USE AND MAINTENANCE MANUAL

QSET
DRIVE CONFIGURATOR

Contents

1. General recommendations

The recommendations regarding safe use in this document should be observed at all times.
- Some hazards can only be associated with the product after it has been connected to the drive. It is the task of the final user to identify these hazards and reduce the associated risks accordingly.
- Before proceeding with use of the product, carefully read all information in this document.
- Conserve this document in a safe place accessible to all personnel throughout the product life cycle.
- This document should accompany the product in the event of transfer to a new owner or user.
- The instructions in this manual must be observed together with the instructions and additional information regarding connected drive,

available from the following reference links:
- web site http://www.camozzi.com
- Camozzi general catalogue
- Technical assistance service
- Assembly and start-up operations must be performed exclusively by qualified and authorized personnel on the basis of these instructions.
- For all situations not contemplated in this manual and in situations in which there is the risk of potential damage to objects, or injury to persons or animals, contact Camozzi for advice.
- The product may only be used in observance of the specifications provided; if these requirements are not met, the product may only be used if previously authorized by Camozzi.

2. System requirements

CPU	2.0 GHz or more
RAM	2 GB or more
Operating System	Windows 7 or more recent versions
Minimum HD free space available	600 MB
USB	2.0 standard
Minimum Screen resolution	1280x720
Comply with the above system requirements.	

3. Installation and start-up

Download the set-up file of the "QSet" software from the web site http://www.camozzi.com and proceed with installation according to the instructions displayed on screen during the process.

Start the "QSet" software by pressing the appropriate icon on the screen or from the appropriate folder on the program menu.

4. Configuration

Once QSet is started, you will be required to enter the device code

By entering the correct code and pressing the View button, the description of the selected item will be displayed.
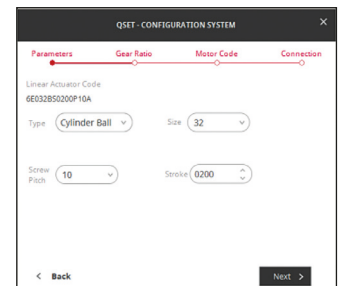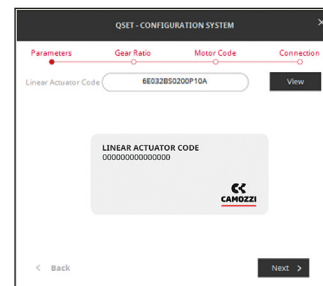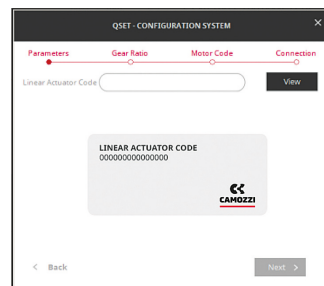
In the event you do not know the code, you can select the View button with the empty field; this will allow you to select the device by using the drop-down menu.

In particular, you will be able to select:
- Cylinder Ball Screw
- Cylinder Lead Screw
- Linear Belt
- Linear Belt Screw
- Only Motor

Each field will then be edited manually.
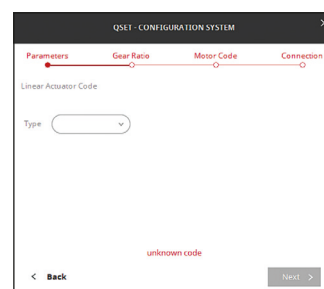
By pressing the Next button,
you will access the next page.
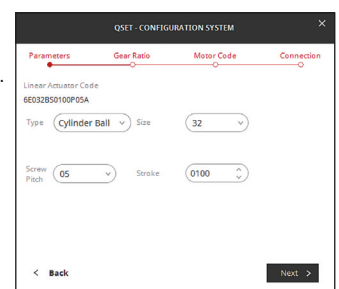
4.1 Gear ratio

You will be required to enter the gear ratio which may be a whole number (1,0:1) or a decimal 1,5:1.

By pressing the Next button, you will access the next page,
by pressing the Back button, you will return to the previous page.
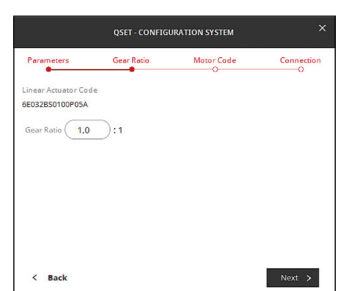
4.2 Selection of the motor type

By entering the code printed on the label on the motor and pressing the View button, description of the type of motor selected will be displayed:
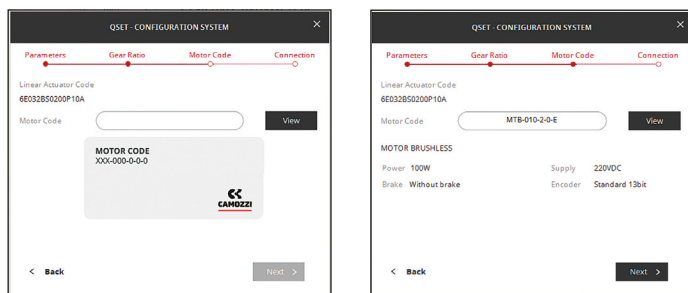
In Brushless motors, the following information will be detailed:
• Power
• Supply Voltage
• The presence of brakes
• The encoder available on the motor.
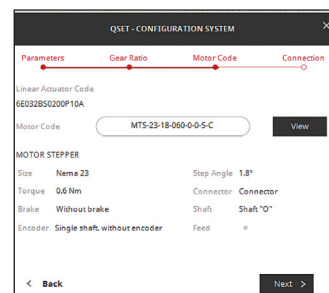
In stepper motors, the following information will be detailed:
• Size
• Step angle
• Torque
• Presence of a connector

• Presence of brakes
• Round shaft or with key
• Input or output shaft
• Presence of an encoder

4.3 Connection

By pressing the Next button, you will access the next page where you can select the type of COM connection.
The green dot displayed next to Connection OK confirms successful connection.

