

DESCRIPTION

JP is a 2 or 3 axis electronic joystick with power outputs, able to directly control up to 6 proportional solenoid valves with PWM outputs proportional to joystick movements.

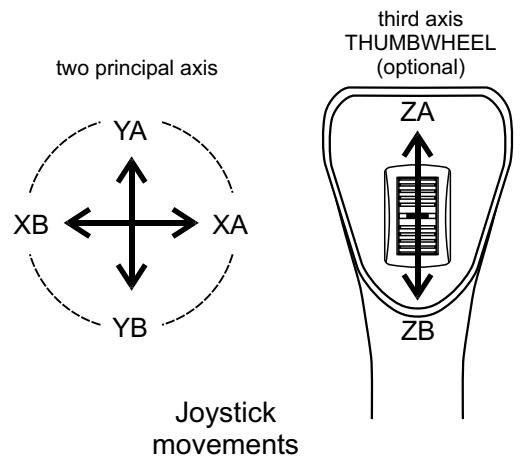
Joystick movements are derived from the measurement of the magnetic field produced by permanent ferromagnets; the measurement is taken through redundant Hall effect probes. This kind of probes are not subject to consumption.

JP contains a microprocessor electronic card; this makes the joystick very reliable and highly customizable.

Also the push button panel is customizable.

Main characteristics:

- you can control two or three proportional independent axis (4 or 6 PWM outputs) or just one proportional output (PWM) with 4 or 6 ON/OFF outputs
- optional "virtual cross" to forbid diagonal movements
- linear or parabolic output curve
- up to 3 speed set selectable by two input
- straight BYPASS output, with delayed turn off
- FAULT output
- standard or capacitive dead man switch
- independent regulation (for each semiaxis) of
 - minimum current
 - maximum current
 - rise timeramp
 - fall timeramp
- PWM frequency adjustable from 50 to 300 Hz
- power supply voltage from 10Vdc to 30Vdc
- completely resinated electronic card
- third proportional axis THUMBWHEEL ready to mount
- provided with a 50 cm long unpluggable cable



TECHNICAL SPECIFICATIONS

Power Supply Voltage	10Vdc ÷ 30Vdc
Current absorption	200 mA + output load (max 10A)
Working temperature range	-20 ÷ 70 °C
PWM output minimum current	from 100 to 2500 mA (with 10 mA resolution)
PWM output maximum current	from 100 to 2500 mA (with 10 mA resolution)
Available PWM frequency	50-60-70-85-100-125-150-200-250-300 Hz
ON/OFF output maximum current	2500 mA
Maximum number of manoeuvres	3 PWM outputs at the same time
Connections	14 poles Molex minifit Jr. conn. with a 50 cm cable included
Under panel size	diameter 80 - width 90 mm
Programming Device	PRG2 serial keyboard

WORKING MODE

The FAULT output in normal operating conditions supplies a positive output (max 2,5A).
In faulty conditions the FAULT output is turned off.

Connecting this signal to a system that puts the installation in safety conditions it is possible to stop the machine operations in case of joystick fault.

The BYPASS output is turned on (positive output max 2,5 mA) every time the joystick is moved from the zero position. When the joystick is released the output is turned off with a 0,4 seconds delay (programmable).

SIGNALS

The red and the green LEDs under the joystick are used to show different working conditions.
In normal operating conditions, the red LED is used as a power supply LED; it is turned on when the power supply is present.

Red LED is turned off for a little while when bypass output is turned on or off.

In case of faulty operations the two LEDs flash in various modes depending on the fault type:

RED LED

Two flash: system turned on with the joystick not at zero position. Outputs will stay turned off. It is necessary to turn off the joystick and turn it on again releasing the lever.

Four flash: Internal error on the magnetic sensors (excessive signal difference between the two probes of the same channel) or movement of the lever too fast. It remains blocked until it is turned off.

Five flash: Internal error on the magnetic sensors or on the third axis input (signal out of range). It remains blocked until it is turned off.

Seven flash: Calibrating parameters not valid. It remains blocked until it is turned off.

GREEN LED

When you move the joystick, the green led is turned on proportional to the greater current supplied. If joystick is not plugged or a wired is broken, the green LED will stay turned off because no current will be supplied.

RED and GREEN LED at the same time

One flash at second: joystick has to be calibrated. Follow the appropriate procedure (reserved).

