

Manual



FlexiBowl[®]

Yaskawa YRC1000 Plug-In

ars
automation

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This Plugin was born with the idea of communicating **quickly and safely with FlexiBowl®** through **YASKAWA** robots.

The Plugin requires the “**MotoPLUS**” package installed on the robot.

The robot controller version must be **YRC1000**.

FlexiBowl® is a partner product of Yaskawa.

FlexiBowl® Plug-In

YASKAWA

Plug-In Installation

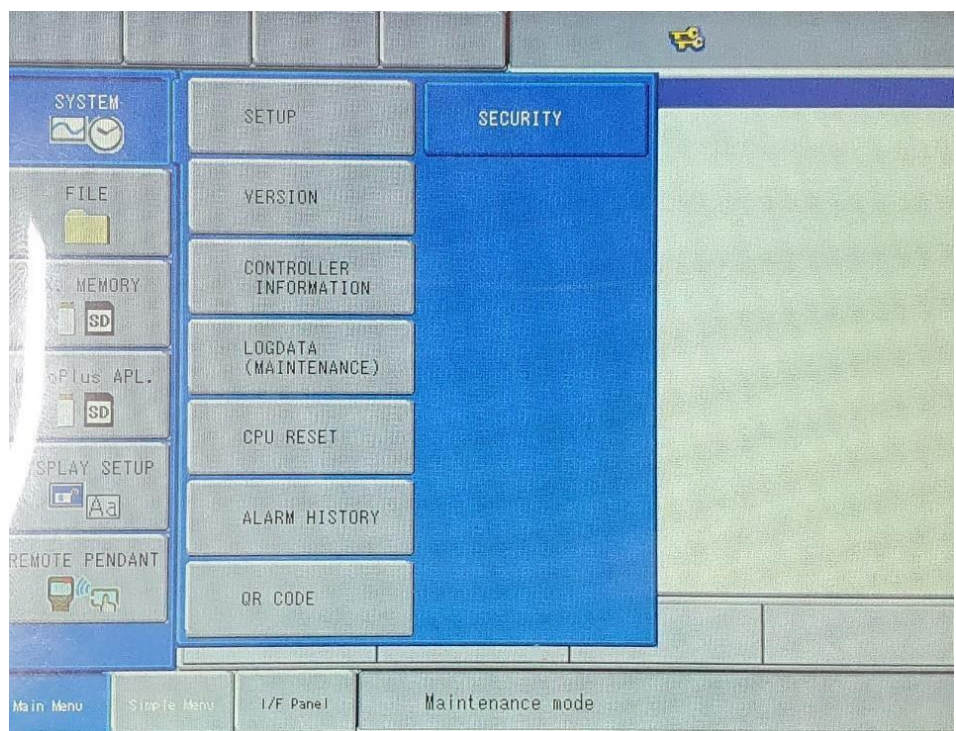
Step 1.

In order to install the Plug-in, it is necessary to insert a USB memory stick with the **YaskawaFlexiBowlV0.out** file (located in the *Yaskawa_FlexiBowlV0_Plug-in* folder) provided and start the robot in MAINTENANCE mode:

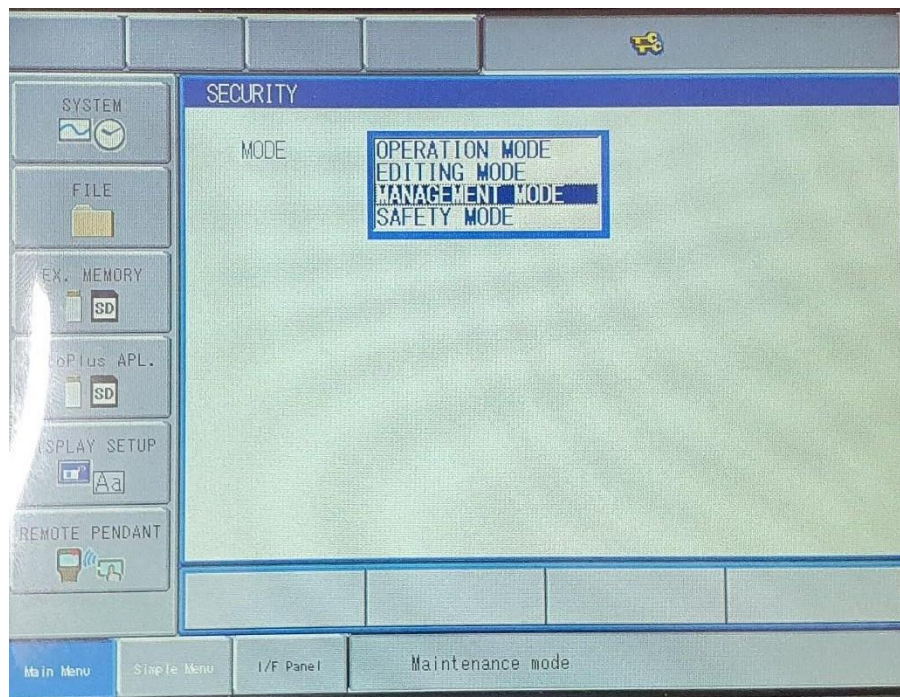
- a) Press and hold down the MAIN MENU button on the pendant and turn the robot on at the same time.
- b) Wait until the robot is switched on.