Connection OK •

If, instead, the dot is gray, it means that connection was not successful; select another COM and press Connect once again.

Connection OK •

By pressing the NEXT button, you will access the SETUP page.
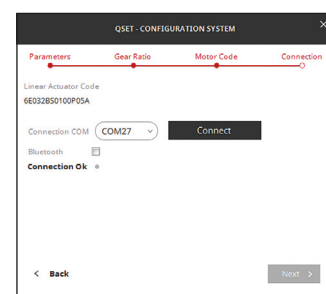
4.4 Bluetooth

If you want to establish a Bluetooth connection with the stepper drive DRCS, before starting the QSet software, you need to link a COM port from the Windows menu "Bluetooth device-add device" (the authentication code is "0000"). In the above page, select the Bluetooth check, select the COM port associated and press the command Connect.

---

5.   General

All common commands of Windows have been included in the General page.
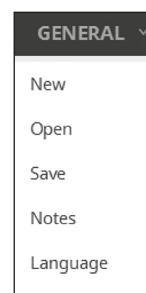
5.1 New

Allows opening a new program file.

5.2 Open

Allows opening a program file previously created.

5.3 Save

Allows saving an open program file.

5.4 Notes

Allows opening a dialogue box where notes related to the project can be entered.

5.5 Language

The Language can be selected.

5.6 Exit

You can Exit the program.

6. Setup

The Setup page is divided into 4 sections and each section has a functional role:
• General Parameters
• Homing Parameters
• Jog Parameters
• Set Digital Output

6.1 General Parameters

The "General Parameters" window summarizes the basic settings of the device selected, as these are different in Brushless motors and Stepper motors.
Max Torque: this parameter cannot be changed and it indicates the maximum torque that the system can develop; the current indicated depends on the motor type selected during the configuration phase.
Max Stroke: this parameter indicates the maximum stroke of the system selected during the configuration phase. This value can be reduced but not increased.
Direction: this parameter allows setting the sense of rotation of the motor which can be clockwise (standard) or counter clockwise (reverse).
Units: you can select the units of measurement that can be expressed in "mm" or "inc" (inches).

GENERALS PARAMETERS	Units	mm ∨
Torque Max (A) 2,70000		
Max Stroke 100,010 ⌄	Direction	Standar ∨
Operation Mode Digital ∨		
Enable External ☐		

6.2 Digital Operation Mode (for brushless and stepper motor)

The drives in use envisage the entry of 6 digital inputs whose binary combination produces 64 different combinations; a command line will be associated to every single combination (see Manage page). The combinations are expressed as follows:

In6	In5	In4	In3	In2	In1	Program	Linea Strobe
OFF	OFF	OFF	OFF	OFF	OFF	0	↑
OFF	OFF	OFF	OFF	OFF	ON	1	↑
OFF	OFF	OFF	OFF	ON	OFF	2	↑
OFF	OFF	OFF	OFF	ON	ON	3	↑
OFF	OFF	OFF	ON	OFF	OFF	4	↑
OFF	OFF	OFF	ON	OFF	ON	5	↑
OFF	OFF	OFF	ON	ON	OFF	6	↑
OFF	OFF	OFF	ON	ON	ON	7	↑
OFF	OFF	ON	OFF	OFF	OFF	8	↑
OFF	OFF	ON	OFF	OFF	ON	9	↑
OFF	OFF	ON	OFF	ON	OFF	10	↑
OFF	OFF	ON	OFF	ON	ON	11	↑
OFF	OFF	ON	ON	OFF	OFF	12	↑
OFF	OFF	ON	ON	OFF	ON	13	↑
OFF	OFF	ON	ON	ON	OFF	14	↑
OFF	OFF	ON	ON	ON	ON	15	↑
OFF	ON	OFF	OFF	OFF	OFF	16	↑
OFF	ON	OFF	OFF	OFF	ON	17	↑
OFF	ON	OFF	OFF	ON	OFF	18	↑
OFF	ON	OFF	OFF	ON	ON	19	↑
OFF	ON	OFF	ON	OFF	OFF	20	↑
OFF	ON	OFF	ON	OFF	ON	21	↑
OFF	ON	OFF	ON	ON	OFF	22	↑
OFF	ON	OFF	ON	ON	ON	23	↑
OFF	ON	ON	OFF	OFF	OFF	24	↑
OFF	ON	ON	OFF	OFF	ON	25	↑
OFF	ON	ON	OFF	ON	OFF	26	↑
OFF	ON	ON	OFF	ON	ON	27	↑
OFF	ON	ON	ON	OFF	OFF	28	↑
OFF	ON	ON	ON	OFF	ON	29	↑
OFF	ON	ON	ON	ON	OFF	30	↑
OFF	ON	ON	ON	ON	ON	31	↑
ON	OFF	OFF	OFF	OFF	OFF	32	↑
ON	OFF	OFF	OFF	OFF	ON	33	↑
ON	OFF	OFF	OFF	ON	OFF	34	↑
ON	OFF	OFF	OFF	ON	ON	35	↑
ON	OFF	OFF	ON	OFF	OFF	36	↑
ON	OFF	OFF	ON	OFF	ON	37	↑
ON	OFF	OFF	ON	ON	OFF	38	↑
ON	OFF	OFF	ON	ON	ON	39	↑
ON	OFF	ON	OFF	OFF	OFF	40	↑
ON	OFF	ON	OFF	OFF	ON	41	↑
ON	OFF	ON	OFF	ON	OFF	42	↑
ON	OFF	ON	OFF	ON	ON	43	↑