VIRTUAL CROSS

PWM outputs are turned on to regulate the current that flows in the load proportional to the movements of the joystick. If you activate the "virtual cross" function, you will be able to move joystick in just one direction at a time: the first manoeuvre done forbids all the other manoeuvres until the joystick will return at rest position.

Otherwise, if the "virtual cross" function is not activated, you will be able to do two manovreus at the same time, by moving the joystick in diagonal direction.

The "virtual cross" fuction, if activated, is referred only to the two principal axis; the third axis, if present, will continue to work indipendently to the two other axis.

PROGRAMMING MODE

To adjust JP working parameters, it is necessary to plug the PRG2 programming keyboard into the appropriate connector. JP automatically recognises PRG2 connected and modify his working way to allow current calibration as described below.

Adjustable parameters:

The number of flashes of the programming keyboard LED indicates the programming step in which you are. As PRG2 is connected You are in step no. 1.

By the pressure of "PREV" and "NEXT" push buttons you are able to navigate through the programming steps; otherwise, by the pressure of "+" "-" push buttons you are able to increase and decrease the parameter corresponding to the actual programming step.

At the end of the programming procedure, you have to push "PREV" and "NEXT" push buttons at the same time to save in memory the new parameters value. If You do not give the SAVE command all modification will be loose when JP is turned off.

- Step 1: minimum current regulation (manoeuvres start up speed)
- Step 2: maximum current regulation (manoeuvres max speed)
- Step 3: rise timeramp regulation (manoeuvres acceleration speed)
- Step 4: fall timeramp regulation (manoeuvres deceleration speed)
- Step 5: bypass delay regulation (bypass delay time when all the manoeuvres stop)
- Step 6: PWM frequency regulation (to reduce the solenoid valves histeresis)

For the programming steps from 1 to 4 it is necessary move the joystick to choose the manoeuvre which has to be regulated. Actually, it is possible to set different values of min/max currents, rise/fall timeramp for each movement (semi-axis).

During the programming mode, joystick continues to work normally to give you a real time feedback of the changes done.

The only programming step which modifies joystick behaviour is step number 1, in which you regulate the manoeuvres start up speeds. When the joystick is into this programming step, when you move the joystick the manoeuvres will be turned on only at their start up speed; You have to adjust start speed until all manoeuvres will start to move very slowly or are near to start.

When You move into programming step number 2, to tune maximum speed, You can verify the complete range of the output currents from the minimum speed (regulated in the programming step number 2) to the maximum speed (regulated here).

While the programming steps for 1 to 5 give you a real time feedback of the modifications, the programming step number 6 (PWM frequency regulation) does not. If you cannot estimate the effects of the modifications, you have to do a "blind" regulation.

So you have to know the right frequency value for the solenoid valve that you are using (usually indicated by manufacturer). Find in the following table the index that correspond to the requested frequency.

When you are in programming step number 6, press for at least 2 seconds the "-" button (in this way you reach the 0 value of the frequency parameter). Then push the "+" button a number of times equal to the desired frequency corresponding number.

NOTE: Remember to save parameters before turning off the joystick.

