Manual

FlexiBowl®

Kassow Robots Plug-In

ars automation

FlexiBowl® by ars

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This Plug-In was developed with the aim of facilitating communication between **Kassow Robots** and the FlexiBowl® system.

Thanks to this integration, automation processes can be optimised, providing a smooth and reliable interface for controlling and managing the FlexiBowl®.

The Plug-In offers a stable and immediate connection, reducing set-up time and improving operational efficiency.

FlexiBowl® Plug-In

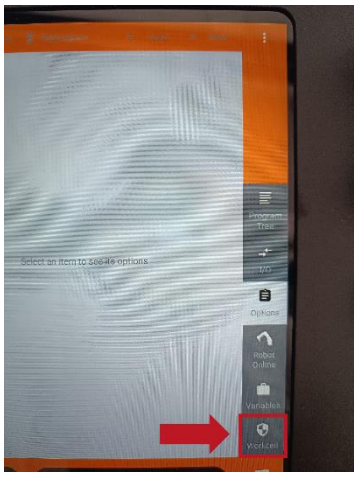
kassow robots

strong · fast · simple

Installing the Plug-In

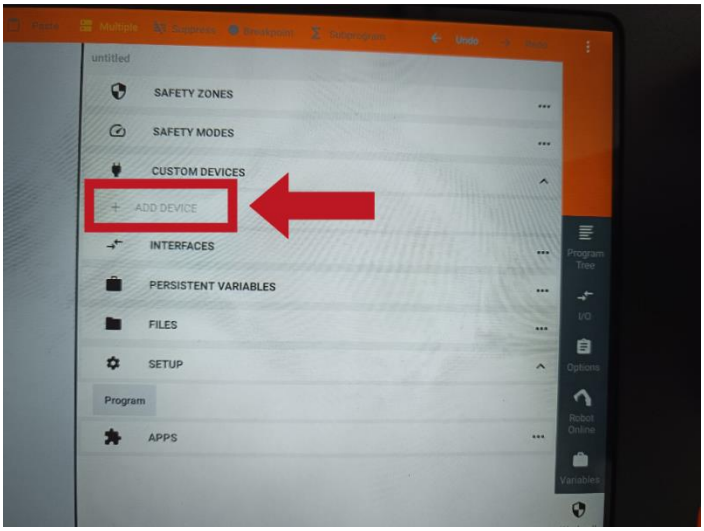
Before starting, open the side door of the robot controller and insert the USB stick with the Plug-In into the USB port on the right side of the controller.

Step 1.



Select the "**Workcell**" window from one of the two side menus of the Pendant.

Step 2.



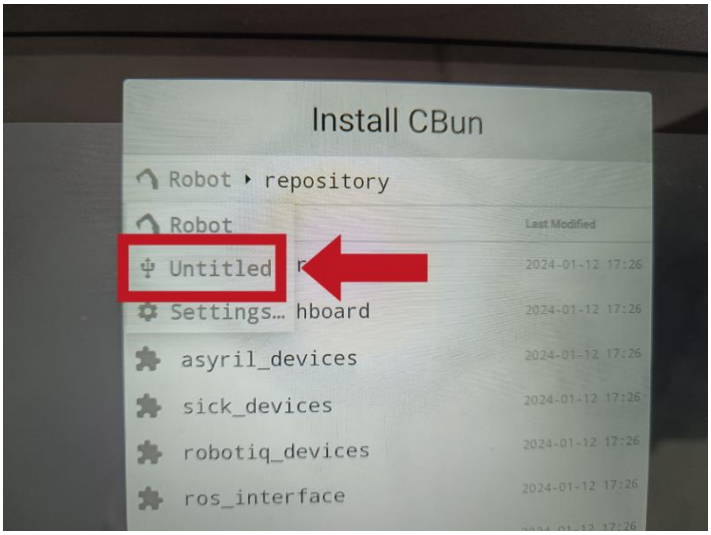
Go to the '**+ ADD DEVICE**' section .

Installing the Plug-In

Step 3.

Press **“+“**.