In6	In5	In4	In3	In2	In1	Program	Linea Strobe
ON	OFF	ON	ON	OFF	OFF	44	↑
ON	OFF	ON	ON	OFF	ON	45	↑
ON	OFF	ON	ON	ON	OFF	46	↑
ON	OFF	ON	ON	ON	ON	47	↑
ON	ON	OFF	OFF	OFF	OFF	48	↑
ON	ON	OFF	OFF	OFF	ON	49	↑
ON	ON	OFF	OFF	ON	OFF	50	↑
ON	ON	OFF	OFF	ON	ON	51	↑
ON	ON	OFF	ON	OFF	OFF	52	↑
ON	ON	OFF	ON	OFF	ON	53	↑
ON	ON	OFF	ON	ON	OFF	54	↑
ON	ON	OFF	ON	ON	ON	55	↑
ON	ON	ON	OFF	OFF	OFF	56	↑
ON	ON	ON	OFF	OFF	ON	57	↑
ON	ON	ON	OFF	ON	OFF	58	↑
ON	ON	ON	OFF	ON	ON	59	↑
ON	ON	ON	ON	OFF	OFF	60	↑
ON	ON	ON	ON	OFF	ON	61	↑
ON	ON	ON	ON	ON	OFF	62	↑
ON	ON	ON	ON	ON	ON	63	↑

ATTENTION: command line 1 (with all inputs OFF) corresponds to the zero command (Homing).

6.3 Enable external Commando Jog

You can also set external Jog commands by checking the box as shown in the image below:

If you select the external Jog command the IN6 and IN7 are used in Camozzi DRCS Stepper and IN5 and IN6 are used in Brushless drive.
A message informs you that the number of command lines will be reduced.
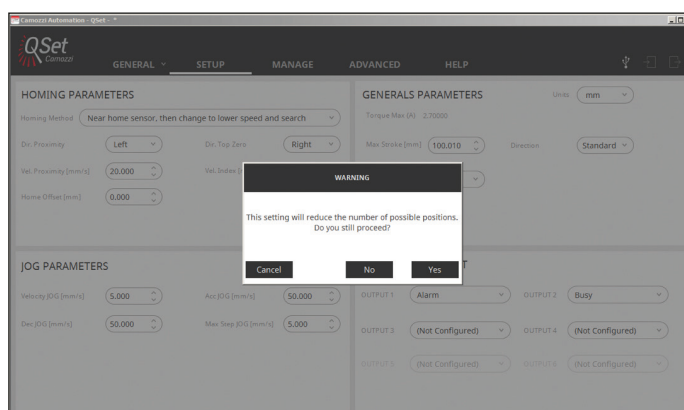
6.4 Analogue Operation Mode (only for brushless motors)

Setting the analogue operation mode allows controlling the motor's motion following a voltage profile that can be positive or negative depending on the sense of rotation of the motor.
With the Scaling parameter, you can set the ratio between linear velocity and voltage.
Example: by entering 10 as value, you will have a velocity of 10 mm/s for every volt; therefore, by entering the maximum reference (10V), you will have a velocity of 100 mm/s.
With the "Dead Band" parameter, you can filter noise (not transforming it into a velocity parameter); values between the 10mV and 500mV are usually used.

6.5 Step-direction Operation Mode (stepper motors)

By selecting this operation mode, the motor's rotation direction is set by using the PHASE B- and PHASE B + signals (pin 2 and pin 4 of the "Encoder" connector) and the execution of each single step is controlled with the PHASE A- and PHASE A + signals (pin 6 and pin 8 of the "Encoder" connector).

The motor's rotation direction can be reversed by changing the value in the "Direction" field: "Standard" or "Reverse".

Direction   [Standar ⌄]   Direction   [Inverse ⌄]

NOTE: when using the step-direction mode, the encoder will no longer be available as they share the same connector.

GENERALS PARAMETERS   Units (mm ⌄)

Max Stroke (100,010 ⌄)   Direction (Standar ⌄)

Operation Mode (StepDir ⌄)

Enable External ☐

6.6 Step-direction Operation Mode (brushless motors)

this operating mode allows to choose between two rotation speeds:

FAST: with the "line drive" connection type, the maximum speed is (4 Mpps).

SLOW: with the "open collector" type, the maximum speed is (500 Kpps) See the DRWB drive instruction sheet (93-7545-0001) for the pinout of the modes listed above.

GENERALS PARAMETERS

Torque Max (A)   7,50000

Max Stroke [mm] (100,010 ⌄)   Direction (Standard ⌄)

Operation Mode (StepDir ⌄)   Speed [✓ Slow / Fast]

6.7 CanOpen Operation Mode (only for stepper motors)

By selecting this operation mode, communication with a CanOpen network is enabled (only for DRCS-XXX-XCXX drives).
The motor's rotation direction can be reversed by changing the value in the "Direction" field ("Standard" or "Reverse"), the node ID address (from 1 to 127) and the communication speed (10k, 20k, 50k , 100k, 125k, 125k, 250k, 500k, 800k, 1M Baud/s).

