

# Manual



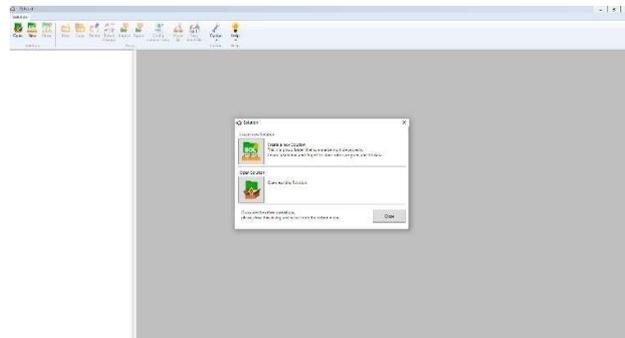
# FlexiBowl<sup>®</sup>

Shibaura Machine

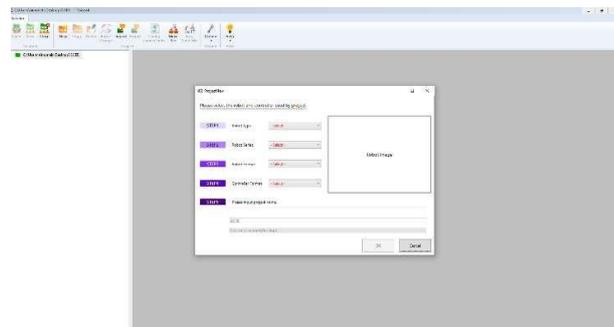
**ars** LEAN TECHNOLOGIES  
FOR SMART MANUFACTURING

# 1. Shibaaura Machine configuration

Open TSAssist and click 'New Solution', enter the name and save path. Press OK.



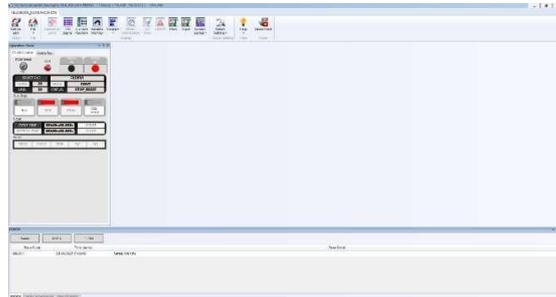
At the end of this procedure an empty window is shown; clicking 'New' opens the window below, which allows the robot data to be entered.



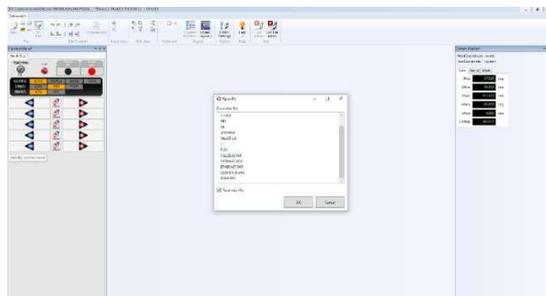
At the end of the process, the window shown below is displayed.



Click 'Connect to Controller' and then 'Online Edit'.



From the newly opened window, click 'Open File', tick the 'Parameter file' checkbox, and select the ETHERNET.PAR file.



Open the ETHERNET.PAR file, set in [E00] 'open mode' for IP3 as client (value 2) and save.

```
[E00]·OPEN·MODE·IP0·IP1·IP2·IP3 ↓
↓
{0:non·1:Robot·is·TCP·server·2:Robot·is·client} ↓
=·1··1··0··2 ↓
```

In [E06] in IP3 enter port number used 7776, and in [E07] enter the IP address of the FlexiBowl in IP3.

```
[E06]·PORT·NO·OF·DESTINATION
{IP3}
=·7776
[E07]·IP·ADDRESS·OF·DESTINATION
{IP3}
=·192.168.0.13
```

# 1. Shibaura Machine configuration: step 1.

Using the same procedure as for opening the ETHERNET.PAR file, now open the USER.PAR file in [U25], configure the 'INPUT character string conversion' function by setting the value 3 in the first row first column position.

```
[U25]·FUNCTION·SELECT·SWITCH ↓
↓
=·3·0·0·0·0·0·0·0 ↓
=·0·0·0·0·0·0·0·0 ↓
=·0·0·0·0·0·0·0·0 ↓
=·0·0·0·0·0·0·0·0 ↓
```

In [U56] enter

```
[U56]·FUNCTION·SELECT·SWITCH2 ↓
=·0·0·0·0·0·1·1 ↓
=·0·0·0·0·0·0·0 ↓
=·0·0·0·0·0·0·0 ↓
=·0·0·0·0·0·0·0 ↓
[END] ↓
```

Import the STRING.PAR file provided directly by ARS srl into the controller.

