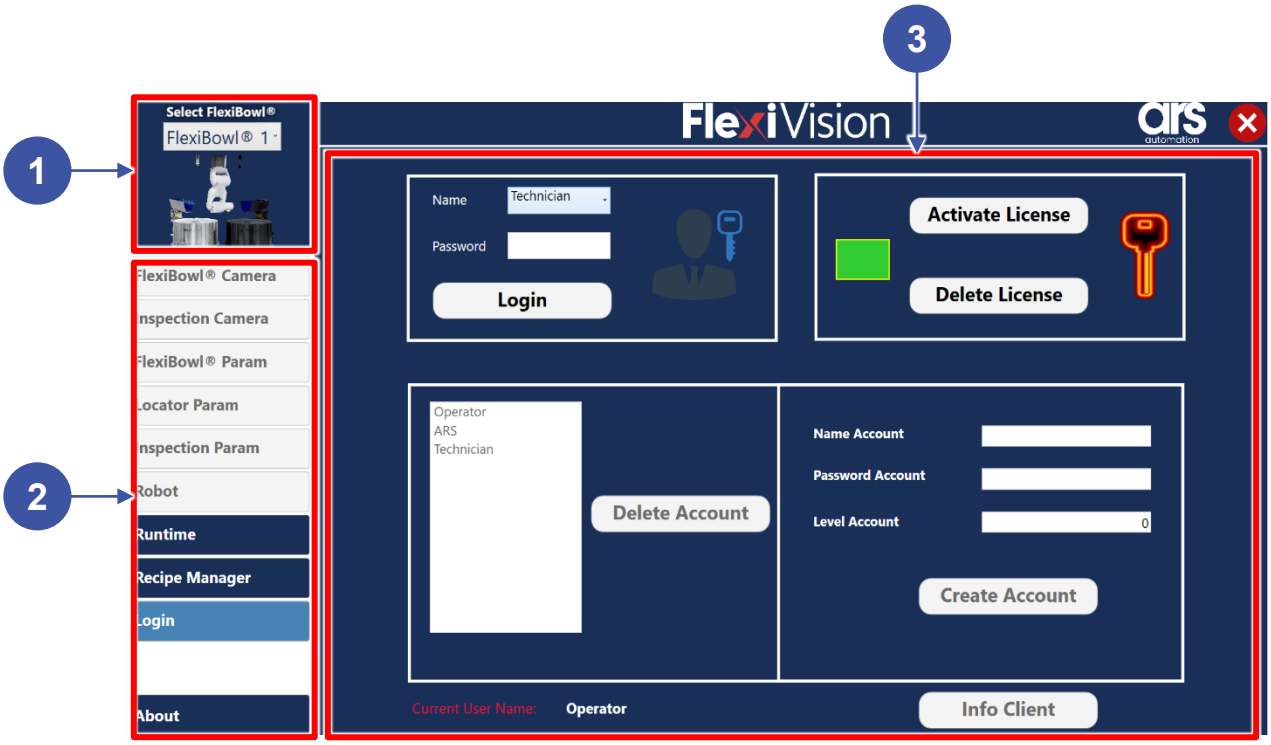
Description	Picture
Robot, 1 FlexiBowl, Camera and Bulk feeder	
Robot, 2 FlexiBowls, Camera and Bulk feeder	

Description	Picture
Top-Mount Robot, 1 FlexiBowl, Camera and Bulk feeder	

FLEXIVISION can manage a system composed of:

- **up to 4 cameras.**
- **up to 2 FlexiBowls®.**
- **up to 2 robots.**

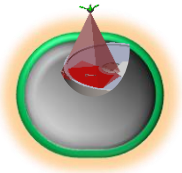
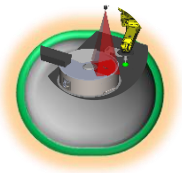
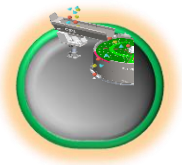
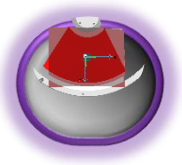
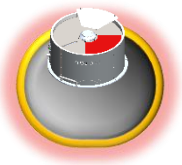
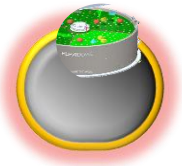
3.2 Operator interface

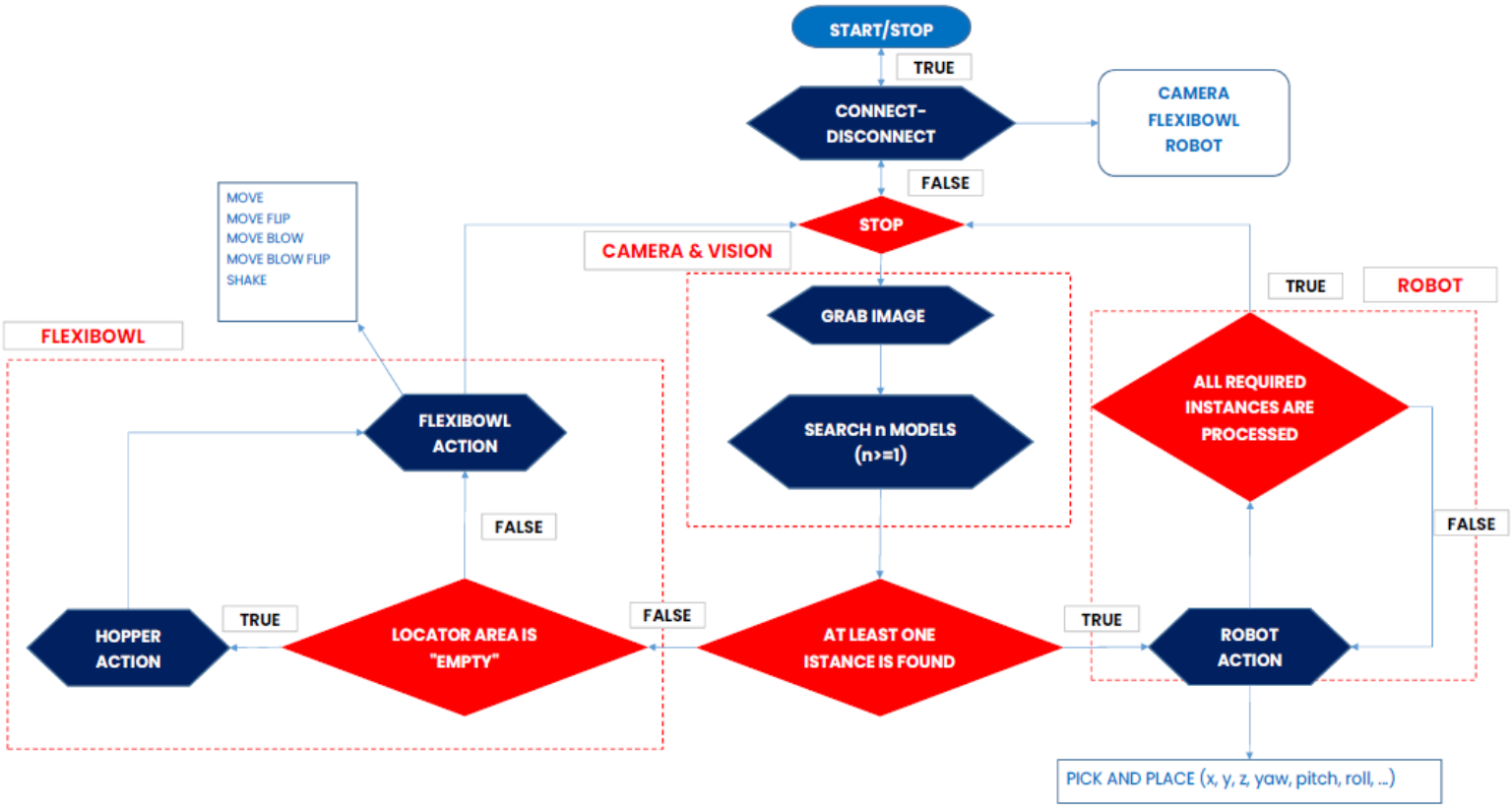


Position	Element/section	Description
1	FLEXIBOWL SELECTION A drop-down menu is available to select the Flexibowl system (1 or 2). ▪ Selected Flexibowl becomes coloured. ▪ Non-selected Flexibowl is black.	
2	OPERATION MENU: ▪ FLEXIBOWL CAMERA ▪ INSPECTION CAMERA ▪ FLEXIBOWL PARAM ▪ LOCATOR PARAM ▪ INSPECTION PARAM ▪ ROBOT ▪ RUNTIME ▪ RECIPE MANAGER ▪ ABOUT	Includes all the control and operation procedures. According to the access level, press to select and enter the required operation page.
3	CENTRAL SCREEN	The parameters or images are displayed, according to the selected operation.

3.3 General workflow

Two Parallel Tasks are recommended: one to handle robot movements, the second one to handle vision, Bulk Feeder and Flexibowl®.

Step	Action	Notes/Pictures
1	Camera locates parts	
2	Pick&Place	
3	Part dropping	
		
4	Check part quantities	
		
5	Move command	
6	Flip command	

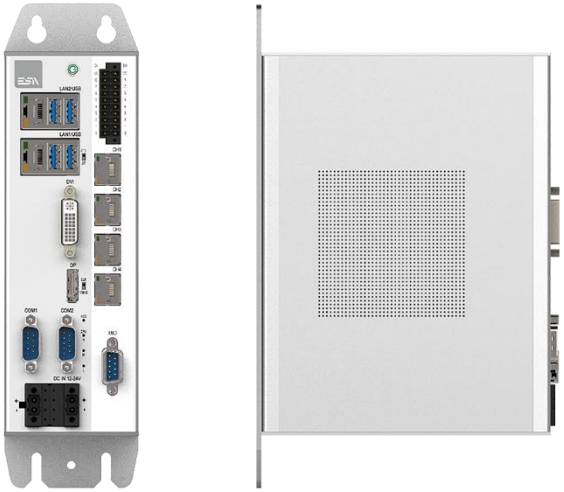

START/STOP
TRUE
CONNECT-DISCONNECT
CAMERA
FLEXIBOWL
ROBOT
FALSE
STOP
MOVE
MOVE FLIP
MOVE BLOW
MOVE BLOW FLIP
SHAKE
CAMERA & VISION
GRAB IMAGE
TRUE
ROBOT
FLEXIBOWL
ALL REQUIRED INSTANCES ARE PROCESSED
FLEXIBOWL ACTION
SEARCH n MODELS (n>=1)
FALSE
HOPPER ACTION
TRUE
LOCATOR AREA IS "EMPTY"
FALSE
AT LEAST ONE ISTANCE IS FOUND
TRUE
ROBOT ACTION
PICK AND PLACE (x, y, z, yaw, pitch, roll, ...)

3.4 Main features

- Dynamic control of all FlexiBowl® features
- Integrated calibration
- Configuration of the hopper management algorithm
- Complete configuration of the recognition tools
- Complete configuration of inspection tools
- Saving and dynamic management of the recipe database
- Definition of multiple vision models for each single recipe
- Management of communication with the Robot
- Recognition of components position and orientation

Thanks to our software, bulk parts can be downloaded to the feeder surface, separated, recognized, and picked up. FlexiVision is developed using Cognex vision libraries and provides the possibility to add custom sequences to introduce inspection capabilities into the application. FlexiVision provides a simple programming environment to make FlexiBowl® system integration easy and with guaranteed results.

3.5 Minimum system requirements

Element		Features
Vision PC		*SO: Windows 10 64 bit* *Processor: intel i7* *Graphics card: NVIDIA or integrated* *RAM:8/16 GB* *SSD: 250 GB* *At least, one free USB port*

Element		Features
Camera		*Resolution: 2592x1944* *Frame Rate: 14 fps* *Sensor dimensions: 1/2.5"* *Sensor type: CMOS* *Protocol: GigE*
Robot		*TCP/IP protocol compatibility* *String manipulation*
Switch GigE		*4 Ethernet ports* *4 Ethernet POE ports*
Display		*16/9"*

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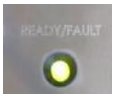
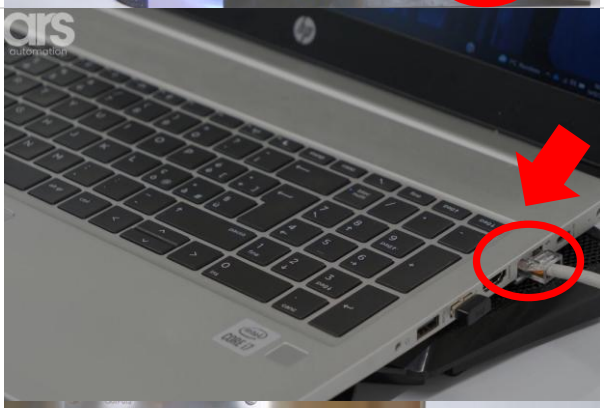
4 SOFTWARE INSTALLATION

Video tutorial is available.

For further and complete details about the Cognex softwares, please refer to the whole Cognex User Manuals.

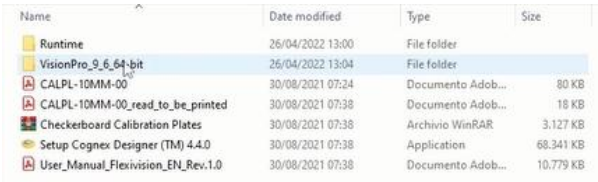
4.1 How to connect the FlexiBowl ®

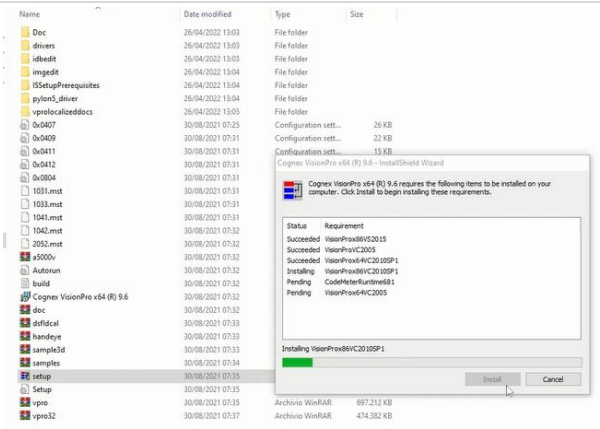
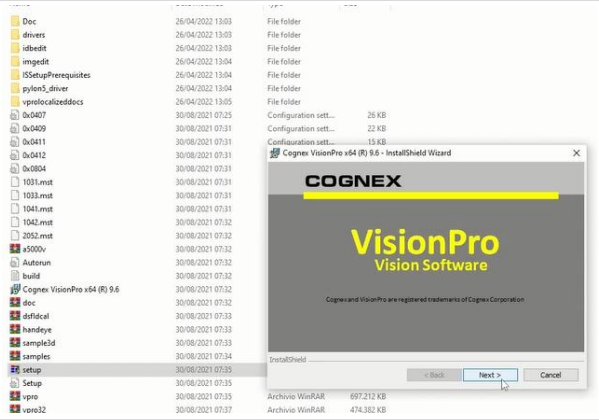
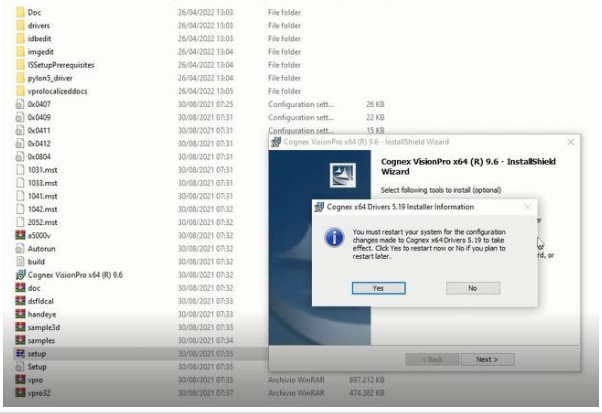
Step	Action	Notes/Pictures
1	Connect the power supply to the FlexiBowl® connection. Note: refer to the FlexiBowl® user manual for power supply spcifications.	
2	Connect Ethernet cable to the FlexiBowl® Ethernet socket.	
3	Connect the compressed air to the FlexiBowl® connection. Note: refer to the FlexiBowl® user manual for power supply spcifications.	

Step	Action	Notes/Pictures
4	Turn ON the FlexiBowl® AC switch (position "I"). The READY led is ON. 	
5	Connect the FlexiBowl® to the ethernet switch.	
6	Connect the PC via the Ethernet connection.	 

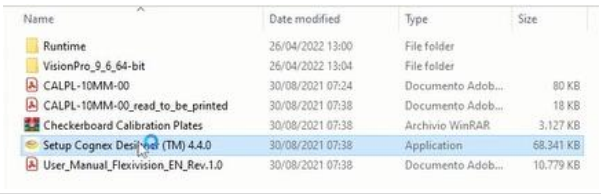
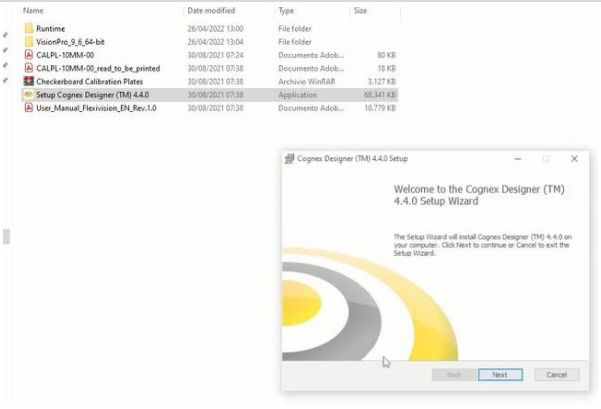
Step	Action	Notes/Pictures
7	Connect the camera. **The camera is compatible via POE (Power Over Ethernet), so it has to be connected to a switch or to a PC with POE ports.**	

4.2 How to install Cognex Vision Pro

Step	Action	Notes/Pictures
1	Uninstall any existing Vision Pro software.	Use the Add or Remove Programs feature of the Windows Control Panel to remove any of the following programs if they are present: • *Cognex VisionPro* • *Cognex Drivers* • *Cognex Japanese Documentation* • *Cognex Software Licensing Center.* Restart your computer if prompted.
2	Connect the FLEXIVSION®USB drive to the PC.	
3	Ensure that the Windows Update service has installed all the important updates.	
4	Open the VisionPro folder.	

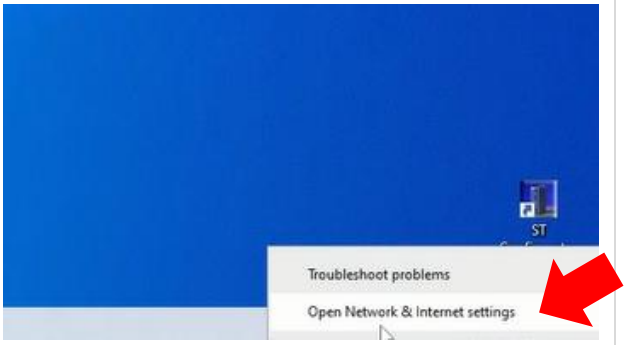
5	Launch the *setup.exe* application from the installation media.	 ATTENTION • You must have Administrator privileges to install VisionPro. • If your computer does not already have Microsoft Visual Studio Redistributables installed, they will automatically be installed. If your computer requires an update to the Windows Installer, it will automatically be updated. Depending on how your system is configured, you might see a message about this update taking piace
6	Press NEXT and follow the instructions of the installation wizard (accept the license agreement, enter the customer information, launch Cognex driver installer).	
7	At the end of the installation, restart the PC.	

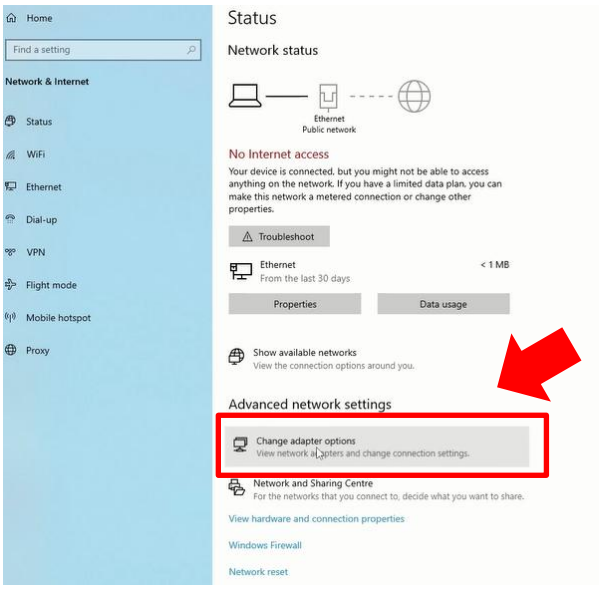
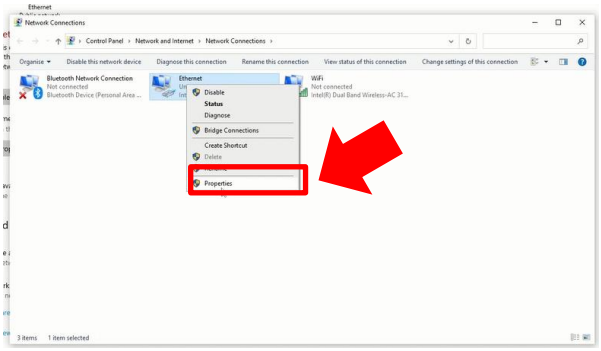
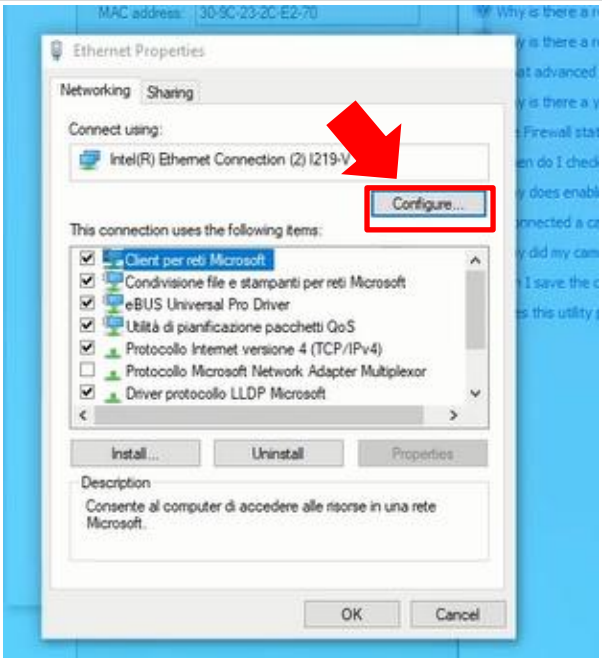
4.3 How to install Cognex Designer

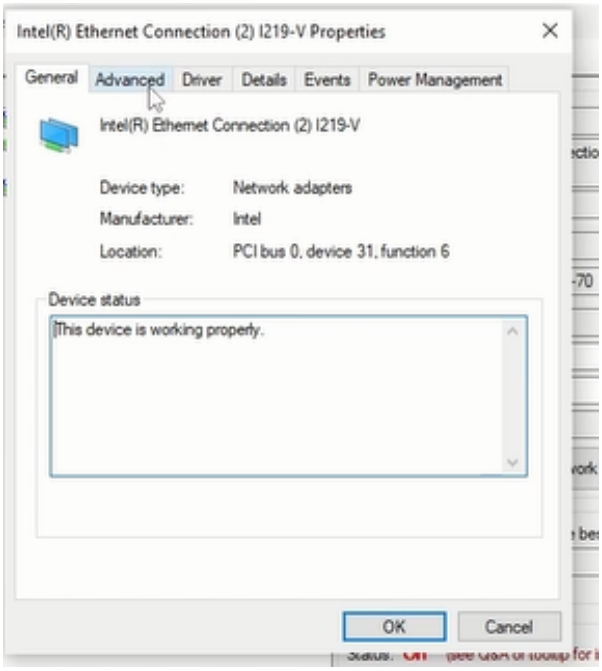
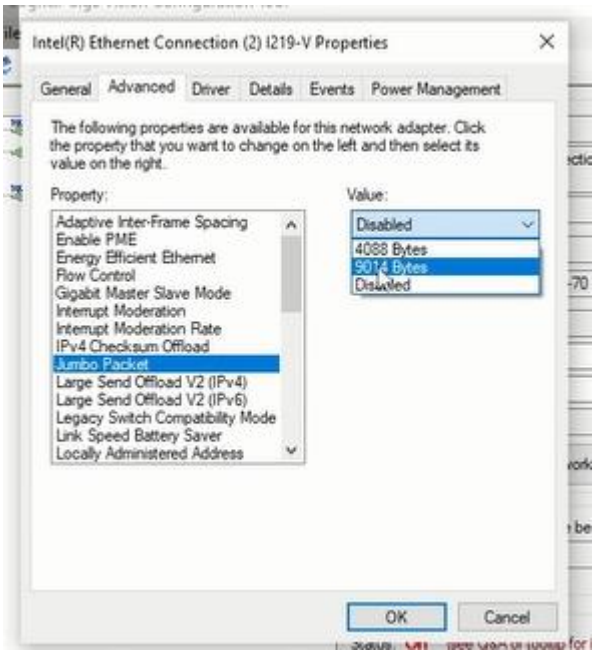
Step	Action	Notes/Pictures
1	Launch the *setup.exe* application from the installation media.	
2	Press NEXT and follow the instructions of the setup wizard (accept the license agreement, launch Cognex driver installer).	