Now, change the robot's security level to MANAGEMENT MODE:
go to: MAIN MENU > SYSTEM > SECURITY and change the MODE field to MANAGEMENT MODE.

Default password: 9999999999999999

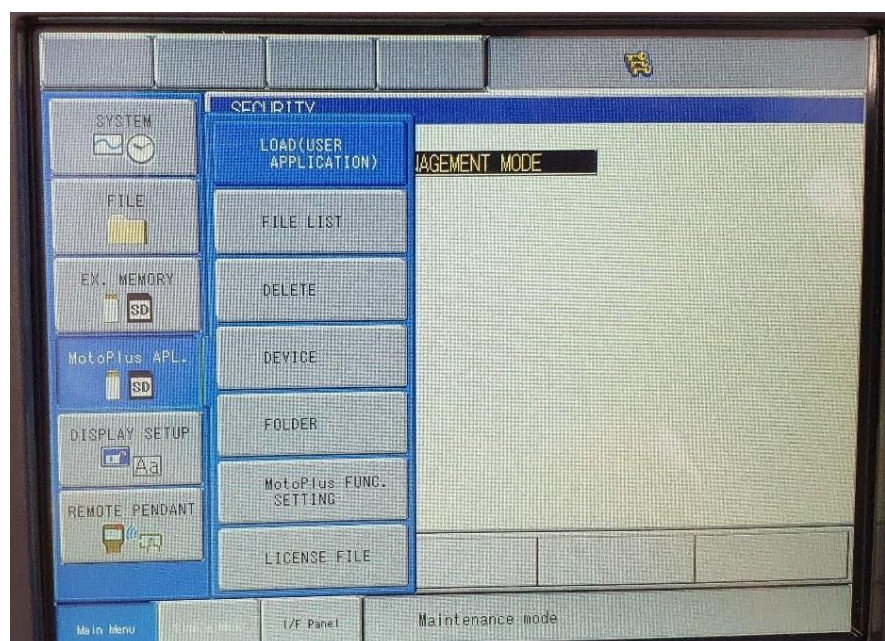


Plug-In Installation

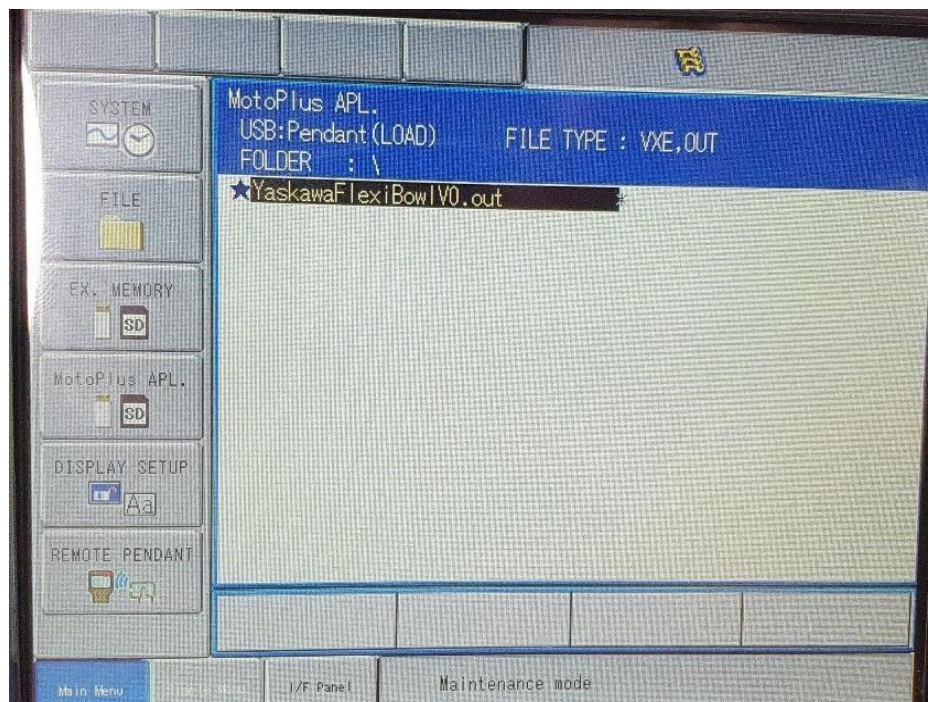
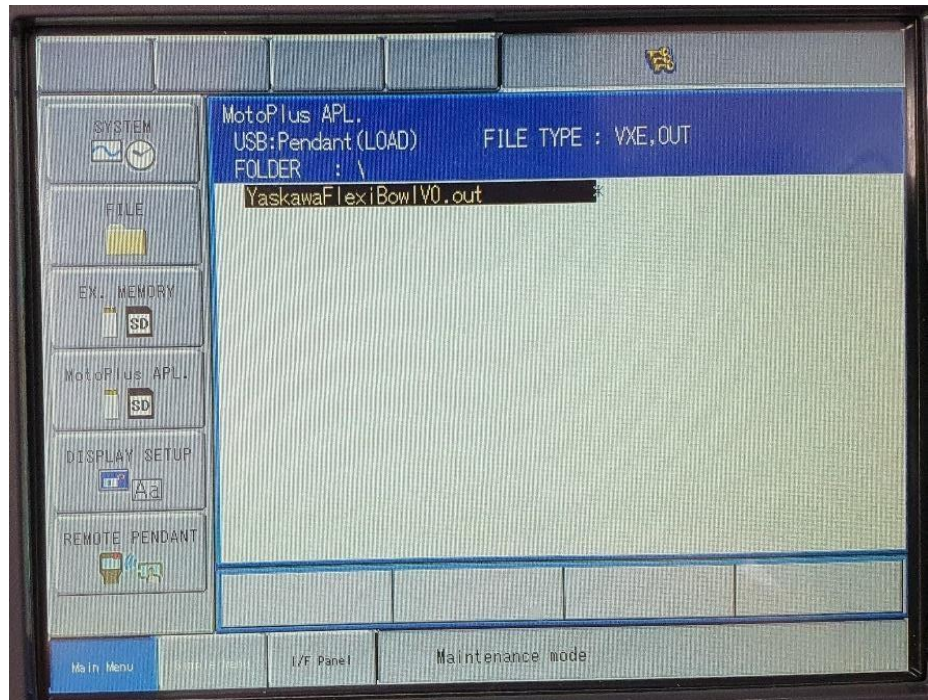


Now go to: MAIN MENU > MOTOPLUS APL. > LOAD(USER APPLICATION) and select **YaskawaFlexiBowlV0.out** using the SELECT button.

A star appears to the left of the selected file.

