



Instructions in case of frequent modifications to the FlexiBowl® parameters



Models 200 – 350 – 500 – 650 – 800

Revision 1.0 – edition 07/2022



ARS S.r.l.

Via G. Vico, 7 – 52100 Arezzo (AR) Italy

Tel. +39 0575 398611 – Fax +39 0575 398620

info@arsautomation.com – www.arsautomation.com

FlexiBowl® is a registered trademark and a patented product of Ars S.r.l.

Contents

| | | |
|------------|--|---------------|
| 1 | GENERAL REMARKS | 3.1-3 |
| 2 | ETHERNET PACKET SYNTAX | 3.1-3 |
| 3 | REDUCTION VALUE | 3.1-4 |
| 3.1 | Read the reduction ratio of FlexiBowl® | 3.1-4 |
| 4 | RXA – ACCELERATION | 3.1-5 |
| 4.1 | Read the acceleration value of the FlexiBowl® | 4.1-5 |
| 4.2 | Write the acceleration value of the FlexiBowl® | 4.2-5 |
| 5 | RXB – DECELERATION | 4.2-6 |
| 5.1 | Read the deceleration value of the FlexiBowl® | 5.1-6 |
| 5.2 | Write the deceleration value of the FlexiBowl® | 5.2-6 |
| 6 | RXV – SPEED | 5.2-7 |
| 6.1 | Read the speed value of the FlexiBowl® | 6.1-7 |
| 6.2 | Write the speed value of the FlexiBowl® | 6.2-7 |
| 7 | DI – ANGLE | 6.2-8 |
| 7.1 | Read the movement angle of the FlexiBowl® | 7.1-8 |
| 7.2 | Write the movement angle of the FlexiBowl® | 7.2-8 |
| 8 | FL | 7.2-9 |
| 9 | SC | 7.2-10 |
| 10 | USING THE FLIP | 7.2-11 |

1 GENERAL REMARKS

Should it be required to change the FlexiBowl® parameterisation frequently, it will be mandatory to use the “FL” command and all relevant instructions instead of the standard “QX” commands.

This function will directly control the motor using the parameters (acceleration, deceleration, speed and angle), specified with the functions “RXA”, “RXB”, “RXV”, “DI”.



Important!

When using the multi-sector disk, it is mandatory to use the “FL” command, as the handling parameters may change at each iteration.

2 ETHERNET PACKET SYNTAX

The following syntax must be used to control the FlexiBowl® via an Ethernet protocol (TCP/IP or UDP).



IMPORTANT!

The default IP address is 192.168.1.10 in class B (Subnet Mask 255.255.0.0). The TCP/IP communication port is 7776 and the UDP port is 7775.

The correct syntax for each packet will be:

| Header | | Description | Footer |
|--------|--------|----------------------------------|---------|
| Chr(0) | Chr(7) | Command (ASCII character vector) | Chr(13) |

For each string sent to the FlexiBowl®, an ECHO of the command received will be returned. If the command is interpreted correctly the following answer will be given:

| Header | | ECHO | Footer |
|--------|--------|------|---------|
| Chr(0) | Chr(7) | % | Chr(13) |

Otherwise if the command is not interpreted correctly:

| Header | | ECHO | Footer |
|--------|--------|------|---------|
| Chr(0) | Chr(7) | ? | Chr(13) |

3 REDUCTION VALUE

FlexiBowl® 500-650-800 have a drive belt, therefore a reduction ratio of 1:3 must be taken into account when writing the parameters (RXA, RXB, RXV, DI).

For example, if we wish to set a rotation angle of 90°, the value 270 must be stored in the "DI" register.

In FlexiBowl® 200 and 350, since there is no drive belt, the reduction ratio is 1:1.