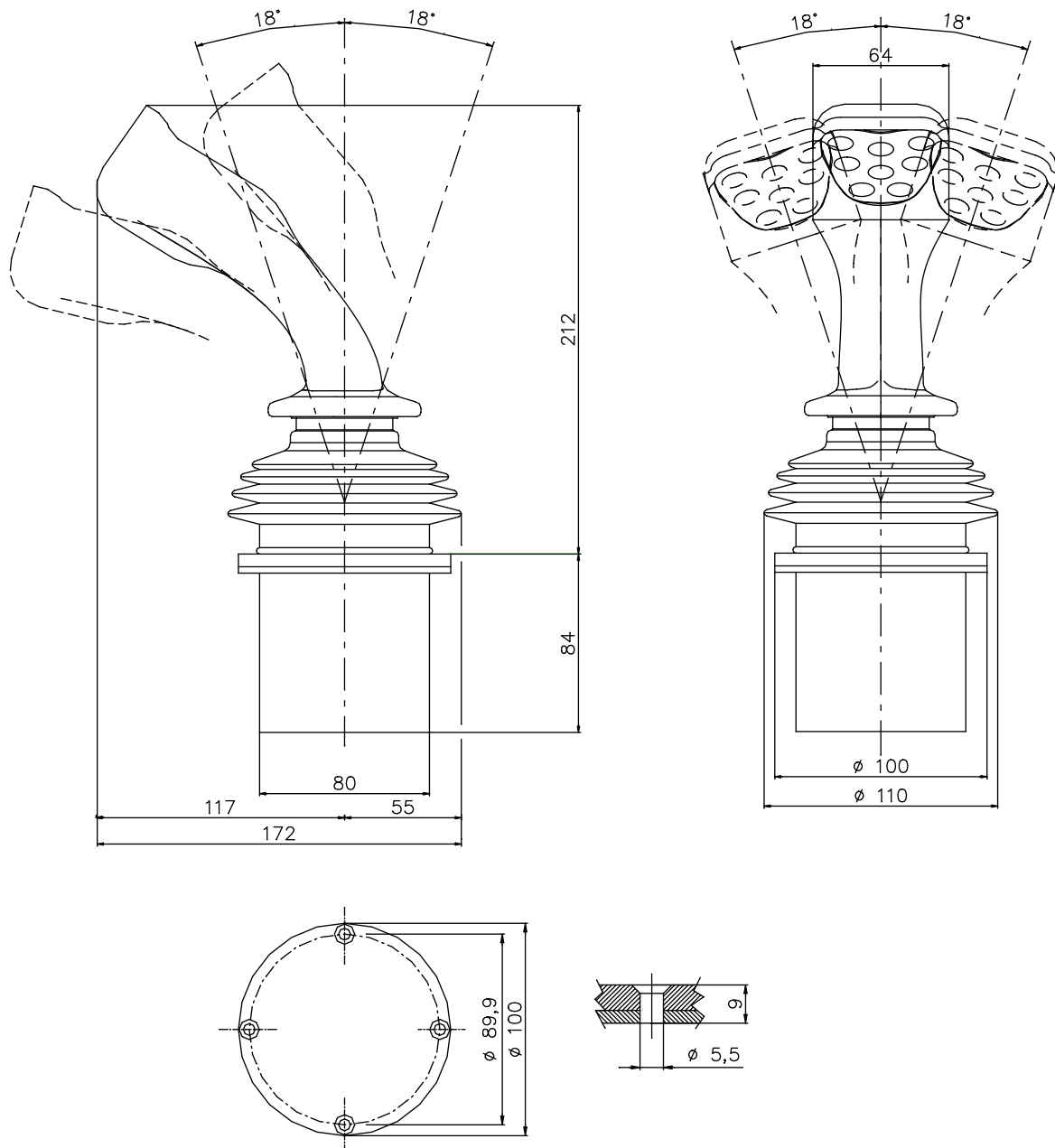
Table of available frequencies for PWM

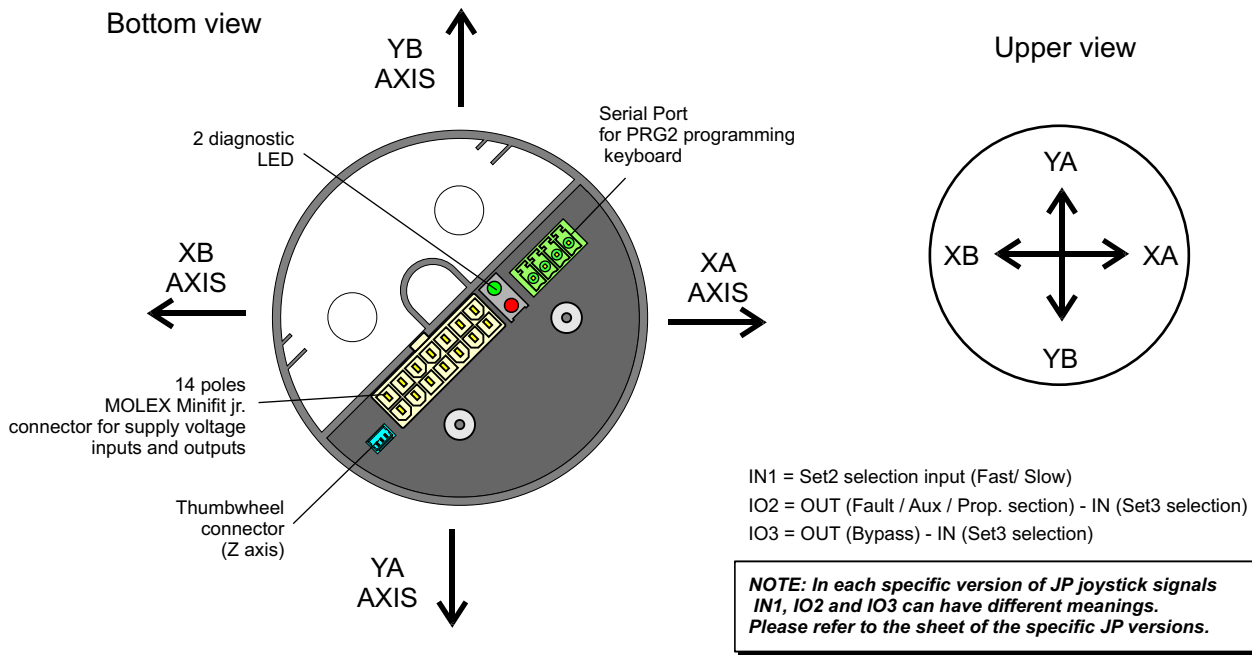
PWM freq.	50 Hz	60 Hz	70 Hz	85 Hz	100 Hz	125 Hz	150 Hz	200 Hz	250 Hz	300 Hz
Index	0	1	2	3	4	5	6	7	8	9