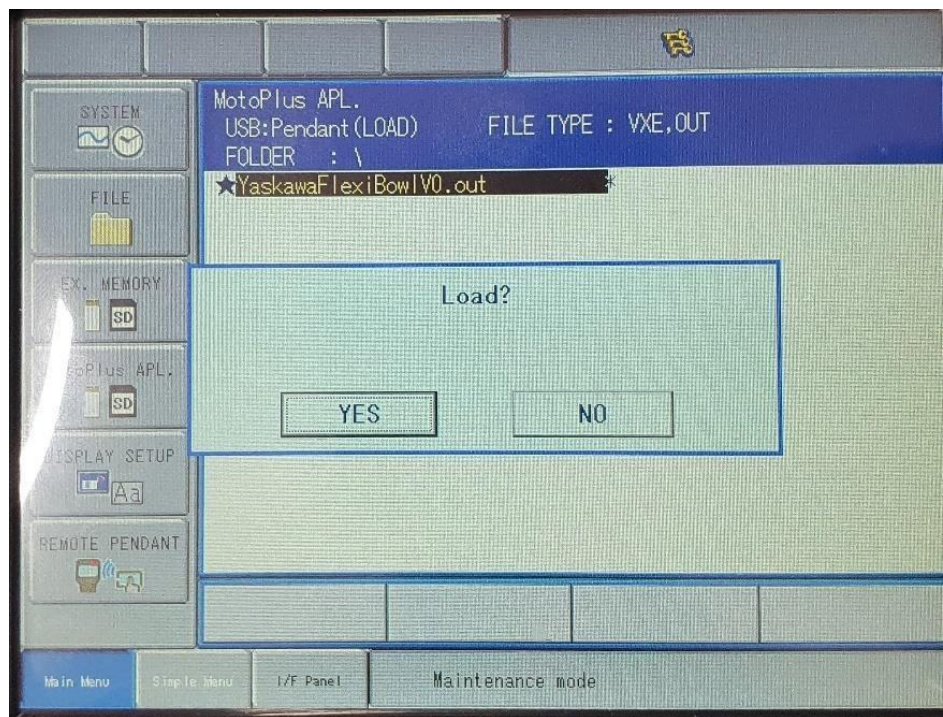


Plug-In Installation

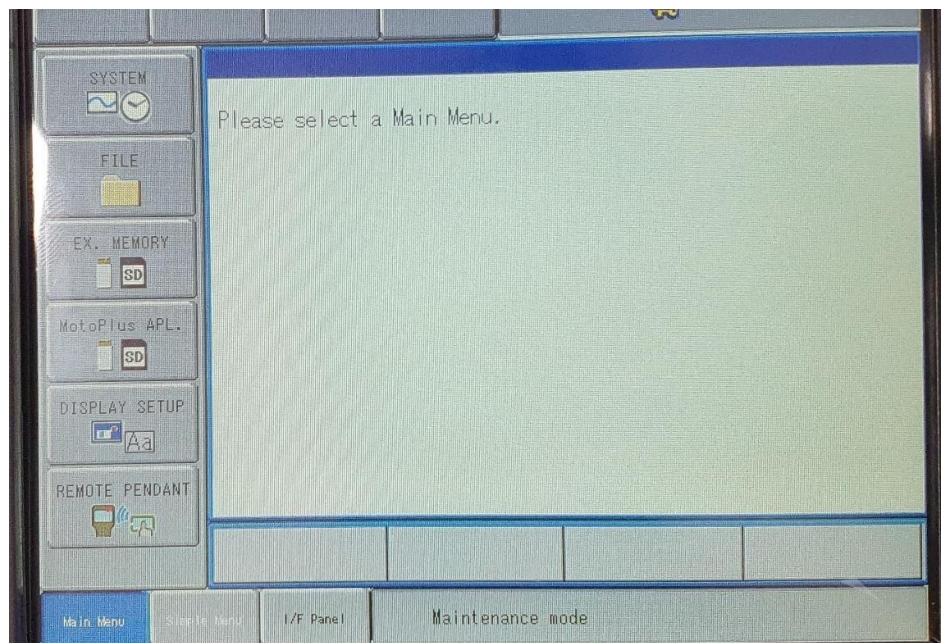


Press **ENTER** and select YES at the LOAD popup.