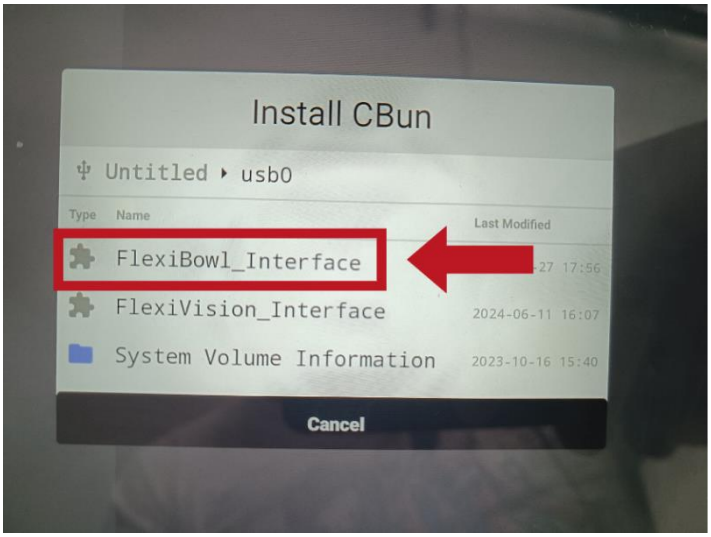
Step 4.



Go to the **'Untitled'** section .

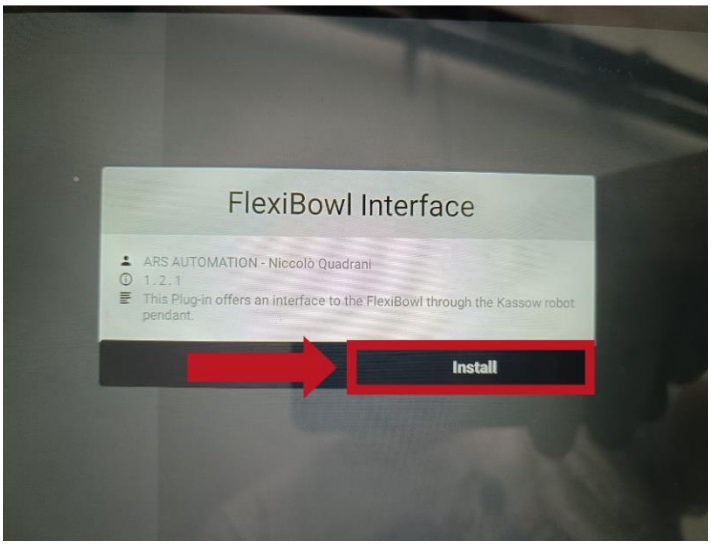
Installing the Plug-In

Step 5.



Select the '**FlexiBowl_Interface**' file.

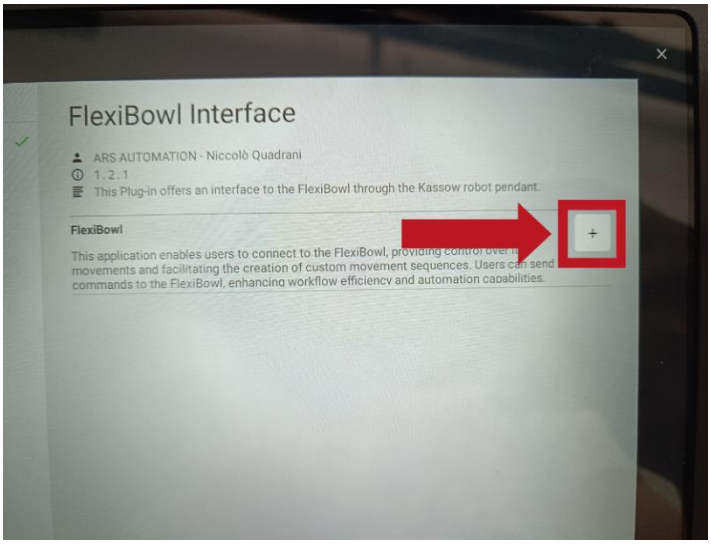
Step 6.



Select '**Install**' to successfully install the Plug-In within the controller.