GENERALS PARAMETERS   Units (mm ⌄)

Max Stroke (100,010 ⌄)   Direction (Inverse ⌄)

Operation Mode (CanOpe ⌄)   Node ID (1 ⌄)

Enable External ☐   BaudRate (250 ⌄)

6.8 Master-Slave Operation Mode (only for brushless motors)

Selecting this mode enables master-slave operation; this involves the use of two drives with one of the two drives (called slave) tracks the movements of the other (called master).
To make sure they operate correctly, it is necessary to configure the master from Qset by setting all the necessary parameters, save the file, connect the slave, and keep the previously saved configuration file unchanged except for the "Operation Mode" parameter, which must be changed to "slave", and lastly, download the configuration in the drive.

GENERALS PARAMETERS

Torque Max (A)   7,50000

Max Stroke [mm] (300,010 ⌄)   Direction (Standard ⌄)

Operation Mode (Slave ⌄)

Enable External Jog ☐

7. Jog Parameters (only for Digital Operation Mode)

In Jog Parameters you can select the maximum desired Jog velocity; acceleration and deceleration values.
You can also set a step movement of the Jog; in the window

You can set the quantity, mm or inches, for each movement.

Max Step JOG [mm/ (5,000 ⌄)

JOG PARAMETERS

Velocity JOG [mm/s] (10.000 ⌄)   Acc JOG [mm/s] (100.000 ⌄)

Dec JOG [mm/s] (100.000 ⌄)   Max Step JOG [mm/s] (5.000 ⌄)

7.1 Homing Parameters (only for Digital operation mode)

Based on the motor type, there are several rules for finding the zero position (homing).

7.2 Brushless Motors

In Brushless motors, there are three methods for finding the zero position:

HOMING PARAMETERS

Homing Method (Near home sensor, then change to lower speed and ⌄)

Dir. Proximity (Left ⌄)   Dir. Top Zero (Right ⌄)

Vel. Proximity [mm/ (20,000 ⌄)   Vel. Index [mm/s] (5,000 ⌄)

Home Offset [mm] (0,000 ⌄)

7.3 Index Signal Only:

The motor rotates until the zero-encoder signal is reached; the sense of rotation of the search is based on what is set in the window:

Where Left corresponds to clockwise rotation and Right to counter clockwise. Search velocity is set in the window:

Dir. Top Zero [Left ⌄]   Vel. Index [mm/s] [5,000 ⌃⌄]

7.4 Home Sensor Only

The motor rotates until the zero-limit sensor is reached; the sense of rotation of the search is based on what is set in the window:

Where Left corresponds to clockwise rotation and Right to counter clockwise. Search velocity is set in the window:

Dir. Proximity [Left ⌄]   Vel. Proximity [mm/s] [1.000 ⌃⌄]

7.5 Home sensor, then change to lower speed and search index

The motor rotates until the zero-limit sensor is reached; once this is identified, the zero-encoder search will start. The sense of rotation of the search is based on what is set in the window:

Where Left corresponds to clockwise rotation and Right to counter clockwise. Search velocities are set, respectively, in the following windows:

Dir. Proximity [Left ⌄]   Dir. Top Zero [Left ⌄]   Vel. Proximity [mm/s] [20,000 ⌃⌄]   Vel. Index [mm/s] [5,000 ⌃⌄]

7.6 Stepper Motors

There is only one zero method in Stepper motors and it is based on the zero-limit sensor; the method is described as follows: the motor rotates searching the zero -limit sensor and the sense of rotation of the search is based on what is set in the window.

Dir. Proximity [Left ⌄]

Search velocity is set in the window:

Vel. Proximity [mm/s] [20,000 ⌃⌄]

Once detected the limit sensor, the motor stops and changes rotation sense until the limit sensor is no longer engaged.

Dir. Proximity [Left ⌄]

In this case, velocity for the new zero search will be set in the window:

Vel. Index [mm/s] [5,000 ⌃⌄]

It is important that the final search velocity is very low in order to ensure high accuracy of zero.
For stepper motors, if you want to perform homing without proximity to the current position, just set the two speeds to zero.

HOMING PARAMETERS

Dir. Proximity [Left ⌄]

Vel. Proximity [mm/ [20,000 ⌃⌄]   Vel. Final [mm/s] [5,000 ⌃⌄]

Home Offset [mm] [0,000 ⌃⌄]

8. Set Digital Output (brushless motor)

You can configure 4 NPN type output signals. For each output, you can set:
- Busy: the motor is moving therefore it can't receive more movement commands.
- Ready: the motor is stationary and is ready to receive new commands.
- Alarm: every alarm that occurs in the drive will activate this output.
- Position Completed: indicates when the set position is reached.
- Homing Completed: indicates when the Homing operation is completed.

SET DIGITAL OUTPUT

OUTPUT 1 [Alarm ⌄]   OUTPUT 2 [Busy ⌄]

OUTPUT 3 [(Not Configured) ⌄]   OUTPUT 4 [(Not Configured) ⌄]

OUTPUT 5 [(Not Configured) ⌄]   OUTPUT 6 [(Not Configured) ⌄]

8.1 Set Digital Output (stepper motor)

For the stepper motor, the only settable output is 3, while the other outputs are not configurable.
Output 1, Alarm: every alarm that occurs in the drive activates this output.
Output 2, Occupied: the motor is moving and therefore cannot receive other commands.
Output 3, not configured: it can be configured with the same function as the fixed ones.
Output 4, movement: indicates when the target position has been reached.
Output 5, homing completed: indicates when the Homing procedure has been completed.
Output 6, Ready: the motor is stopped and can receive other movement commands.