Plug-In Installation



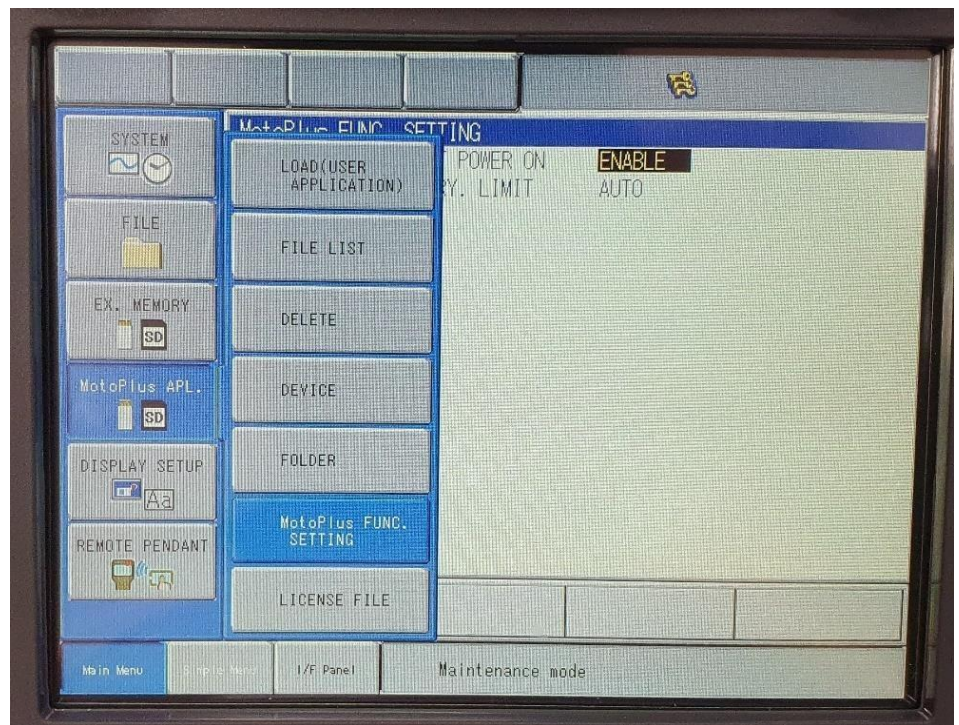
A few soft “beeps” will be played and you will be redirected to the next screen.