Place the PLGFLEX file in the 'working' folder of the created project.

E.G.: In the image below, the solution created is "TEST" and the project is "FLEXIBOWL\_COMMUNICATION". the PLGFLEX file is placed inside the 'working' folder.



# 1. Shibaura Machine configuration: step 1.

Using the same procedure as for opening the ETHERNET.PAR file, now open the USER.PAR file in [U25], configure the 'INPUT character string conversion' function by setting the value 3 in the first row first column position.

```
[U25]·FUNCTION·SELECT·SWITCH ↓
↓
=·3·0·0·0·0·0·0·0 ↓
=·0·0·0·0·0·0·0·0 ↓
=·0·0·0·0·0·0·0·0 ↓
=·0·0·0·0·0·0·0·0 ↓
```

In [U56] enter

```
[U56]·FUNCTION·SELECT·SWITCH2 ↓
=·0·0·0·0·0·1·1 ↓
=·0·0·0·0·0·0·0 ↓
=·0·0·0·0·0·0·0 ↓
=·0·0·0·0·0·0·0 ↓
[END] ↓
```

Import the STRING.PAR file provided directly by ARS srl into the controller.

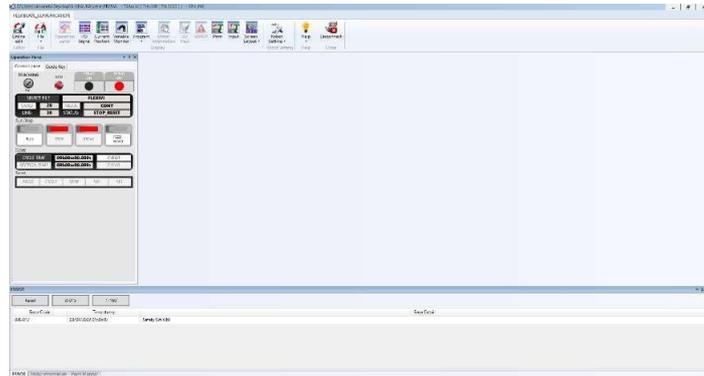
Place the PLGFLEX file in the 'working' folder of the created project.

E.G.: In the image below, the solution created is "TEST" and the project is "FLEXIBOWL\_COMMUNICATION". the PLGFLEX file is placed inside the 'working' folder.



## SHIBAURA MACHINE CONFIGURATION

Now transfer the PLGFLEX file to the controller.  
After connecting to the controller as described in step 1, click  
file/send and transfer the PLGFLEX file to the controller.



Restart the controller now.

## FLEXIBOWL DISCONNECTION INFORMATION

If the FlexiBowl is disconnected during its movement, the  
'Invalid Channel error' alarm is triggered. Proceed to reset  
the alarm and restart the program.

**The SUB\_FLEXIBOWL\_PLG program takes the number of the command to be executed as a parameter.**

The permissible commands are listed below:

Command	Action	Description
QX2	Move	Moves the Flexibowl® with the current parameters
QX3	Move - Flip	Moves the Flexibowl® and activates the Flip during the movement.
QX4	Move - Blow - Flip	Moves the Flexibowl® and activates the Flip and the second valve during the movement.
QX5	Move - Blow	Moves the Flexibowl® and activates the second valve during the movement.
QX6	Shake	Shakes the Flexibowl® with the current parameters.
QX7	Light on	Turns the backlight on.
QX8	Light off	Turns the backlight off.
QX9	Blow	Turns the Air blow on with the current parameters.
QX10	Flip	Turns the Flip on with the current parameters.
QX11	Quick Emptying	Perform the Quick Emptying sequence of the Flexibowl®
QX12	Reset Alarm	Reset the alarm and enable the motor

Parameters to be passed to the SUB\_FLEXIBOWL\_PLG program to execute commands

Parameter	Command
2	QX2
3	QX3
4	QX4
5	QX5
6	QX6
7	QX7
8	QX8
9	QX9
10	QX10
11	QX11
12	QX12

Example of a call to the SUB\_FLEXIBOWL\_PLG function to run the 'QX2'(MOVE) and 'QX6' (SHAKE) command.

```

PROGRAM MAIN ↓
.....Flexibowl_comm=2 ↓
.....SUB_FLEXIBOWL_PLG(Flexibowl_comm) ↓
.....PRINT TP, "DONE-QX2" ↓
.....SET COMMAND ↓
.....Flexibowl_comm=6 ↓
.....SUB_FLEXIBOWL_PLG(Flexibowl_comm) ↓
.....PRINT TP, "DONE-QX6" ↓
END ↓