3.1 Read the reduction ratio of FlexiBowl®

Copy the contents of register "14" to the reading register "1":

| Header | | Description | Footer |
|--------|--------|-------------|---------|
| Chr(0) | Chr(7) | RR114 | Chr(13) |

To read the reduction ratio, it will be required to send the command:

| Header | | Description | Footer |
|--------|--------|-------------|---------|
| Chr(0) | Chr(7) | RX1 | Chr(13) |

The FlexiBowl® will respond with the current value:

| Header | | ECHO | Footer |
|--------|--------|------------------------|---------|
| Chr(0) | Chr(7) | RX1=" reduction ratio" | Chr(13) |



4 RXA - ACCELERATION

4.1 Read the acceleration value of the FlexiBowl®

To read the acceleration value, it will be required to send the command:

| Header | | Description | Footer |
|--------|--------|-------------|---------|
| Chr(0) | Chr(7) | RXA | Chr(13) |

The FlexiBowl® will respond with the current value:

| Header | | ECHO | Footer |
|--------|--------|---------------------------|---------|
| Chr(0) | Chr(7) | RXA= "acceleration value" | Chr(13) |

4.2 Write the acceleration value of the FlexiBowl®

To write the acceleration value, it will be required to send the command:

| Header | | Description | Footer |
|--------|--------|--|---------|
| Chr(0) | Chr(7) | RXA "acceleration value * reduction ratio" | Chr(13) |

The FlexiBowl® will respond with an ECHO based on the command reception:

| Header | | ECHO | Footer |
|--------|--------|------|---------|
| Chr(0) | Chr(7) | % | Chr(13) |

5 RXB - DECELERATION

5.1 Read the deceleration value of the FlexiBowl®

To read the deceleration value, it will be required to send the command:

| Header | | Description | Footer |
|--------|--------|-------------|---------|
| Chr(0) | Chr(7) | RXB | Chr(13) |

The FlexiBowl® will respond with the current value:

| Header | | ECHO | Footer |
|--------|--------|---------------------------|---------|
| Chr(0) | Chr(7) | RXB=" deceleration value" | Chr(13) |

5.2 Write the deceleration value of the FlexiBowl®

To write the deceleration value, it will be required to send the command:

| Header | | Description | Footer |
|--------|--------|--|---------|
| Chr(0) | Chr(7) | RXB "deceleration value * reduction ratio" | Chr(13) |

The FlexiBowl® will respond with an ECHO based on the command reception:

| Header | | ECHO | Footer |
|--------|--------|------|---------|
| Chr(0) | Chr(7) | % | Chr(13) |



6 RXV - SPEED

6.1 Read the speed value of the FlexiBowl®

To read the speed value, it will be required to send the command:

| Header | | Description | Footer |
|--------|--------|-------------|---------|
| Chr(0) | Chr(7) | RXV | Chr(13) |

The FlexiBowl® will respond with the current value:

| Header | | ECHO | Footer |
|--------|--------|--------------------|---------|
| Chr(0) | Chr(7) | RXV=" speed value" | Chr(13) |

6.2 Write the speed value of the FlexiBowl®

To write the speed value, it will be required to send the command:

| Header | | Description | Footer |
|--------|--------|-------------------------------------|---------|
| Chr(0) | Chr(7) | RXV "speed value * reduction ratio" | Chr(13) |

The FlexiBowl® will respond with an ECHO based on the command reception:

| Header | | ECHO | Footer |
|--------|--------|------|---------|
| Chr(0) | Chr(7) | % | Chr(13) |

7 DI - ANGLE

7.1 Read the movement angle of the FlexiBowl®

To read the movement angle, it will be required to send the command:

| Header | | Description | Footer |
|--------|--------|-------------|---------|
| Chr(0) | Chr(7) | DI | Chr(13) |

The FlexiBowl® will respond with the current angle:

| Header | | ECHO | Footer |
|--------|--------|----------------------|---------|
| Chr(0) | Chr(7) | DI=" movement angle" | Chr(13) |

7.2 Write the movement angle of the FlexiBowl®

To write the movement angle, it will be required to send the command:

| Header | | Description | Footer |
|--------|--------|---------------------------------------|---------|
| Chr(0) | Chr(7) | DI "movement angle * reduction ratio" | Chr(13) |