Plug-In Installation

Make sure **AUTOSTART** is enabled for the execution of the application at controller start-up.

Go to: MAIN MENU > MOTOPLUS APL. > MOTOPLUS FUNC.SETTING and set APPLI.AUTOSTART AT POWER ON on the ENABLE value.



Proceed with restarting the controller.

Plug-In Installation

Step 2.

After following the instructions in the FlexiBowl user manual and making the necessary connections:

- Power supply
- Compressed air

You can then proceed to switch on the device.



Now simply take an Ethernet cable from the FlexiBowl panel to the robot controller to establish communication.

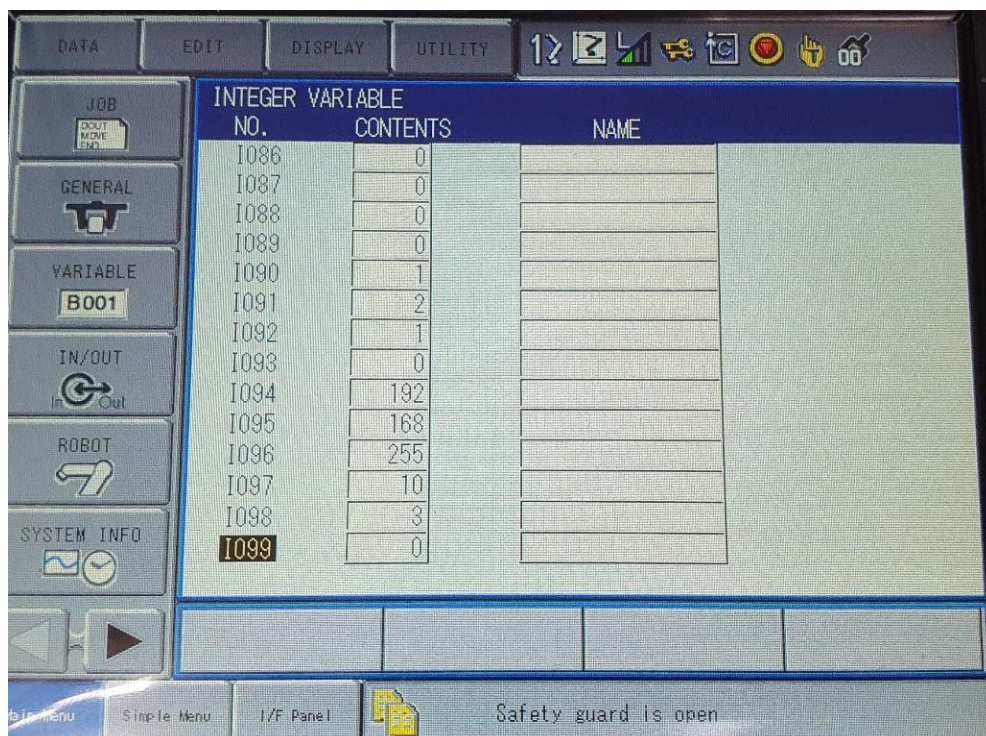


Make sure that the IP address of the robot and that of the FlexiBowl are under the same subnet.

Plug-In Installation

After restarting the controller, go to: MAIN MENU > VARIABLE and open the INTEGER VARIABLE window.

Now set the value of the index integers 94, 95, 96, 97 to the corresponding 4 bytes of the FlexiBowl's IP address (in the image the FlexiBowl® has IP address 192.168.255.10).



In addition, set integer no. 99 to the value 1 (or any value other than 0).