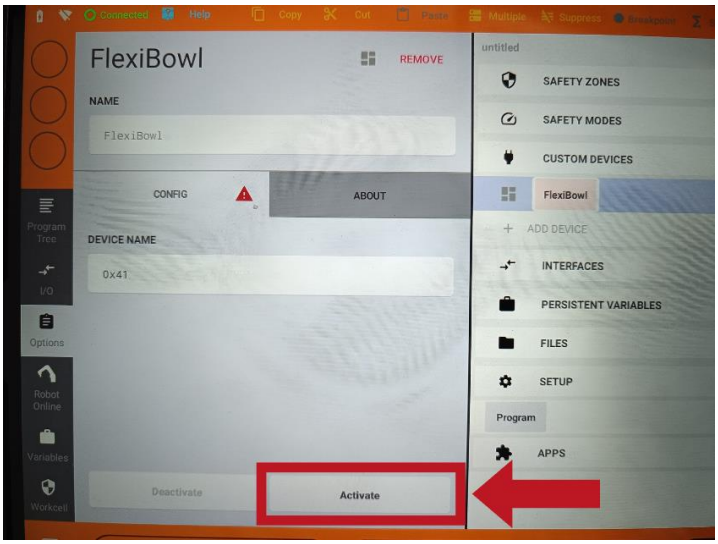
Installing the Plug-In

Step 7.



Press the '**+**' button to add the plug-in to the '**Program Tree**'.

Step 8.



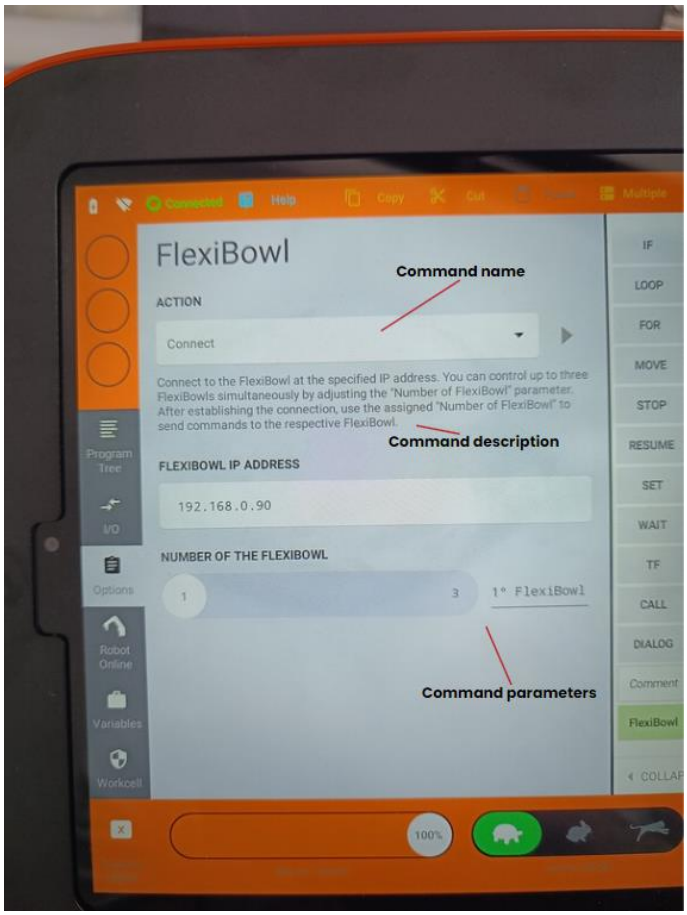
Press on the red '**FlexiBowl**' rectangle under '**CUSTOM DEVICES**', then enter a name in the '**DEVICE NAME**' field or leave the Default name and press the '**Activate**' button.

If the operation is successful, the '**FlexiBowl**' rectangle will turn light green and you will be able to see the '**FlexiBowl**' block in the '**Program Tree**' section (bottom green section).

Here you will be able, by dragging the block, to use the FlexiBowl functions within your program.

Using the Plug-in

GUI explanation and use of commands.



The **'Command** Name ' section indicates the name of the command to be executed with the selected block. Clicking on the command name will open a dialogue box for choosing the desired command.

Under the section of the command name, you will find a brief **description** of the function offered by the command.

At the bottom of the screen, there is the section dedicated to the **parameters required** for the command to be executed correctly.