SET DIGITAL OUTPUT

OUTPUT 1 [Alarm ⌄]   OUTPUT 2 [Busy ⌄]

OUTPUT 3 [(Not Configured) ⌄]   OUTPUT 4 [Position Completed ⌄]

OUTPUT 5 [Homing Completed ⌄]   OUTPUT 6 [Ready ⌄]

Once Setup operations are completed, save the drive data by using the special icons:

In particular:

Save data from the PC to the drive.

Uploads previously saved data in the drive making it available to the PC. the PC.

Restore the USB connection to the drive.

9. Manage

In the Manage page, you will find the motion operational commands, in particular:

9.1 Servo ON and Servo OFF

By clicking on the switch with the mouse, you can change the status from Servo OFF to Servo ON.
ATTENTION! The Servo ON status is possible only if the enable hardware selection is enabled (input IN9 Pin 9 for Brushless drives and input X3 Pin 10 for Stepper drives).
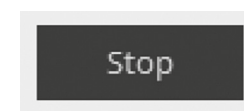
Servo OFF

Servo ON
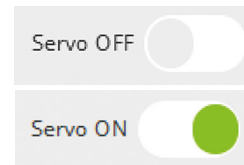
9.2 Homing

By clicking on the Homing icon with the mouse, the Homing procedure previously set in the Setup will begin. ATTENTION!! The Servo must be found in the ON status.

Homing
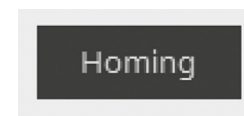
9.3 STOP

If the motor is in motion, this will stop by clicking on the STOP icon.

Stop

9.4 Programs

"Programs" is the table that contains all command lines; the table is directly editable and, in order to easily enter data, you can use the Add

New command. By clicking on the + symbol, you can expand the notes line in order to read its content.

By clicking on the ▷ symbol, you can run the command and therefore move the actuator.
BEFORE RUNNING THE COMMAND; MAKE SURE THAT NO ORGANS, THINGS OR PEOPLE CAN BE DAMAGED OR HARMED BY THE MOTION.

PROGRAMS   Cycle

Add new

PROG.	TYPE COMMAND		FORCE [N] max 3020	POSITION [mm] max 100	VELOCITY [mm/s] max 375	ACC [mm/s²] max 25000	DEC [mm/s²] max 25000		
1	Absolute Pos.	⌄	0,000	0,000	0,000	0,000	0,000	+	▷
2	Absolute Pos.	⌄	0,000	0,000	0,000	0,000	0,000	+	▷
3	Absolute Pos.	⌄	0,000	0,000	0,000	0,000	0,000	+	▷
4	Absolute Pos.	⌄	0,000	0,000	0,000	0,000	0,000	+	▷
5	Absolute Pos.	⌄	0,000	0,000	0,000	0,000	0,000	+	▷
6	Absolute Pos.	⌄	0,000	0,000	0,000	0,000	0,000	+	▷
7	Absolute Pos.	⌄	0,000	0,000	0,000	0,000	0,000	+	▷

9.5 Add New
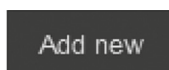
Add new

With the Add new command, you can enter motion data and their position in the command lines of the table. In particular, by clicking on the Add new icon with the mouse, the following image will be displayed:

Where   PROG.   1
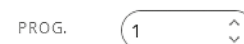
defines the line in the table and can be modified by using the Up and Down arrows or by simply typing the desired line number

Digital Input   ● ● ● ● ● ● ● ●

The "Digital input" icon expresses the combination of the inputs that must be activated depending on the value of the selected program line (see table in the SETUP chapter, paragraph Operation Mode: Digital). The least significant input will be seen on the right and the most significant on the left.

EXAMPLE:

Program Line 1

Digital Input   ● ● ● ● ● ● ● ●   PRO   1

Program Line 25

Digital Input   ● ● ● ● ● ● ● ●   PRO   25

9.6 Command Type

The command type can be:
• Absolute
• Relative
• Force Command.
• Abs pos. + stop
• Abs pos. + Force

TYPE COMMAND   [Pos. Absolute ⌄]

9.7 Absolute

This means that the value expressed is absolute compared to the zero position, therefore if the absolute value is set at 200 mm, the actuator will move 200 mm with respect to the zero position.

TYPE COMMAND   [Pos. Absolute ⌄]   POSITION [mm] max 200   [200.000 ⌄]

If the absolute value is set at 30 mm, the actuator will move (170 mm compared to the previous value), which means it will move 30 mm from the zero position.

TYPE COMMAND   [Pos. Absolute ⌄]   POSITION [mm] max 200   [30.000 ⌄]

9.8 Relative

It means that the movement is relative to the position where the actuator is found, therefore, if you run an absolute movement of 200 mm, and then you set up a relative motion of 30 mm, the actuator will be moved to a value of 230 mm. Every time the relative value is selected, it will be added with respect to its current position at that moment.

TYPE COMMAND   [Pos. Relative ⌄]   POSITION [mm] max 200   [30.000 ⌄]

9.9 Force Command

Force command is measured in Newton and the maximum settable value (which depends on the type of motor and actuator selected) is shown on the side of the settings window. Force command is a temporary command, i.e. it is limited in time; this in order not to enable the motor/drive thermal protection systems. In particular, the time value depends on the value set and, more precisely, the maximum settable value is applied to a value no greater than 1.5 sec.
This time value will increase by reducing the force value.
The force value requires velocity and acceleration/deceleration settings as well.
FORCE COMMAND IS NOT PROVIDED IN STEPPER MOTORS.