Disregard, for the moment, the value of the other integer variables.

Now, restart the controller again and wait a few seconds after start-up to allow the robot to start the plug-in and automatically connect with the FlexiBowl.

Using FlexiBowl

This Plug-in only enables the QX2 – QX12 commands of the FlexiBowl.

After restarting the controller, if the value of integer no. 99 is 0, the connection between robot and FlexiBowl® is successful. You can then proceed with sending QX2-QX12 commands **via pendant** or via any other **application** running on the robot.

If the connection failed (integer no. 99 different from 0), the connections between robot and FlexiBowl, the IP addresses of the two machines and the FlexiBowl settings should be checked.

Restart the controller and then start again from [Step 2](#).

If necessary, a debugging session can be started to better understand the cause of the error (Chapter 3).

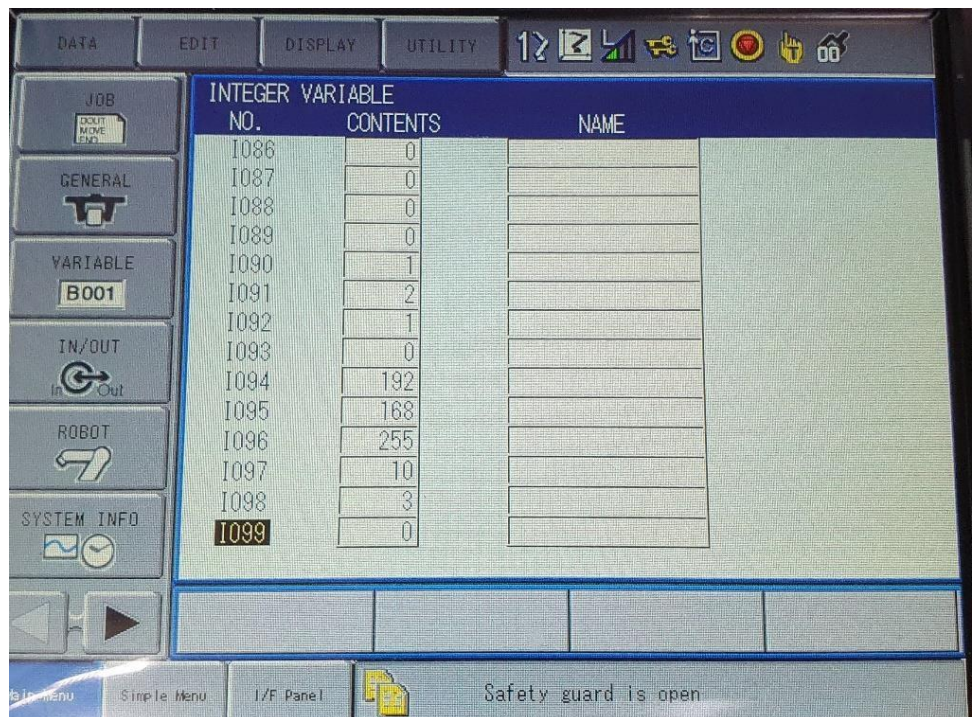
VIA PENDANT

In the integer variables window, you can select the command to be sent to the FlexiBowl and request the execution of the command via the index variables 98 and 99.

Variable 98 allows the selection of a QX2-QX12 command by setting its value to one of the corresponding values in the range 2-12.

For example, in the following image, the value set for variable 98 is 3, so the selected command will be QX3.

Using FlexiBowl



The screenshot shows the FlexiBowl control interface. On the left is a vertical menu with buttons: JOB (with a floppy disk icon), GENERAL (with a robot icon), VARIABLE (with 'B001' selected), IN/OUT (with a circular arrow icon), ROBOT (with a robot arm icon), and SYSTEM INFO (with a clock icon). Below these are navigation arrows. The main display area shows a table titled 'INTEGER VARIABLE' with three columns: 'NO.', 'CONTENTS', and 'NAME'. The table lists integer variables from I086 to I099. The 'CONTENTS' column shows values: I086-I089 are 0, I090 is 1, I091 is 2, I092 is 1, I093 is 0, I094 is 192, I095 is 168, I096 is 255, I097 is 10, I098 is 3, and I099 is 0. The 'NAME' column is empty. At the bottom, there are buttons for 'Main Menu', 'Simple Menu', and 'I/F Panel', along with a status indicator 'Safety guard is open'.

