

USER MANUAL



ARS S.r.l. Via Aretina Nord, 157 – 52041 Civitella in Val di Chiana (AR) Italia Tel. +39 0575 398611 – Fax +39 0575 398620 info@arsautomation.com – www.flexibowl.com

FOREWORD

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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.

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TABLE OF CONTENTS

1	IDE	INTIFICATION		
	1.1	Software developer identification	6	
	1.2	Software identification	6	
2	PRE	LIMINARY INFORMATION	8	
	2.1	Addressees	8	
	2.2	Supply and preservation	8	
	2.3	Updates	8	
	2.4	Language	8	
	2.5	Skills and qualification required	9	
	2.6	Symbols used in the manual	9	
3	GEN	IERAL DESCRIPTION	11	
	3.1	What is FlexiVision®	11	
	3.1.1	Typical configuration examples	12	
	3.2	Operator interface	14	
	3.3	General workflow	15	
	3.4	Main features	17	
	3.5	Minimum system requirements	17	
4	SOF	TWARE INSTALLATION	.20	
	4.1	How to connect the FlexiBowl ®	. 20	
	4.2	How to install Cognex Vision Pro	23	
	4.3	How to install Cognex Designer	. 25	
	4.4	How to configure the PC	. 25	
	4.5	How to keep the connection active	.35	
	4.6	How to insert the Dongle key	.38	
	4.7	Projects files	.38	
	4.8	Files back up	.38	
	4.9	Login page	.39	
	4.10	Authentication procedure	.40	
	4.11	How to activate the licence	.40	
5	CAN	MERAS	.43	
	5.1	Compatibility	.43	

ļ	5.2	How to connect the camera	
	5.2.1	Security requirements	
	5.2.2	2 GigE Vision Camera Networks	
	5.2.3	GigE Vision Network Adapters and Switches	
į	5.3	Camera working conditions	
ļ	5.4	How to calibrate the camera	
	5.4.1	Why calibration is necessary	
	5.4.2	2 How to install the checker board	
	5.4.3	Calibration procedure (checkerboard supplied by ARS)	51
	5.4.4	Calibration procedure (printable checkerboard)	
6	FLE	(IBOWL®	
(6.1	How to set the IP address	57
	6.1.1	IP address recovery	
(6.2	How to connect the Flexibowl® to Flexivision	61
	6.2.1	Flexibowl Param page	61
	6.2.2	2 Connection to FLEXIBOWL	
7	ROB	от	
-	7.1	General requirements	
	7.1.1	Standard data structure	
-	7.2	Robot-Tool creation and calibration	
-	7.3	How to connect the robot	
-	7.4	Example	70
8	LOC	ATOR	
ł	8.1	Locator page	72
9	INSE	PECTION	
9	9.1	Inspection Param page	
10	HOF	PER	
1	0.1	Installation	
Ī	0.2	How to start the bulk feeder	
١	0.3	Bulk flow control	
Ī	0.4	Histogram page	
11	INS	PECTION AND RECOGNITION TOOLS	
	11.1.1	How to edit the script	
	11.1.2	How to set the control histograms	
	11.1.3	How to set the input image to the new tool	

1	1.2	How to export tools) 7
1	1.3	How to import tools	99
12	RUN	ITIME	01
٦	2.1	RUNTIME page	01
1	2.2	How to set the output image10)2
13	REC	IPE MANAGEMENT)8
1	3.1	RECIPE MANAGER page)8
	13.1.1	How to load an existing recipe10)9
	13.1.2	2 How to modify an existing recipe10)9
	13.1.3	3 How to create a new recipe10)9
	13.1.4	4 How to delete an existing recipe1	10
14	HO	N TO CONTACT US	12
1	4.1	ABOUT page1	12

1 IDENTIFICATION

1.1 Software developer identification

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

Туре	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	
С	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

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. 	Select Flexibowl System Flexibowl 2 Flexibowl 1 Flexibowl 2
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	







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
Camera	FlexiVision	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.	Power supply
2	Connect Ethernet cable to the FlexiBowl® Ethernet socket.	Ethernet socket
3	Connect the compressed air to the FlexiBowl® connection. Note: refer to the FlexiBowl® user manual for power supply spcifications.	Compressed air connection



Step	Action	Notes/Pictures
4	Turn ON the FlexiBowl® AC switch (position "I"). The READY led is ON.	AC Switch
5	Connect the FlexiBowl® to the ethernet switch.	D-Link os sort
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.	Name Date modified Type Size Runtime 26/04/2022 13:00 File folder VisionPro_9_6_6_1_bit 26/04/2022 13:04 File folder ACALPL-10MM-00 30/08/2020 107:34 Documento Adob 80 KB ACALPL-10MM-00_read_to_be_printed 30/08/2020 107:38 Documento Adob 18 KB CALPL-10MM-00_read_to_be_printed 30/08/2021 07:38 Archivio WinRAR 3.127 KB Stup Cognex Designer (TM) 44.0 30/08/2021 07:38 Application 68.341 KB User_Manual_Flexivision_EN_Rev.1.0 30/08/2021 07:38 Documento Adob 10.779 KB