TYPE COMMAND   [Force ⌄]

FORCE [N] max 272   [0.000 ⌄]

9.10 Abs pos. + stop (Command with Stop) (only for brushless motors)

It is possible to execute a command line where the end of the motion is not necessarily the position reached but is an input signal that blocks the motion.
For example, you could set a command line like the following:

If the stop input is not activated, the actuator will stop at the 100 mm position. If the stop signal is activated before the absolute position is achieved, the motor will stop using the set deceleration ramp.
In the Brushless motors the Stop input is IN6.
NOTE: with the DRCS stepper drivers all positioning can be stopped with the stop input (pin6 of the "Proximity" connector or pin2 of the "25-pole I/0" connector).

PROG.	TYPE COMMAND	FORCE [N] max 1087	POSITION [mm] max 100	VELOCITY [mm/s] max 375	ACC [mm/s²] max 7000	DEC [mm/s²] max 7000		
1	Abs Pos.+Stop ⌄	0.000	100.000	375.000	1000.000	1000.000	**+**	▷

9.11 Abs pos. + Force (Command with Force) (only for brushless motors)

It is possible to execute a command line where the end of the motion is not necessarily the absolute position reached, but a force greater than that set in the field FORCE. The maximum force changes according to the size of the selected motor.

PROG.	TYPE COMMAND	FORCE [N] max 755	POSITION [mm] max 300	VELOCITY [mm/s] max 1333	ACC [mm/s²] max 25000	DEC [mm/s²] max 25000		
1	Abs Pos.+Force ⌄	250.000	100.000	50.000	1000.000	1000.000	**+**	▷

9.12 Velocity, Acceleration, Deceleration

For each command line, you can set the velocity, acceleration and deceleration in addition to its position; the maximum settable values are shown next to the respective setting window, and are related to the type of motor and actuator set; these values also refer to the reduction ratio set, therefore indicating the actual movement of the actuator.
To facilitate data entry, three easily settable configurations were created.

FORCE [N] max 3020   [0,000 ⌄]   VELOCITY [mm/s] max 375   [375,000 ⌄]

ACC [mm/s²] max 25000   [25000,000 ⌄]   DEC [mm/s²] max 25000   [25000,000 ⌄]

10.   Profile

Profile   ⦿ High Performance   ○ Best Position   ○ Long Life

10.1   High Performance

With High Performance, you can set the maximum velocity, acceleration and deceleration settable for the device.

Profile	⦿ High Performance	○ Best Position	○ Long Life
TYPE COMMAND	Pos. Absolute ⌄	POSITION [mm] max 100	0,000
FORCE [N] max 3020	0,000	VELOCITY [mm/s] max 375	375,000
ACC [mm/s²] max 25000	25000,000	DEC [mm/s²] max 25000	25000,000

10.2   Best Position

With Best Position, you can set maximum velocity and maximum acceleration that can be applied to the device, while deceleration is reduced by 50% so as to be brought in position with greater accuracy therefore reducing the possible over shots.

Profile	○ High Performance	⦿ Best Position	○ Long Life
TYPE COMMAND	Pos. Absolute ⌄	POSITION [mm] max 100	0,000
FORCE [N] max 3020	0,000	VELOCITY [mm/s] max 375	375,000
ACC [mm/s²] max 25000	25000,000	DEC [mm/s²] max 25000	7250,000

10.3   Long life

With Long Life, velocity, acceleration and deceleration are reduced by 50% over the maximum acceptable value, so as to ensure a long product life.

Profile	○ High Performance	○ Best Position	⦿ Long Life
TYPE COMMAND	Pos. Absolute ⌄	POSITION [mm] max 100	0,000
FORCE [N] max 3020	0,000	VELOCITY [mm/s] max 375	187,500
ACC [mm/s²] max 25000	7250,000	DEC [mm/s²] max 25000	7250,000

10.4   Notes

Notes

Comments or reminders can be entered in the notes field in support of reading the program that will be executed.

The Add new button allows entering the commands in the table and also closes the dialog box, while by pressing Cancel you will close the dialog box without implementing the data entered.

ADD NEW   ✕

Digital Input	● ● ● ● ● ● ●	PROG.	1

Profile	⦿ High Performance	○ Best Position	○ Long Life
TYPE COMMAND	Pos. Absolute ⌄	POSITION [mm] max 200	200.000
FORCE [N] max 272	0.000	VELOCITY [mm/s] max 750	750.000
ACC [mm/s²] max 7000	7000.000	DEC [mm/s²] max 7000	7000.000

Notes

Cancel   Add new

10.5 Cycle

Through the Cycle command, you can enter a series of commands in sequential order from one line to another. To compile a cycle table, you must click on the ☑ icon.

From Step and To Step set the limits of the command lines between which the program will run its cycle; in the example above, you will run the cycles included in program lines 1, 2 and 3 and, with this sequence, these programs will continue to cycle. You cannot change the order of execution of the command lines.
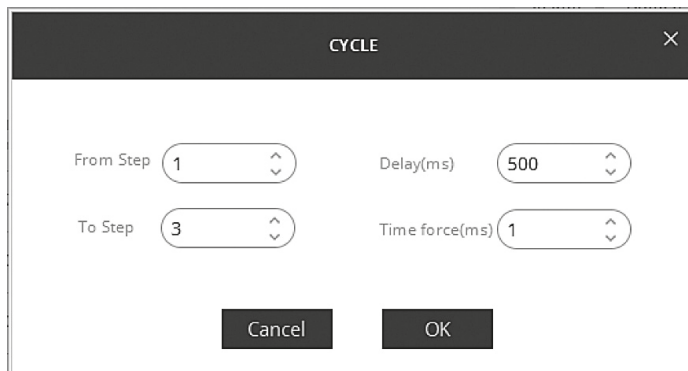The execution time between a line and the other is defined in the Delay settings.