These parameters vary depending on the chosen command and must be configured according to the specific needs of the user.

One parameter common to all commands is **'Number of the FlexiBowl',** which identifies the number of the FlexiBowl that the command should be sent to. This parameter is essential, as the Plug-in supports a maximum of three FlexiBowls per robot.

For a thorough understanding of how the various commands work and the appropriate parameters to send, refer to the next section of the documentation.

Plug-In Functions

1. Communication Functions

1.1 FlexiBowl – Connect

The Connect function allows a stable connection to be established with the FlexiBowl by making it possible to send commands, this command is compulsorily the first to be used in the application before the other commands.

Function

CBUN_PCALL MyDevice::connection(string IP,int n_FlexiBowl)

Parameters

string IP - IP of the FlexiBowl to connect to the open listening port.
int n_FlexiBowl - ID of the FlexiBowl being connected to for re-use in commands.

Return_Value

CBUN_PCALL_RET_OK - Connection successfully established.
CBUN_PCALL_RET_ERROR - A connection could not be established.

1.2 FlexiBowl – Test Connection

The Test Connection function allows you to check the connection between the robot and a specific FlexiBowl at any time during the program.

Function

CBUN_PCALL MyDevice::test_Connection(int n_FlexiBowl)

Parameters

int n_FlexiBowl - ID of the FlexiBowl whose connection is to be checked.

Return_Value

CBUN_PCALL_RET_OK - Stable connection and communication possible.
CBUN_PCALL_RET_ERROR - Communication with the FlexiBowl was not possible.

1.3 FlexiBowl – Send custom command

The Send custom command function allows a string to be sent to the FlexiBowl with the necessary formatting (char(0)+ char(7) + string + char(13)).

Function

CBUN_PCALL MyDevice::send_Custom_Command(string custom, int n_FlexiBowl)

Parameters

custom string - String to be sent to the FlexiBowl.
int n_FlexiBowl - ID of the FlexiBowl that the command is to be sent to.

Return_Value

CBUN_PCALL_RET_OK - The FlexiBowl interpreted the command correctly.
CBUN_PCALL_RET_ERROR - *The* FlexiBowl did not interpret the command correctly.

Plug-In Functions

2. Procedure Functions

2.1 FlexiBowl – Back-Light ON

The Back-Light ON function activates the LED lights in the robot's pick area.

Function

`CBUN_PCALL MyDevice::back_Light_ON(int n_FlexiBowl)`

Parameters

`int n_FlexiBowl` - ID of the FlexiBowl that the Back-Light needs to be switched on for.

Return_Value

`CBUN_PCALL_RET_OK` - Back-Light switched on successfully.

`CBUN_PCALL_RET_ERROR` - Communication error, cannot switch on the Back-Light.

2.2 FlexiBowl - Back-Light OFF

The Back-Light OFF function switches off the LED lights in the robot's pick area.

Function

`CBUN_PCALL MyDevice::back_Light_OFF(int n_FlexiBowl)`

Parameters

`int n_FlexiBowl` - ID of the FlexiBowl that the Back-Light needs to be switched off for.

Return_Value

`CBUN_PCALL_RET_OK` - Back-Light successfully switched off.

`CBUN_PCALL_RET_ERROR` - Communication error, cannot switch off the Back-Light.

2.3 FlexiBowl – Quick Emptying

The Quick Emptying function makes it possible, through quick movements, to remove pieces that are on the surface of the FlexiBowl without having to do it manually.

Function

`CBUN_PCALL MyDevice::quick_Emptying(int n_FlexiBowl)`

Parameters

`int n_FlexiBowl` - ID of the FlexiBowl in which we want to start the procedure.

Return_Value

`CBUN_PCALL_RET_OK` - Quick Emptying successfully completed.

`CBUN_PCALL_RET_ERROR` - Communication error, unable to start the Quick Emptying procedure

Plug-In Functions

2.4 FlexiBowl –Reset Alarms

The Reset alarms function resets all alarms within the FlexiBowl.

Function

```
CBUN_PCALL  MyDevice::reset_Alarms(int n_FlexiBowl)
```

Parameters

`int n_FlexiBowl` - ID of the FlexiBowl that the reset alarms needs to be switched on for.