5	Launch the setup.exe application from the installation media.	Name Dec devit	String String String String <td< th=""></td<>
6	Press NEXT and follow the instructions of the installation wizard (accept the license agreement, enter the customer information, launch Cognex driver installer).	Occ o	2004/2021 100 File folder 2004/2021 100 Configuration sett
7	At the end of the installation, restart the PC.	Dec: divies divi	20042022103 File felder 20042022103 File felder 20042022104 File felder 2004202104 File felder 20042021045 File felder 200420210455 File felder 20042021



4.3 How to install Cognex Designer

Step	Action Notes/Pictures		
1	Launch the setup.exe application from the installation media.	Name Date modified Type Size Runtime 26/04/2022 13:00 File folder File folder VisionPro_9_6_64-bit 26/04/2022 13:00 File folder File folder CALPL-10MM-00 26/04/2022 13:01 File folder B0 KB CALPL-10MM-00_read_to_be_printed 30/08/2021 07:38 Documento Adob 18 KB Checkerboard Calibration Plates 30/08/2021 07:38 Archivio WimRAR 31/27 KB Setup Cognex Desit Vet (M) 44.0 30/08/2021 07:38 Application 68:341 KB User_Manual_Flexivision_EN_Rev.1.0 30/08/2021 07:38 Documento Adob 10.779 KB	
2	Press NEXT and follow the instructions of the setup wizard (accept the license agreement, launch Cognex driver installer).	Name Diet modified Type Size Sicologie 5,6 54 bit 2540-0021 2004 Field freider G. CARL 10004-00 1000 2012 0033 Decumento Adoba. 1938 C. CARL 10004-00 1000 2012 0033 Achte Sixol Achte 1938 C. CARL 10004-00 1000 2012 0033 Achte Sixol Achte 1938 Decumento Adoba. 1939 Decumento Adoba. 1979 88 C. Carlo 10004-00 1003 Achte Sixol Achte 1938 Decumento Adoba. 1977 98 C. Carlo 10004-00 1003 Achte Sixol Achte 1938 Decumento Adoba. 1977 98 C. Carlo 1004-00 1004 Achter 1938 Decumento Adoba. 1977 98 Decumento Adoba. 1977 9	

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.	ST Troubleshoot problems Open Network & Internet settings

Flexi	Vision

Step	Action	Notes/Pictures
Step 2	Action Enter the CHANGE ADAPTER OPTIONS settings.	Status Implementation Status S
3	From the ETHERNET menu, select PROPERTIES, then NETWORKING.	Termin Versional Constant + Hensek Educations
4	From the ETHERNET PROPERTIES window, press CONFIGURE.	MAC address: 30-95C-23-2C-E2-70 W. Why is there and at advanced with the advanced withe advanced with the advanced with the advanced with th



Step	Action	Notes/Pictures		
5	This window opens.	Intel(R) Ethernet Connection (2) I219-V Properties × General Advanced Driver Details Events Power Management Intel(R) Ethernet Connection (2) I219-V Device type: Network adapters Manufacturer: Intel Location: PCI bus 0. device 31, function 6 Device status This device is working property. Note: Cancel OK Cancel Cancel Content status Co		
6	Select ADVANCED, JUMPO PACKET and select the higher speed; then press OK.	Intel(R) Ethernet Connection (2) 1219-V Properties × General Advanced Driver Details Events Power Management The following properties are available for this network adapter. Click the property that you want to change on the left and then select its value on the right. Property: Adaptive Inter-Frame Spacing Enable PME Energy Efficient Ethernet Row Control Gigabit Master Slave Mode Interrupt Moderation Rate Inved Deckaston Network Moderation Rate Inved Deckaston Network Moderation Rate Inved Deckast Official V2 (IPV4) Large Send Official V2 (IPV4) Locally Administered Address OK Cancel		

Step	Action	Notes/Pictures
7	Repeat as above for RECEIVE BUFFERS, and set the maximum value.	Intel(R) Ethernet Connection (2) 1219-V Properties General Advanced Driver Details Events Power Management The following properties are available for this network adapter. Click the property that you want to change on the left and then select its value on the right. Property: Value: Unk Speed Battery Saver Locally Administered Address Locally Administered Address Packet Priority & VLAN Protocol ARP Offload Protocol ARP Offload Protocol NS Offload Protocol Speed On Power Down Receive Side Scaling Receive Side Receive Receive Receive Re
8	Repeat as above for TRANSMIT BUFFERS, and set the maximum value.	Intel(R) Ethernet Connection (2) 1219-V Properties X General Advanced Driver Details Events Power Management The following properties are available for this network adapter. Click the property that you want to change on the left and then select its value on the right. Property: Value: PTP Hachware Timestamp Receive Side Scaling Reduce Speed On Power Down RSS load balancing profile Software Timestamp Speed & Duplex System Idle Power Saver TCP Checksum Offload (IPv4) TCP Checksum Offload (IPv4) UDP Checksum Offload (IPv6) Utra Low Power Mode OK Cancel Datus, Vit: previous unuep for int



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.	Intel(R) Ethernet Connection (2) I219-V Properties × General Advanced Driver Details Events Power Management • Intel(R) Ethernet Connection (2) I219-V • Allow the computer to turn off this device to save power • Allow the computer to turn off this device to save power • Allow this device to wake the computer • Only state may be packet to wake the computer • • • <t< th=""></t<>
10	Wait for the restart of the Ethernet Card.	
11	From the ETHERNET menu, select PROPERTIES, then NETWORKING.	Mental constraint - 0 X Protect Constraint - 0 - 0 Protect - 0 - 0
12	Select the I PV 4 (TCP/IPv4)	Index Constants I