JP

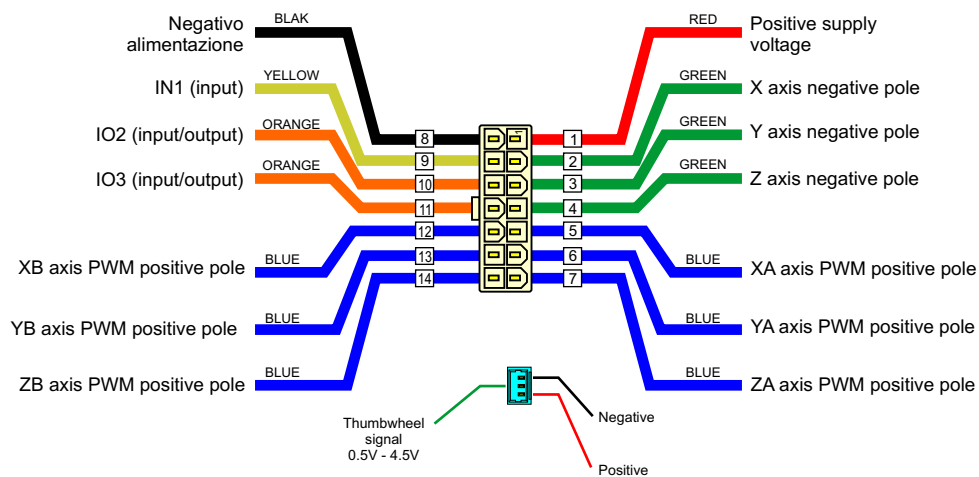
2 / 3 axis joystick with power outputs (PWM)