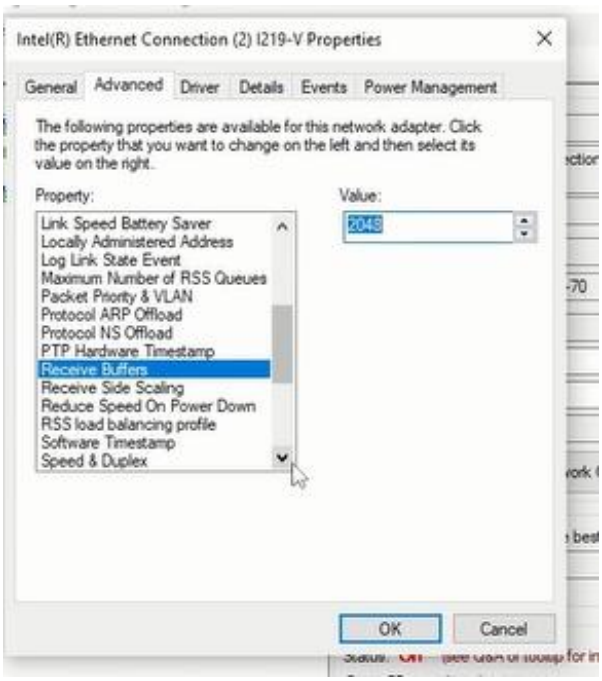
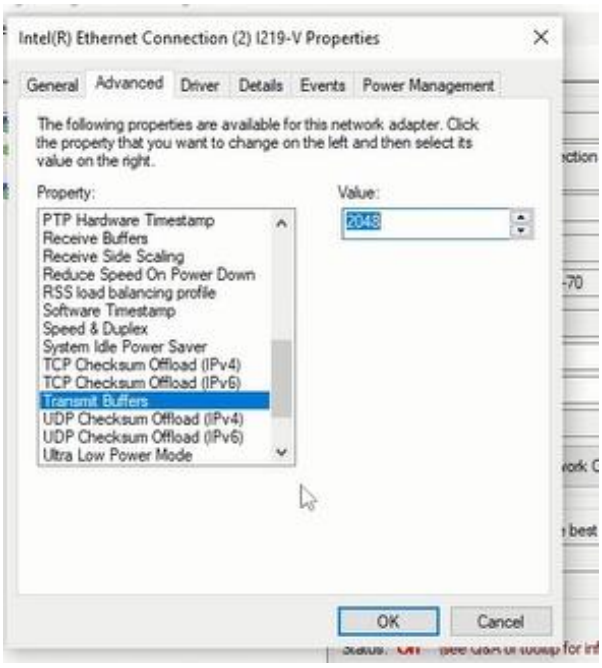
4.4 How to configure the PC

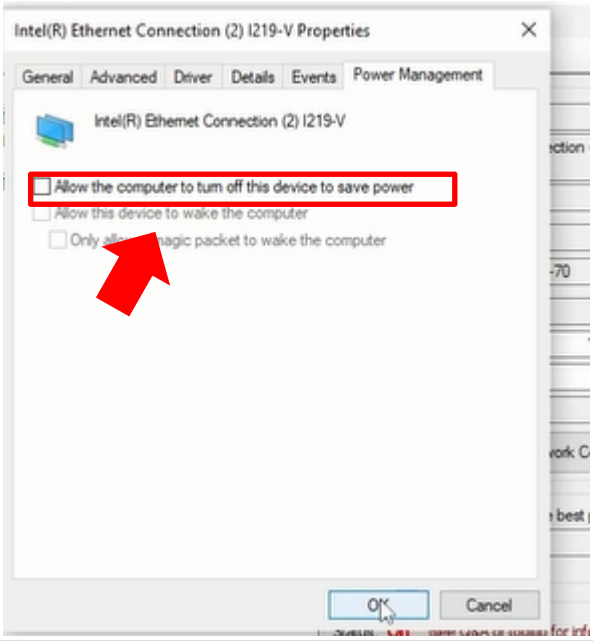
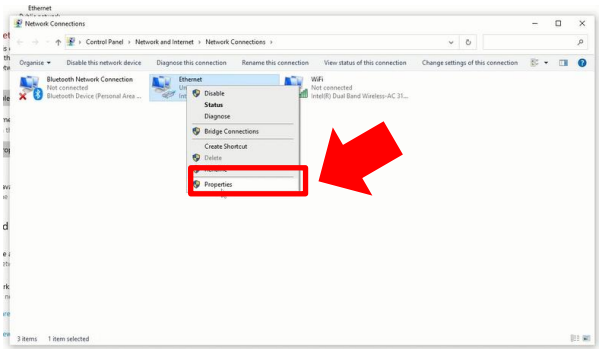
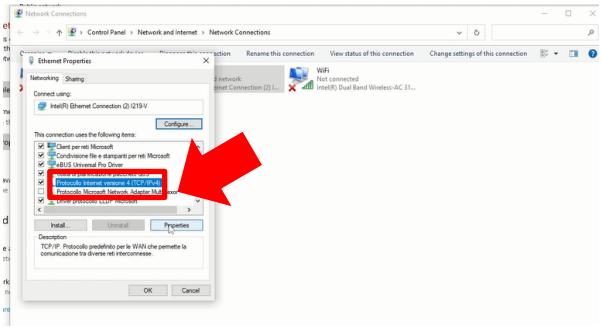
If the PC has been supplied together with the FLEXIVISION software, it has not to be configured.

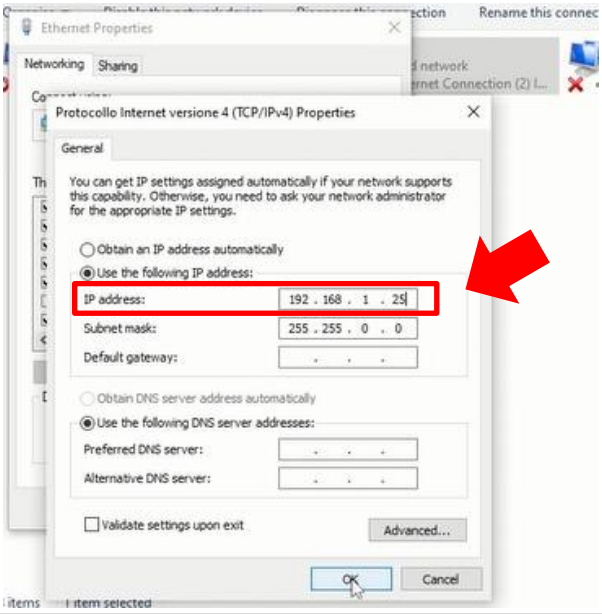
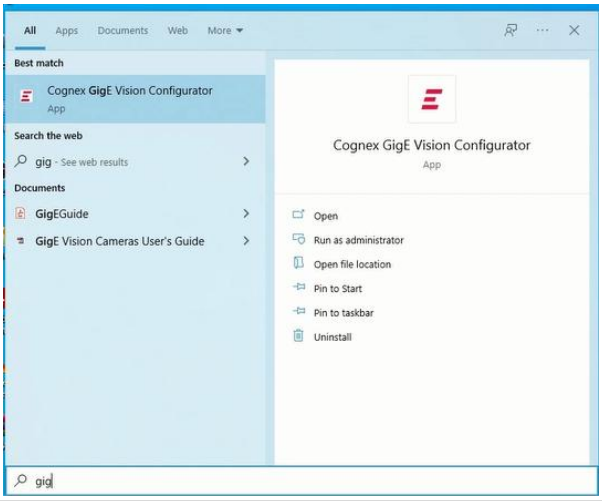
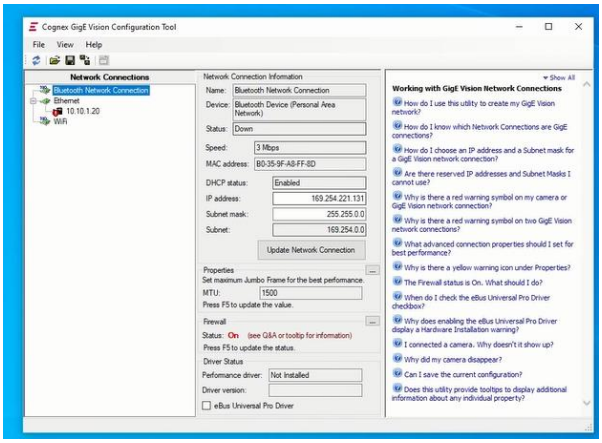
Step	Action	Notes/Pictures
1	From the PC desktop, open the NETWORK & INTERNET SETTINGS window.	

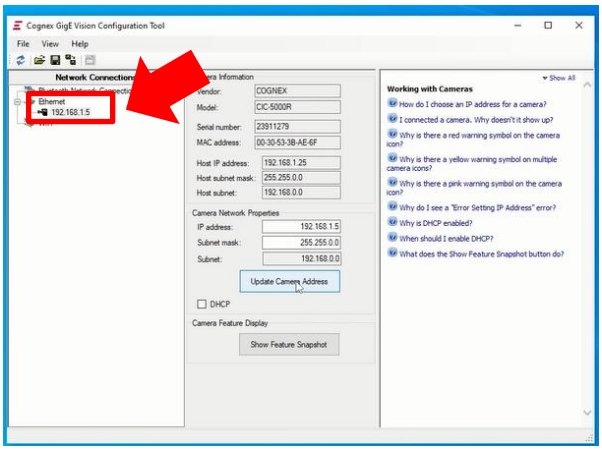
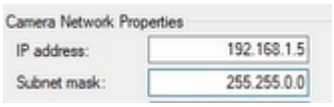
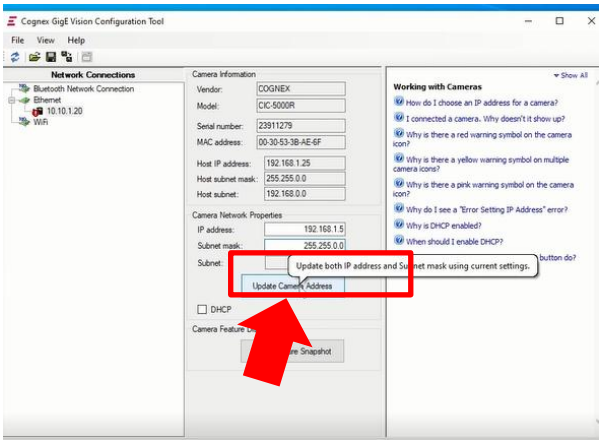
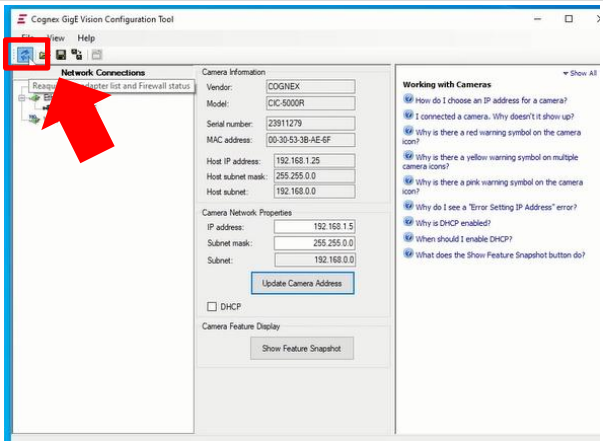
Step	Action	Notes/Pictures
2	Enter the CHANGE ADAPTER OPTIONS settings.	
3	From the ETHERNET menu, select PROPERTIES, then NETWORKING.	
4	From the ETHERNET PROPERTIES window, press CONFIGURE.	

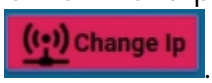
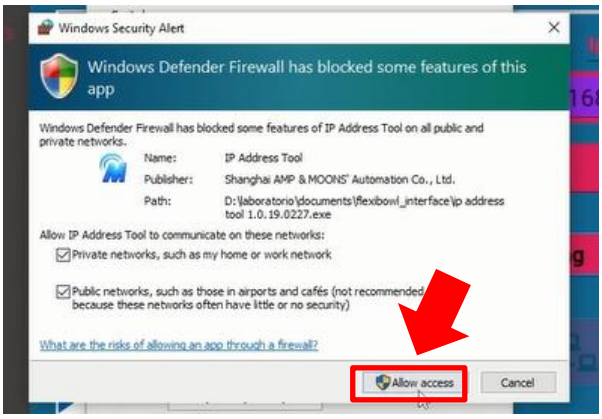
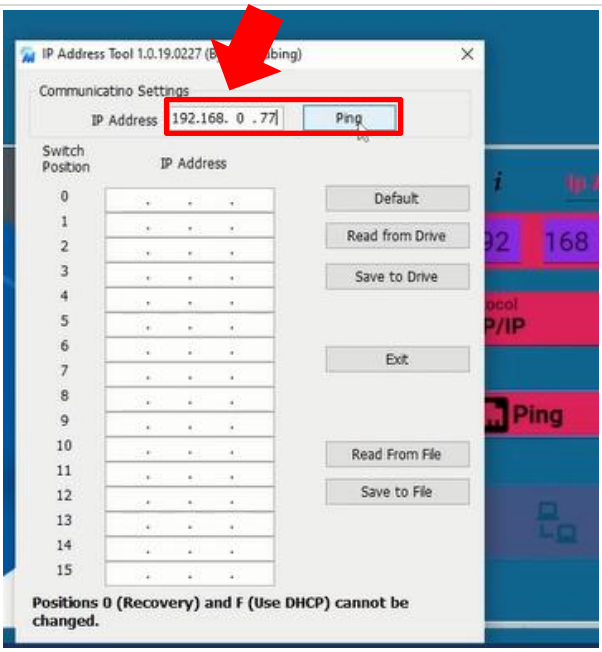
Step	Action	Notes/Pictures
5	This window opens.	
6	Select ADVANCED, JUMPO PACKET and select the higher speed; then press OK.	

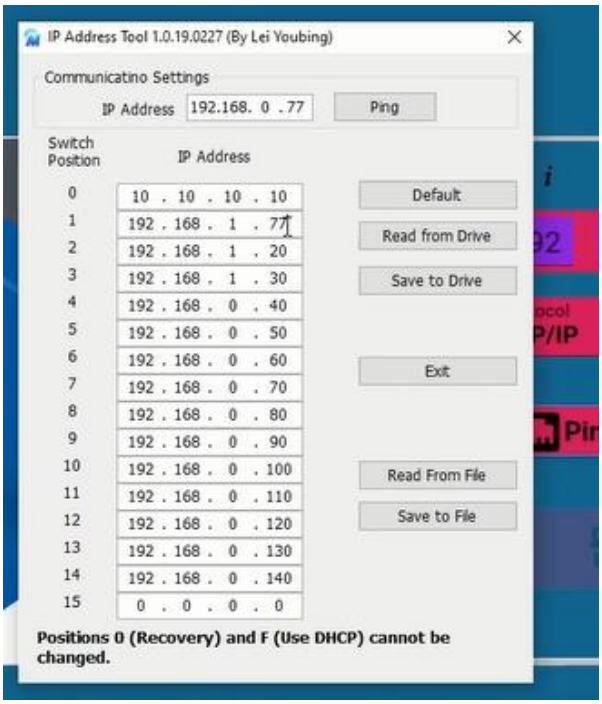
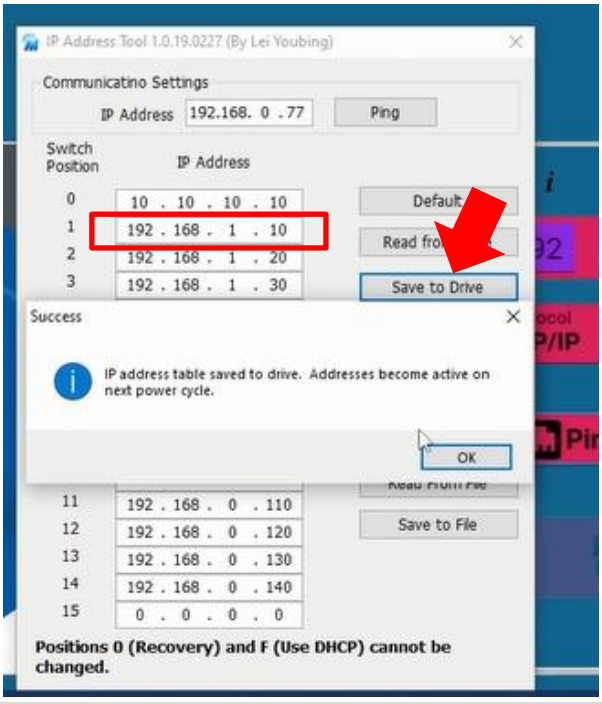
Step	Action	Notes/Pictures
7	Repeat as above for RECEIVE BUFFERS, and set the maximum value.	
8	Repeat as above for TRANSMIT BUFFERS, and set the maximum value.	

Step	Action	Notes/Pictures
9	**In order to keep the connection active, the Ethernet ports have to stay always ON.** Select POWER MANAGEMENT and unflag the checkbox for the marked sentence. Then press OK.	
10	Wait for the restart of the Ethernet Card.	
11	From the ETHERNET menu, select PROPERTIES, then NETWORKING.	
12	Select the I**PV**4 (TCP/IPv4)	

Step	Action	Notes/Pictures
13	Enter the IP address and press OK.	
14	Close all the menus.	
15	Find (on the PC) and open the Cognex GigE Vision Configurator App.	
16	Enter the Cognex GigE Vision Configurator tool.	

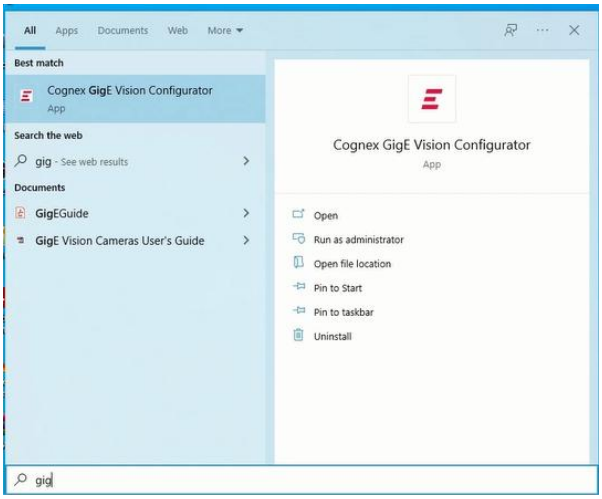
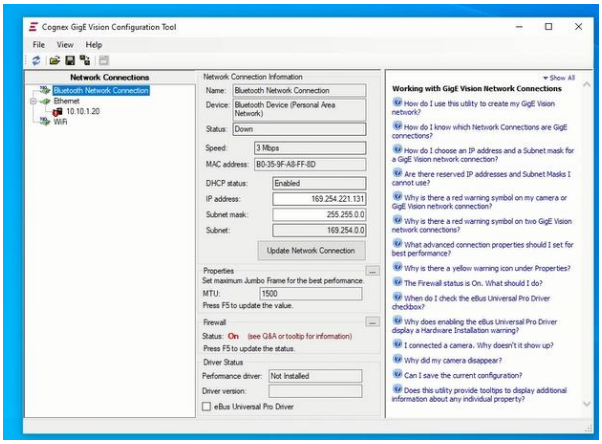
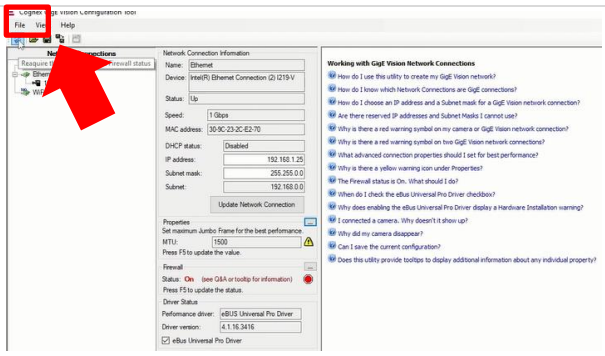
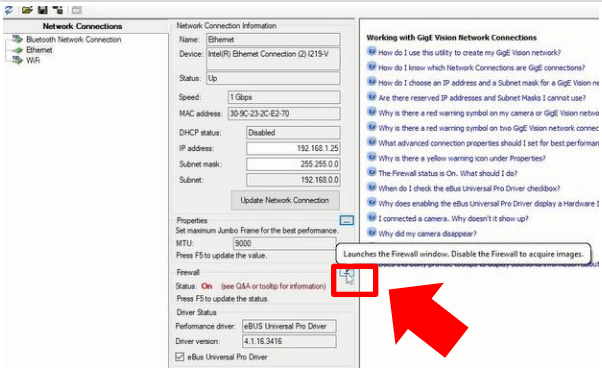
Step	Action	Notes/Pictures
17	From the Network Connections menu, select the camera information by pressing on .	
18	Modify the CAMERA NETWORK PROPERTIES (IP addess and Subnet mask) as in the picture aside.	
19	Press UPDATE CAMERA ADDRESS (to update both IP address and Subnet mask using current settings).	
20	Press the icon to reaquire the adapter list and Firewall status.	
21	Close the window by the × icon on the top right angle.	

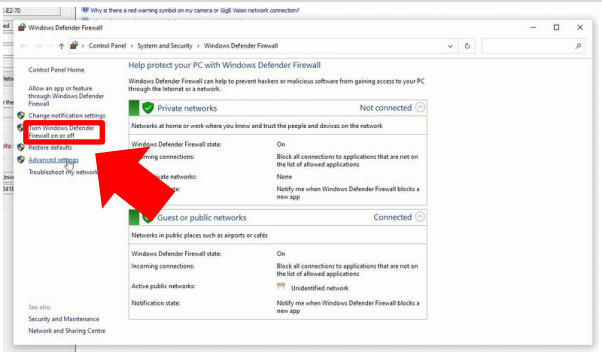
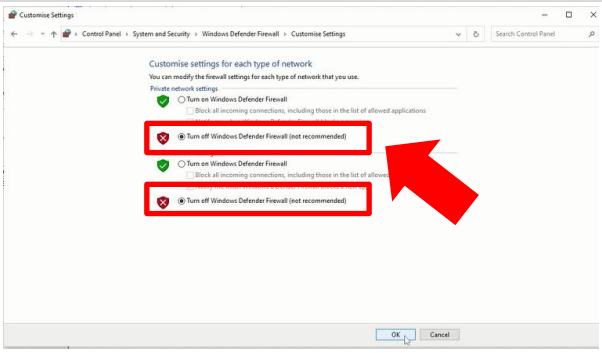
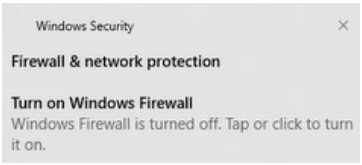
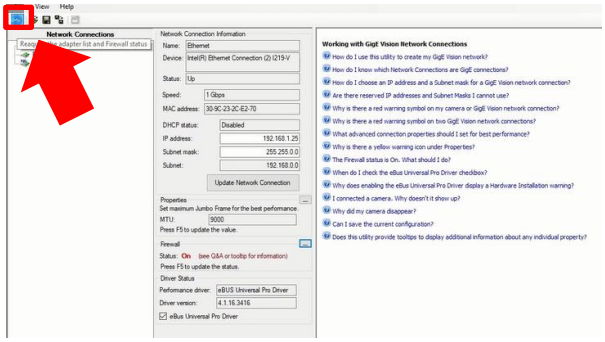
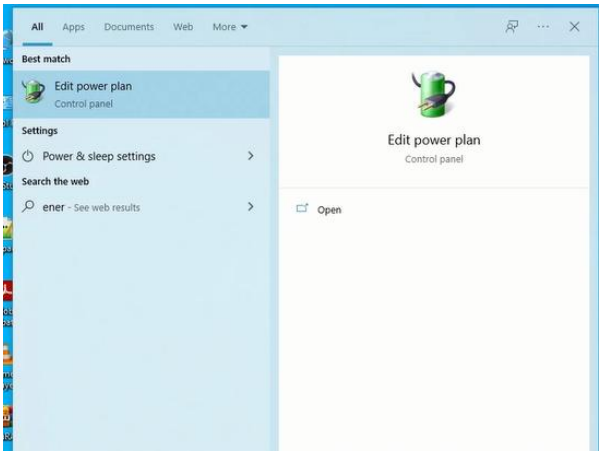
Step	Action	Notes/Pictures
22	From the FlexiBowl interface® enter the IP address of the FlexiBowl® and press the CHANGE IP icon  .	
23	Allow access.	
24	Enter the IP address of the FlexiBowl®, then press PING.	

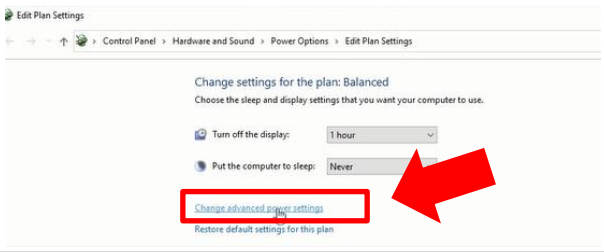
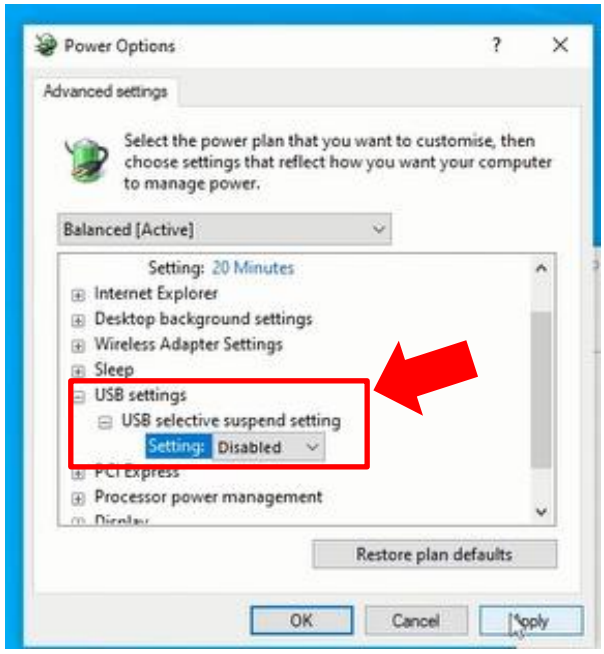
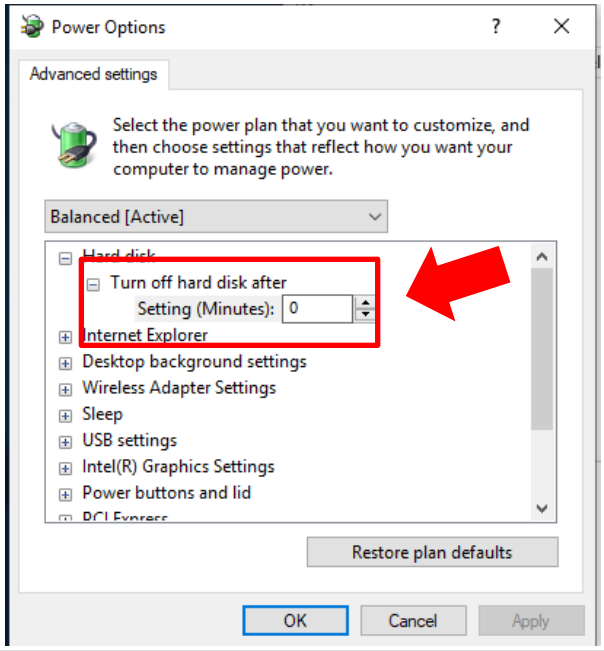
Step	Action	Notes/Pictures
25	The window will be updated.	
26	Modify IP address for switch position 1 (192.168.1.10) and press SAVE TO DRIVE. Then press OK. **Make sure to set all the devices (FlexiBowl®, PC, robot and camera) onto the same subnet.** **FlexiBowl® default IP address is 192.168.1.10.**	

Step	Action	Notes/Pictures
27	Close the FlexiBowl® by the  icon on the top right angle. You will also need to powercycle the FlexiBowl® after changing its IP address.	

4.5 How to keep the connection active

Step	Action	Notes
1	Find (on the PC) and open the Cognex GigE Vision Configurator App.	
2	Enter the Cognex GigE Vision Configurator tool.	
3	Press the icon to reaquire the adapter list and Firewall status.	
4	Open the firewall window.	