Step	Action	Notes/Pictures
13	Enter the IP address and press OK.	Ethemet Properties Stating Instruction Stating Instruction Stating Composition Stating Instruction Stating Composition Stating Instruction Stating Composition Stating Instruction Stating Composition Stating Instruction Stating Instruc
14	Close all the menus.	
15	Find (on the PC) and open the Cognex GigE Vision Configurator App.	All Apps Documents Web More → R ··· × Best match Image: Cognex GigE Vision Configurator App Search the web > > gig - See web results > Documents > Image: GigE Vision Cameras User's Guide > Image: GigE Vision Cameras User's Guide > Image: GigE Vision Cameras User's Guide > Image: Pin to Start > <tdt< th=""></tdt<>
16	Enter the Cognex GigE Vision Configurator tool.	Copyers Grigt Vision Configuration Tool Copyers Grigt Vision Configuration Tool Copyers Grigt Vision Configuration Tool Copyers Copyers Grigt Vision Configuration Tool Copyers Copyers



Step	Action	Notes/Pictures
17	From the Network Connections menu, select the camera information by pressing on **	Cogned Gigt Vision Centifyourston Tool File View Help The View Help The View Help The View Help The View Help The View Help The View Help The View Help The View Help The View H
18	Modify the CAMERA NETWORK PROPERTIES (IP addess and Subnet mask) as in the picture aside.	Camera Network Properties IP address: 192.168.1.5 Subnet mask: 255.255.0.0
19	Press UPDATE CAMERA ADDRESS (to update both IP address and Subnet mask using current settings).	Cogner Gigt Vision Certifiqueation Tool
20	Press the 🐔 icon to reaquire the adapter list and Firewall status.	Cogner Gigi Vision Configuration Tool
21	Close the window by the \times 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	<image/>
23	Allow access.	 Windows Security Alert Windows Defender Firewall has blocked some features of this app Windows Defender Firewall has blocked some features of IP Address Tool on all public and grivate networks. Windows Defender Firewall has blocked some features of IP Address Tool on all public and grivate networks. Webster: Shanghai AMP & MOONS' Automation Co., Ltd. Reit: D'Address Tool in Lo. 19.0227. Reit and these networks: Private networks, such as my home or work network Public networks, such as those in alports and cafes (not recommended because these networks of then have little or no security) What are the risks of allowing an apo through a freewal?
24	Enter the IP address of the FlexiBowl®, then press PING.	IP Address Tool 1.0.19.0227 (b Lbing) X Communicatino Settings IP Address IP Address IP Address IP Address IP Address 0 • • 1 • • 2 • • 3 • • 4 • • 5 • • 6 • • 7 • • 8 • • 9 • • 10 • • 11 • • 12 • • 13 • • 14 • • 15 • • Positions 0 (Recovery) and F (Use DHCP) cannot be changed. Image in the image in th



Step	Action	Notes/Pictures
25	The window will be updated.	IP Address Tool 1.0.19.0227 (By Lei Youbing) × Communicatino Settings IP Address 192.168.0.77 Ping Switch IP Address IP Address IP Address 0 10.10.10.10 IP 1 192.168.1.77 Ping 2 192.168.1.77 Read from Drive 3 192.168.1.20 Save to Drive 12 3 192.168.0.50 Save to Drive 12 6 192.168.0.50 Ext 12 7 192.168.0.100 Ext 12 11 192.168.0.100 Ext 12 12 192.168.0.100 Save to File 12 13 192.168.0.110 Save to File 12 14 192.168.0.130 Save to File 14 15 0.00.00 N 14 192.168.0.140 14 15 0.00.00 N N N N Positions 0 (Recovery) and F (Use DHCP) cannot be changed.
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.	IP Address Tool 1.0.19.0227 (By Lei Youbing) X Communicatino Settings IP Address IP Address 192.168.0.77 Switch IP Address 0 10.10.10.10 1 192.168.1.10 2 192.168.1.20 3 192.168.1.30 Swee to Drive X Success X IP address table saved to drive. Addresses become active on next power cycle. IP address table saved to drive. Addresses become active on next power cycle. II 192.168.0.110 12 192.168.0.120 13 192.168.0.130 14 192.168.0.140 15 0.00.0.0 Positions 0 (Recovery) and F (Use DHCP) cannot be changed.