SIZE



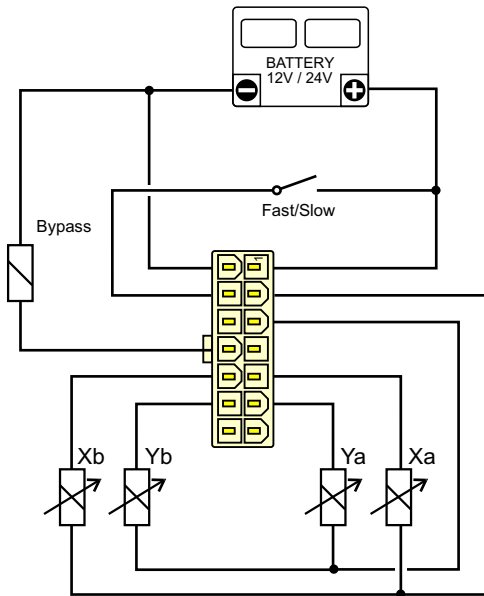


Joystick will be provided with a 50 cm unpluggable cable

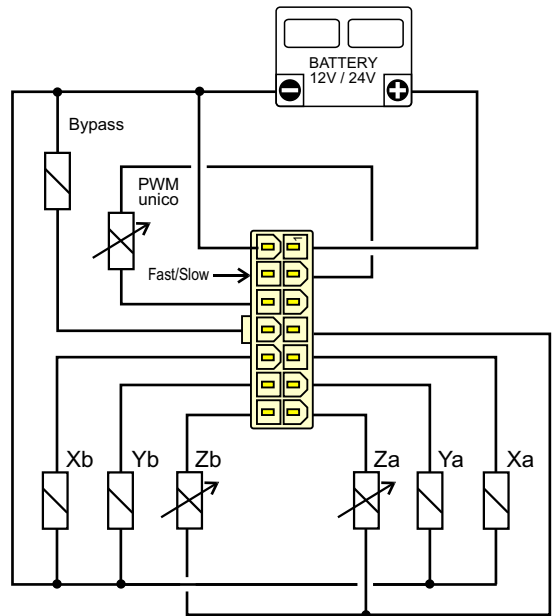


Connection examples in the following page show some possible configurations that can be realized with JP. Each example can require a specific configuration of JP joystick.

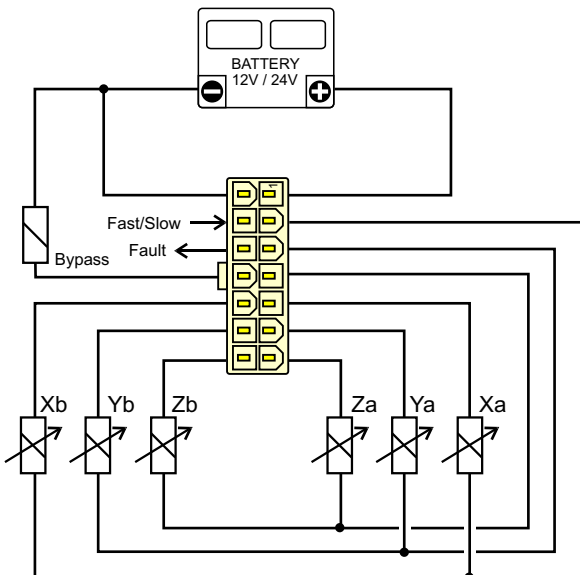
CONFIGURATION EXAMPLES



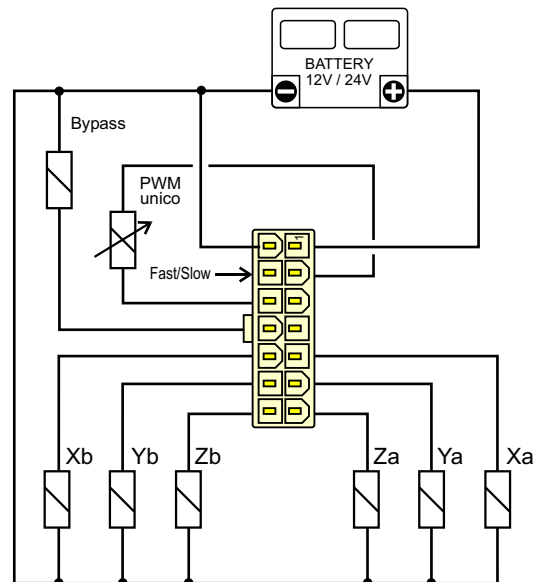
- 2 proportional independent PWM sections (A+B)
- bypass output
- speed selection input (Fast/Slow)



- 1 proportional PWM output + 4 ON/OFF directional outputs
- 1 proportional PWM section (A+B)
- bypass output
- speed selection input (Fast/Slow)



- 3 proportional PWM sections
- bypass output
- fault output
- speed selection input (Fast/Slow)



- 1 proportional PWM output + 6 ON/OFF directional outputs
- bypass output
- speed selection input (Fast/Slow)