Return_Value

`CBUN_PCALL_RET_OK` - Reset alarms successfully switched on.

`CBUN_PCALL_RET_ERROR` - Communication error, cannot switch on the Back-Light.

Plug-In Functions

3. Movement Functions

3.1 FlexiBowl – Move

The Move function moves the surface of the FLexiBowl according to the parameters set using the 'set' commands.

Function

```
CBUN_PCALL  MyDevice::move(int n_FlexiBowl)
```

Parameters

`int n_FlexiBowl` - ID of the FlexiBowl that the move command is to be sent to.

Return_Value

`CBUN_PCALL_RET_OK` - Move successfully completed.

`CBUN_PCALL_RET_ERROR` - Communication error, unable to send the command.

3.2 FlexiBowl – Shake

The Shake function makes the surface of the FlexiBowl move in a sequence of rapid clockwise and anticlockwise movements while respecting the parameters set with the 'set' commands.

Function

```
CBUN_PCALL  MyDevice::shake(int n_FlexiBowl)
```

Parameters

`int n_FlexiBowl` - ID of the FlexiBowl that the shake command is to be sent to.

Return_Value

`CBUN_PCALL_RET_OK` - Shake successfully completed.

`CBUN_PCALL_RET_ERROR` - Communication error, unable to send the command.

3.3 FlexiBowl – Flip

The Flip function activates and deactivates the pneumatic Flip mechanism within the FlexiBowl according to the parameters set by the 'set' commands.

Function

```
CBUN_PCALL  MyDevice::flip(int n_FlexiBowl)
```

Parameters

`int n_FlexiBowl` - ID of the FlexiBowl that the flip command is to be sent to.

Return Value

`CBUN_PCALL_RET_OK` - Flip successfully completed.

`CBUN_PCALL_RET_ERROR` - Communication error, unable to send the command.

Plug-In Functions

3.4 FlexiBowl – Blow

The Blow function activates the blowers mounted on the FlexiBowl according to the parameters set with the 'set' commands.

Function

```
CBUN_PCALL  MyDevice::blow(int n_FlexiBowl)
```

Parameters

`int n_FlexiBowl` - ID of the FlexiBowl that the blow command is to be sent to.

Return Value

`CBUN_PCALL_RET_OK` - Blow successfully completed.
`CBUN_PCALL_RET_ERROR` - Communication error, unable to send the command.

3.5 FlexiBowl – Move-Flip

The Move-Flip function simultaneously activates the 'Move' movement of the FlexiBowl and the Flip mechanism respecting the parameters set by the 'set' commands.

Function

```
CBUN_PCALL  MyDevice::move_Flip(int n_FlexiBowl)
```

Parameters

`int n_FlexiBowl` - ID of the FlexiBowl that the flip command is to be sent to.

Return Value

`CBUN_PCALL_RET_OK` - Move-flip successfully completed.
`CBUN_PCALL_RET_ERROR` - Communication error, unable to send the command.

3.6 FlexiBowl – Move-Flip-Blow

The Move-Flip-Blow function simultaneously activates the 'Move' movement of the FlexiBowl and the Flip and Blow mechanism respecting the parameters set by the 'set' commands.

Function

```
CBUN_PCALL  MyDevice::move_Flip_Blow(int n_FlexiBowl)
```

Parameters

`int n_FlexiBowl` - ID of the FlexiBowl that the move-flip-blow command is to be sent to.

Return Value

`CBUN_PCALL_RET_OK` - Move-flip-blow successfully completed.
`CBUN_PCALL_RET_ERROR` - Communication error, unable to send the command.

Plug-In Functions

4. Setting Functions (FLIP PARAMETERS)

4.1 FlexiBowl – Set Flip Count

The Set Flip Count function allows you to change the number of ON-OFF cycles that the flip mechanism executes when used in the program in the 'Flip', 'Move-Flip' and 'Move-Flip-Blow' commands.

Function

```
CBUN_PCALL  MyDevice::set_Flip_Count(int flip_Count,int n_FlexiBowl)
```

Parameters

`int Flip_Count` - Number of ON-OFF cycles executed by the flip mechanism.