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



4.5 How to keep the connection active

Step	Action	Notes
1	Find (on the PC) and open the Cognex GigE Vision Configurator App.	All Apps Documents Web More → R ··· × Best match
2	Enter the Cognex GigE Vision Configurator tool.	Coprec Gigt Vision Configuration Tool
3	Press the 🖻 icon to reaquire the adapter list and Firewall status.	Votes at sums temperators not Provide at sums temperators Provide at at sums temperators Provide at at a sums temperators Provide at at a sums te
4	Open the firewall window.	Research Remotion Hender Connection Information Werking with Carrentonia Hender Connection Information Betwerk Remotion Betwerk Enternal Betwerk Interviel Connections Betwerk Enternal Betwerk Interviel Connections Betwerk Enterviel Connections and Edited Connections Betwerk Interviel Connections Betwerk Enterviel Research Connections Betwerk Interviel Connections Betwerk Enterviel Research Connections Betwerk Interviel Research Connections Betwerk Interviel Research Connections Betwerk Interviel Research Connections Betwerk Intervielen Research Connections

Step	Action	Notes
5	Enter the WINDOWS DEFENDER FIREWALL menu.	22 When here to de unimage projektion to structure a regific biance shows monoconcell
6	Disable the firewalls.	Control Statisty Control Float Specific Control Specific Contro Specific Contro Specific Control Specific Control
7	Press the 🖻 icon to reaquire the adapter list and Firewall status.	Weight Bind According Method: Start Start Method: Start Star
8	Find (on the PC) and open the EDIT POWER PLAN App.	All Apps Documents Web More → R ··· × Best match Edit power plan Control panel Settings > O Power & sleep settings > > Search the web > P ener - See web results > > Ø Open
User manual



Step	Action	Notes
9	From the EDIT PLAN SETTINGS, enter the CHANGE ADVANCED POWER SETTINGS.	 È Edit Plan Settings → - ↑ > Control Panel > Hardware and Sound > Power Options > Edit Plan Settings Change settings for the plan: Balanced Choose the sleep and display settings that yeu want your computer to use. Tom off the display: 1 hour Put the computer to sleep: Never Change advanced agger sattings Restore default settings for the plan
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.	Power Options ? × Advanced settings Select the power plan that you want to customise, then choose settings that reflect how you want your computer to manage power. Balanced [Active] Setting: 20 Minutes Internet Explorer Desktop background settings Wireless Adapter Settings USB setting: USB selective suspend setting String: Disabled Processor power management Diredar OK Cancel
11	In the hard disk settings, disable the turning off selective suspend setting and press APPLY. Then press OK and close the app.	Power Options ? × Advanced settings Select the power plan that you want to customize, and then choose settings that reflect how you want your computer to manage power. Balanced [Active] Hard dick Internet Explorer Desktop background settings Wireless Adapter Settings Intel(R) Graphics Settings Intel(R) Graphics Settings Power buttons and lid DCI Eveneer OK Cancel

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.

📙 🖸 📴 🖛 Flexivision			
File	Home	Condividi Visualizza	
$\leftarrow \rightarrow$	· ↑	> Questo PC > Documenti > Flexivision >	
> ≱ Ac > ● Oi > □ Qi > ∅ Re	ccesso rapido neDrive uesto PC ete	Nome Data Languages Recipes Flexivision.exe Package.dat	



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).	Activate License A Delete License		

Step		Action		Notes/Pic	tures
	The following p	age opens:			
	Select FlexiBowl® FlexiBowl® 1 ≚			∙ lexi Vision	
		7	Fle	Vision	7
	FlexiBowl® Camera	Product Key	00330-50000-0	00000-AAOEM	
	Inspection Camera	Company Name	company name	e	
	Locator Param	Company Address	company adre	ss	Generate File to
4	Inspection Param	First Name	name		be sent
	Robot	Last Name	last name		(c)
	Runtime	Email	omail@avamn	lo com	
	Recipe Manager		eman@examp	le.com	
	Login				
					E Activate
	About				
	Enter the requir	ed data (comp	any name, c	address, etc.) in the (B) fi	ields.
5	Press GENERATE	FILE TO BE SENT	r (c).	A window message sh download.	all appear for file
6	E-mail the g info@flexibowl.	enerated file <u>com</u> .	(.xlm) to	ARS srl shall generate licence key.	and send back a
7	Enter the licenc	e key in the (D)	field.		
7	Press ACTIVATE	(E).		If activation is square shown in the becomes GREEN.	is successful, the ne picture below cense

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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/visionprosoftware/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.

Manufacturer		Interface	
All	~	GigE Vision	~
Color or Mono		Area or Line	
All	~	All	~

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 .	

User manual



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			
	Press I Camera_Fb1_Calibration * to start the	calibration procedure by the			
	Camera_Flb1_Calibration (CogCalibCheckerboard1	, , , , , , , , , , , , , , , , , , ,			
Calbrate Origin Warping Run Params Graphics Point Results Transform Results					
	Linear	•			
	Degrees of Freedom to Compute:				
	Scaling, Aspect, Rotation, Skew And Translation	•			
2	Calibration Plate				
	Feature Finder: Tile Size X:	1 -			
	CheckerboardExhaustive	10			
	Fiducial Mark: Tile Size Y:				
	Grab Calibration Image Compute Calibration				
	Calibration Info				
	Constant a no.				
	In the CALIBRATE TAB, enter the grid spacing for the co	alibration plate. For a checkerboard-			
	style plate, this is the TILE SIZE.				
	For a grid-of-dots calibration plate, this is the spacin	ng between dot centers in the X- and			
	Y-direction.				
	Enter the grid spacing using real-world units of med	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 in	nches for your application and your			
3	calibration plate uses tiles that are one-half inch in	size, enter a value of 0.5.			
	ΝΟΤΕ				
	In case the checkerboard brovided by ARS is used	, both TILE SIZE X and TILE SIZE Y are			
	10mm.				
_	Grab Calibration Image				
4	Click to copy	y the current image.			
	Compute Calibration	,Q			
5	Clickto have	ve the tool calculate the best-fit 2D			
5	transformation, linear or nonlinear, based on the	Current.Calibration image and the			
	current set of parameters.				
C					
c					

User manual



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

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.
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 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.