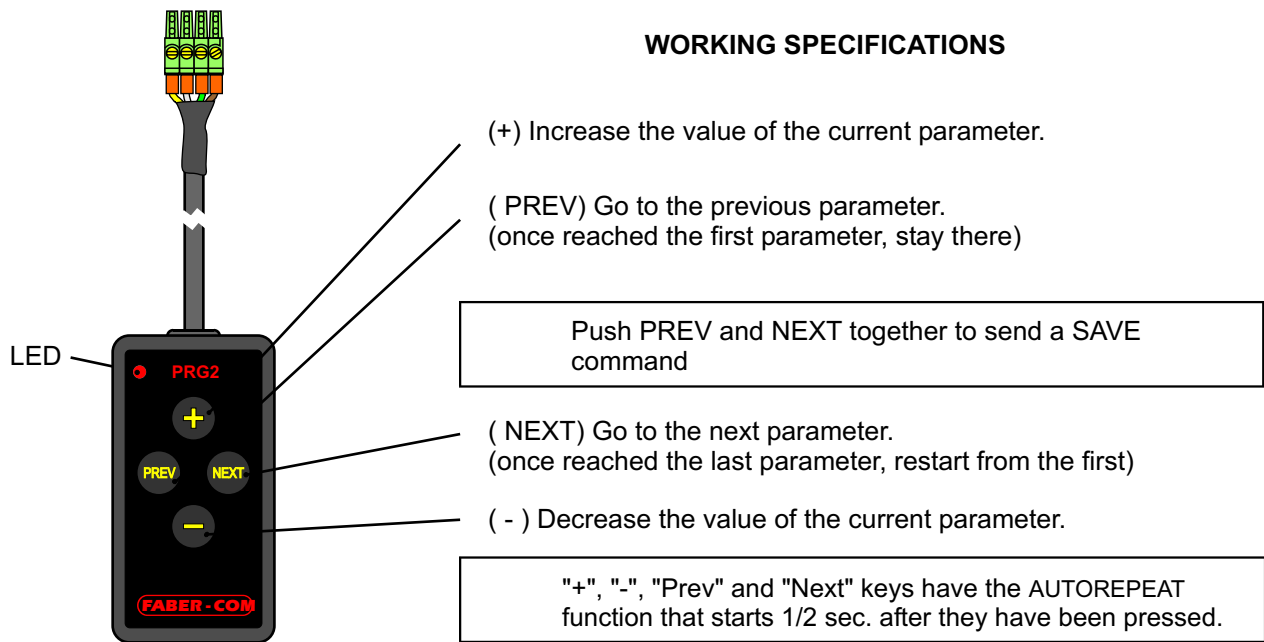
PRG2: SERIAL PROGRAMMING KEYBOARD

With PRG2 keyboard you will be able to scroll the working parameters and tune them at will.

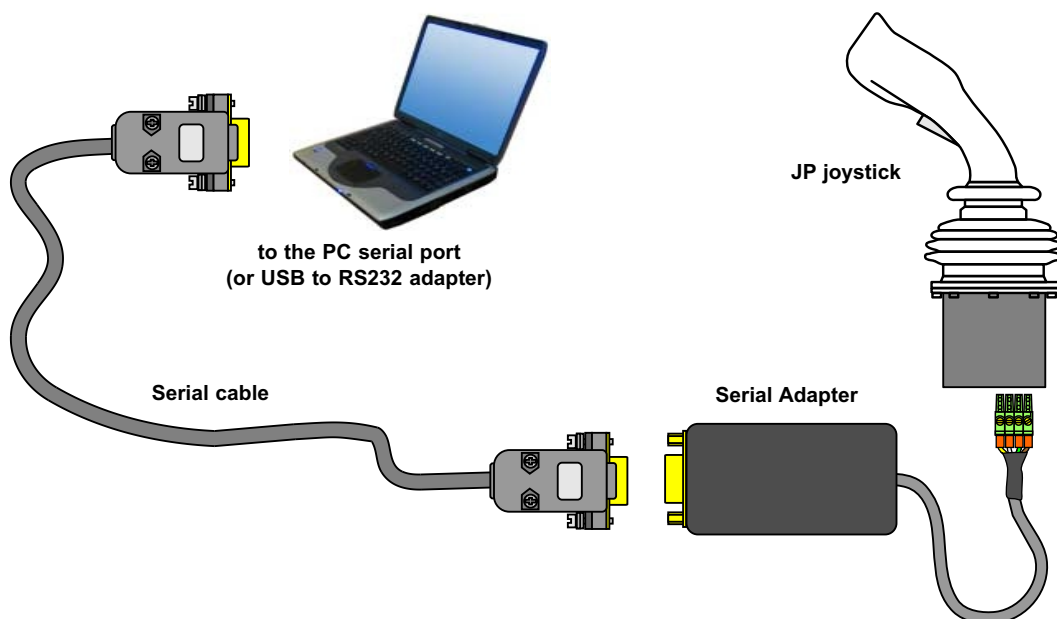
At the end of the programming phase, it is necessary to save parameters in memory, otherwise all the modifications will be lost when the device will be turned off.

PRG2 keyboard connector can be plugged in and pulled out from his socket on the electronic card even with the system turned on. The presence of the programming keyboard will be automatically detected and the device will go in programming mode.

The LED shows, with a series of flashes, the current programming step.