`int n_FlexiBowl` - ID of the FlexiBowl that the command is sent to.

Return Value

`CBUN_PCALL_RET_OK` - Parameter saved correctly.

`CBUN_PCALL_RET_ERROR` - Communication error, unable to send the command.

4.2 FlexiBowl – Set Flip Delay

The Set Flip Delay function allows you to change the pause time for which the slide of the flip mechanism remains raised when the command is used in the program in the 'Flip', 'Move-Flip' and 'Move-Flip-Blow' commands.

Function

```
CBUN_PCALL  MyDevice::set_Flip_Delay(int flip_Delay,int n_FlexiBowl)
```

Parameters

`int Flip_Delay` - *Time during which the slide of the flip mechanism remains raised.*

`int n_FlexiBowl` - ID of the FlexiBowl that the command is sent to.

Return Value

`CBUN_PCALL_RET_OK` - Parameter saved correctly.

`CBUN_PCALL_RET_ERROR` - Communication error, unable to send the command.

Plug-In Functions

(MOVE PARAMETERS)

4.3 FlexiBowl – Set Move Acceleration

The Set Move Acceleration function allows you to change the acceleration of the FlexiBowl that will be used as a parameter in the 'Move', 'Move-Flip' and 'Move-Flip-Blow' commands.

Function

```
CBUN_PCALL  MyDevice::set_Move_Acceleration(int acc,int n_FlexiBowl)
```

Parameters

`int acc` - Acceleration value of all 'Move' commands.

`int n_FlexiBowl` - ID of the FlexiBowl that the command is sent to.

Return Value

`CBUN_PCALL_RET_OK` - Parameter saved correctly.

`CBUN_PCALL_RET_ERROR` - Communication error, unable to send the command.

4.4 FlexiBowl – Set Move Deceleration

The Set Move Deceleration function allows you to change the deceleration of the FlexiBowl that will be used as a parameter in the 'Move', 'Move-Flip' and 'Move-Flip-Blow' commands.

Function

```
CBUN_PCALL  MyDevice::set_Move_Deceleration(int dec,int n_FlexiBowl)
```

Parameters

`int dec` - Deceleration value of all 'Move'commands.

`int n_FlexiBowl` - ID of the FlexiBowl that the command is sent to.

Return Value

`CBUN_PCALL_RET_OK` - Parameter saved correctly.

`CBUN_PCALL_RET_ERROR` - Communication error, unable to send the command.

Plug-In Functions

4.5 FlexiBowl – Set Move Speed

The Set Move Speed function allows you to change the Speed of the FlexiBowl that will be used as a parameter in the 'Move', 'Move-Flip' and 'Move-Flip-Blow' commands.

Function

```
CBUN_PCALL  MyDevice::set_Move_Speed(int speed,int n_FlexiBowl)
```

Parameters

`int speed` - Speed value of all 'Move' commands.

`int n_FlexiBowl` - ID of the FlexiBowl that the command is sent to.

Return Value

`CBUN_PCALL_RET_OK` - Parameter saved correctly.

`CBUN_PCALL_RET_ERROR` - Communication error, unable to send the command.

4.6 FlexiBowl – Set Move Angle

The Set Move Angle function allows you to change the movement angle of the FlexiBowl, which will be used as a parameter in the 'Move', 'Move-Flip' and 'Move-Flip-Blow' commands.

Function

```
CBUN_PCALL  MyDevice::set_Move_Angle(int angle,int n_FlexiBowl)
```

Parameters

`int` *angle*- Angle of *movement used in the* 'Move'commands.

`int n_FlexiBowl` - ID of the FlexiBowl that the command is sent to.

Return Value

`CBUN_PCALL_RET_OK` - Parameter saved correctly.

`CBUN_PCALL_RET_ERROR` - Communication error, unable to send the command.

Plug-In Functions

(SHAKE PARAMETERS)

4.7 FlexiBowl – Set Shake CW

The Set Shake CW function allows you to change the clockwise angle that will be used as a parameter in the 'Shake' command.