Step	Action	Notes
5	Enter the WINDOWS DEFENDER FIREWALL menu.	
6	Disable the firewalls.	 
7	Press the icon to reaquire the adapter list and Firewall status.	
8	Find (on the PC) and open the EDIT POWER PLAN App.	

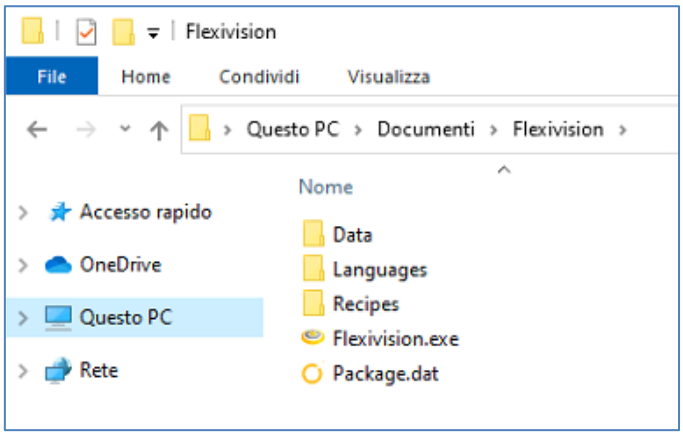
Step	Action	Notes
9	From the EDIT PLAN SETTINGS, enter the CHANGE ADVANCED POWER SETTINGS.	
10	**USB ports have to be always ON to allow the COGNEX license to be active.** In the USB settings, disable the USB selective suspend.	
11	In the hard disk settings, disable the turning off selective suspend setting and press APPLY. Then press OK and close the app.	

4.6 How to insert the Dongle key

Step	Action	Notes
1	To run FlexiVision, correctly insert the hardware license key in the USB port of the PC.	

4.7 Projects files

Project files are stored into the FLEXIVISION folder.



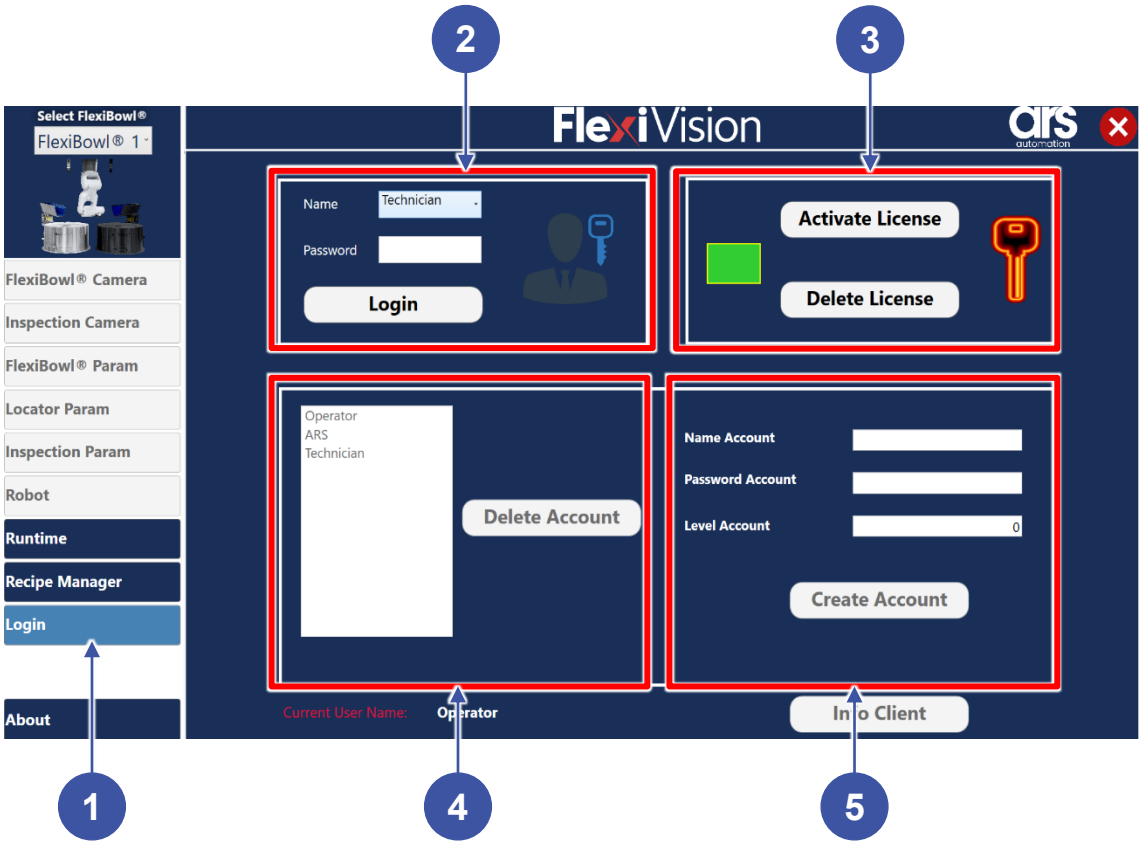
WARNING!
Do not modify and/or delete the projects files.
Risk of malfunctions.

4.8 Files back up

WARNING!
Copy the whole FlexiVision folder onto an external storage device and archive it.

4.9 Login page

When running FLEXIVISION for the first time, the following page opens.



Position	Element/section	Description
1	OPERATION MENU	Includes all the control and operation procedures.
2	LOGIN	Allows the authentication procedure.
3	LICENSE	Is used to activate or delete a license.
4	ACCOUNT DELETE	Allows the account delete procedure.
5	ACCOUNT CREATION	Allows the account creation procedure.

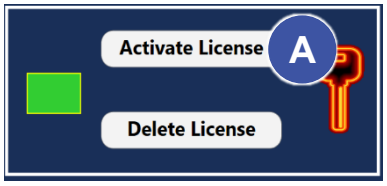
NOTE
When running FLEXIVISION for the first time, the square in the LICENSE section is RED.

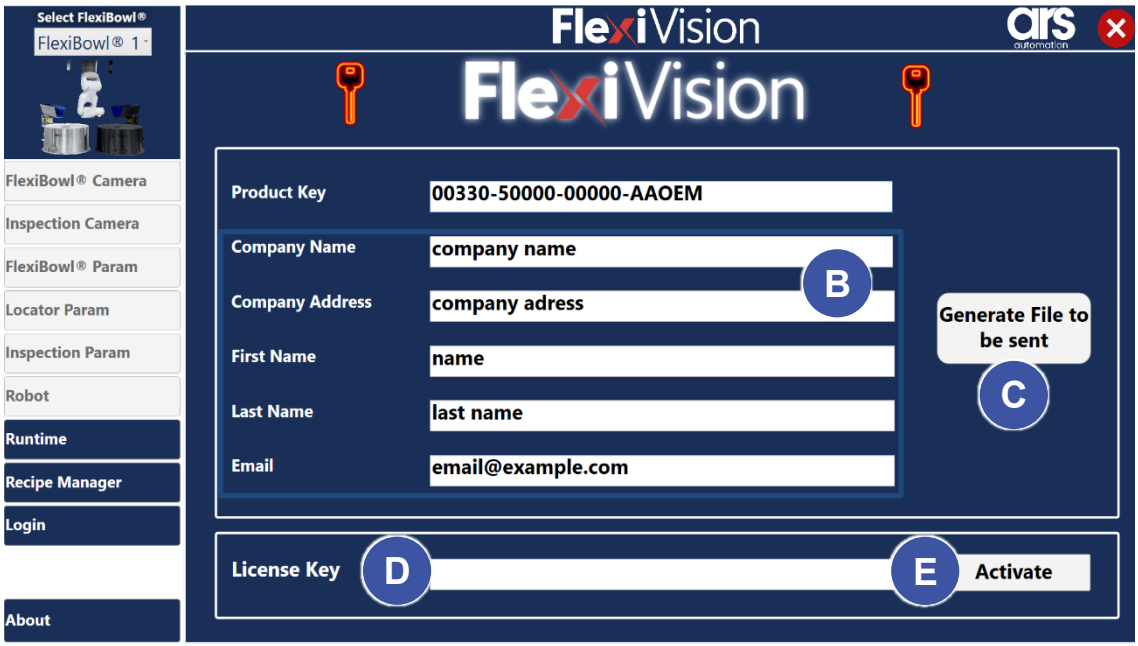
4.10 Authentication procedure

NOTE
Each user has a different access level to procedures.

Step	Action	Notes/Pictures
1	Select the user from the drop-down menu *NAME* (LOGIN section of MAIN PAGE): ▪ Operator ▪ Technician ▪ ARS	Operator ARS Technician
2	Enter the password in the related field.	Default password are: 1 for "operator"; 2 for "Technician".
3	Press *LOGIN*.	If login is successful, available functions are unlocked, according to the access level for the user.

4.11 How to activate the licence

Step	Action	Notes/Pictures
1	Run FLEXIVISION	
2	Login as operator or technician.	See par. 4.5
3	Press *ACTIVATE LICENSE* (**A**).	

Step	Action	Notes/Pictures
4	The following page opens:  Enter the required data (company name, address, etc.) in the (**B**) fields.	
5	Press *GENERATE FILE TO BE SENT* (**C**).	A window message shall appear for file download.
6	E-mail the generated file (.xlm) to info@flexibowl.com.	ARS srl shall generate and send back a licence key.
7	Enter the licence key in the (**D**) field.	
7	Press *ACTIVATE* (**E**).	If activation is successful, the square shown in the picture below becomes GREEN. 

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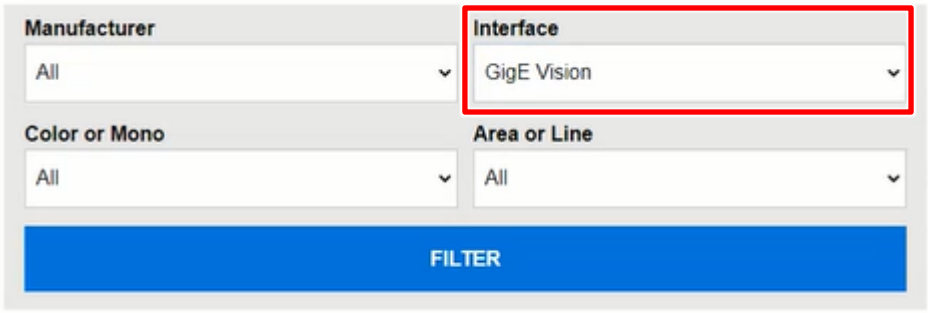
5 CAMERAS

5.1 Compatibility

The system is compatible with a wide range of industrial cameras.
The complete list is available on:
https://www.cognex.com/products/machine-vision/vision-software/visionpro-software/visionpro-camera-support

Find the compatible models by entering *GigE Vision* in the interface field of the filter mask, as shown in the picture below.



5.2 How to connect the camera

The following is an extract from the Cognex User Manual: for further and complete details, please refer to the whole Cognex User Manual.
For non-Cognex hardware, follow the manufacturer's installation instructions.

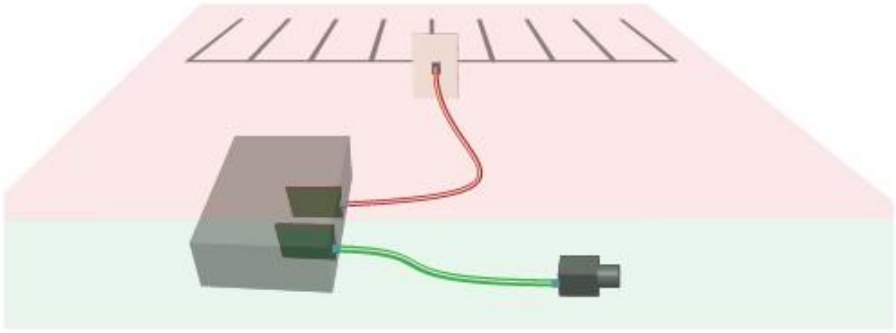
5.2.1 Security requirements

In addition to the standard software and hardware requirements listed in your product documentation, your PC must include both of the following security mechanisms to run Cognex software:

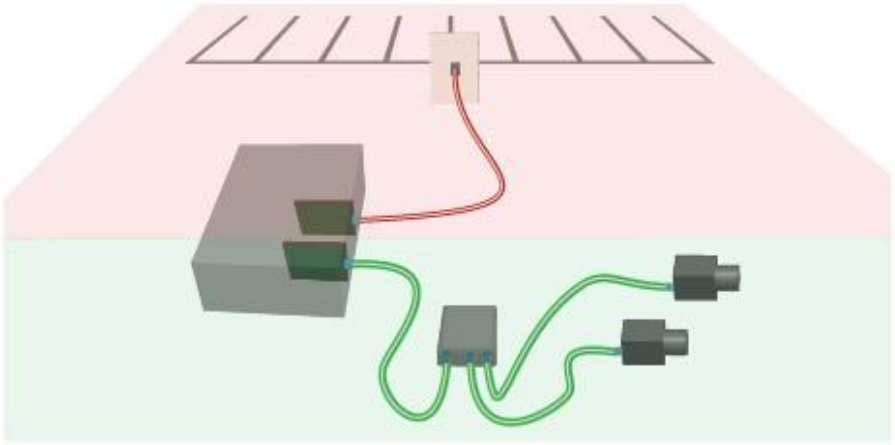
- a Cognex frame grabber
- a Cognex security key (dongle).

5.2.2 GigE Vision Camera Networks

For an application that uses only one camera, the GigE Vision camera network will consist only of a Gigabit Ethernet network adapter and the camera:



If you are using more than one camera, you can use a multi-port network adapter or a Gigabit Ethernet switch (shown):



Be aware the network bandwidth is shared among all connected the cameras when you are using a network switch.

Your PC may already have a network adapter that is used to connect your PC to a local area network or to the Internet. The network adapter(s) you use for image acquisition should be dedicated only for GigE Vision cameras and not connected to your local area network or to the Internet.

WARNING!
To avoid electromagnetic interference, any Ethernet cables you use must be shielded. Cognex strongly recommends Cat 6 or Cat 7 cables with S/STP shielding.

5.2.3 GigE Vision Network Adapters and Switches

Cognex recommends Gigabit Ethernet network adapters that use the PCI Express bus, and supports a variety of multi- port adapters and Ethernet switches. Select a network adapter that support a minimum of 9000 Kbytes jumbo frame size.

5.3 Camera working conditions

FlexiVision® is designed to work with images taken orthogonally on a work plane (the FlexiBowl plane).

Place your camera on the top view of the plane at the right distance (e.g. 1 meter) to optimize the field of view (depending by choosed lens).
These conditions are suitable for 2D object matching performed by the locator procedure.

The camera calibration procedure (describe in the following pages) reduces the perspective effect due to the misalignment between camera sensor and work plane.

5.4 How to calibrate the camera

FlexiVision requires a camera calibration before starting to work with images.

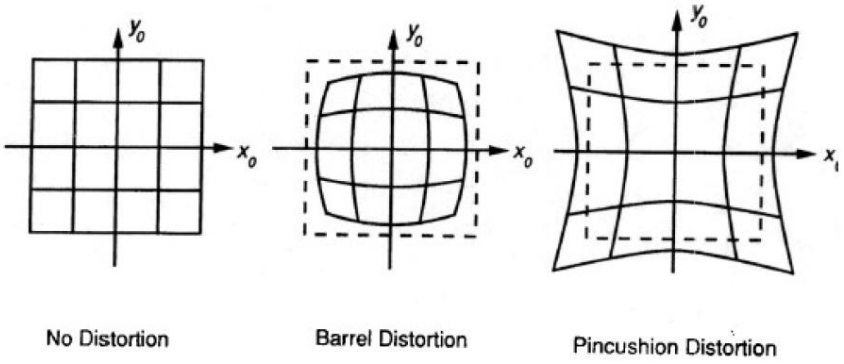
You will need a custom interface flange to install the universal laser calibration tool on your robot.

Both the calibration laser tool and the checker board can be supplied by ARS as an option.
As an alternative, the COGNEX VISION PRO checker board can be used.

For further and complete details about the checkerboard, please refer to the dedicated user manual.

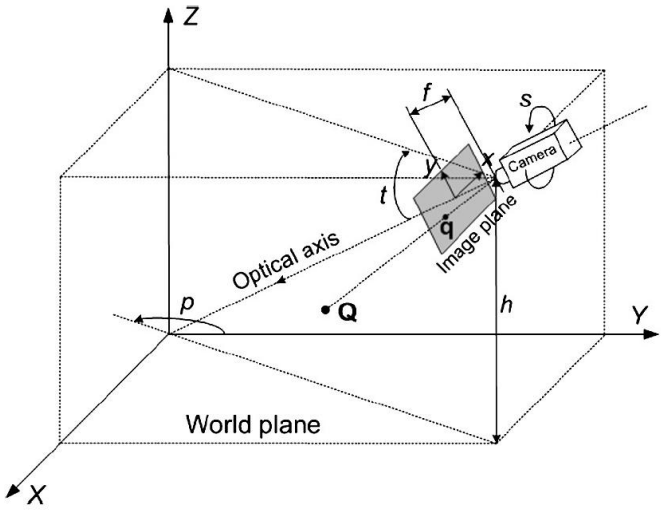
5.4.1 Why calibration is necessary

Every pair of camera sensor and lens applies its own particular distortions on taken image.
So, every pair of camera and lens needs a specific calibration.



Distortions are produced also by additional filters and the focus/aperture setup.

You have to find the optimal camera position and lens setup before starting the calibration procedure.
The calibration must be repeated every time a camera physical feature is modified.



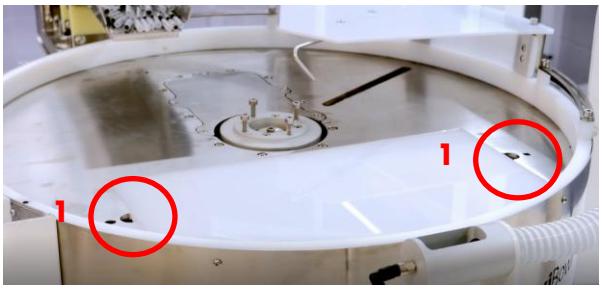
With camera calibration it is possible to get the internal intrinsic (sensor resolution, focal length, lens distortions, ...) and external (position and orientation) camera parameters.
Through the calibration, every frame got by the camera can be "undistorted", that means lens distortions and perspective effect can be corrected in relation to the specific work context conditions. This operation is needed in order to get accurate results during any further image processing and pattern matching tasks: if the image is well undistorted, the metric dimensions of each pixel become constant and well known, in other words measurable.

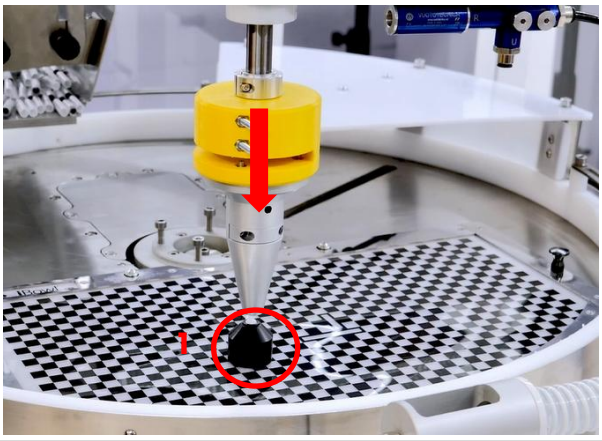
5.4.2 How to install the checker board

Video tutorial is available.

NOTE
This procedure can be carried out by the following users:
- **TECHNICIAN**
- **ARS**

Step	Action	Notes/Pictures
1	Unscrew the four screws of the central flange.	
2	Remove the central flange.	
3	Lift and remove the rotary disk.	
4	Pick up the **calibration grid**.	

Step	Action	Notes/Pictures
5	Place the c**alibration grid** in the proper position by using the reference holes (1) on the FlexiBowl® and the pins on the grid (2).	 
6	Install the interface flange on the robot and fix it.	
7	Turn on the laser.	

Step	Action	Notes/Pictures
8	Use the spacer bracket (1) to position the laser pointer. **NOTE:** **The spacer measures 3cm, which is the right distance required between the laser pointer and the grid, for optimal calibration results.**	
9	Remove the spacer bracket.	

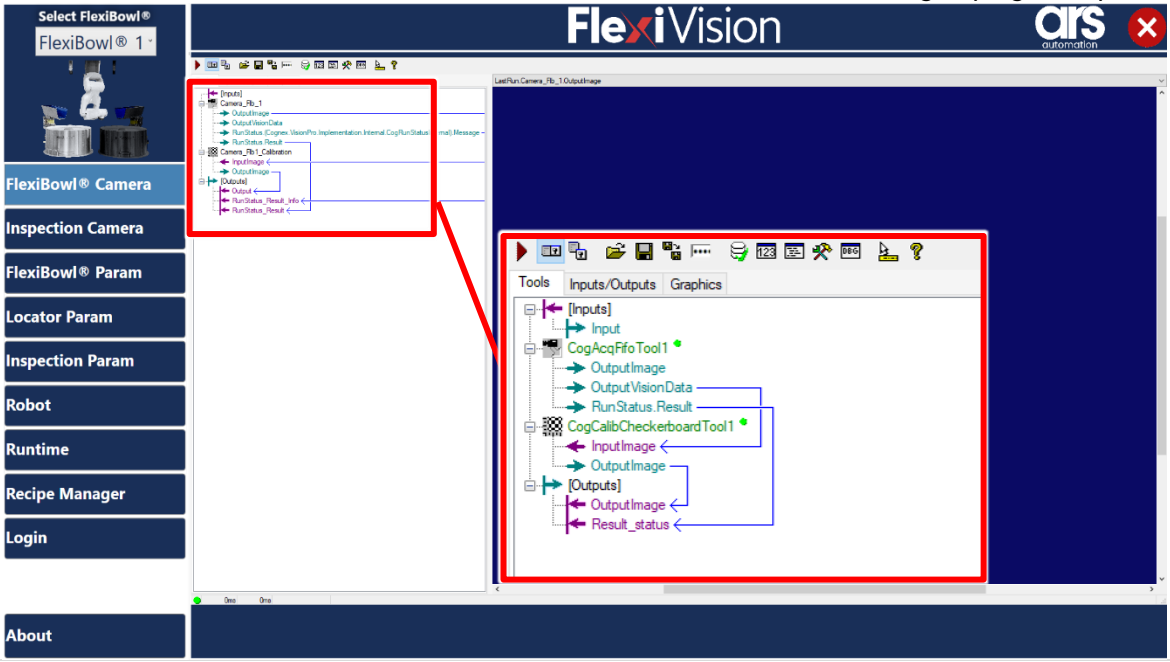
5.4.3 Calibration procedure (checkerboard supplied by ARS)

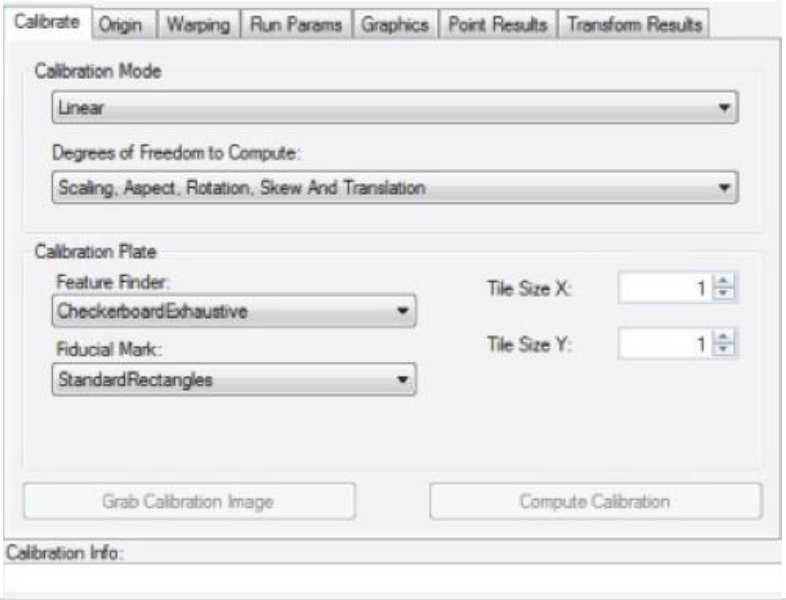
Video tutorial is available.

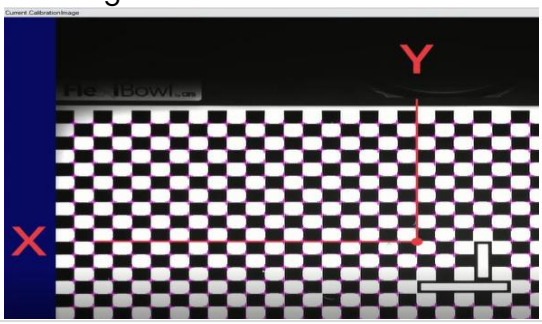
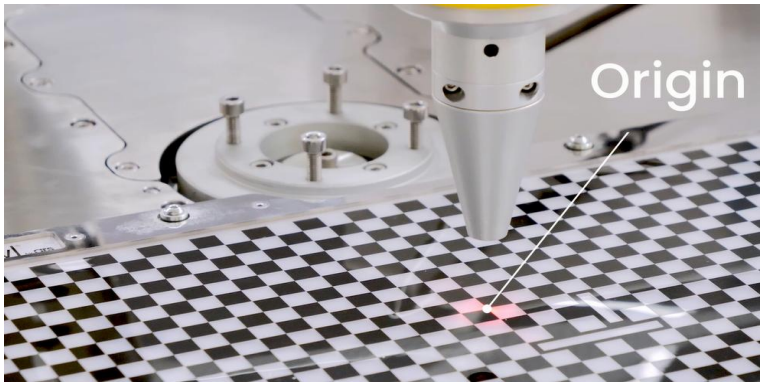
NOTE
This procedure can be carried out by the following users:

- **TECHNICIAN**
- **ARS**

Step	Action	Notes/Pictures
1	Press the Camera icon on the **left** bar. The following page opens:	



Step	Action	Notes/Pictures
2	Press Camera_Flb1_Calibration to start the calibration procedure by the Camera_Flb1_Calibration (CogCalibCheckerboardTool). The CALIBRATE TAB opens. 	
3	In the CALIBRATE TAB, enter the grid spacing for the calibration plate. For a checkerboard-style plate, this is the TILE SIZE. For a grid-of-dots calibration plate, this is the spacing between dot centers in the X- and Y-direction. Enter the grid spacing using real-world units of measurement you want to use for your vision application. For example, if you want to use inches for your application and your calibration plate uses tiles that are one-half inch in size, enter a value of 0.5. **NOTE** **In case the checkerboard brovided by ARS is used, both TILE SIZE X and TILE SIZE Y are 10mm.**	
4	Click Grab Calibration Image to copy the current image.	
5	Click Compute Calibration to have the tool calculate the best-fit 2D transformation, linear or nonlinear, based on the Current.Calibration image and the current set of parameters.	
6	On the left bottom angle, the following message appears: CALIBRATED.	