User manual



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

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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):

IF	P Address*	
0	10.10.10.10	
1	192.168.1.10	
2	192.168.1.20	3450
3	192.168.1.30	~ ホー
4	192.168.0.40	
5	192.168.0.50	123450
6	192.168.0.60	~008~
7	192.168.0.70	
8	192.168.0.80	
9	192.168.0.90	
A	192.168.0.100	
в	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	IP Address* 0 10.10.10.10 1 192.168.1.10 2 192.168.1.20 3 192.168.0.40 5 192.168.0.60 7 192.168.0.60 7 192.168.0.60 9 192.168.0.80 9 192.168.0.100 B 192.168.0.100 B 192.168.0.120 D 192.168.0.130 E 192.168.0.140 F DHCP
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	$\frac{IP \text{ Address}^{\star}}{0 10.10.10.10} \\ 1 192.168.1.10 \\ 2 192.168.1.20 \\ 3 192.168.0.40 \\ 5 192.168.0.50 \\ 6 192.168.0.60 \\ 7 192.168.0.70 \\ 8 192.168.0.80 \\ 9 192.168.0.90 \\ A 192.168.0.100 \\ B 192.168.0.100 \\ B 192.168.0.100 \\ B 192.168.0.120 \\ D 192.168.0.130 \\ E 192.168.0.140 \\ F DHCP$
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.
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	Setstheno.ofsteps(forwardmovements)whichpassbetweenthebacklitimagingacquiringareaandthehopper.
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).	Select Flexibowl System Flexibowl 2 Flexibowl 1 Flexibowl 2
2	Enter the FLEXIBOWL IP ADDRESS in the (\mathbf{B}) field.	Select the Ip Address of FlexiBowl 1 192.168.1.10
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.	Connection Test Connection Test
4	Set the FLEXIBOWL parameters value (E), by the slide bars.	MOVE Acoteration 131 SHAKE Speed 131 Acoteration Argle 131 Acoteration Declaration 220 Speed 220 Bitor Time 000 Light Cn Speedstraits Parameters
5	Enable or disable the backlight.	Light On 🗾

Step	Action	Notes/Pictures
6	Press the SYNCHRONIZE PARAMETERS pushbutton.	Synchronize Parameters
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.	Step 1 MOVE Step 1 MOVE Step 2 FLIP Step 3 FAUSE 200 ms Step 4 NULL Step 5 Step 6 Step 6 I



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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"	





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.

Select FlexiBowl®	Flexi Vision	×
ł.	A ROBOT 1	
FlexiBowl® Camera	PORT: 4004	
Inspection Camera		
FlexiBowl® Param	Reconfigure Server	
Locator Param		
Inspection Param		
Robot		
Runtime	SEND E	
Recipe Manager		
Login	G	
About		

Step	Action	Notes/Pictures
1	Ensure that the robot client is up.	
2	Enter the SERVER PORT you will use in the (A) field.	PORT: 4004
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.	PORT: 4004 SERVER CLIENT CONNECT: CONNECT: CONNE
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.





This procedure can be carried out by the following users:

- TECHNICIAN
- ARS


Step	Action	Notes/Pictures
3	Select FlexiBowl® FlexiBowl® FlexiBowl® FlexiBowl® Inspection Camera FlexiBowl® FlexiBowl® FlexiBowl® Cator FlexiBowl® Parameter Inspection Camera Inspection Param Robot Runtime Recipe Manager Login	biliowing page opens:
	About RUN TaskFib1; Not Found	Enable Histogram Histogram Value 20
4	Press Run to acquire the	e first image.
5	Adjust the exposure value, so recognized and the FlexiBowl® s	to have the maximum contrast between the item to be surface.
6	Poubleclick on CocMReduction The second se	• Tool • . The tool opens.
7	Set the picking area by dragging this grad shall be recognized and	ng the blue line by the red squares: only the parts inside

Step	Action	n	Notes/Pictures
	Open the drop down menu	l:	
	CopPMRedlineTool1 ✓		- a ×
	Peter Peter Peter Peter Pa		
8		Q	FleyIVision
	Trained c		· · · · · · · · · · · · · · · · · · ·
	Select Current.TrainImage		
9	Current.InputImage Current.InputImage Current TrainImage LastRun.InputImage		
10	Grab Train Image	to acquire the image.	
	Resize the ROI (Region Of In	nterest) by moving the blue lin	ne around the pattern.
	Tan Para Tan Regard Orgin Ruch Ress. Seen Frigon Graphics Reads Peters Peter	FlexiVision	
11			
	Untrained		