Function

`CBUN_PCALL  MyDevice::set_Shake_CW(int CW,int n_FlexiBowl)`

Parameters

`int CW` - *Clockwise movement angle* used in 'Shake' commands.
`int n_FlexiBowl` - ID of the FlexiBowl that the command is sent to.

Return Value

`CBUN_PCALL_RET_OK` - Parameter saved correctly.
`CBUN_PCALL_RET_ERROR` - Communication error, unable to send the command.

4.8 FlexiBowl – Set Shake CCW

The Set Shake CCW function allows you to change the counterclockwise angle that will be used as a parameter in the 'Shake' command.

Function

`CBUN_PCALL  MyDevice::set_Shake_CCW(int CCW,int n_FlexiBowl)`

Parameters

`int CCW` - *Counterclockwise movement angle* used in 'Shake' commands.
`int n_FlexiBowl` - ID of the FlexiBowl that the command is sent to.

Return Value

`CBUN_PCALL_RET_OK` - Parameter saved correctly.
`CBUN_PCALL_RET_ERROR` - Communication error, unable to send the command.

4.9 FlexiBowl – Set Shake Speed

The Set Shake Speed function allows you to change the speed of the FlexiBowl that will be used as a parameter in the 'Shake' command.

Function

`CBUN_PCALL  MyDevice::set_Shake_Speed(int speed,int n_FlexiBowl)`

Parameters

`int speed` - *FlexiBowl speed used during the shake sequence.*
`int n_FlexiBowl` - ID of the FlexiBowl that the command is sent to.

Return Value

`CBUN_PCALL_RET_OK` - Parameter saved correctly.
`CBUN_PCALL_RET_ERROR` - Communication error, unable to send the command.

Plug-In Functions

4.10 FlexiBowl – Set Shake Acceleration

The Set Shake Acceleration function allows you to change the speed that will be used as a parameter in the 'Shake' command.

Function

```
CBUN_PCALL  MyDevice::set_Shake_Acceleration(int Shake_Acc,int n_FlexiBowl)
```

Parameters

`int Shake_Acc` - *Speed used in* 'Shake' commands .

`int n_FlexiBowl` - ID of the FlexiBowl that the command is sent to.

Return Value

`CBUN_PCALL_RET_OK` - Parameter saved correctly.

`CBUN_PCALL_RET_ERROR` - Communication error, unable to send the command.

4.11 FlexiBowl – Set Shake Deceleration

The Set Shake Deceleration function allows you to change the deceleration that will be used as a parameter in the 'Shake' command.

Function

```
CBUN_PCALL  MyDevice::set_Shake_Deceleration(int shake_Dec,int n_FlexiBowl)
```

Parameters

`int Shake_Dec` - *Deceleration used in* 'Shake' commands.

`int n_FlexiBowl` - ID of the FlexiBowl that the command is sent to.

Return Value

`CBUN_PCALL_RET_OK` - Parameter saved correctly.

`CBUN_PCALL_RET_ERROR` - Communication error, unable to send the command.

4.12 FlexiBowl – Set Shake Count

The Set Shake Count function allows you to change the number of sequences that will be executed when the 'Shake' command is used.

Function

```
CBUN_PCALL  MyDevice::set_Shake_Count(int count,int n_FlexiBowl)
```

Parameters

`int count` - *Number of clockwise and anticlockwise movements performed during the shake command.*

`int n_FlexiBowl` - ID of the FlexiBowl that the command is sent to.

Return Value

`CBUN_PCALL_RET_OK` - Parameter saved correctly.

`CBUN_PCALL_RET_ERROR` - Communication error, unable to send the command.

Plug-In Functions

(BLOW PARAMETERS)

4.13 FlexiBowl – Set Blow Time

The Set Blow Time function allows you to change the time for which the blow is active used as a parameter in the 'Shake' command.

Function

```
CBUN_PCALL  MyDevice::set_Blow_Time(int time,int n_FlexiBowl)
```

Parameters

`int time` - Time for which blow remains on when activated.

`int n_FlexiBowl` - ID of the FlexiBowl that the command is sent to.

Return Value

`CBUN_PCALL_RET_OK` - Parameter saved correctly.

`CBUN_PCALL_RET_ERROR` - Communication error, unable to send the command.

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)	Command	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