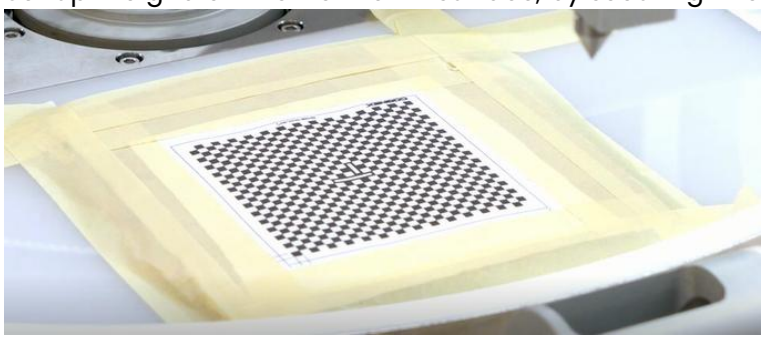
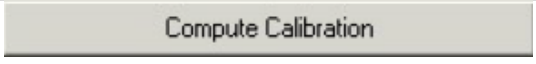
Step	Action	Notes/Pictures
7	Make sure that all the points on the calibration plate have been recognized, by pressing on the “Current. CalibrationImage” view. 	
8	Create a 3-point frame on the robot. For more details on this procedure refer to the robot user manual.   	

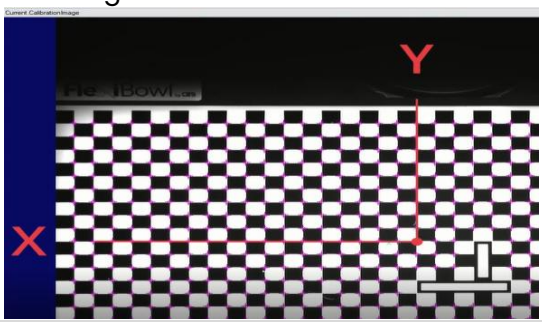
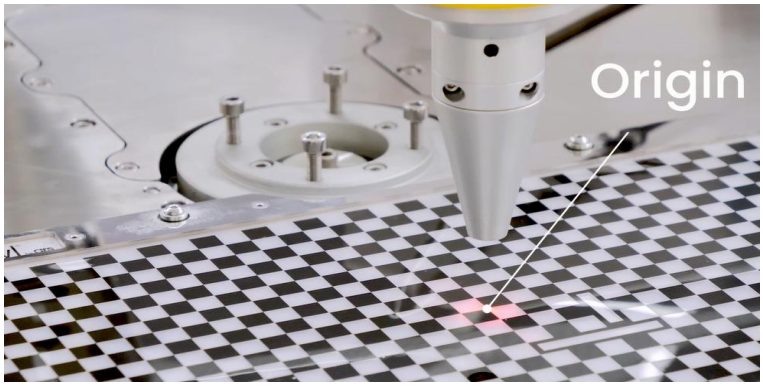
5.4.4 Calibration procedure (printable checkerboard)

Video tutorial is available.

NOTE
This procedure can be carried out by the following users:
- **TECHNICIAN**
- **ARS**

The printable grid can be found on the USB key provided by ARS.

Step	Action	Notes/Pictures
1	Print the grid.	
2	Remove the rotary disc (as described at paragraph 5.2.2).	
3	Set up the grid on the FlexiBowl® surface, by securing it to a steady support.  **NOTE** **If the calibration grid moves, the calibration procedure has to be repeated.**	
4	By a caliper, measure the lenght corresponding to 10 squares and divide it per the no. of squares: this average value shall be entered as TILE SIZE.	
4	Click  to copy the current image.	
5	Click  to have the tool calculate the best-fit 2D transformation, linear or nonlinear, based on the Current.Calibration image and the current set of parameters.	
6	On the left bottom angle, the following message appears: CALIBRATED.	

Step	Action	Notes/Pictures
7	Make sure that all the points on the calibration plate have been recognized, by pressing on the “Current. CalibrationImage” view. 	
8	Create a 3-point frame on the robot. For more details on this procedure refer to the robot user manual.   	

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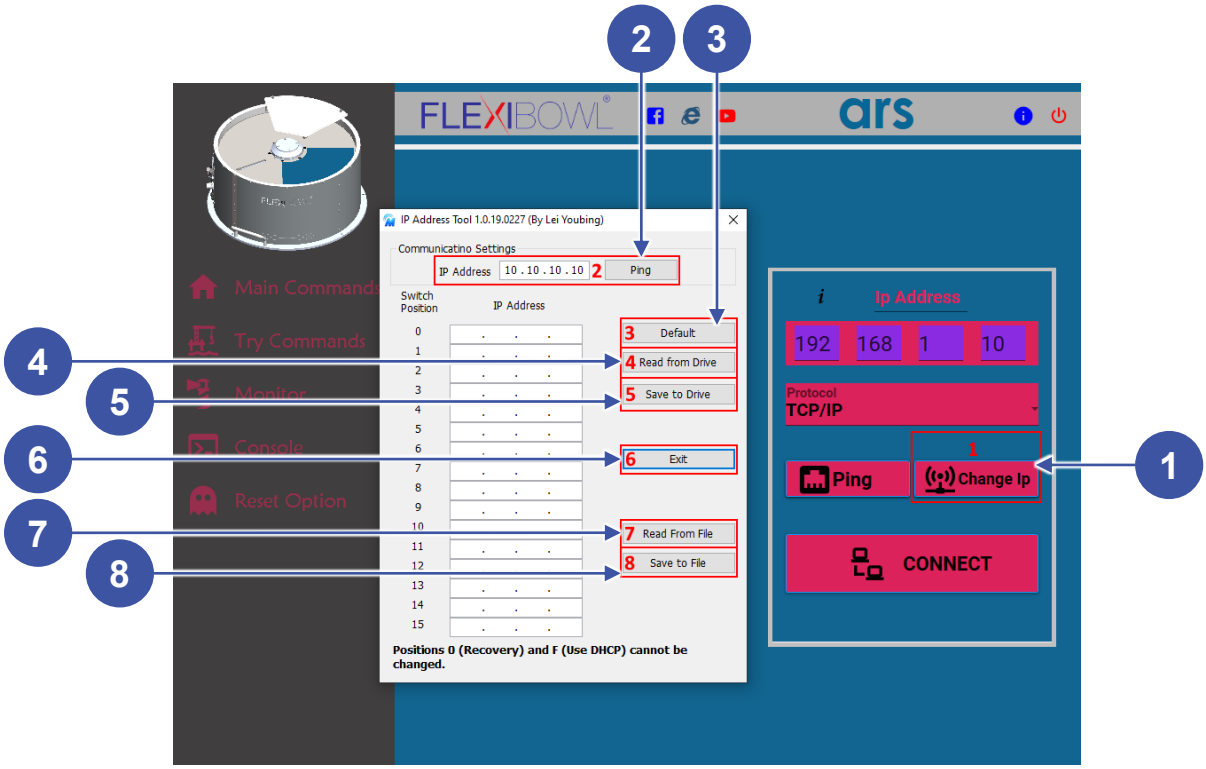
6 FLEXIBOWL®

6.1 How to set the IP address

With FLEXIBOWL running, press the **Change IP** button in the following page.
The table shown in the picture is used to set a different IP address (even if in the same class).



Position	Element	Description
1	Change IP	Opens a window that allows to change the IP address.
2	Ping	Allows to ping the Flexibowl® with the address specified in the IP address.
3	Default	Enters the FLEXIBOWL® default addresses in the table.
4	Read from Drive	Reads the current set IP addresses.
5	Save to Drive	Saves the current set IP addresses.
6	Exit	Exit from this page.

Position	Element	Description
7	Read from file	Reads the file with the IP addresses, if previously geneerated by pressing the SAVE TO FILE key.
8	Save to File	Generates a file containing the current table of IP addresses.

NOTE
Restart Flexibowl® to make the changes effective.

NOTE
IP addresses related to position O and F cannot be modified.

6.1.1 IP address recovery

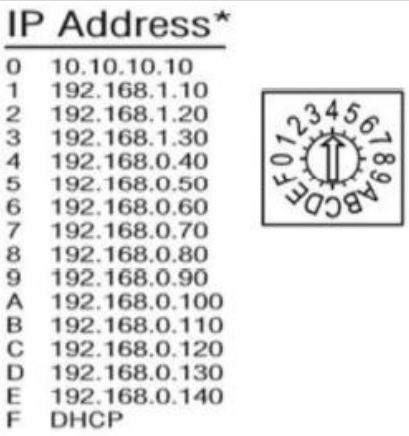
If the IP address is lost, the rotary dip switch can be used to interface again with the Flexibowl (see following picture):

IP Address*

0	10.10.10.10
1	192.168.1.10
2	192.168.1.20
3	192.168.1.30
4	192.168.0.40
5	192.168.0.50
6	192.168.0.60
7	192.168.0.70
8	192.168.0.80
9	192.168.0.90
A	192.168.0.100
B	192.168.0.110
C	192.168.0.120
D	192.168.0.130
E	192.168.0.140
F	DHCP

CAUTION!
Disconnect the power supply before taking the cover off.

For **FLEXIBOWL®200 and 350**, proceed as follows to place the dip switch in a position different from the current one:

Step	Action	Notes/Pictures
1	Unplug the power cable from the control panel.	
2	Take the cover off the FlexiBowl®.	
3	Find the driver.	
4	Use a flat screwdriver to select the correct dip switch position	
5	Riassemble all the components.	

For **FLEXIBOWL®500, 650 and 800**, proceed as follows to place the dip switch in a position different from the current one:

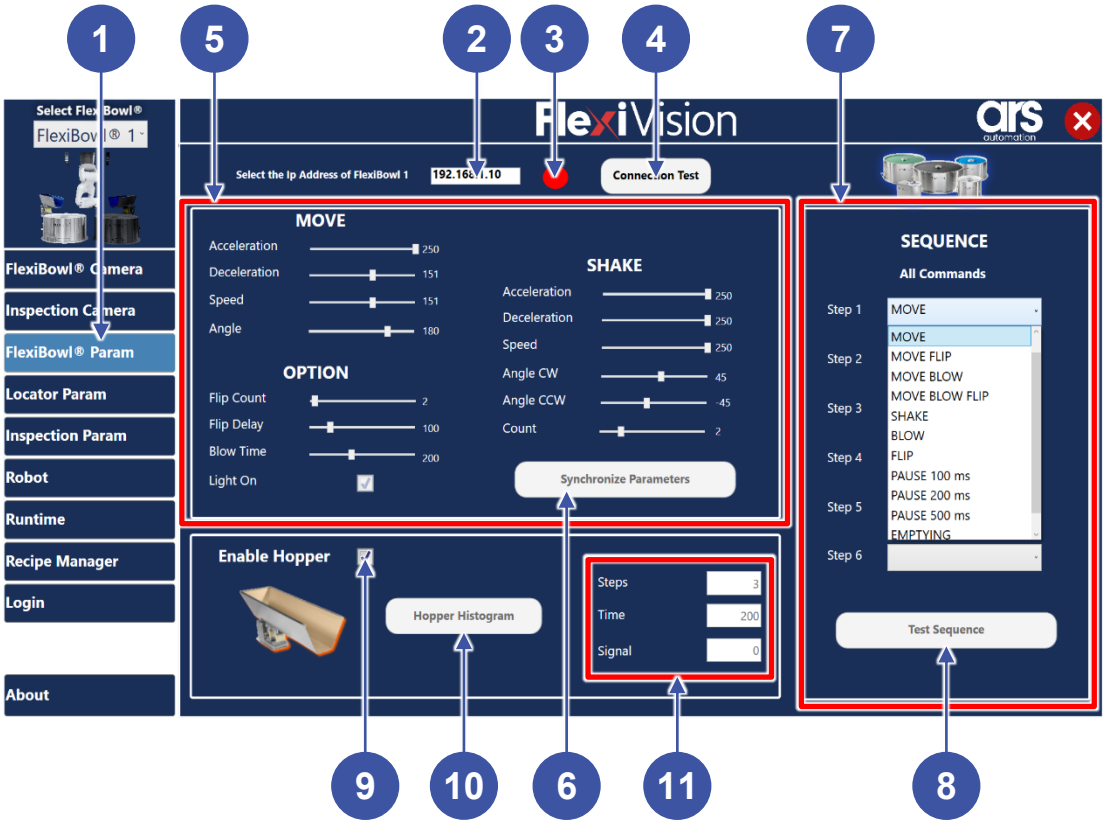
Step	Action	Notes/Pictures
1	Unplug the power cable from the control panel.	
2	Take the cover off the FlexiBowl®.	
3	Remove the connector between the backlight and the connection board.	

Step	Action	Notes/Pictures
4	Unscrew the socket head cap screws fixing the backlight to the FlexiBowl®. **Note** **Keep the removed screws for reassembly.**	
5	Use a flat screwdriver to select the correct dip switch position	IP Address* 0 10.10.10.10 1 192.168.1.10 2 192.168.1.20 3 192.168.1.30 4 192.168.0.40 5 192.168.0.50 6 192.168.0.60 7 192.168.0.70 8 192.168.0.80 9 192.168.0.90 A 192.168.0.100 B 192.168.0.110 C 192.168.0.120 D 192.168.0.130 E 192.168.0.140 F DHCP 
6	Riassemble all the components.	

6.2 How to connect the Flexibowl® to Flexivision

6.2.1 Flexibowl Param page

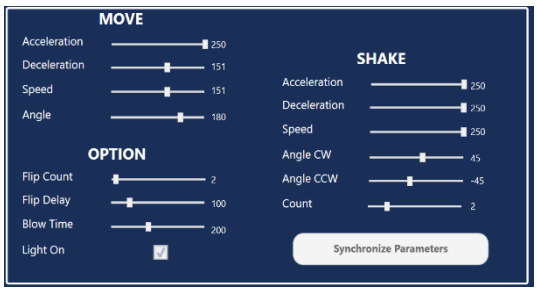
By pressing the *FLEXIBOWL PARAM* key on the OPERATION MENU, the following page opens.



Position	Element/section	Description
1	OPERATION MENU	
2	FLEXIBOWL IP ADDRESS	
3	CONNECTION STATUS led	Led GREEN: Flexibowl connected Led RED: Flexibowl not connected
4	TEST CONNECTION pushbutton	
5	FLEXIBOWL PARAMETERS	
6	SYNCHRONIZE PARAMETERS pushbutton	
7	FLEXIBOWL MOVEMENT SEQUENCE	
8	TEST SEQUENCE pushbutton	

Position	Element/section	Description
9	HOPPER ACTIVATION check box	
10	HOPPER HYSTOGRAM pushbutton	
11	HOPPER HYSTOGRAM PARAMETERS	

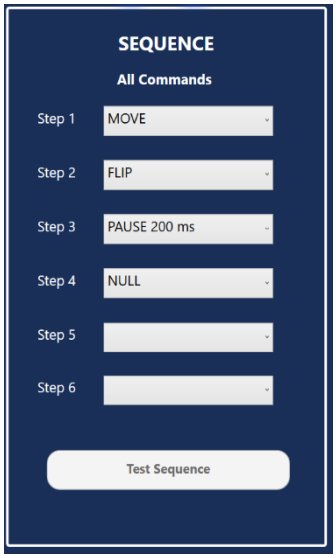
6.2.1.1 FLEXIBOWL Parameters

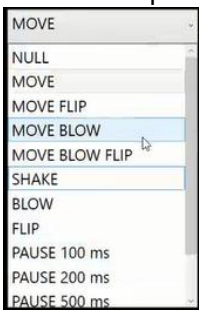


ID	Element	Description
1	MOVE - Acceleration	Acceleration value used at each MOVE command
2	MOVE - Deceleration	Deceleration value used at each MOVE command
3	MOVE – Speed	Speed value (rpm) used at each MOVE command
4	MOVE - Angle	Angle at which FlexiBowl® moves at each MOVE command
5	SHAKE - Acceleration	Acceleration value used at each SHAKE command
6	SHAKE - Deceleration	Deceleration value used at each SHAKE command
7	MOVE – Speed	Speed value (rpm) used at each SHAKE command
8	MOVE – Angle CW	Clockwise Angle with which FlexiBowl® moves at each SHAKE command
9	MOVE – Angle CCW	Counterclockwise Angle with which FlexiBowl® moves at each SHAKE command
10	OPTION – Flip Count	Number of Flip activations that will be carried out
11	OPTION – Flip Delay	Time (in milliseconds) between a flip activation and deactivation
12	OPTION – Blow time	Time (in milliseconds) of blow time activation

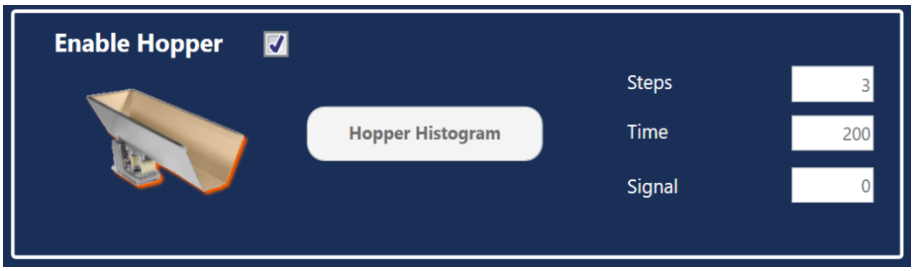
ID	Element	Description
13	OPTION – Light on	Press to enable/disable the backlight

6.2.1.2 Robot sequence



ID	Element	Description
1	SEQUENCE	For each step of the sequence, select the movement from the drop-down menu.  If during image acquisition the camera does not find any object, FlexiVision will automatically recall this sequence to move the FlexiBowl® plate to present other components.
2	TEST SEQUENCE	Press to test the sequence

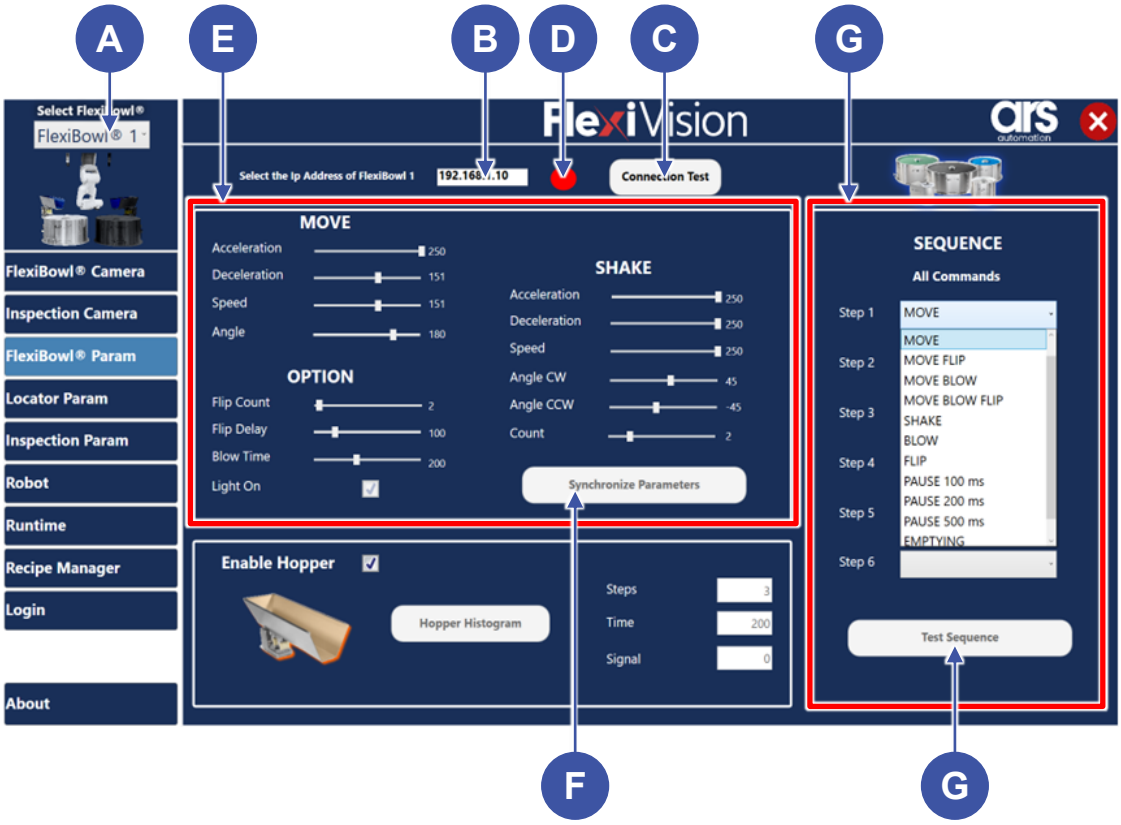
6.2.1.3 HOPPER parameters setting

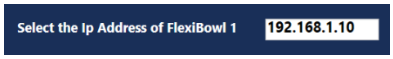
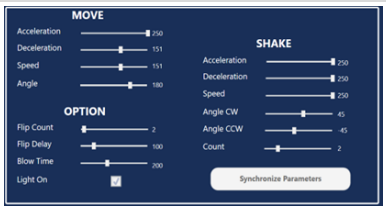


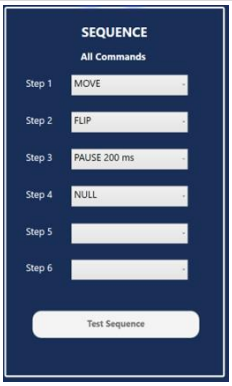
ID	Element	Description
1	ENABLE HOPPER	Enables/disables the vibrating hopper control.
2	HOPPER HISTOGRAM pushbutton	Enters the hopper **CogHistogramTool**.
3	STEPS	Sets the no. of steps (forward movements) which pass between the backlit imaging acquiring area and the hopper.
4	TIME	Sets the hopper vibration time
5	SIGNAL	Sets the signal number to be sent to the robot.

NOTE
Flexivision does not directly control the vibrating hopper by I/O but sends a string to the robot for it to do.

6.2.2 Connection to FLEXIBOWL



Step	Action	Notes/Pictures
1	Select the FLEXIBOWL from the drop down menu (**A**).	
2	Enter the FLEXIBOWL IP ADDRESS in the (**B**) field.	
3	Press the CONNECTION TEST button (**C**). If connection is successful, led (**D**) turns to green. If connection is not successful, led (**D**) remains red.	
4	Set the FLEXIBOWL parameters value (**E**), by the slide bars.	
5	Enable or disable the backlight.	

Step	Action	Notes/Pictures
6	Press the SYNCHRONIZE PARAMETERS pushbutton.	
7	Select, for each step, the ROBOT MOVEMENT SEQUENCE: if the camera does not find any object during image acquisition, FlexiVision will automatically recall this sequence to move the Flexibowl plate.	

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7 ROBOT

7.1 General requirements

The robot must have the ability to open and manage one or more communication servers using the TCP / IP protocol, in order to receive and send strings by a task parallel to the main one, so as to receive information from the vision system while the main job is running.

7.1.1 Standard data structure

Data	Terminator char
String (command)	CHR (13)

Command	Action
"set_Recipe=recipe name"	The recipe corresponding to the sent "recipe name" is loaded.
"get_Recipe"	The name of the recipe currently loaded on FlexiVision is shown. **Return**:" recipe name".
"start_Locator"	Starts the parts localization process by recalling the FlexiBowl® handling routine in case there are no parts that can be picked up. **Return**: "Pattern_1;x;y;r".
"stop_Locator"	Stops the process of locating the object with the aid of the FlexiBowl®.
"turn_Locator"	If no parts are picked up, by this command the operator can make the Flexibowl rotate and the "start_Locator" routine start. **Return**: "Pattern_1;x;y;r".
"test_Locator"	Starts the process of locating the object without the aid of the FlexiBowl®. **Return**: "Pattern_1;x;y;r".
"start_Control"	Starts the inspection cycle. Return: "Control_1;x;y;r".
"state_Locator"	Locator status diagnostics is shown: **Return**: ▪ "Locator is Running" ▪ "Locator is in Error" ▪ "Locator is not Running".
"start_Empty"	Start the FlexiBowl® Quick-Emptying sequence. **Return**: "start_Empty ended"

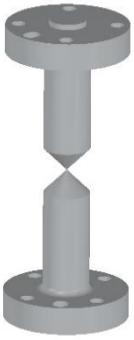
If hopper should be activated you will receive the string "Hopper;signalnumber;time"

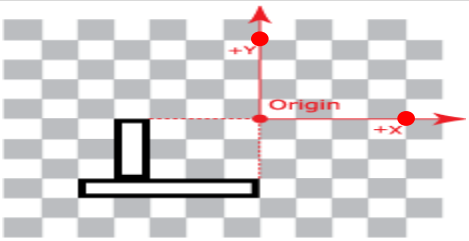
7.2 Robot-Tool creation and calibration

NOTE
For more details about the procedure for creating working tools and working frames, refer to the robot instruction manual.

This operation requires two calibration tips:

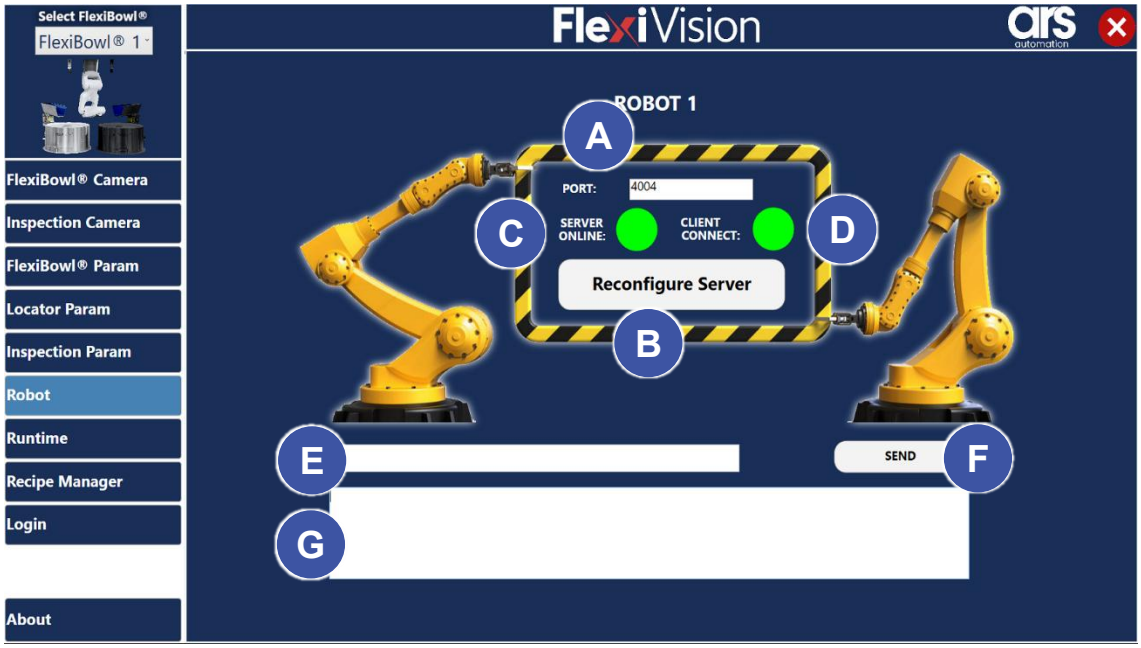
- the first shall be applied on the robot flange;
- the second one shall be positioned on the FlexiBowl® or on a planar surface, in order to carry out the tool procedure.