It is expressed in mS (1s= 1000 ms)
If a command line consists of a force command, you must also set the time in which the force will remain applied before moving on to the next line.


10.6 Status

The status window displays a series of information that are not editable.
• In particular:
• In will become lit green while the motor is moving.
• Home will become lit green when the actuator has reached the Homing position.
• Read will become lit green when the drive is ready to receive commands.
• IN, the input LEDs become dark black when the inputs are in the ENABLED status.
• OUT, the output LEDs become dark black when the outputs are in the ENABLED status.
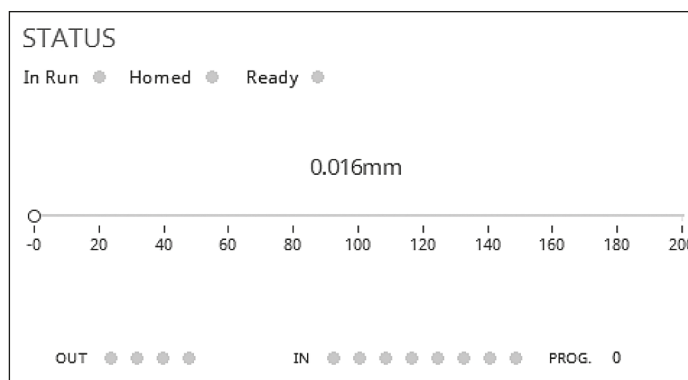
10.7 Manual Control

With the manual controls you can move the actuators clockwise or counter clockwise by pressing the relative icons.
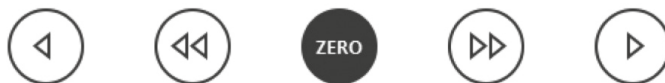

Motion will remain continuous as long as the buttons are pressed.
Use the Step buttons to move the actuators and each time you press the button, you will move the actuator according to the set Step value.

11. Errors

Brushless Motor			
Alarm Code Qset	**Description**	**HIWIN ERROR on display**	**Solution**
1	Amplifier over temperature	E07	The drive is over temperature. (1) Check that the drive is placed in a well-ventilated location. (2) Check if the ambient temperature is too high. (3) Wait for the internal temperature of drive to decrease. (4) To drive a large load or operate at a high duty cycle, install the heat sink if needed.
2	Encoder error	E04	The encoder signal is incorrect, or the alarm pin reports an error. (1) Confirm that all encoder connectors are connected firmly. (2) Confirm that the encoder wiring is correct. (3) If the encoder is a digital type, it may be caused by the external interference. Confirm that the encoder cable has an anti-interference twisted wire and shield, or is equipped with an iron core.
3	PWM disable	W05	The drive's PWM output switch is greater than the limit value and the current output cannot be increased. If this warning continues occurring in the position control, the error of "E03 PEBIG" will happen. (1) Change the power source to 220 V if 110 V is used currently. (2) Reduce the speed, acceleration, or deceleration.