Step	Action	Notes/Pictures
14	Also, the origin coordinates can be def (ORIGIN X and ORIGIN Y). CogPMRedLineTool CogPMRedLineTool CogPMRedLineTool CogPMRedLineTool Region Mode: Pixel Algned Bounding Box Adjust Mask Region Shape: CogRectangleAffine Selected Space Name: - Use Input Image Space Select Mode CogRectangleAffine Selected Space Name: - Use Input Image Space Select Mode Congin X Origin X Origin X Origin Y: 46,3828 ¢ Length X 19,1496 ¢ Length Y: 8,76352 ¢ Rotation: 35,1205 ¢ deg Skew: - Train	Results
14	NOTE In case it is necessary to hide some line Select the IMAGE MASK EDITOR by the EDITOR tool. A window mask appears, with tools (in not useful for the pattern recognition details).	the top part) to delete or mask details which are e.g. use rubber for delete; use red brush to mask
15	Select the BRUSH and the BRUSH DIMEN	SION
16	By the brush, cover the pattern lines w	nich have not to be recognzed.
17	Press APPLY.	
18	Press OK.	
19	Press Train	

Step		Action	Note	s/Pictures
	Press			
20	Select FlexiBowl® 1- FlexiBowl® 1- FlexiBowl® Camera Inspection Camera FlexiBowl® Param Locator Param Inspection Param Robot Runtime Recipe Manager Login	Bit Source Control of the second	FlexiVision	
	About	RUN TaskFib1; Not Found	☑ Enable Hi	stogram Histogram Value 20
	NOTE It could be n interference Enable the HI	ecessary to define ro and avoiding crashes STOGRAM function.	egions which have to be free s). Flexi Vision	from items (to avoid
	FlexiBowl® 1	▶ 🔤 💁 📽 📮 🐂 戸 🗊 回 安 田 🔔 🕈 Techt: Hysel College Stagebes	Landlan Card Minister Traditions	automation
21	FlexiBowl & Camera Inspection Camera FlexiBowl & Param Locator Param Inspection Param Robot Runtime Recipe Manager Login	Portal Portal		
				u A
	About	Andream Understanding of France Region Andream Understanding of France Region Some Region RUN TaskFib1; Not Found	C Enable Hi	stogram Histogram Value 20















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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.	2
3	Place the Controller $({f 3})$ 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).	Z 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
2	Turn the frequency adjustment (2) and amplitude adjustment (3) knob of the controller to "•".	AMPLICITE 10 THE PROPERTY FILM (C) THE PROP
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
то	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.	
т	At time TI, 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
Т3	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
	From any page	e, press the	key to enter the	following page:
	Select FlexiBowl® FlexiBowl® 1 [×]		Flexi Vision	
	2	Select the Ip Address of FlexiBowl 1 192.168.1.10	Connection Test	
		Acceleration 250		SEQUENCE
	FlexiBowl® Camera	Deceleration 151	SHAKE	All Commands
	Inspection Camera	Speed 151 Accel Angle 180	eration 250 eration 250	Step 1 MOVE -
	FlexiBowl® Param	Speed OPTION Angle	t 250 ≥ CW 45	Step 2 FLIP
	Locator Param	Flip Count 2 Angle	-45 CCW	Step 3 PAUSE 200 ms
	Inspection Param	Flip Delay 100 Coun Blow Time 200	t 2	Step 4 NULL
I	Robot	Light On 📝	Synchronize Parameters	
	Runtime			Step 5
	Recipe Manager	Enable Hopper 🛛		Step 6
	Login	Hopper Histogram	Steps 3 Time 200 Signal 0	Test Sequence
	About			
	NOTE The FlexiBowl®	must be connected to acc	ess the histogram	setting page.







Step	Action	Notes/Pictures
	Image: Set is in the length Set is in the length Image: Set is in the length <	
6	Press Run to acquire the i	mage.
7	Mean value and standard devia hopper stands by) or empty (the mage in the stands by) or empty (the interval in the standard devia interval in the standard by iteration interval interv	ion value shall be used to define if a sector is full (the hopper has to fill the FlexiBowl® area).
8	Noubleclick on Flexivision Run	ysisTooll*: the tool opens. Histogram 1 use of the codequarted system the code open set of the code open set open set of the code open set of the code op
	Main Page Locator Histogram Configure S	ector Change Centering Device Camera Plexibolity & Recipe Manager License Login & Info



>			Actio	'n			Notes/Pic
	Se	t the values	s in the wind	ow (ACCE	PT means th	nat the sector	is EMPTY).
	200	CogResultsAnalysisTe	pol1				- 0 ×
	•	/ 📽 🖬 🛍 🖆	1 🛓 🖇				
	Set	ings Results					
	Å	• 🤨 🖮 🗙 🛧	÷				
		Name	Argument0	Operator	Argument1	Value	Output
	Þ	Mean				134,044543405701	
		StandarDeviation				4,45637468438296	
	1	ExprG	Mean	LessThan	180	True	
	3	 ExprH 	StandarDeviation	LessThan	25	True	
	3	AND_	ExprG	And	ExprH	True	
		Output	Accept	H	ExprH	Accept	7



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.	> Mar Space Start > Control > Mar Space

Step	Action	Notes/Pictures
2	Select Script, then press the Add/Remove Re- bus date of the second of	efferences icon from the top bar.
3	Press the 🔟 to enter the Enter Assembly name mask, then press Browse .	Assendly Name Path Sign Minimum Path Sign Minimum Path Code Enter Assendly Name Code Enter Assendly Name Code Code Concel Code Concel Code Concel Code Concel Code Concel Code Code Code Code Code Code Code Code
4	Select the tool from the ReferenceAssemblies folder.	Constraining Open Vision Open Vision