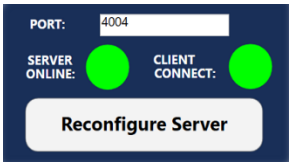


Step	Action	Notes/Pictures
1	Remove any tool on the robot flange and replace it with the first calibration tip.	
2	Place the second calibration tip on the FlexiBowl® or on a planar surface.	
3	Create the tool following the procedure written in the robot's manual.	
4	Create a 3-point frame (origin, x, y) on the robot.	
5	Open the dialogue window to create the calibration working frame, keeping care not to activate the tool created previously.	
6	For registration of calibration points, position the robot on the intersection of the squares of the calibration grid, as shown in the picture.	

7.3 How to connect the robot

By pressing the *ROBOT* key on the OPERATION MENU, the following page opens.



Step	Action	Notes/Pictures
1	Ensure that the robot client is up.	
2	Enter the SERVER PORT you will use in the (**A**) field.	
3	Press the RECONFIGURE SERVER button (**B**). Led (**C**) turns to green. Once the robot has connected to the system Led (**D**) will turn to green.	
5	Enter a string in the (**E**) field and press SEND (**F**) to test the communication with the robot.	
6	The message sent by the robot is displayed in field (**G**).	

7.4 Example

Contact ARS at info@flexibowl.com to receive communication examples.

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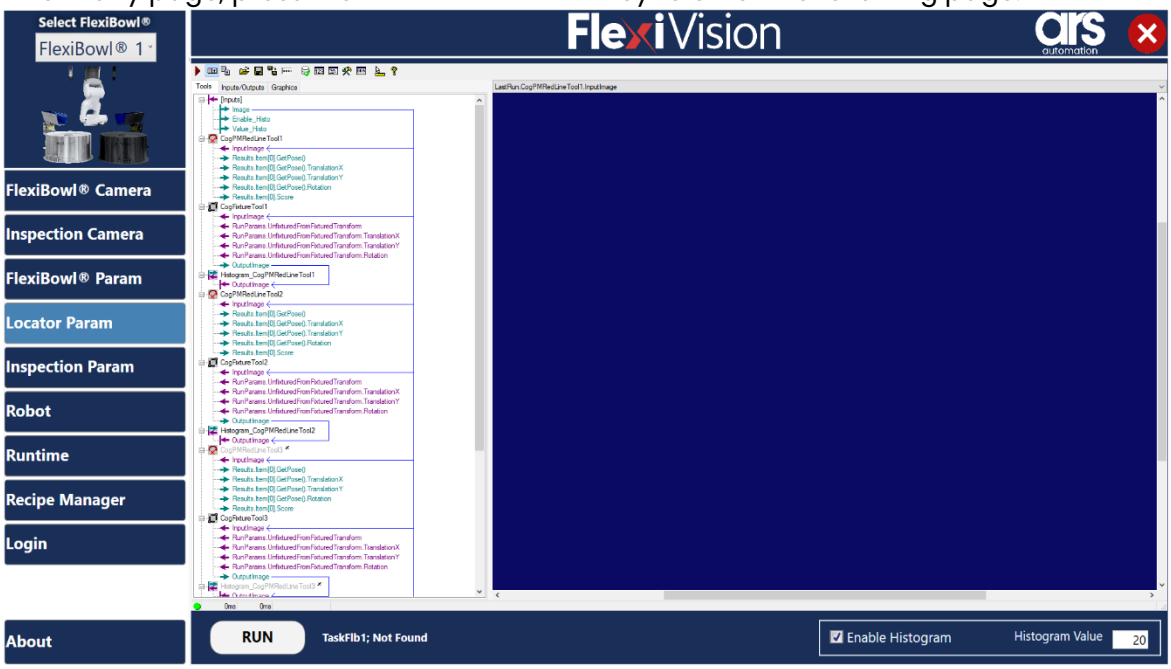
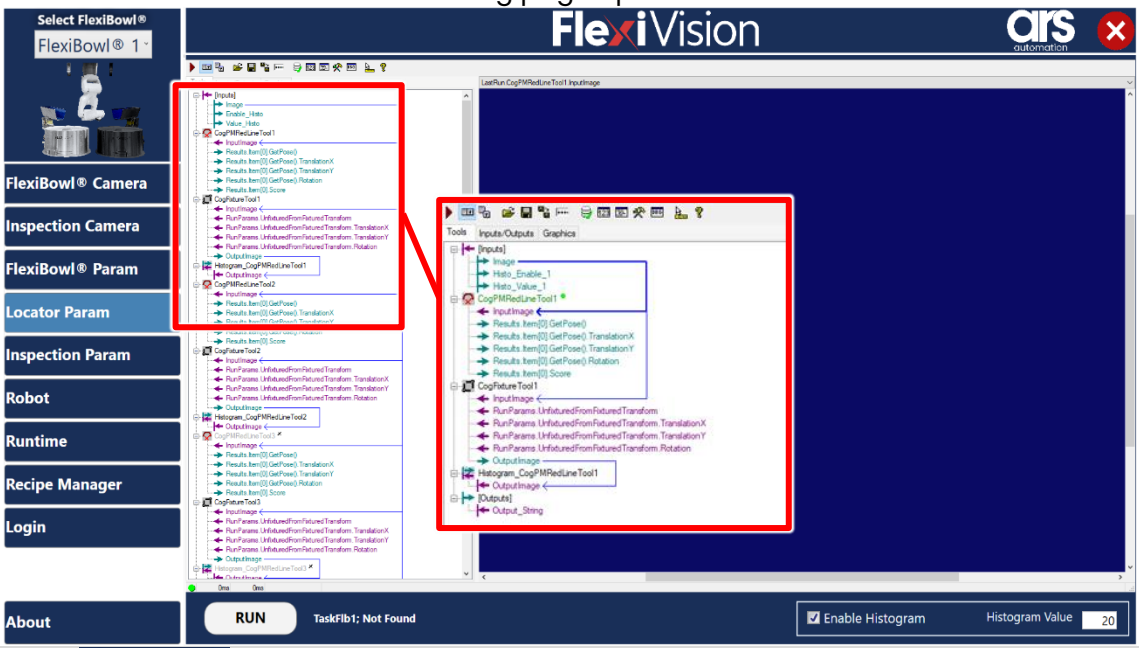
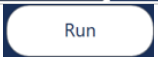
8 LOCATOR

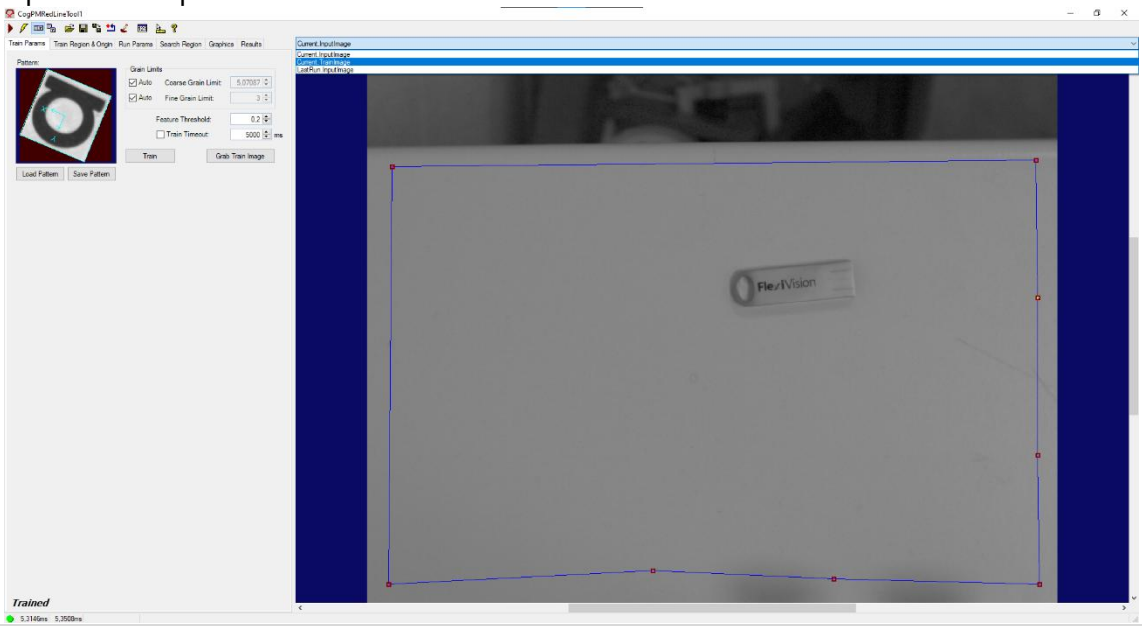
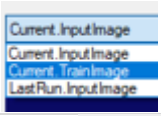
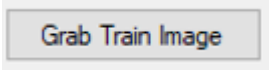
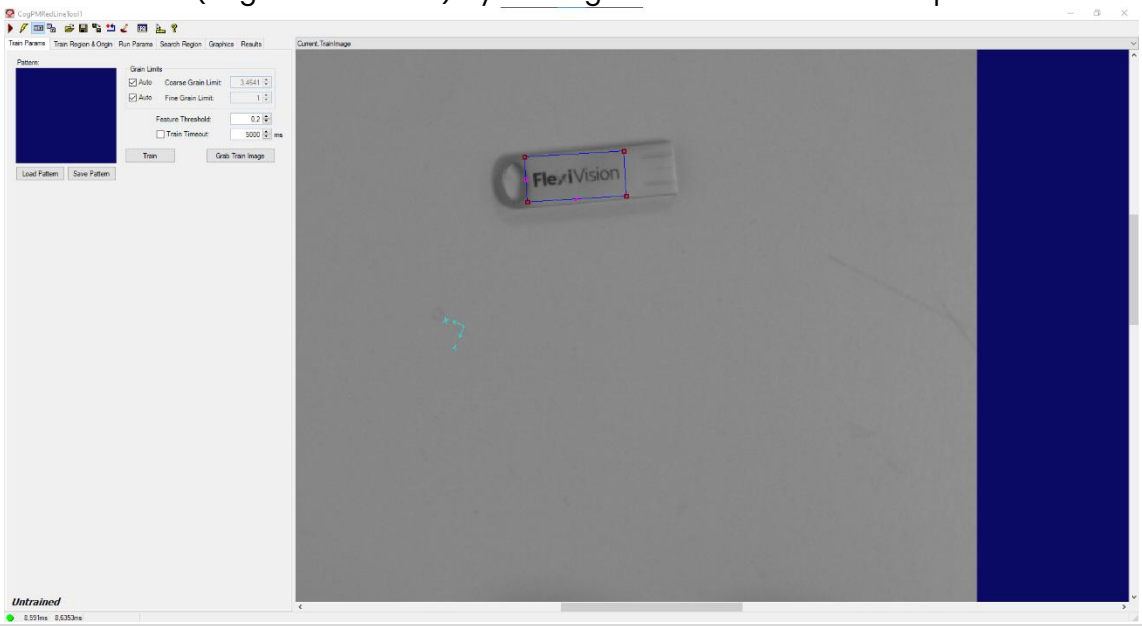
8.1 Locator page

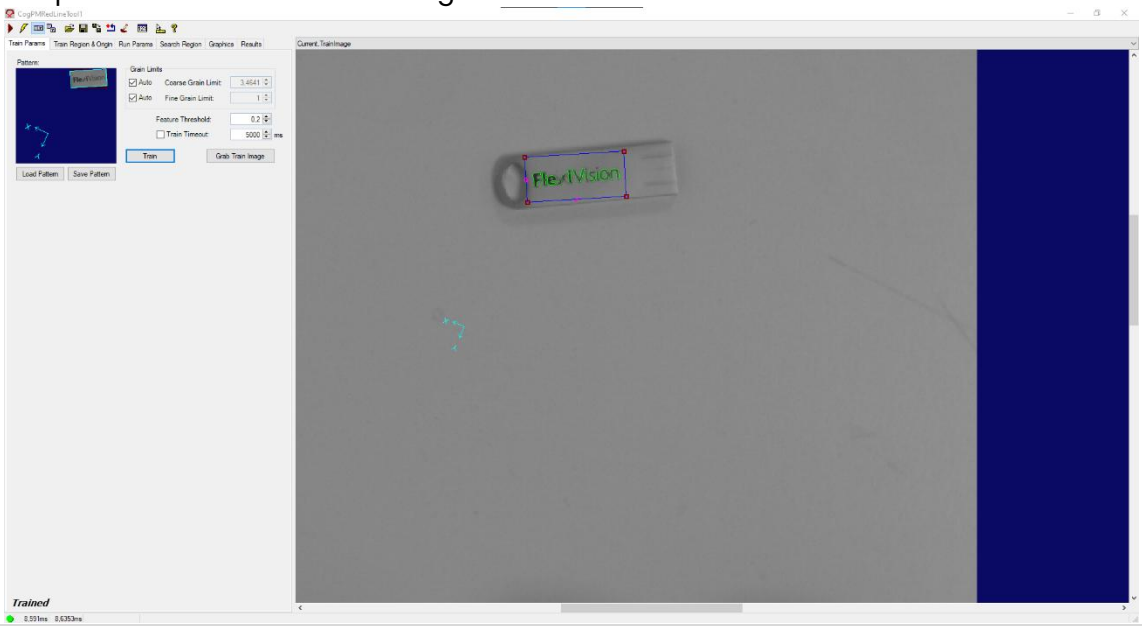
Video tutorial is available.

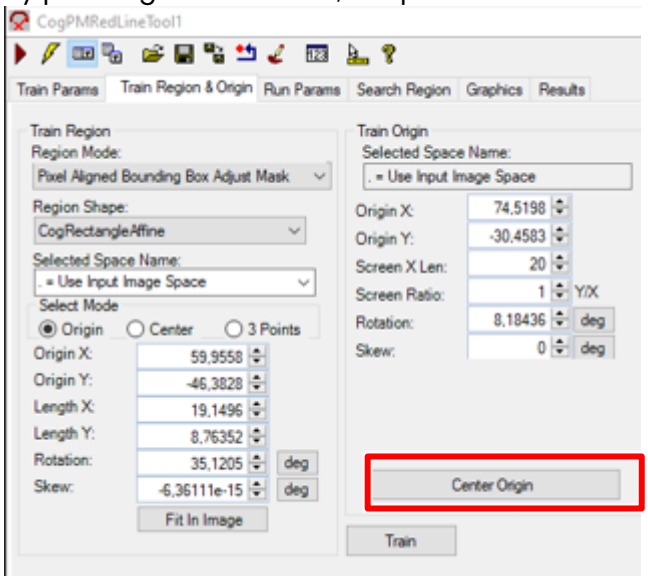
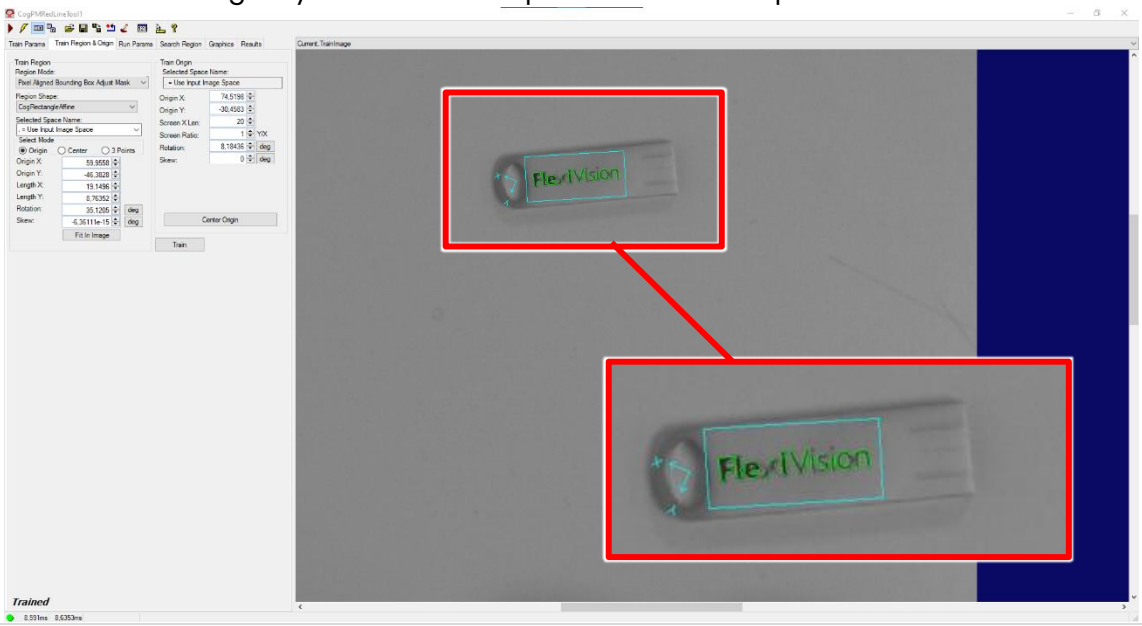
NOTE
This procedure can be carried out by the following users:
- **TECHNICIAN**
- **ARS**

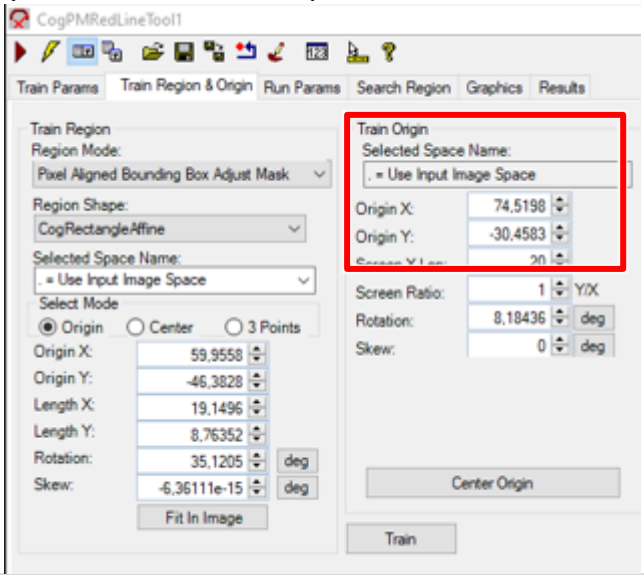
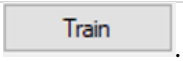
Step	Action	Notes/Pictures
1	From any page, press the **Locator Param** key to enter the following page: 	
2	Position one part at the center of the field of view	

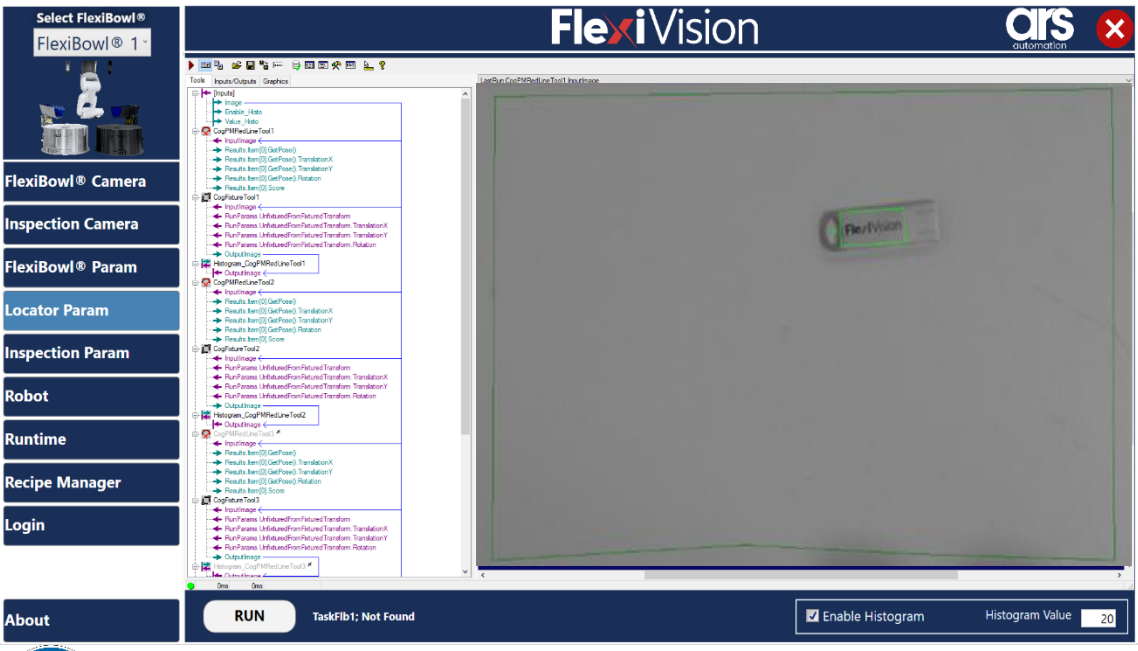
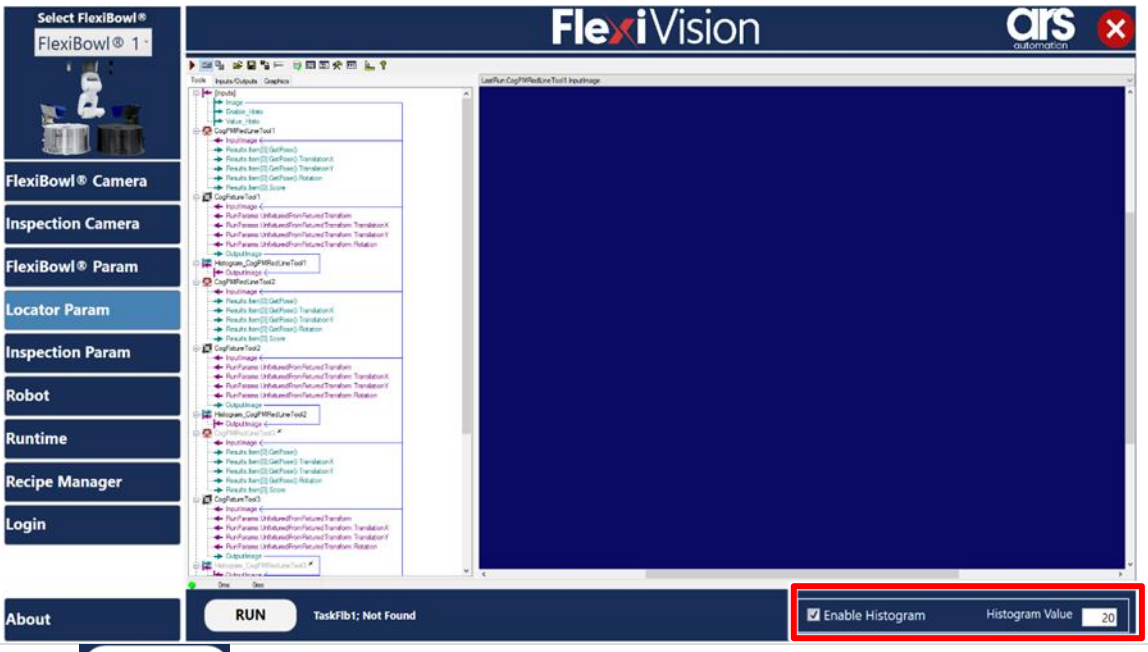
Step	Action	Notes/Pictures
3	Press LOCATOR SECTOR 1. The following page opens: 	
4	Press  to acquire the first image.	
5	Adjust the exposure value, so to have the maximum contrast between the item to be recognized and the FlexiBowl® surface.	
6	Doubleclick on  . The tool opens. 	
7	Set the picking area by dragging the blue line by the red squares: only the parts inside this area shall be recognized and shall be available for robot picking.	

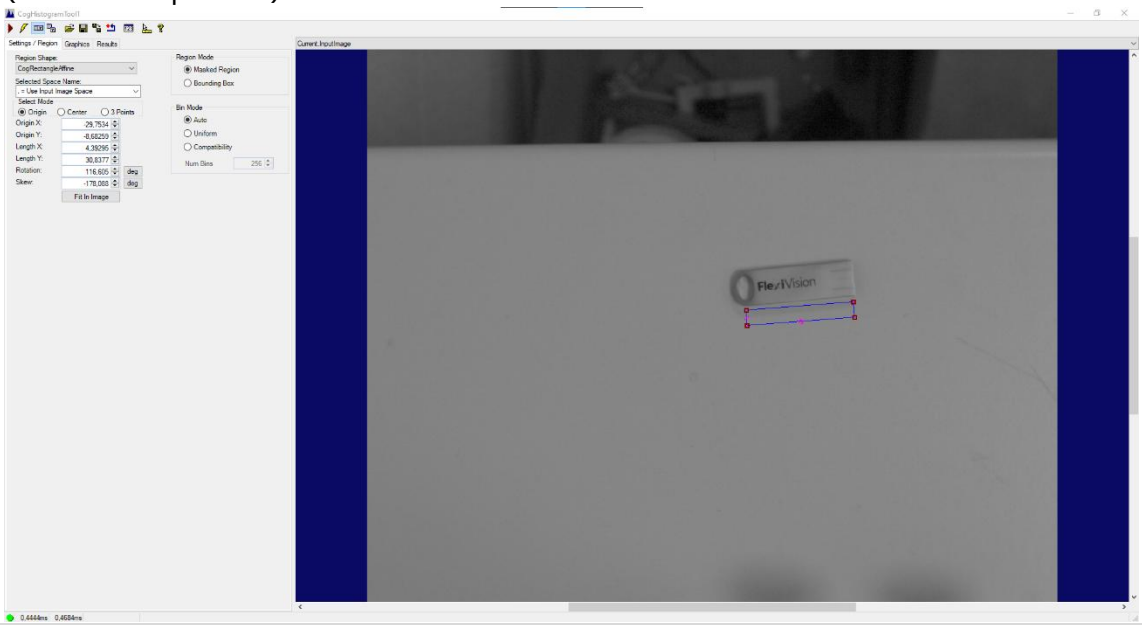
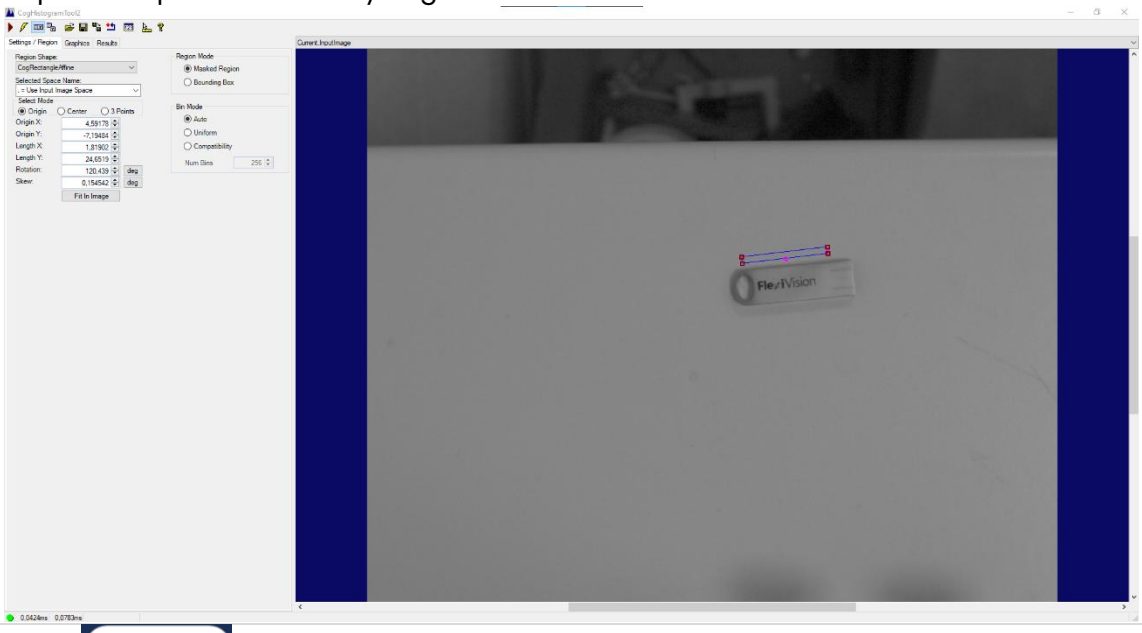
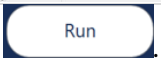
Step	Action	Notes/Pictures
8	Open the drop down menu: 	
9	Select Current.TrainImage. 	
10	Press  to acquire the image.	
11	Resize the ROI (Region Of Interest) by moving the blue line around the pattern. 	