INTEGER VARIABLE		
NO.	CONTENTS	NAME
I086	0	
I087	0	
I088	0	
I089	0	
I090	1	
I091	2	
I092	1	
I093	0	
I094	192	
I095	168	
I096	255	
I097	10	
I098	3	
I099	0	

To request execution of the command on the FlexiBowl, simply set the value of index variable 99 to 1.

The command will now be executed on the FlexiBowl and the integer no. 99 will remain at 1 as long as the command is running.

As soon as the latter is finished, the value of integer no. 99 will return to 0 pending the next command.

If the command is not executed on the FlexiBowl, the connections between robot and FlexiBowl, the IP addresses of the two machines and the FlexiBowl settings must be checked. Restart the controller and then start again from [Step 2](#).

If necessary, a debugging session can be started to better understand the cause of the error (Chapter 3).

Using FlexiBowl

VIA ROBOT APPLICATION

As in case 3a, the execution of a command via any robot application is possible via the index integers 98 and 99.

Variable 98 allows the selection of a QX2-QX12 command by setting its value to one of the values in the range 2-12.

To request execution of the command on the FlexiBowl, simply set the value of index variable 99 to 1.

The command will now be executed on the FlexiBowl and the integer no. 99 will remain at 1 as long as the command is running.

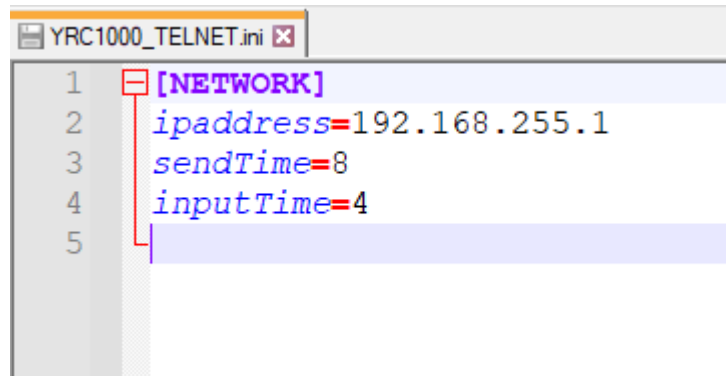
As soon as the latter is finished, the value of integer no. 99 will return to 0 pending the next command.

If the command is not executed on the FlexiBowl, the connections between robot and FlexiBowl, the IP addresses of the two machines and the FlexiBowl settings must be checked. Restart the controller and then start again from [Step 2](#).

If necessary, a debugging session can be started to better understand the cause of the error (Chapter 3).

Debugging

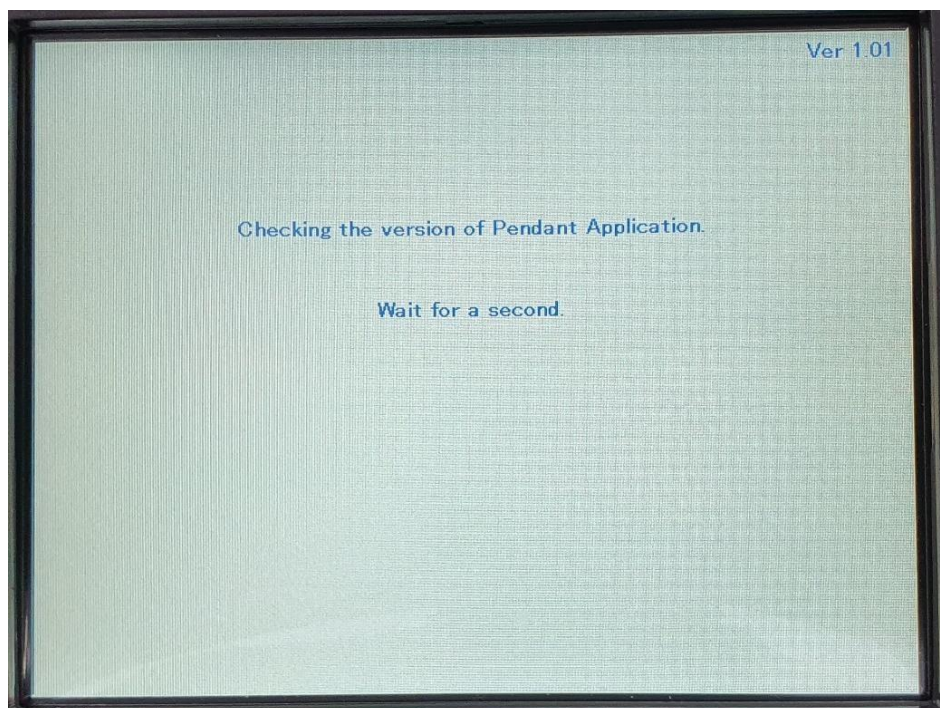
It is necessary to edit the file "**YRC1000_TELNET.ini**" inside the **YRC1000_TELNET** folder by setting the value "ipaddress" to the robot's IP address. For example, in the following image, the robot's IP address is 192.168.255.1