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

3	Scrip	it is a second se
h	Eile	Edit Search Script Build
Ξ	ø ⊌	🗞 🖕 🗊 🛅 🕼 🕫 🔊 🕫 😹 + 🖌 💾 Release - 🗸 🔮
•	CogT	oolBlockAdvancedScript
lh.	1	Bhamespace imports
Ш	12	Tenhio slaas CartaslBlackidunaadSavirt . CartaslBlackidunaadSavirtBaas
Ш	14	{
Ш	15	Erivate Member Variables
Ш	18	_ /// <summary></summary>
1	20	/// Called when the parent tool is run.
	21	/// Add code here to customize or replace the normal run behavior.
	23	/// <param name="message"/> Sets the Message in the tool's RunStatus.
	24	/// <pre>/// <pre>comme="result">Sets the Result in the tool's RunStatus</pre>/// <pre>/// <pre>// <p< th=""></p<></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre>
	26	/// False if Groupkun customizes run behavior
	27	public override bool GroupRun(ref string message, ref CogToolResultConstants result)
	28	' // To let the execution stop in this script when a debugger is attached, uncomment the following lines.
	30	// fif DEBUG
	31	<pre>// if (System.Diagnostics.Debugger.IsAttached) System.Diagnostics.Debugger.Break(); // #endif</pre>
	33	
	34	//ADD variable OUTPUT
	36	CogfoolBlockTerminal m_CogOutput_Cutput_String = mToolBlock.Outputs["Output_String"] as CogToolBlockTerminal;
	37	//Add Beference
	39	CogBiobTool = mToolBlock.Tools["CogBiobTool]"] as CogBiobTool; Define the reference to the blob
	40	
	41	//Init m Codutput Found, Value = false: Initialize the variable Found to false
	43	
	44	//Execute the tool mToolBlock_Burbool m BlobTool, ref message, ref result);
	46	Run the Blob tool
	47	//take the result
	49	m BlobResults = m BlobTool.Results.GetBlobs(); Chock the recurity
	50	
	52	//if i field biological is Count(1)
	53	
	54	<pre>m CogOutput Jound.value = talse; m CogOutput Output String.Value = string.Format("{0};{1};{2};{3};\n\r",</pre>
	56	"Null",
	57	"NULL", If no results are found
	59	"Null");
	60	return false:
	62	
	63	}
	65	else
	66	//if I have results
	68	foreach (CogBlobResult blobResult in m_BlobResults)
	69	{
	71	<pre>m_CogOutput Output String.Value = string.Format("{0};{1};{2};{3};\n\r",</pre>
	72	blobResult.ID,
	74	blobResult.CenterofMassY.ToString("0.4*"), If results are found
	75	((blobResult.Angle * 180) / Math.PI).ToString
	76	return false;
	78	
	79 80	3
	81	
111	182	

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 I on the top bar.	Image Image Image Image ImanParama Informedured Irandom Irandom Ira
2	Select SAVE COMPLETE TOOL .	Image Image Image Image Image Enable_Hato Save complete tool Save complete tool Image Enable_Hato Save complete tool Save complete tool Image Enable_Hato Save complete tool Image Enable_Hato Save complete tool Image Enable_Hato Save complete tool Image CoopMAdgeMabTool Save complete tool Image CoopMadeTool Save complete tool Image CoopMadeTool Save complete tool Image FaunParama CoopMadeTool Image FaunParama CoopMadeTool Image FaunParama UndouredFromFoturedTransform Image FaunParama Image complete Image FaunParama Image complete Image FaunParama Image complete
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.	Tools Inputs/Outputs Graphics Image Image Image Image Image
5	Select a Pattern and press the SAVE icon 📕.	Image Name Trained Grain Trained Save complete tool Image Image Image Save complete tool Image Image<
6	Select SAVE COMPLETE TOOL.	Image Name Trained Gran Train Image Name Trained Gran Trained Image Name Trained Gran Gran Image Name Trained Gran Gran Image Name Trained Gran Gran Image Name G
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.



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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
4	Select All (unfiltered) in the Browse drop down menu.	Arender Borner A Expand: Common Member: • • Proditinge Path Is Property Path Is Property <t< th=""></t<>
5	Select CreateLastRunRecord .	Member Browser Image: Common Member * Browse: Auto Expand: Common Member * Displayed Name: Image: Common Member * Path to Property Path to Property Image: Common Member * Image: Common Member *
6	Enter the SubRecords, find and select Item(0).	Member Browser Auto Expand: Common Member: * Diskplayd Name: * Correct-ISAB (Record): Cogne. Vision/Pro. Implementation. CogRecord): SubRecords. Cognes. Vision/Pro. Implementation. CogRecord: Record Implementation. CogRecord: SubRecords. Cognes. Vision/Pro. Implementation. CogRecord: Record Implementation. CogRecord: SubRecords. Cognes. Vision/Pro. Implementation. CogRecord: SubRecords. Cognes. Vision/Pro. Implementation. CogRecord: SubRecords. CogRecord: SubRecord: SubRecord: CogRecord: SubRecord: SubRecord: CogRecord: SubRecord: SubRecord: SubRecord: SubRecord: SubRecord: SubRecord: SubRecord: CogRecord: SubRecord: Su