Step	Action	Notes/Pictures
12	Press Train to acquire the shape of the pattern; green lines shall be displayed: the pattern lines have been recognized. 	

Step	Action	Notes/Pictures
13	On the display, the origin if a cartesian system is shown: the origin coordinates shall be sent to the robot for picking. By pressing ENTER ORIGIN, the position will be centered on the ROI (Region Of Interest).  You can also drag it by the mouse to a position inside the pattern 

Step	Action	Notes/Pictures
14	Also, the origin coordinates can be defined by using the TRAIN REGION AND ORIGIN menu (ORIGIN X and ORIGIN Y). 	
14	**NOTE** **In case it is necessary to hide some lines on the pattern, a mask shall be applied.** Select the IMAGE MASK EDITOR by the  icon on the upper bar, to open the IMAGE MASK EDITOR tool. A window mask appears, with tools (in the top part) to delete or mask details which are not useful for the pattern recognition (e.g. use rubber for delete; use red brush to mask details).	
15	Select the BRUSH and the BRUSH DIMENSION	
16	By the brush, cover the pattern lines which have not to be recognzed.	
17	Press APPLY.	
18	Press OK.	
19	Press  .	

Step	Action	Notes/Pictures
20	Press Run. 	
21	**NOTE** **It could be necessary to define regions which have to be free from items (to avoid interference and avoiding crashes).** **Enable the HISTOGRAM function.** 	
22	Press Run: green lines shall appear out of the pattern.	

Step	Action	Notes/Pictures
23	Doubleclick on  drag and resize the lines delimiting zones (around the pattern) that have to be free. 	
24	Repeat the procedure for Hystogram 2. 	
25	Press 	

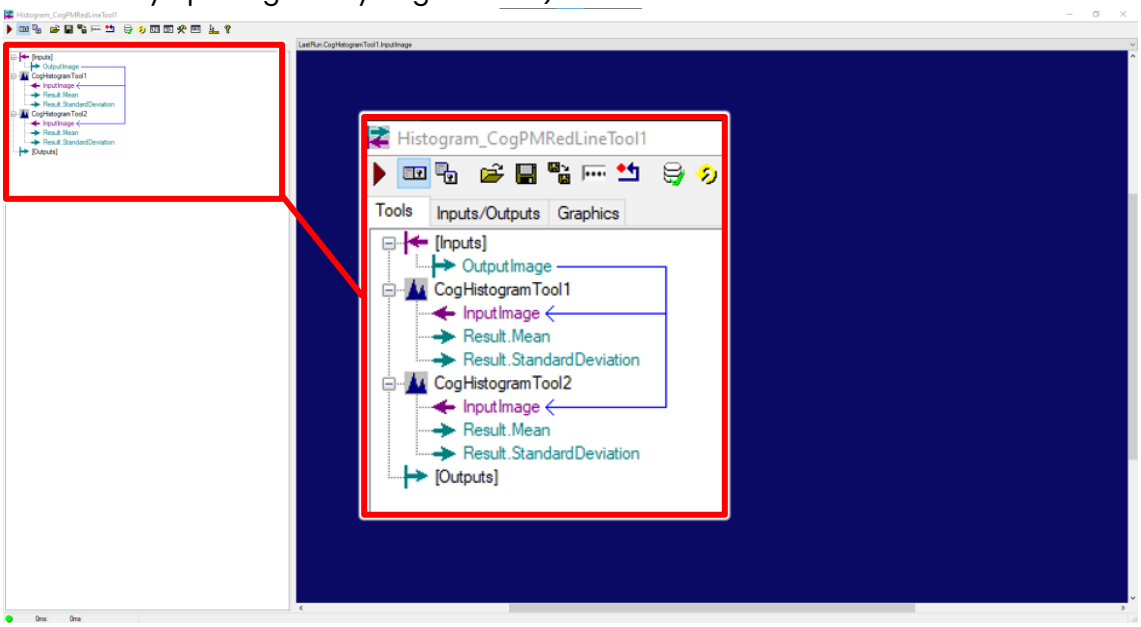
Step	Action	Notes/Pictures

NOTE

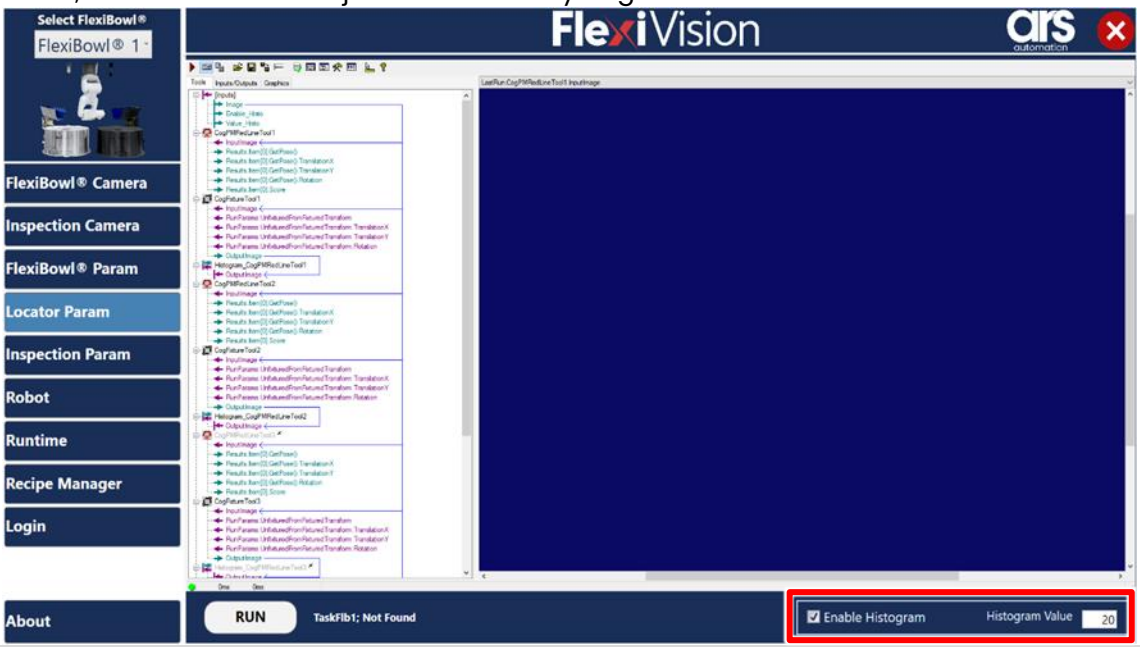
Histograms are used to measure the greyscale threshold for an image or section of an image in order to determine the presence/absence of a part or to determine relative fill levels.

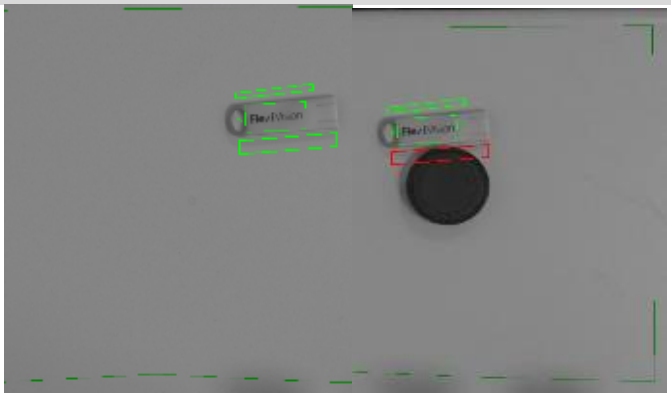
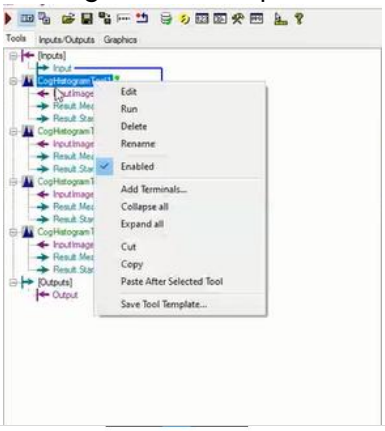
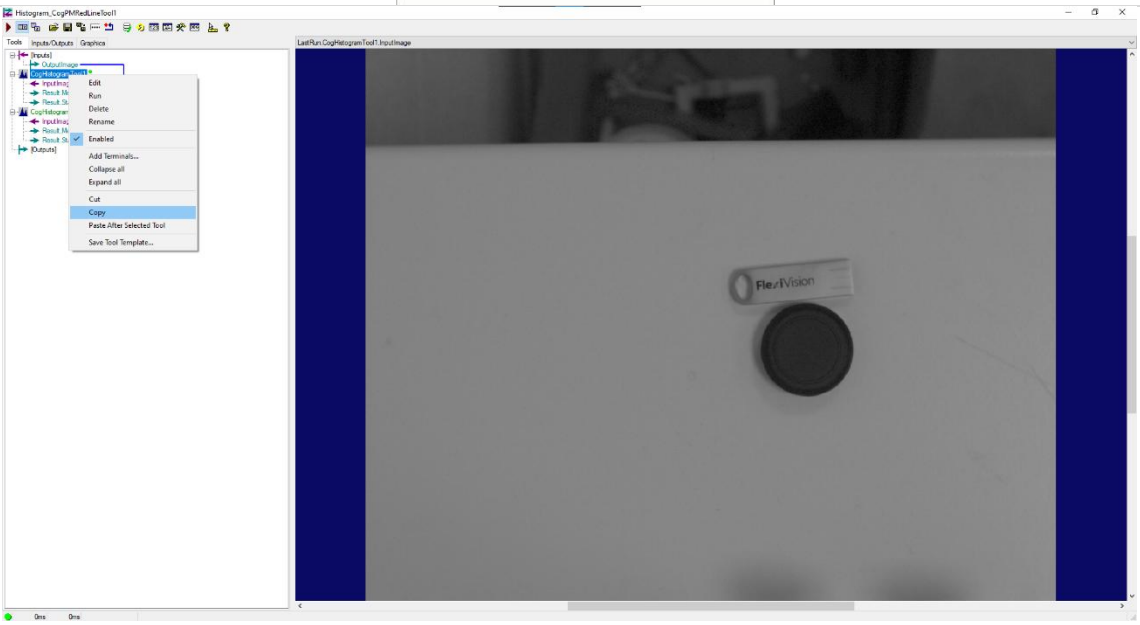
To carry out the hystogram controls, the standard deviation is used (this parameter cam be found by opening the Hystogram tool).

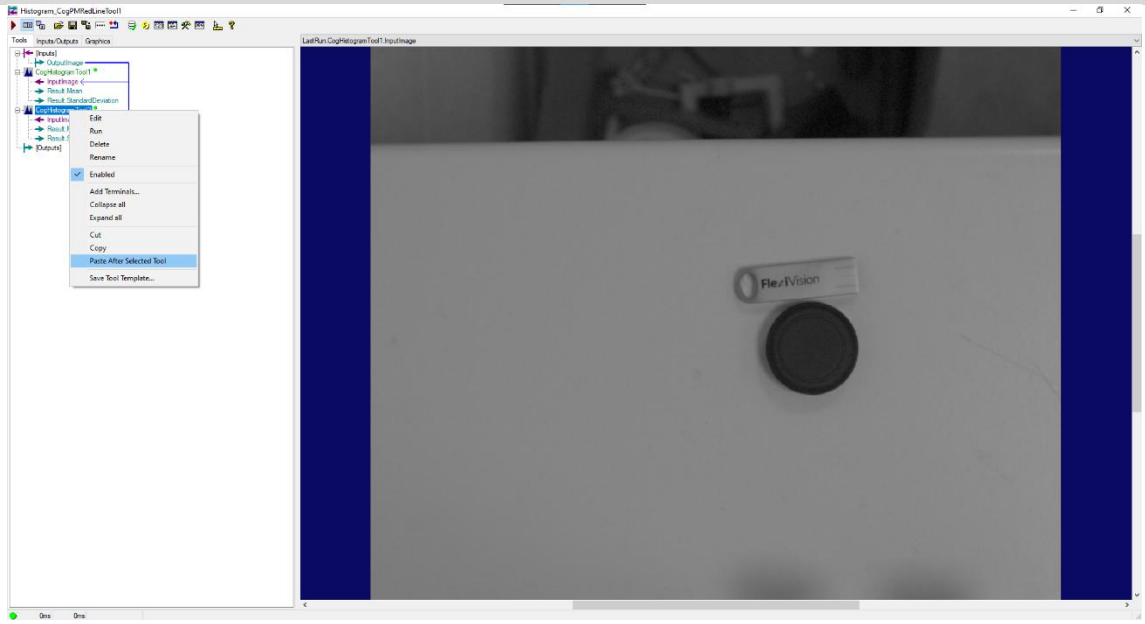
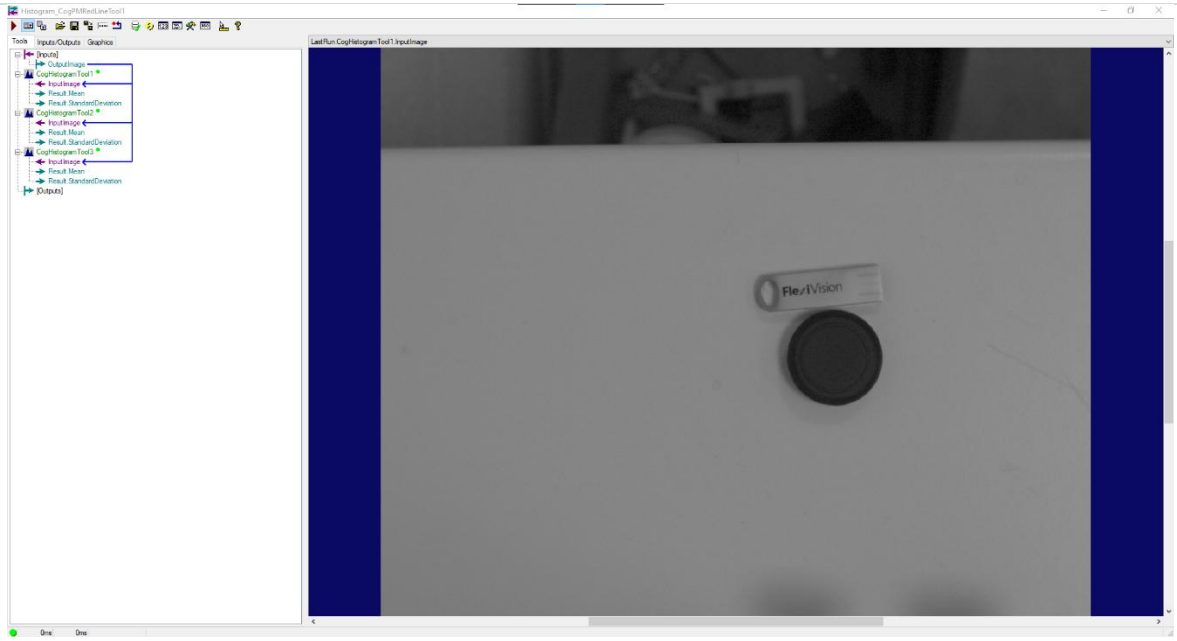
26



In the **Hystogram value** field, set the reject threshold, related to grey scale: below this value, the item shall be rejected and the hystogram lines shall turn to red.



Step	Action	Notes/Pictures
	 Examples of OK or NOT OK hystograms	
27	**NOTE** **It is possible to add or remove hystograms.** Move on each CogHistogramTool, right-click to open the menu. 	
28	 Press COPY.	

Step	Action	Notes/Pictures
29		Press PASTE AFTER THE SELECTED TOOL.
30		Connect the OUTPUT IMAGE to the the INPUT IMAGE of the CogHystogramTool3 (the new added).

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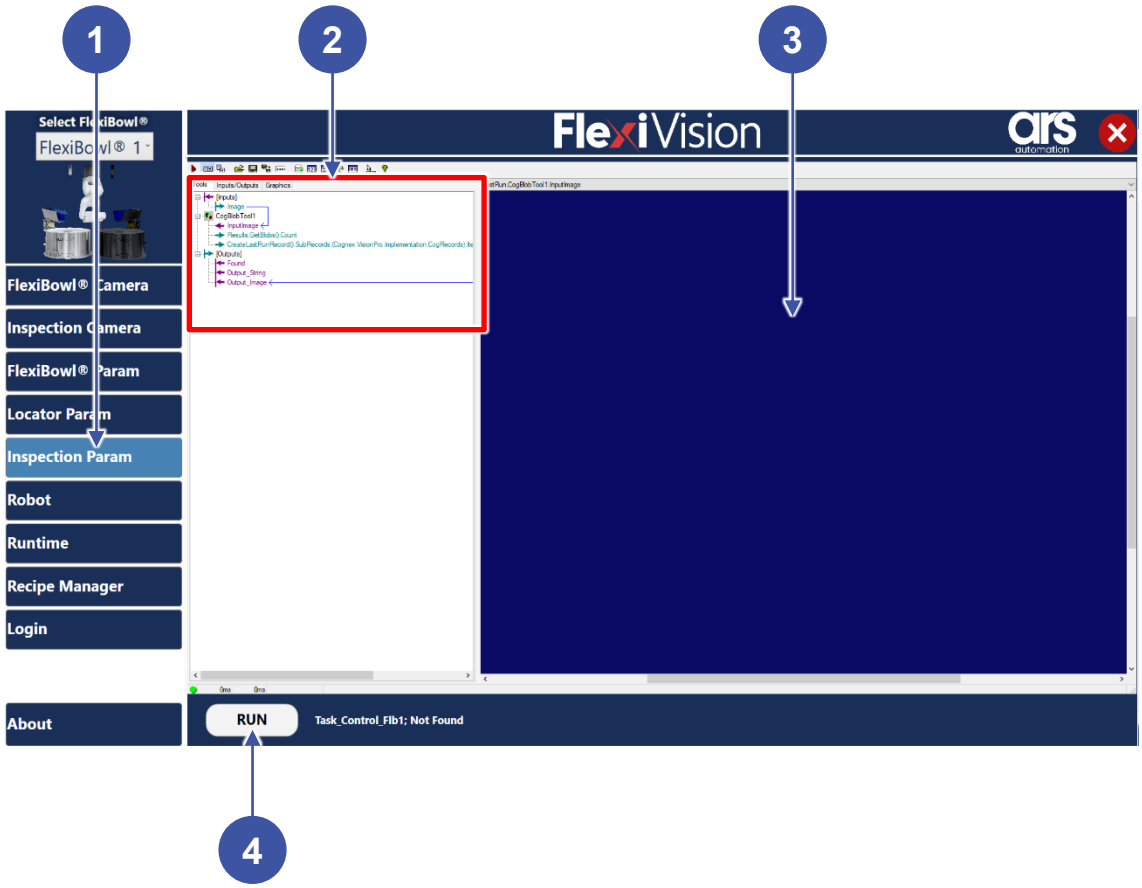
9 INSPECTION

9.1 Inspection Param page

By pressing LOCATOR PARAM in the OPERATIONS menu, the following page opens:



Position	Element/section	Description
1	OPERATION MENU	Includes all the control and operation procedures.
2	BlobEdit Control TOOL	
3	LAST INPUT IMAGE	
4	RUN key	

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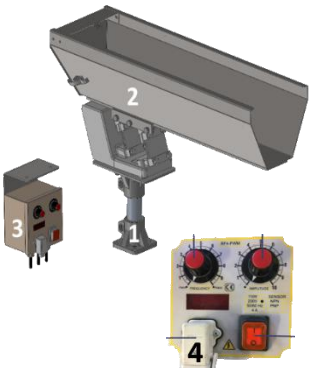
10 HOPPER

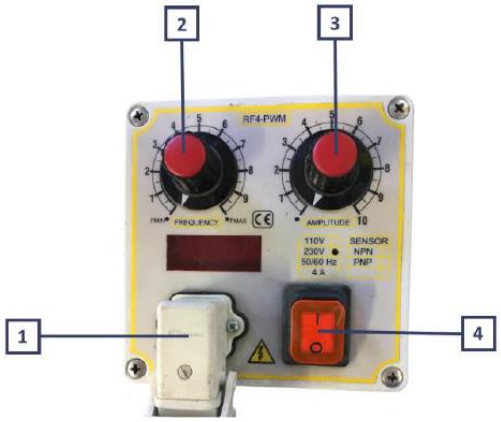
Video tutorial is available.

NOTE
This procedure can be carried out by the following users:
- **TECHNICIAN**
- **ARS**

10.1 Installation

Step	Action	Notes/Pictures
1	Place the support (**1**) on the machine (use M8 screws to anchor it firmly).	
2	Place the vibrating base (**2**) on the support (**1**) fastening it firmly with the screws.	
3	Place the Controller (**3**) in a suitable place	
4	Connect the system to the power supply 220Vac +/- 5% (110Vac upon request) and connect the cable of the base to the outlet connector of the Controller (**4**).	

10.2 How to start the bulk feeder

Step	Action	Notes/Pictures
1	Connect the cable of the linear base to the outlet connector of the controller, then connect the vibrator to the outlet connector (**1**).	
2	Turn the frequency adjustment (**2**) and amplitude adjustment (**3**) knob of the controller to "•".	
3	Turn on the controller with the ON/OFF button (button at position 1 (**4**))	
4	Slowly turn the adjustment knobs (**2** and **3**).	

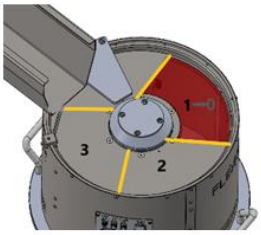
NOTE
Before bringing vibration to maximum (Amplitude Potentiometer (3)) it is recommended to look for the maximum possible efficiency using the Frequency potentiometer (2).

NOTE
Check the dedicated manual for electric connection and potential adjustments of the inner trimmers.

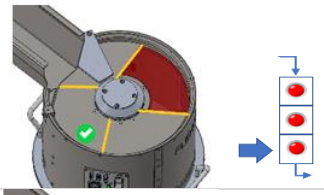
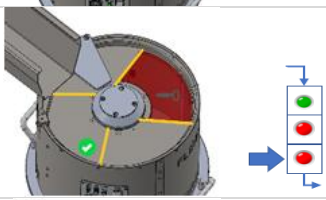
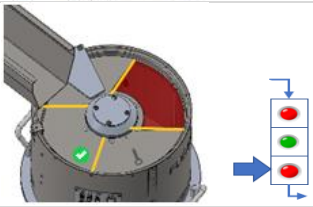
10.3 Bulk flow control

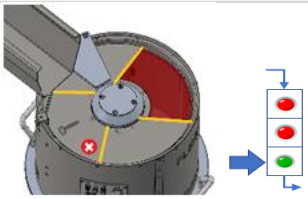
In the following, the procedure to have a constant part-flow on the FlexiBowl® (or equivalent) surface is described.

Example: let's assume a 60-degree forward movement for the disc and 3 steps necessary to shift from picking area to hopper dropping area.

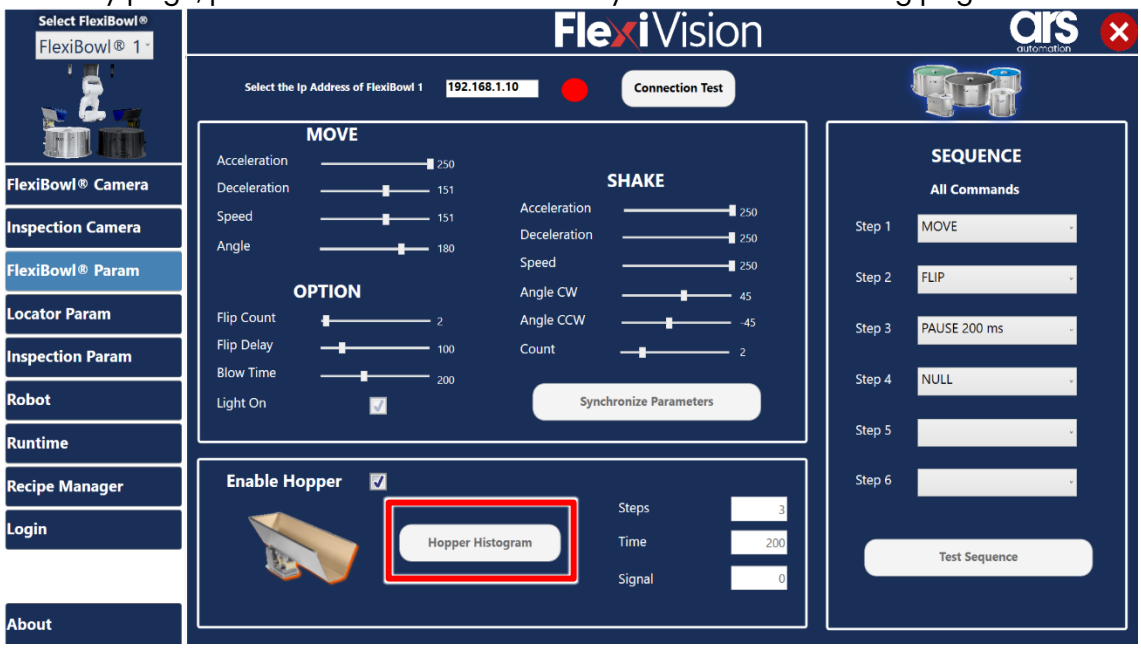


A FIFO register (shift register) stores the histogram result acquired from the camera above the picking area. The status of the last register turns the hopper ON/OFF.