CONNECTION TO PERSONAL COMPUTER BY SERIAL ADAPTER



MAIN PARAMETER DESCRIPTIONS FOR PC INTERFACE PROGRAM

Parameters which have letter "C" in column "TIPO", they DON'T HAVE TO BE modified

Enable "axis rotation", configure output type for each axis and enable the option with only one proportional output.

Each digital input can be configured for doing one of the listed actions in accordance of the signal level (for example: speed SET selection, manoeuvres block, etc.) Otherwise, only for IN/OUT 2 and 3, it can be configured as selected signal's digital output (bypass, auxiliary output, fault, etc.)

CFGB	Tipo	Vis	Letto_A	Letto_B	Descrizione
12	124	D		124	Zb end stroke cal.
13	0x0, 0x0	W	b	00000000	00011100 Global configuration
14	0x0, 0x1	W	b	00000000	00000001 Input 1 configuration
15	0x0, 0x13	W	b	00000000	00000011 In/Out 2 configuration
16	0x0, 0x11	W	b	00000000	00010001 In/Out 3 configuration
17	4	W	D		4 X dead band
18	4	W	D		4 Y dead band
19	4	W	D		4 Z dead band
20	0	W	D		0 Bypass switch on
21	0	W	D		0 Bypass switch off
22	4	W	D		0 Bypass delay (1/10 sec)
23	0x0, 0x7F	W	b	00000000	01111111 Bypass configuration
24	0	W	D		0 ALUX switch on
25	0	W	D		0 ALUX switch off
26	0	W	D		0 ALUX delay (1/10 sec)
27	0x0, 0x0	W	b	00000000	00000000 Aux configuration
28	4	W	D		4 PWM frequency [0 - 9]
29	370	W	D		370 Kp
30	50	W	D		50 Ki
31	1	W	D		1 Kd
32	255	W	D		255 Max probes gap
33	0x0, 0x1	W	b	00000000	00000001 Miscellaneous
34	0	W	D		0 Free 1
35	0	W	D		0 Free 2
36	0	W	D		0 Free 3
37	0	W	D		0 Free 4
38	18, 18	W	d	18	18 s1 - X min. current (L crowd)
39	18, 18	W	d	18	18 s1 - Y min. current (R crowd)
40	18, 18	W	d	18	18 s1 - Z min. current
41	18	W	D		18 s1 - Single min. current
42	52, 52	W	d	52	52 s1 - X max. current (L crowd)
43	52, 52	W	d	52	52 s1 - Y max. current (R crowd)
44	52, 52	W	d	52	52 s1 - Z max. current
45	52	W	D		52 s1 - Single max. current
46	0, 0	W	d	0	0 s1 - X ramp up (L crowd)
47	0, 0	W	d	0	0 s1 - Y ramp up (R crowd)
48	0, 0	W	d	0	0 s1 - Z ramp up
49	0	W	D		0 s1 - Single ramp up
50	0, 0	W	d	0	0 s1 - X ramp down (L crowd)
51	0, 0	W	d	0	0 s1 - Y ramp down (R crowd)
52	0, 0	W	d	0	0 s1 - Z ramp down
53	0	W	D		0 s1 - Single ramp down
54	00000000	W	B		00000000 s1 - Axis configuration
55	0	W	D		0 s1 - Free_1
56	0	W	D		0 s1 - Free_2

Deadman for each axis. Unit of measurement: signal stroke percentage.

Bypass and auxiliary outputs configuration:
 -activation threshold
 -de-activation threshold
 -switch-on delay
 -manoeuvres which can activated the output and them logical of activation

PWM outputs frequency

P.I.D. regulator parameters (don't modify!)

Start current for each axis
 Unit of measurement: mA tens (e.g.: 18 = 180 mA)

Max current for each axis
 Unit of measurement: mA tens (e.g.: 52 = 520 mA)

Ramp Up for each axis
 Unit of measurement: second tenth (e.g.: 2 = 0.2 sec)

Ramp Down for each axis
 Unit of measurement: second tenth (e.g.: 3 = 0.3 sec)

SET1 parameter. SET2 and SET3 are configured at the same way.

Configure output shape for each axis and enable "virtual cross block"

- Active manoeuvres power-on check
- Move X or Y axis to Z axis
- Z axis as digital input
- Reserved
- Not Zero Request for manoeuvres when speed set change
- This mask selects the digital outputs which are driven by selected digital input.