4	Protection Error I²T	E04	Motor overload. (The software detects the motor over-temperature.) (1) Confirm that the continuous current and peak current during motor movement comply with the motor specification. (2) Check if the motor movement is obstructed. (3) It can be eliminated by resetting and re-enabling the drive. However, if the current exceeds the motor specification due to the load and motor parameters, it may occur again. (4) Reduce the speed, acceleration, and deceleration. (5) Check if the motor model name or motor current parameter is set incorrectly.
5	Position error too big Communication	E03	The position error is greater than "maximum pos error" set in the "Motion Protection" area. (1) Check if the gain tuning is improper. (2) Confirm that the maximum position error is set properly (3) Check if the motor movement is obstructed. (4) Check if the load is too heavy. (5) Check if the guideway is without maintenance for a long time. (6) Check if the cable tray is installed too tight. (7) "W05 SVBIG" continues occurring before "E03". If the sed power is 110 V, change it to 220 V.
6	Serial Encoder Error	E12	The serial encoder communication has an error. (1) Check that the encoder cable is connected to the drive. (2) Check that the encoder cable complies with the motor specification.
7	5V for encoder card fail	E10	The 5V power supply of encoder interface is abnormal. (1) Unplug CN6, CN7, and motor power cable of D2 drive. Check whether there is still the error of "E10 V5ERR". If yes, contact the manufacturer for repair; otherwise, check if there is a short circuit and then modify the wiring. (2) Do not hot-plug CN6 and CN7 of D2 drive.
9	Under voltage detected	E09	The DC bus in the drive is too small. Confirm that L1 and L2 of drive are connected to 100 or 220 Vac power sources. Use a multimeter to check whether the input is 100 or 220 Vac.
10	Over voltage detected	E02	The DC bus voltage in the drive exceeds the limit. When the motor has a heavy load and is operated at high speed, the back EMF exceeding the voltage limit will cause this error. Check if the regenerative resistor needs to be installed, which is selected according to the load and the motion specification.
11	Motor short (over current) detected	E01	The short of three motor phases is detected. (1) After power-off, unplug the UVW-phase connector at the drive-side and measure the resistance between each phase of UVW and ground to check if there is a short circuit. The short circuit may burn the motor. (2) Measure the line-to-line resistance between motor UVW phases to check that they are close to the specification. If the line-to-line resistance is lower than the specification too much, the motor may be burned. (3) Separate the motor from the motor power cable and use a multimeter to check if the motor power cable is short.
12	Hall sensor error	E13	The less-wire encoder detects a hall signal error. Check that the encoder cable is properly connected to the drive.
13	Phase initialization error	E11	Motor phase initialization is failed. (1) Check that the encoder signal is normal and motor parameters are set correctly. (2) Check if the payload is too high, the friction is too high, and whether obstacles are on the way.
15	Inconsistent error	E19	Drive hardware signals are conflicted abnormally. Check that each cable is grounded.
16	Current control error	E16	The current control has an error. (1) Check that the motor model name is set correctly. (2) Check that the current-loop gain ("Kp") and servo gain are set appropriately. (3) Check that the encoder cable is connected correctly.
19	Both HW limits active	W11	Both the left and right hardware limits have been triggered. (1) If the hardware limit is not connected to the drive and the false trigger occurs, cancel the enable of hardware limit. (2) If it is confirmed that the limit switch is not actually triggered, check that the wiring or actuation logic is correct.
20	Left HW limit	W03	The hardware limit switch on the left side has been detected and the motor can no longer move to the left. (1) If the hardware limit is not connected to the drive and the false trigger occurs, cancel the enable of hardware limit. (2) If it is confirmed that the limit switch is not actually triggered, check that the wiring or actuation logic is correct.
21	Right HW limit	W04	The hardware limit switch on the right side has been detected and the motor can no longer move to the right. (1) If the hardware limit is not connected to the drive and the false trigger occurs, cancel the enable of hardware limit. (2) If it is confirmed that the limit switch is not actually triggered, check that the wiring or actuation logic is correct.
22	Velocity error warning	W07	The velocity error exceeds the set warning window for velocity error. (1) Check that the servo gain is properly tuned. (2) Check if the warning threshold is set too small. (3) Sometimes, this phenomenon may occur since the maintenance period is over or the lubrication is not implemented.
23	Position error warning	W06	The position error exceeds the set warning window for position error. (1) Check that the servo gain is properly tuned. (2) Check if the warning threshold is set too small. (3) Sometimes, this phenomenon may occur since the maintenance period is over or the lubrication is not implemented.

24	Right SW limit	W02	The set right software limit is reached, and the motor can no longer move to the right.
25	Left SW limit	W01	The set left software limit is reached, and the motor can no longer move to the left.
26	Pulse command and homing conflict	W14	In the position mode, the conflict situation of receiving the pulse command and homing command simultaneously occurs. Do not send the pulse command and perform the built-in homing function at the same time.
28	Homing fail	W13	Failed to perform the homing procedure. (1) Check that the left and right limits, near home sensor, and index signal are normal. (2) Check that "Time out" and "Search end stop current" are set properly.

Stepper Motor			
1			motor not configured
2			homing not executed
3			overflow limit
4			undervoltage
5			Temperature too high
6			overcurrent
7			step lost (if encoder is present)

12. Advanced

12.1 Auto Tune

The Auto Tune command allows automatic calibration of the correct parameters to the drive, depending on the load applied to the actuator.

AUTO TUNE

WARNING

The actuator will produce low and high frequency vibrations.
Before performing the "Auto tune" function make sure that the actuator is in the middle of the stroke.
Be careful object in motion.

GAIN Primary_CG 0,30000

Execute Autotune

Mode ✓ Standard
        Advanced

Stiffness Soft

Execute Autotune

Mode Standard

Stiffness Soft

AUTO TUNE MODE	DESCRIPTION
Standard (Default)	Applicable to the most of mechanical applications. The system stability is very high.
Advanced	Applicable to applications of emphasizing the positioning accuracy. The system performance is better.

STIFFNESS	DESCRIPTION
SOFT	Stiffness is small. Suitable for low stiffness, such as the belt and other mechanisms.
NORMAL (default)	Stiffness is normal. Suitable for high rigidity, such as the ball screw and other mechanisms. If the mechanical stiffness is not clear, select this stiffness.
RIGID	Stiffness is high. Suitable for harmonic drives, gear boxes, and other mechanisms close to the rigid-body system.

Before executing Auto Tune, make sure that:
• The driveis on the ON status (see chapter Manage Servo On Servo Off)
• The actuator is approximately at half its stroke.
• There are no mechanical parts that can collide or break as a result of the oscillations.
• That NO PEOPLE are standing near the actuator.

By pressing the   Execute Autotune   button, the actuator will begin oscillating, initially in low frequency then gradually increasing the oscillation rate.

A dialog box will appear once the test is completed indicating the correct execution of the Auto Tune; resulting parameters will be automatically saved in the drive.

12.2 Log in to modify

The command and the password to access "Log in to modify" is of exclusive information of Camozzi personnel.

🔒 Log in to modify

Contacts

Camozzi Automation S.p.A.
Via Eritrea, 20/I
25126 Brescia - Italy
Tel.+39 030 37921
www.camozzi.com

Customer Service
Tel. +39 030 3792790
service@camozzi.com

Product Certification
Information concerning
product certifications, EC standards,
conformity declarations and instructions
productcertification@camozzi.com

CAMOZZI
Automation

A Camozzi Group Company
www.camozzi.com