```

## The following is the content of the STRINGPART

```

=150."<00><07>%" ↓
=250."<00><07>I0=00000001" ↓
=250."<00><07>I0=00000011" ↓
=250."<00><07>I0=00000101" ↓
=250."<00><07>I0=00000111" ↓
=250."<00><07>I0=00001001" ↓
=250."<00><07>I0=00001011" ↓
=250."<00><07>I0=00001101" ↓
=250."<00><07>I0=00001111" ↓
=55555."<00><07>RS=D" ↓
=55555."<00><07>RS=AD" ↓
=55555."<00><07>RS=DE" ↓
=55555."<00><07>RS=DP" ↓
=55555."<00><07>RS=DS" ↓
=55555."<00><07>RS=DT" ↓
=55555."<00><07>RS=DW" ↓
=55555."<00><07>RS=ADE" ↓
=55555."<00><07>RS=ADP" ↓
=55555."<00><07>RS=ADS" ↓
=55555."<00><07>RS=ADT" ↓
=55555."<00><07>RS=ADW" ↓
=55555."<00><07>RS=DEP" ↓
=55555."<00><07>RS=DES" ↓
=55555."<00><07>RS=DET" ↓
=55555."<00><07>RS=DEW" ↓
=55555."<00><07>RS=DPS" ↓
=55555."<00><07>RS=DPT" ↓
=55555."<00><07>RS=DPW" ↓
=55555."<00><07>RS=DST" ↓
=55555."<00><07>RS=DSW" ↓
=55555."<00><07>RS=DTW" ↓
=55555."<00><07>RS=ADEP" ↓
=55555."<00><07>RS=ADES" ↓
=55555."<00><07>RS=ADET" ↓
=55555."<00><07>RS=ADEW" ↓
=55555."<00><07>RS=ADPS" ↓
=55555."<00><07>RS=ADPT" ↓
=55555."<00><07>RS=ADPW" ↓
=55555."<00><07>RS=ADST" ↓
=55555."<00><07>RS=ADSW" ↓
=55555."<00><07>RS=ADTW" ↓
=55555."<00><07>RS=DEPS" ↓
=55555."<00><07>RS=DEPT" ↓
=55555."<00><07>RS=DEPW" ↓
=55555."<00><07>RS=DEST" ↓
=55555."<00><07>RS=DESW" ↓
=55555."<00><07>RS=DETW" ↓
=55555."<00><07>RS=DPST" ↓
=55555."<00><07>RS=DPSW" ↓
=55555."<00><07>RS=DPTW" ↓
=55555."<00><07>RS=DSTW" ↓
=55555."<00><07>RS=ADEPS" ↓
=55555."<00><07>RS=ADEPT" ↓

```

```
=55555."<00><07>RS=ADEST" ↓  
=55555."<00><07>RS=ADESW" ↓  
=55555."<00><07>RS=ADETW" ↓  
=55555."<00><07>RS=ADPST" ↓  
=55555."<00><07>RS=ADPSW" ↓  
=55555."<00><07>RS=ADPTW" ↓  
=55555."<00><07>RS=ADSTW" ↓  
=55555."<00><07>RS=DEPST" ↓  
=55555."<00><07>RS=DEPSW" ↓  
=55555."<00><07>RS=DEPTW" ↓  
=55555."<00><07>RS=DESTW" ↓  
=55555."<00><07>RS=DPSTW" ↓  
=55555."<00><07>RS=ADEPST" ↓  
=55555."<00><07>RS=ADEPSW" ↓  
=55555."<00><07>RS=ADEPTW" ↓  
=55555."<00><07>RS=ADESTW" ↓  
=55555."<00><07>RS=ADPSTW" ↓  
=55555."<00><07>RS=DEPSTW" ↓  
=55555."<00><07>RS=ADEPSTW" ↓  
=55555."<00><07>RS=" ↓  
=55555."A" ↓  
=55555."D" ↓  
=55555."E" ↓  
=55555."F" ↓  
=55555."H" ↓  
=55555."J" ↓  
=55555."M" ↓  
=55555."P" ↓  
=55555."R" ↓  
=55555."S" ↓  
=55555."T" ↓  
=55555."W" ↓
```

This Plugin was developed with the idea of communicating quickly and safely with the FlexiBowl and the Shibaura Machine robot.

The Plugin does not require additional Shibaura Machine licenses, but the robot's firmware must be upgrade for proper operation.