Step	Action	Notes/Pictures
7	Press Add Input .	Member Browser Auto Expand: Common Member: - Disciputed Name: - Correct Lab (unfittered) - Oracle Lab (MRRCoold), Corpers, Vision/Pro, Implementation, CogRecord), Sub Records, Ecogres, Vision/Pro, Implementation, CogRecord, Sub Records, Ecogres, Vision/Pro, Implementation, CogRecord, Sub Records, Ecogres, Vision/Pro, Implementation, CogRecord, Back Records, CogRecord, False Image: Sub Record, Record, Record, False Image: Sub Record,
8	Press Close .	Member Browser Image: Auto Expand: Common Members * Displayed Name: CreateLastRunRecodt Cognes: VaconPro Implementation CogRecodt SubRecodts (Cognes: VaconPro Implementation CogRecodt SubRecodts) * Total Implementation Implementation (CogRecodts) * Total Implementation
9	The created file is now visible in the structure.	Costal Last Run Records) (Cognex Vision Pro Implementation CogRecords) CogRess Outsource Costal Last Run Records) (Cognex Vision Pro Implementation CogRecords) Sub Records (Cognex Vision Pro Implementation CogRecords) Costal Last Run Records) (Cognex Vision Pro Implementation CogRecords) Cognex Vision Pro Implementation CogRecords) Costal Last Run Records (Cognex Vision Pro Implementation CogRecords) Cognex Vision Pro Implementation CogRecords) Cottage (Cottage (Cognex Vision Pro Implementation CogRecords) Cottage (Cottage (Cognex Vision Pro Implementation CogRecords) Cottage (Cottage (Cognex Vision Pro Implementation CogRecords)



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

🗵 Scrip	t			- 0	ı x
File E	dit S	Search Script Build			
0 🖳	84	🖕 🗟 🛍 🕼 🕼 🤘	🕫 🛹 🛊 🔺 🛗 Release 🔹 🝷 🥊		
As CogTo	olBlock	AdvancedScript		Imp GroupPun(ref string message, ref CogToolResultConstants result)	~
57					^
58		if (m CogPMAlignT	col.Results.Count < 1)		
60		(
61 62		m_CogOutput_Fou m_CogOutput_Out	nd.Value = false; put String.Value = string.Format("{0}:{1}:{2}:{3}:\n\r".		
63		"Null",			
64		"Null",			
66		"Null");			
67		raturn falsat			
69		recuin faise,	If objects are found, results can be	e sequenced according to a set value	
70		}			
72		{		-	
73		System.Collecti	ons.Generic.List <resultpmalign> resultList = new System.Col</resultpmalign>	lections.Generic.List <resultpmalign>(m_CogPMAlignTool.Results.Count); Create a list of the support class</resultpmalign>	
75		{	righkesuit m_cogPharighkesuit in m_cogPharighiooi.kesuits)		1
76		resultList.Ad	d(new ResultPmAlign())		
78		ModelName =	m_CogPMAlignResult.ID m_CogPMAlignResult.ModelName,		
79		ResultScore	= m_CogPMAlignResult.Score,	a list with the values obtained by the PmAlianTool	
80		Translation Translation	X = m_CogPMAlignResult.GetPose().TranslationX, THECTR Y = m_CogPMAlignResult.GetPose().TranslationX.	s list with the voldes obtained by the Enhangemoti	
82		Rotation = :	n_CogPMAlignResult.GetPose().Rotation});		
83		}			
85		var orderByResu	lt = from s in resultList		
86		orderby s.T	ranslationX descending//Sorts the result collection by Scor	Order the results by descending x	
88		select s;		· · · · · · · · · · · · · · · · · · ·	
89		//foreach (var	std in orderByResult)		
90		<pre>// System.Wind foreach (var st)</pre>	ows.Forms.HessageBox.Show(std.ResultScore.ToString()); d in orderBvResult){		
92		m_CogOutput_F	ound.Value = true;	Take the first result and create the string to send to the robot	
93		m_CogOutput_0 std.ResultID.	utput_String.Value = string.Format("{0};{1};{2};{3};\n\r",		
95		std.Translati	onX.ToString("0.##"),		
96		std.Translati	onY.ToString("0.##"),		
98		return false;	1 100/ / Montel/1000111g(0.00 ///		
99		}			
101		1			
102					
103	}	return faise;			
105	-				
106 8	- Wh	nen the Current Ru	n Record is Created		
1 1 m d	n kni		naned in Cenned		~
Messages					
Line	Col	Description			
Line: 58	Line S2, Chan 5 Modified				



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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.	I 2 3 4 5 6 7 8 9 0 - * 1039 q w e r 15 y u 1 0 P I 1 \L a s d f g h j k 1 z * ENTR z x c v b n m . . . CMS SACE
5	Enter a new name for the selected recipe. If the name is already existing, a warning message appears.	Question X Found recipe with the same name, do you want to overwrite It? Si No
6	Press SAVE RECIPE.	
7	Modify the parameters, as required.	

13.1.3 How to create a new recipe





- 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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FlexiVision

14 HOW TO CONTACT US

14.1 ABOUT page

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



FlexiVision

ARS S.r.l. Via Aretina Nord, 157 – 52041 Civitella in Val di Chiana (AR) Italia Tel. +39 0575 398611 – Fax +39 0575 398620 <u>info@flexibowl.com</u> – www. flexibowl.com