Time	Action	Notes/Pictures
T0	At time T0, no parts are left in the pick area Fifo array [**3**] is false, the hopper is activated. **Fifo array [1] is false.**	
T1	At time T1, there are parts left in the pick area, Fifo array [**3**] is false, the hopper is activated. **Fifo array [1] is true.**	
T2	At time T2, no parts left in the pick area, Fifo array [**3**] is false, the hopper is activated. **Fifo array [1] is false.**	

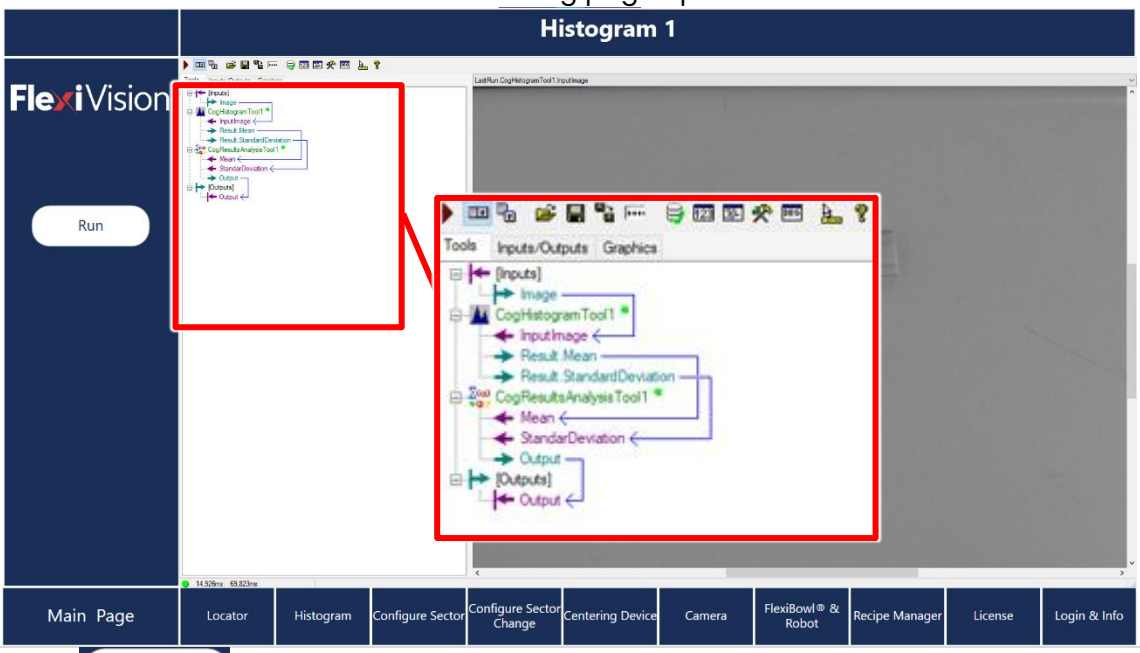
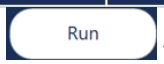
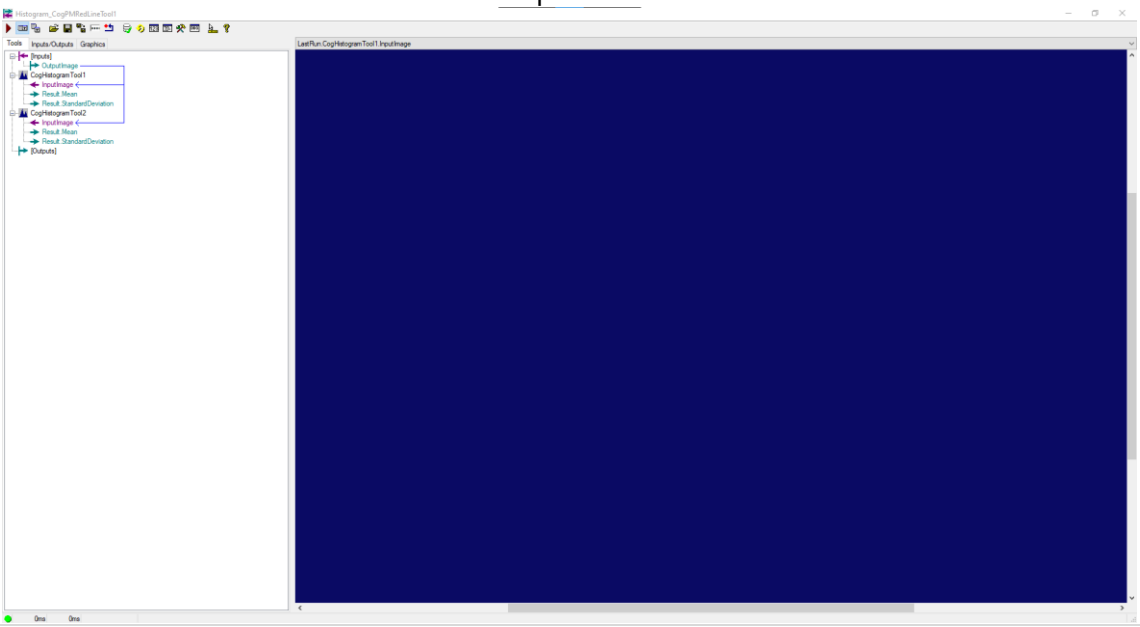
Time	Action	Notes/Pictures
T3	At time T3, no parts left in the pick area, Fifo array [**3**] is true, the hopper isn't activated. **Fifo array [1] is false.**	

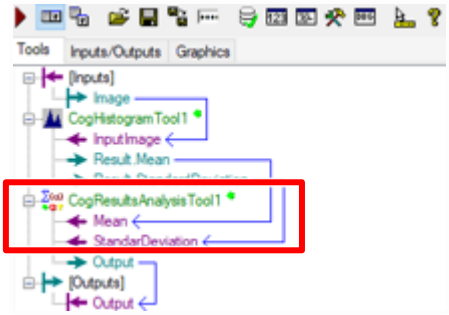
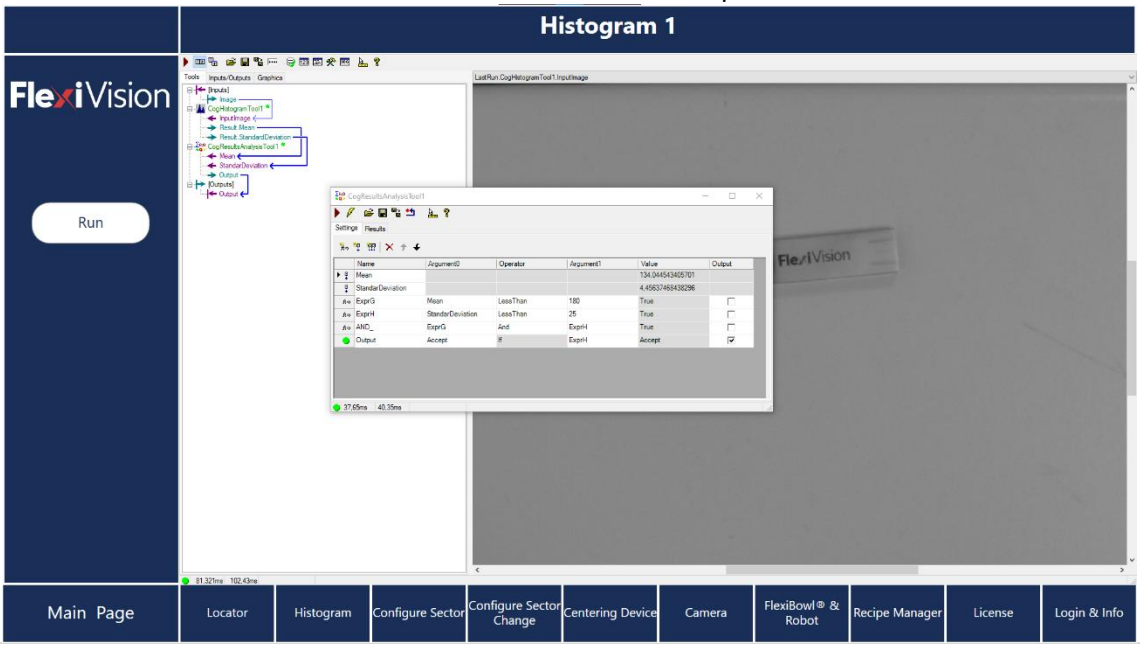
10.4 Histogram page

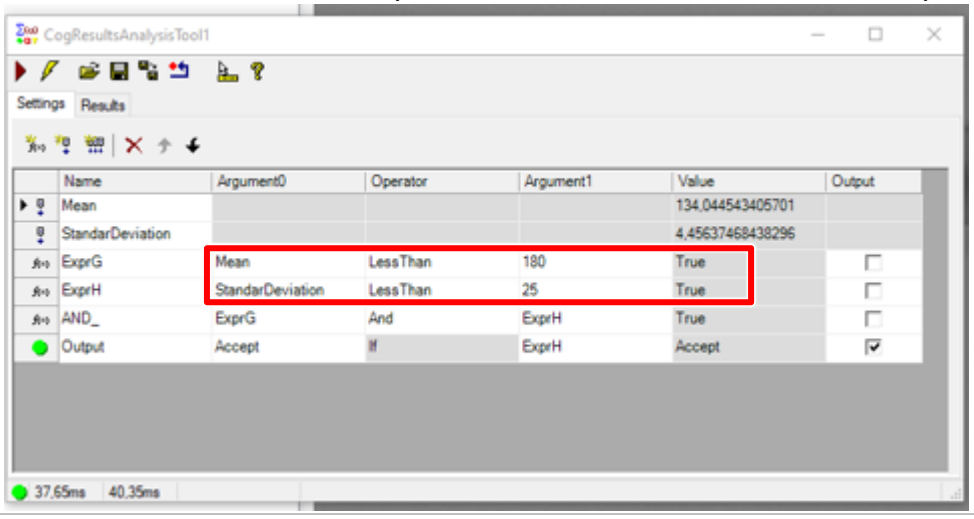
Step	Action	Notes/Pictures
1	From any page, press the **FlexiBowl® Param** key to enter the following page: 	

NOTE

The FlexiBowl® must be connected to access the histogram setting page.

Step	Action	Notes/Pictures
2	Press on HOPPER HYSTOGRAM. The following page opens: 	
3	Press  to acquire the first image.	
4	Doubleclick on  . The tool opens. 	
5	Resize the area by dragging the blue line by the red squares.	

Step	Action	Notes/Pictures
		
6	Press Run to acquire the image.	
7	Mean value and standard deviation value shall be used to define if a sector is full (the hopper stands by) or empty (the hopper has to fill the FlexiBowl® area). 	
8	Doubleclick on CogResultsAnalysisTool1 : the tool opens. 	

Step	Action	Notes/Pictures
9	Set the values in the window (ACCEPT means that the sector is EMPTY). 	

The physical activation of the hopper shall be managed via the robot or PLC or any device connected to the hopper via digital I/O.

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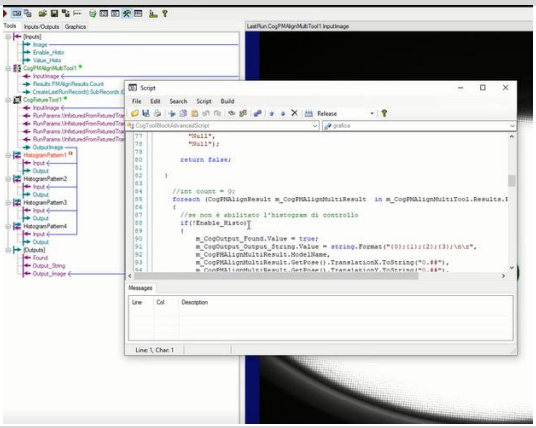
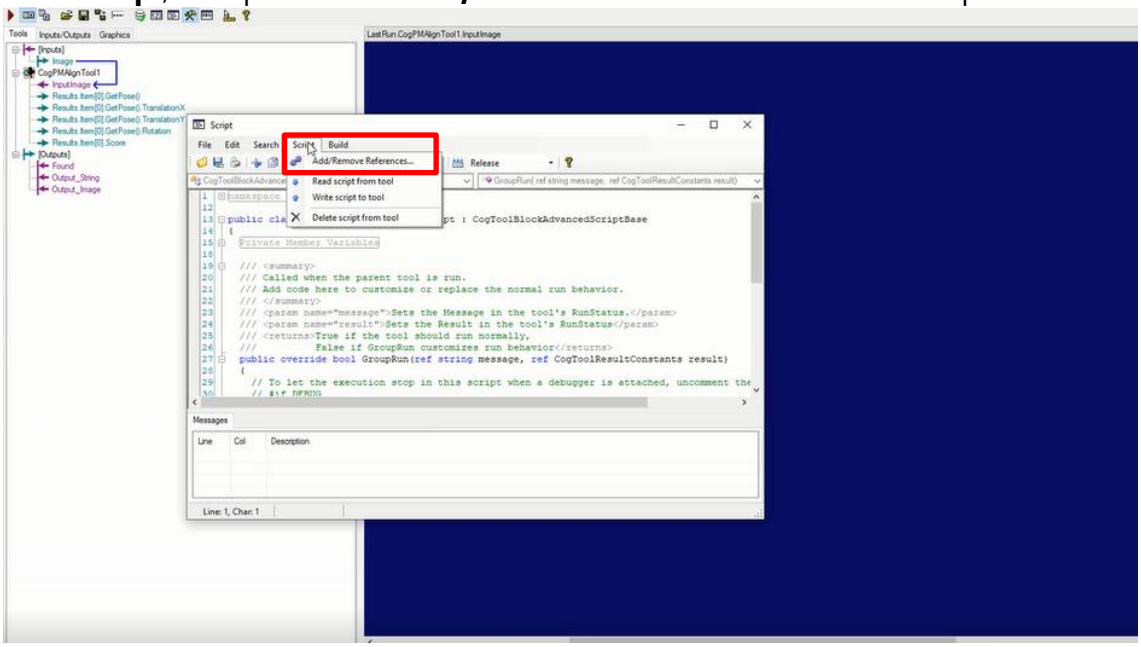
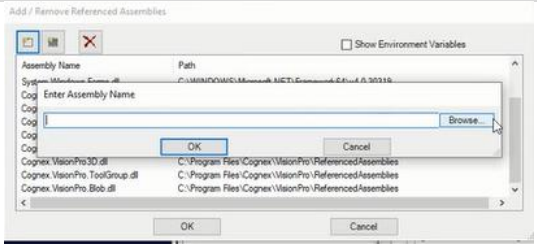
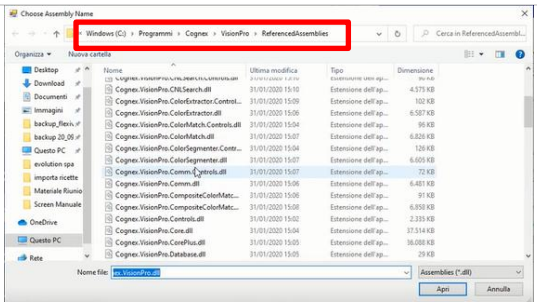
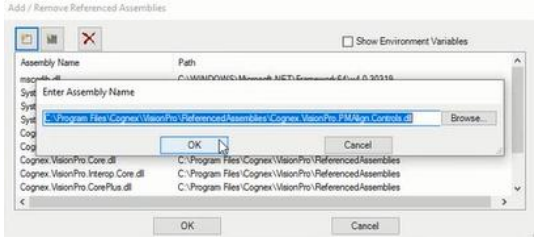
11 INSPECTION AND RECOGNITION TOOLS

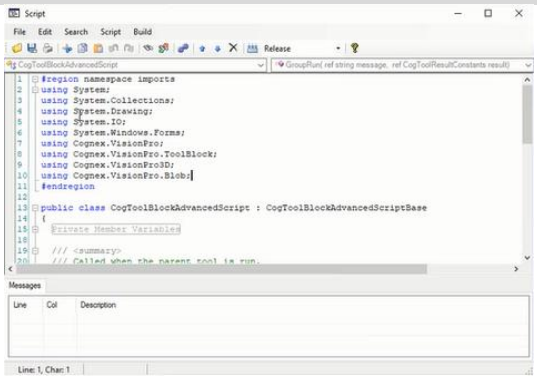
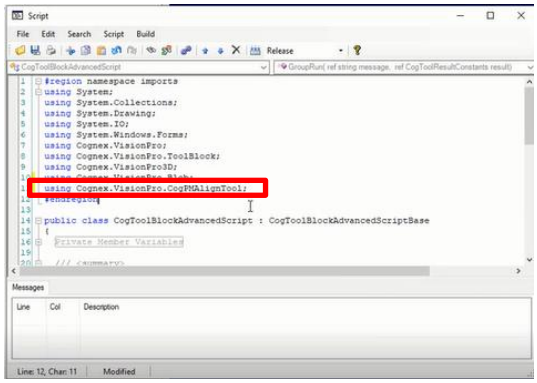
NOTE
These procedures can be carried out by the following users:
- **TECHNICIAN**
- **ARS**

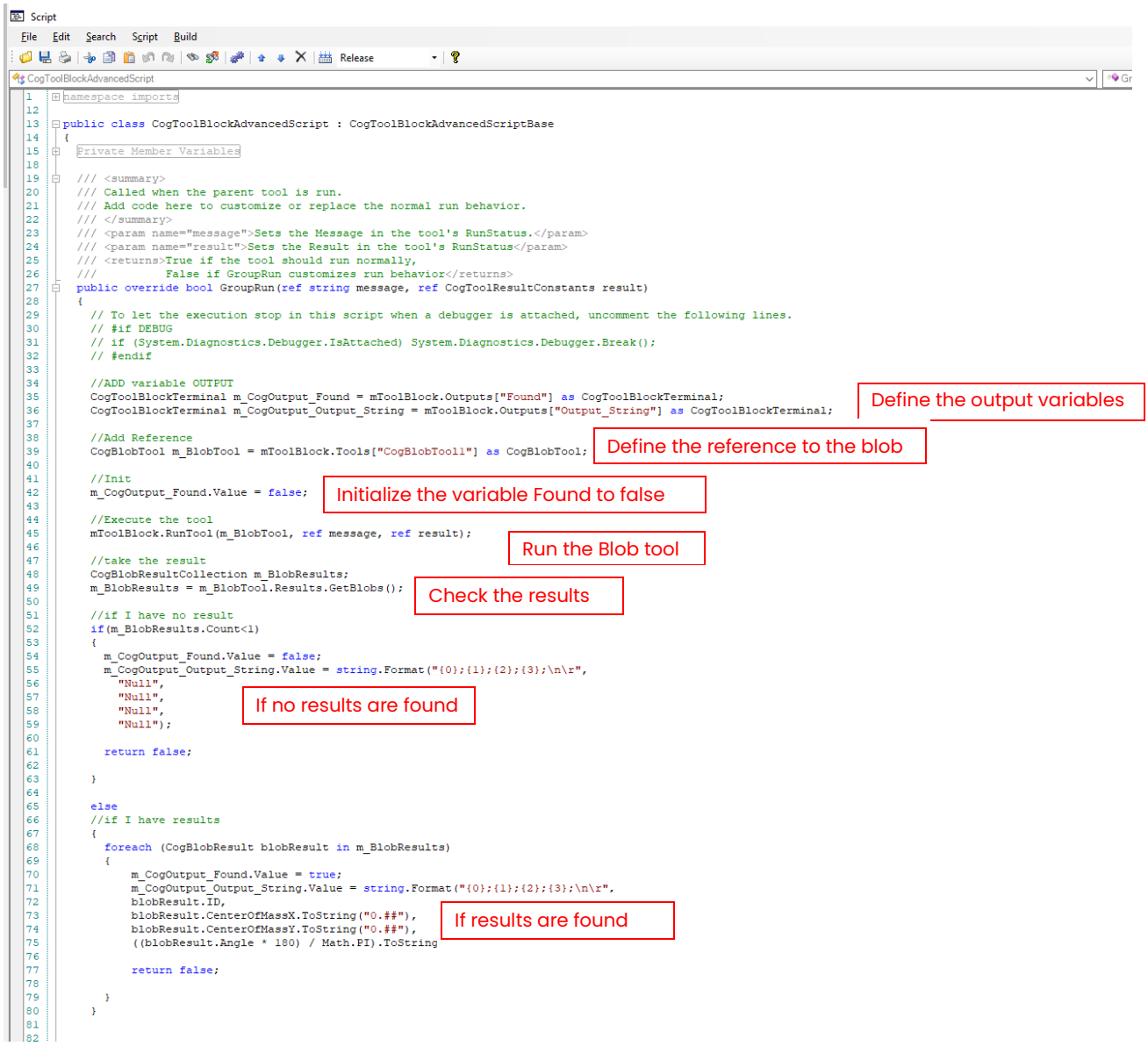
11.1.1 How to edit the script

Configure the tool by editing the script means replacing the variables related to the old tool with the variables related to the new one.
There are three output variables:
- **Found** (a bool to understand if the VisioTool is successfull or if it is necessary to turn the Flexibowl)
- **Output_String** (the output string which shall be sent to the robot)
- **Output_Image** (the tool output image which shall be shown in the RunTime window)**.**

Step	Action	Notes/Pictures
1	Once that tool is set, doubleclick on the **Script** icon of the button bar. This window opens.	

Step	Action	Notes/Pictures
2	Select **Script**, then press the **Add/Remove References** icon from the top bar. 	
3	Press the  to enter the **Enter Assembly name** mask, then press **Browse**.	
4	Select the tool from the ReferenceAssemblies folder.	 

Step	Action	Notes/Pictures
5	Update the script by adding the libraries related to the new tools.	 



11.1.2 How to set the control histograms

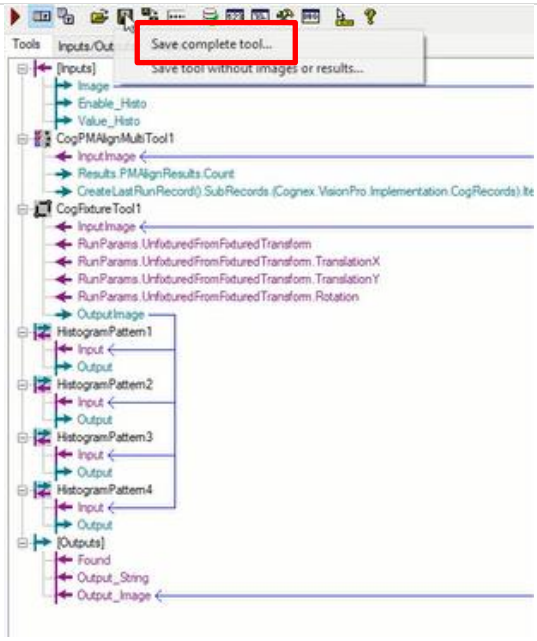
NOTE
It is necessary to add also a "CogFixtureTool", to enable the use of control histograms.
See Paragraph 8.3 for details.

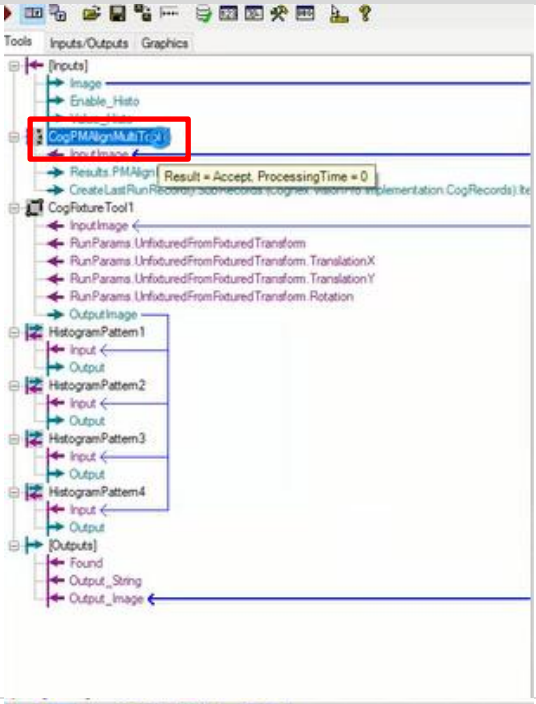
11.1.3 How to set the input image to the new tool

NOTE
See Chapter 12 - RUNTIME.

11.2 How to export tools

NOTE
This procedure can be useful for back up.

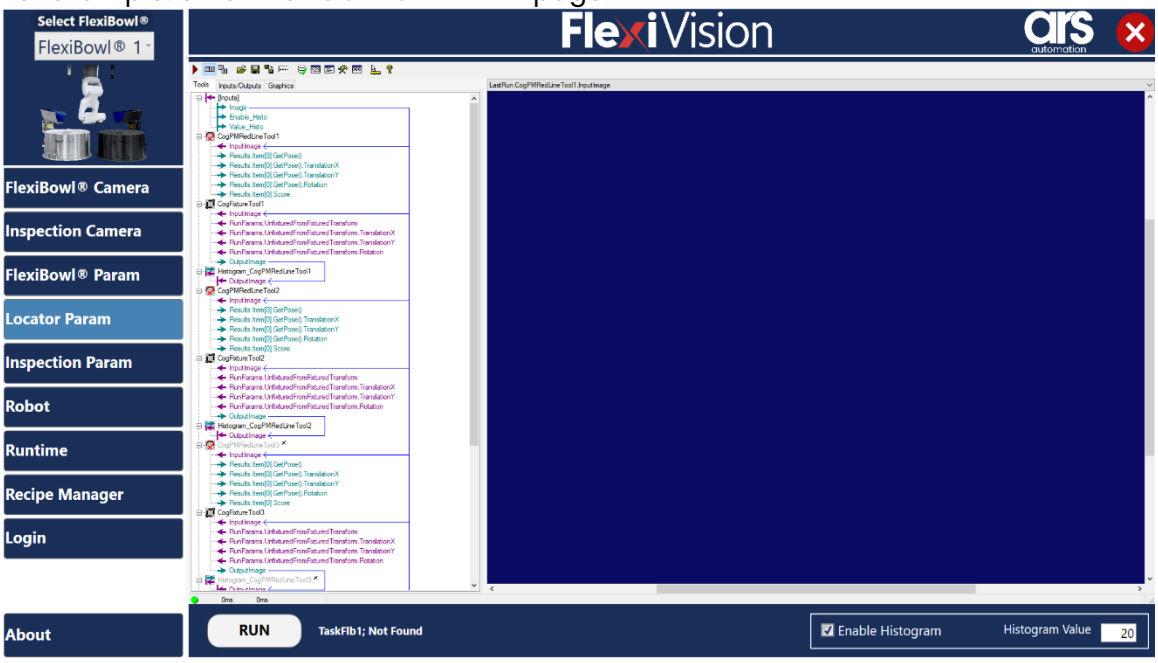
Step	Action	Notes/Pictures
1	Press the **SAVE** icon on the top bar.	
2	Select **SAVE COMPLETE TOOL**.	
3	Define a filename and a destination.	This file shall include all the general structure, shown above (tools and related script block).