The FlexiBowl® will respond with an ECHO based on the command reception:

| Header | | ECHO | Footer |
|--------|--------|------|---------|
| Chr(0) | Chr(7) | % | Chr(13) |

8 FL

Using the "FL" command, the FlexiBowl® will move by using the parameters specified in the registers

"RXA","RXB","RXV","DI".

| Header | | Description | Footer |
|--------|--------|-------------|---------|
| Chr(0) | Chr(7) | FL | Chr(13) |

The FlexiBowl® will respond with an ECHO based on the command reception:

| Header | | ECHO | Footer |
|--------|--------|------|---------|
| Chr(0) | Chr(7) | % | Chr(13) |



IMPORTANT!

Before sending any new movement command, it will be required to check that the motor is not engaged by using the "SC" command (provided in section 9 of this document).

9 SC

To read the driver status, it will be required to send the command:

| Header | | Description | Footer |
|--------|--------|-------------|---------|
| Chr(0) | Chr(7) | SC | Chr(13) |

The FlexiBowl® will respond with a hexadecimal value indicating its status:

| Header | | ECHO | Footer |
|--------|--------|-------------------------|---------|
| Chr(0) | Chr(7) | SC=" hexadecimal value" | Chr(13) |

To interpret the status, refer to the table below:

| Hexadecimal value | description |
|-------------------|--|
| 0001 | Motor Enabled (Motor Disabled if this bit = 0) |
| 0002 | Sampling |
| 0004 | Driver Faulty |
| 0008 | In position |
| 0010 | In motion |
| 0020 | Jogging |
| 0040 | Stopping |
| 0080 | In standby (related to an input) |
| 0100 | Storing (parameters) |
| 0200 | Alarm present |
| 0400 | Homing |
| 0800 | In standby (related to WD or WT commands) |
| 1000 | Wizard running |
| 2000 | Checking the encoder |
| 4000 | "QX" program running |
| 8000 | Initialisation (during start-up) |

The FlexiBowl® driver can assume several statuses at the same time:

| Hexadecimal value | description |
|-------------------|---|
| SC=0009 | Motor enabled and in position (values 0001 and 0008) |
| SC=0004 | Driver faulty and disabled (hexadecimal value 0004) |
| SC=0209 | Driver enabled, in position and in alarm (values 0001, 0008 and 0200) |



IMPORTANT!

Before sending any new movement command, it will be required to check that the driver status is different from "moving".



10 USING THE FLIP

Since it is not recommended to operate the flip with the classic QX command, it is required to create a background program with iterative cycle that constantly switches the state of the solenoid valve, with waiting times and number of iterations at the customer's discretion. The same applies to the Blow (if installed), however, it is recommended to activate it at the start of the cycle and stop it when the FlexiBowl® stops

To switch the status of the Flip solenoid valve by raising the drill:

| Header | | Description | Footer |
|--------|--------|-------------|---------|
| Chr(0) | Chr(7) | IL2 | Chr(13) |

To switch the status of the Flip solenoid valve by retracting the drill:

| Header | | Description | Footer |
|--------|--------|-------------|---------|
| Chr(0) | Chr(7) | IH2 | Chr(13) |

To switch the status of the Blow solenoid valve (if installed), by opening it:

| Header | | Description | Footer |
|--------|--------|-------------|---------|
| Chr(0) | Chr(7) | IL3 | Chr(13) |

To switch the status of the Blow solenoid valve (if installed), by closing it:

| Header | | Description | Footer |
|--------|--------|-------------|---------|
| Chr(0) | Chr(7) | IH3 | Chr(13) |

For all the commands above, the FlexiBowl® will respond:

| Header | | ECHO | Footer |
|--------|--------|------|---------|
| Chr(0) | Chr(7) | % | Chr(13) |



ARS S.r.l.

Via G. Vico, 7 - 52100 Arezzo (AR) Italy

Tel. +39 0575 398611 - Fax +39 0575 398620

info@arsautomation.com - www.arsautomation.com

FlexiBowl® is a registered trademark and a patented product of Ars S.r.l.