Now, while powering up the controller, you need to run the **YRC1000_TELNET.exe** file (inside the YRC1000_TELNET folder) on your PC, which will initiate a Telnet connection with the robot and show its current status on the screen.

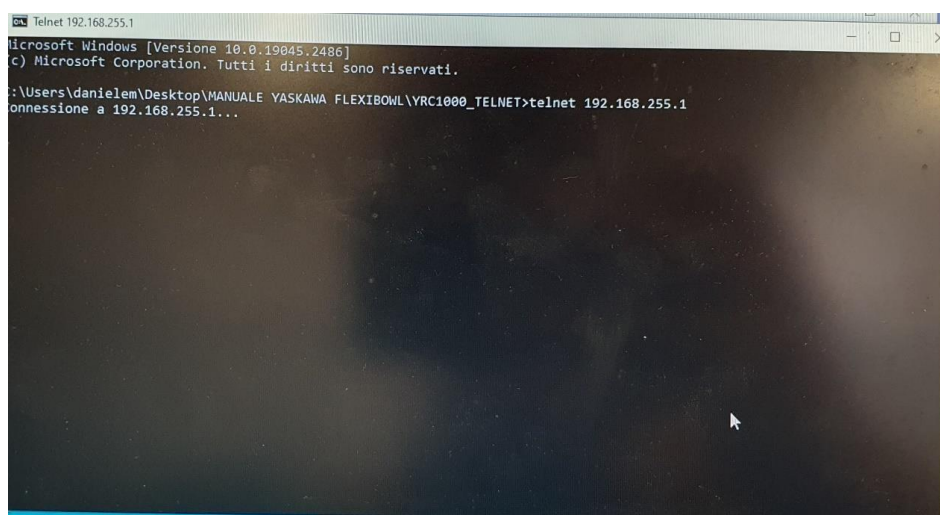
It is advisable to start **YRC1000_TELNET.exe** as soon as the following screen is shown in the Yaskawa pendant during power-up, in order for the Telnet to connect correctly.

Debugging



If the Telnet connection is successful, a prompt window will automatically open showing the robot's status messages (including error states).

See the following images.



Debugging

```
Telnet 192.168.255.1  
DEBUG START  
DEBUG START  
DEBUG START  
DEBUG START  
DEBUG START  
DEBUG START  
DEBUG START  
DEBUG START  
DEBUG START  
DEBUG START  
DEBUG START  
DEBUG START  
DEBUG START  
DEBUG START  
DEBUG START  
DEBUG START  
DEBUG START  
DEBUG START  
DEBUG START  
DEBUG START  
DEBUG START  
DEBUG START  
DEBUG START  
Socket created!  
Socket connected!  
Wait signal of integer variable no. 99...
```

If you do not get the following messages on the screen, you must restart the controller and retry the Telnet connection.

FlexiBowl Command List

List of commands and descriptions to be sent to the FlexiBowl:

Correct syntax for each packet			
Header		Command	Footer
Chr(0)	Chr(7)	Comando	Chr(13)

Action	Description
MOVE	Moves the feeder the current parameters.
MOVE-FLIP	Moves the feeder and activates Flip simultaneously
MOVE-BLOW- FLIP	Moves the feeder and activates Flip and blow simultaneously
MOVE-BLOW	Moves the feeder and activates Flip simultaneously
SHAKE	Shakes the feeder with the current parameters
LIGHT ON	Light on
LIGHT OFF	Light off
FLIP	Flip
BLOW	Blow
QUICK_EMPTYING	Quick Emptying Option
RESET_ALARM	Reset Alarm and enable the motor

Command	Description
QX2	Move
QX3	Move - Flip
QX4	Move - Blow - Flip
QX5	Move - Blow
QX5	Shake
QX7	Light on
QX8	Light off
QX9	Blow
QX10	Flip
QX11	Quick Emptying Option
QX12	Reset Alarm