Step	Action	Notes/Pictures
4	Save the parameters setting for each tool. As an example: Doubleclick on **CogPMAlignMultiTool** to open the Patterns mask.	
5	Select a Pattern and press the SAVE icon .	
6	Select SAVE COMPLETE TOOL.	
7	Define a filename (.vpp) and a destination.	
8	Repeat for each pattern (using different filenames).	

11.3 How to import tools

NOTE
This procedure can be useful in case of restoring data from a back up.

NOTE
This procedure can be carried out also for camera settings and calibration.

Step	Action	Notes/Pictures
1	For example: enter the LOCATOR PARAM page. 	
2	Press the OPEN icon on the top bar.	
3	Select the files related to the required tool.	
4	Doubleclick on **CogPMRedLineTool1** to open the Patterns mask.	
5	Select a Pattern and press the OPEN icon .	
6	Repeat for each Pattern.	

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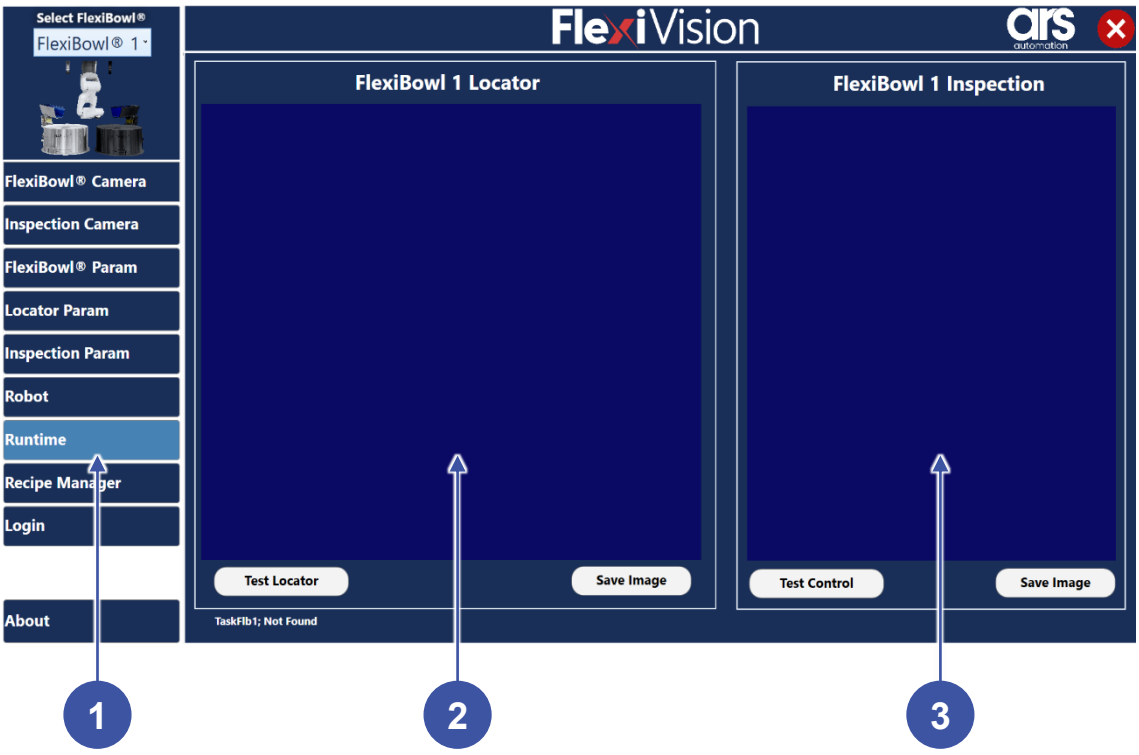
12 RUNTIME

12.1 RUNTIME page

NOTE
Access to this page is allowed to the following users:

- **USER**
- **TECHNICIAN**
- **ARS**

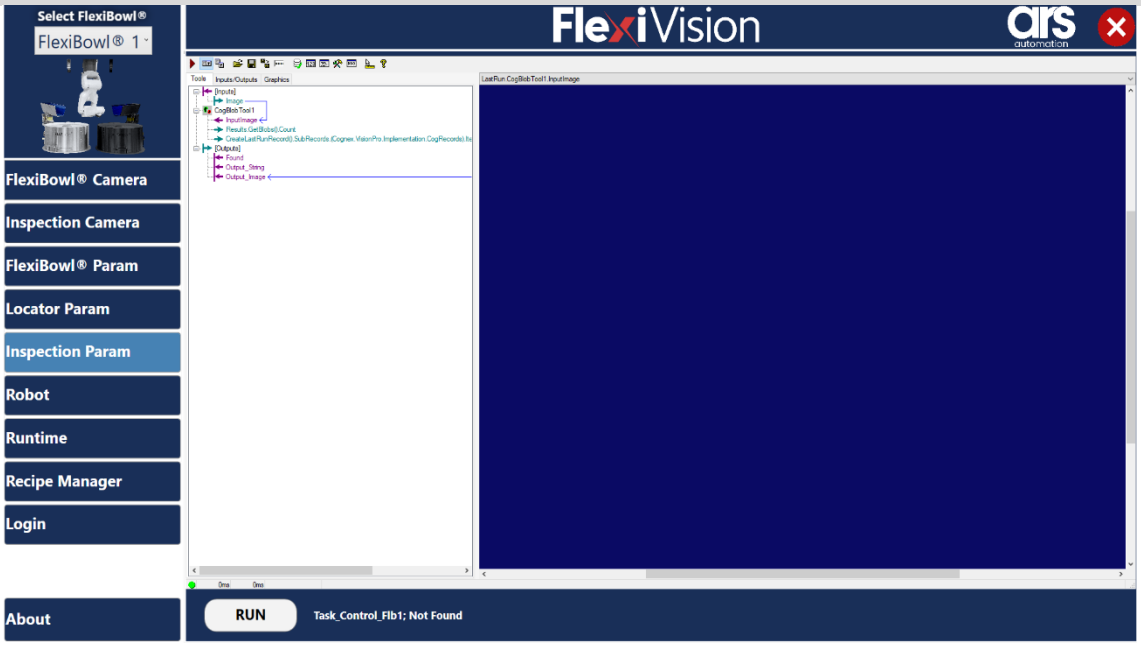
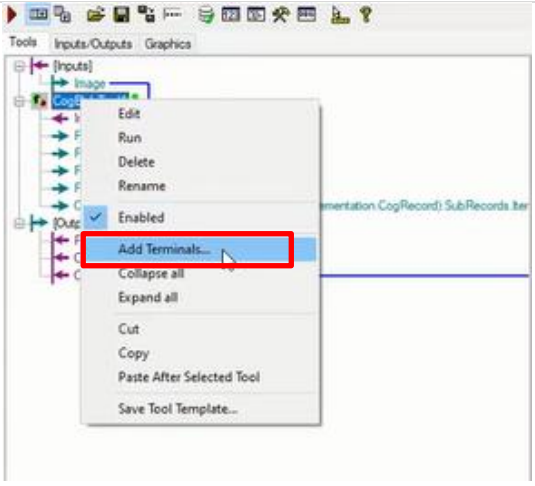
By pressing RUNTIME in the OPERATIONS menu, the following page opens:

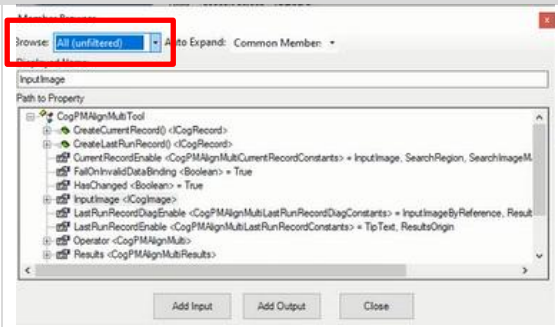
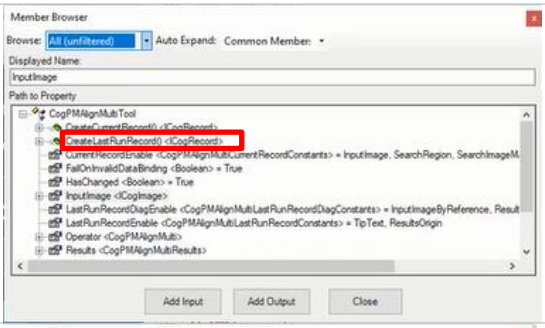
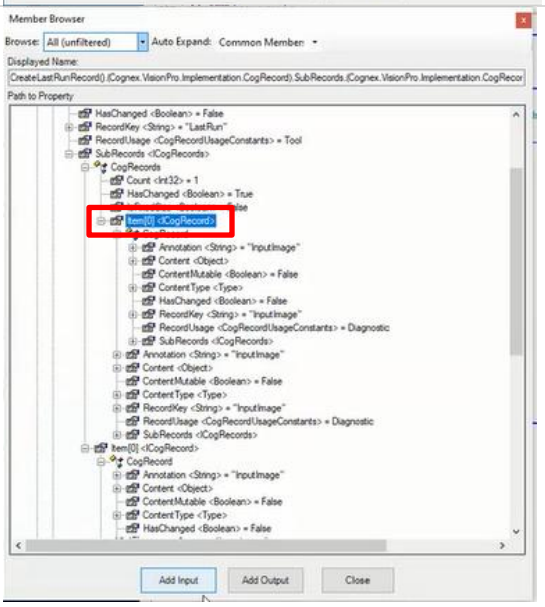


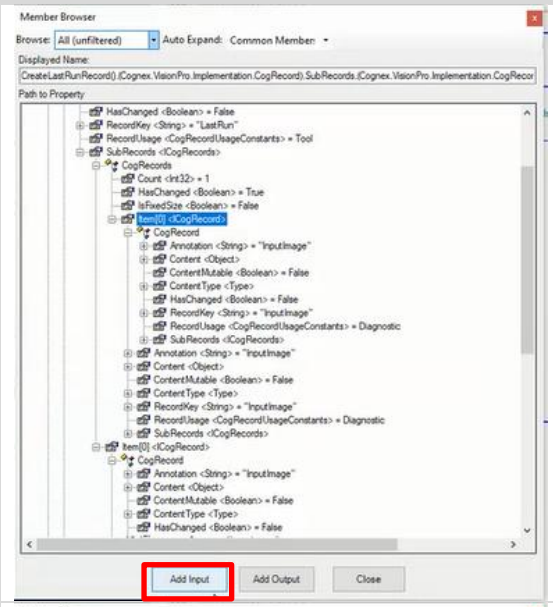
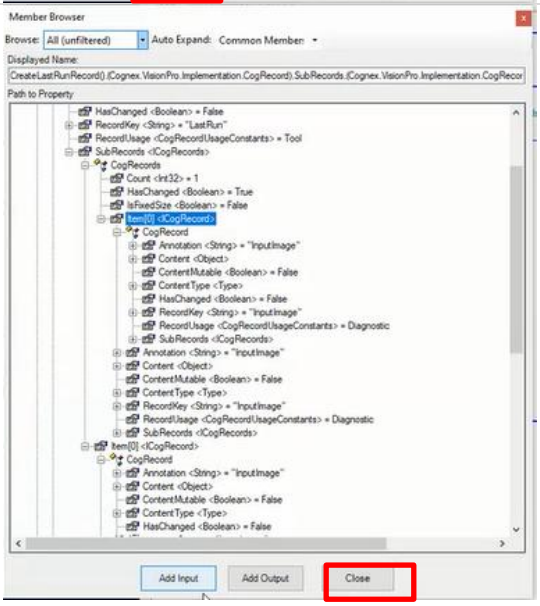
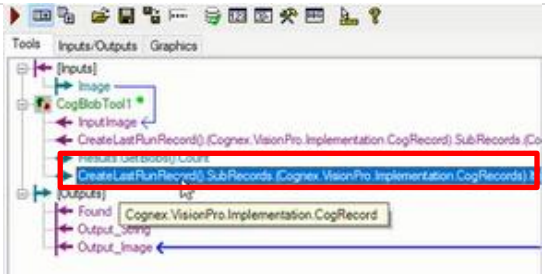
Position	Element/section	Description
1	OPERATION MENU	Includes all the control and operation procedures.
2	LOCATOR image	The locator image coming from the Toolbox is shown.
3	INSPECTION image	The ispection image coming from the Toolbox is shown.

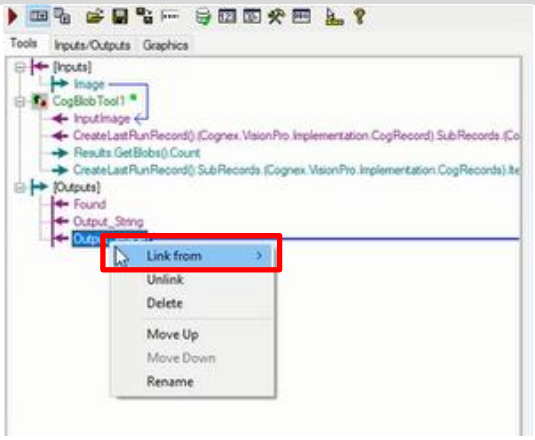
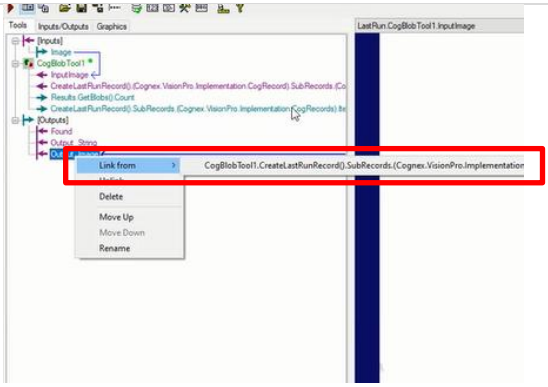
12.2 How to set the output image

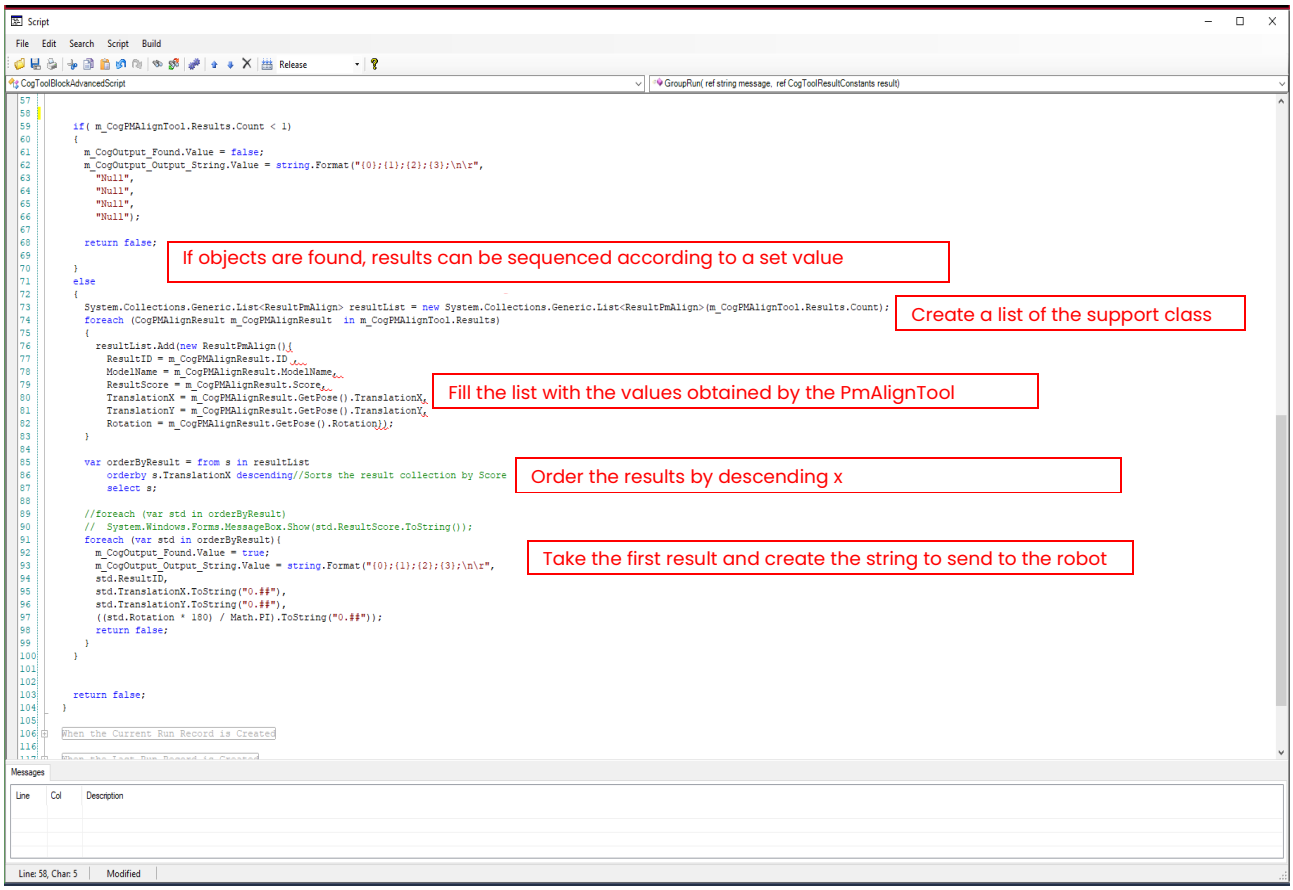
NOTE
These procedures can be carried out by the following users:
- **TECHNICIAN**
- **ARS**

Step	Action	Notes/Pictures
1	Click on **Inspection Param** on the operations menu.	
2	Select the tool we want to display as image (e.g. CogBlobTool1). Right click on **CogBlobTool1.**	
3	The following menu opens. Select **Add Terminal**.	

Step	Action	Notes/Pictures
4	Select **All (unfiltered)** in the Browse drop down menu.	
5	Select **CreateLastRunRecord**.	
6	Enter the SubRecords, find and select **Item(0).**	

Step	Action	Notes/Pictures
7	Press **Add Input**.	
8	Press **Close**.	
9	The created file is now visible in the structure.	

Step	Action	Notes/Pictures
10	Right click on **Output_Image** and select **Link from** in the menu.	
11	Select the required file and click.	
12	Go back to the RUNTIME page, to check if the image is displayed.	


Script
File Edit Search Script Build
Release
CogToolBlockAdvancedScript
GroupRun(ref string message, ref CogToolResultConstants result)
if(m_CogPMAlignTool.Results.Count < 1)
{
m_CogOutput_Found.Value = false;
m_CogOutput_Output_String.Value = string.Format("{0};{1};{2};{3};\n\r",
"Null",
"Null",
"Null",
"Null");
return false;
}
else
{
System.Collections.Generic.List<ResultPmAlign> resultList = new System.Collections.Generic.List<ResultPmAlign>(m_CogPMAlignTool.Results.Count);
foreach (CogPMAlignResult m_CogPMAlignResult in m_CogPMAlignTool.Results)
{
resultList.Add(new ResultPmAlign(){
ResultID = m_CogPMAlignResult.ID,
ModelName = m_CogPMAlignResult.ModelName,
ResultScore = m_CogPMAlignResult.Score,
TranslationX = m_CogPMAlignResult.GetPose().TranslationX,
TranslationY = m_CogPMAlignResult.GetPose().TranslationY,
Rotation = m_CogPMAlignResult.GetPose().Rotation});
}
var orderByResult = from s in resultList
orderby s.TranslationX descending//Sorts the result collection by Score
select s;
//foreach (var std in orderByResult)
// System.Windows.Forms.MessageBox.Show(std.ResultScore.ToString());
foreach (var std in orderByResult){
m_CogOutput_Found.Value = true;
m_CogOutput_Output_String.Value = string.Format("{0};{1};{2};{3};\n\r",
std.ResultID,
std.TranslationX.ToString("0.##"),
std.TranslationY.ToString("0.##"),
((std.Rotation * 180) / Math.PI).ToString("0.##"));
return false;
}
}
return false;
}
When the Current Run Record is Created
Messages
Line Col Description
Line: 58, Char: 5
Modified
If objects are found, results can be sequenced according to a set value
Create a list of the support class
Fill the list with the values obtained by the PmAlignTool
Order the results by descending x
Take the first result and create the string to send to the robot

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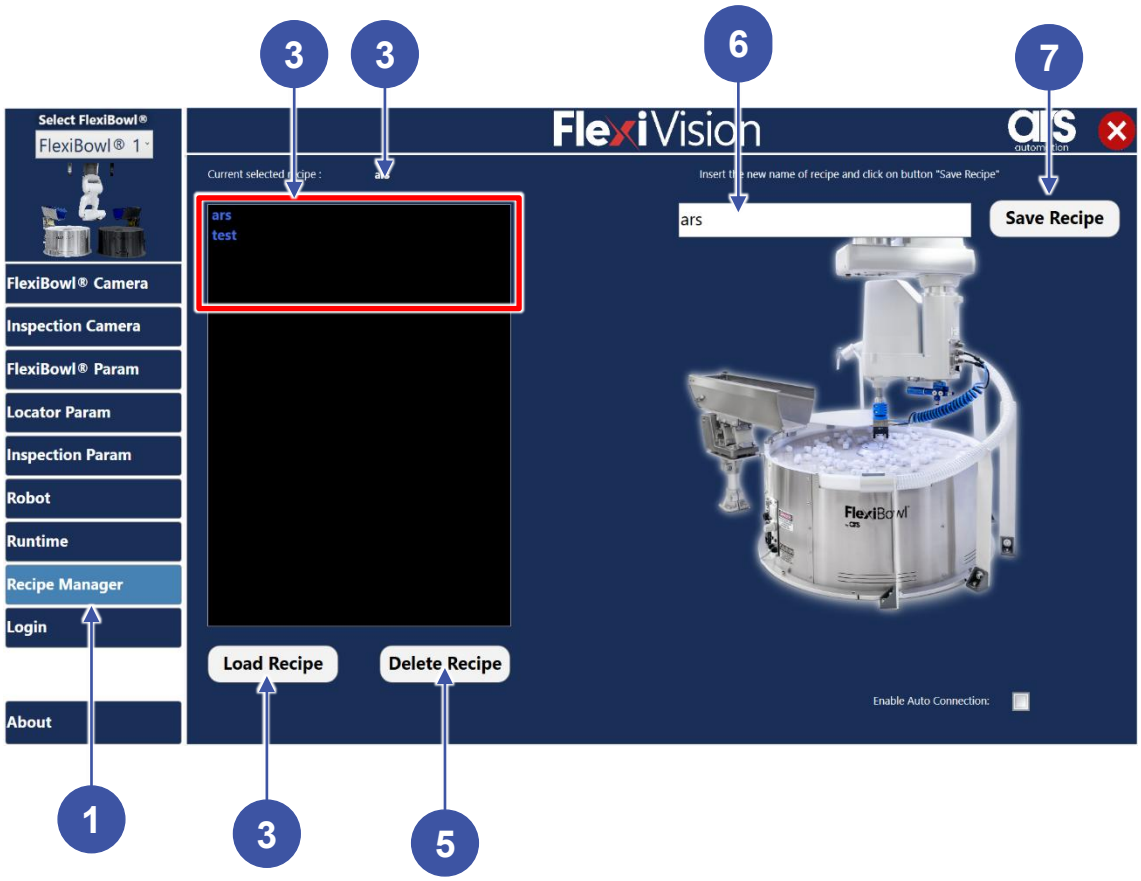
13 RECIPE MANAGEMENT

13.1 RECIPE MANAGER page

By pressing RECIPE MANAGER in the OPERATIONS menu, the following page opens:



Position	Element/section	Description
1	OPERATION MENU	Includes all the control and operation procedures.
2	CURRENT SELECTED RECIPE	Current selected recipe is shown.
3	RECIPE LIST	List of available recipes is shown.
4	LOAD RECIPE	Press to load a recipe selected in the list of available recipes.
5	DELETE RECIPE	Press to delete a recipe selected in the list of available recipes.
6	NEW NAME	Enter a new name for an existing recipe.
7	SAVE A NEW RECIPE	Press to save a new recipe.

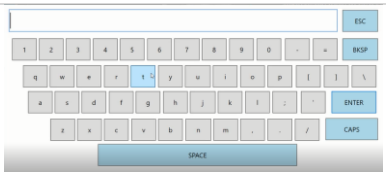
13.1.1 How to load an existing recipe

NOTE
This procedure can be carried out by the following users:
- **USER**
- **TECHNICIAN**
- **ARS**

Step	Action	Notes/Pictures
1	Enter the RECIPE MANAGER page.	
2	Select an existing recipe from the recipe list	The recipe name is surrounded by lines.
3	Press **LOAD RECIPE**	The key keeps coloured for a few seconds.
4	The recipe name appears on the current recipe name field.	

13.1.2 How to modify an existing recipe

NOTE
This procedure can be carried out by the following users:
- **TECHNICIAN**
- **ARS**

Step	Action	Notes/Pictures
1	Enter the RECIPE MANAGER page.	
2	Select an existing recipe from the recipe list.	
3	Load the existing recipe.	
4	Press on the NEW NAME field: a keyboard appears.	
5	Enter a new name for the selected recipe. If the name is already existing, a warning message appears.	
6	Press **SAVE RECIPE.**	
7	Modify the parameters, as required.	

13.1.3 How to create a new recipe

NOTE
This procedure can be carried out by the following users:

- **TECHNICIAN**
- **ARS**

Step	Action	Notes/Pictures
1	Enter the RECIPE MANAGER page.	
2	Select a NULL recipe from the recipe list.	
3	Set all the parameters by entering the pages of the Flexivision.	

Or, as an alternative, proceed as described at paragraph. 13.1.2.

13.1.4 How to delete an existing recipe

NOTE
This procedure can be carried out by the following users:

- **TECHNICIAN**
- **ARS**

Step	Action	Notes/Pictures
1	Enter the RECIPE MANAGER page.	
2	Select an existing recipe from the recipe list.	
3	Press **DELETE RECIPE.**	

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14 HOW TO CONTACT US

14.1 ABOUT page

By pressing ABOUT page in the OPERATIONS menu, the following page opens:

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