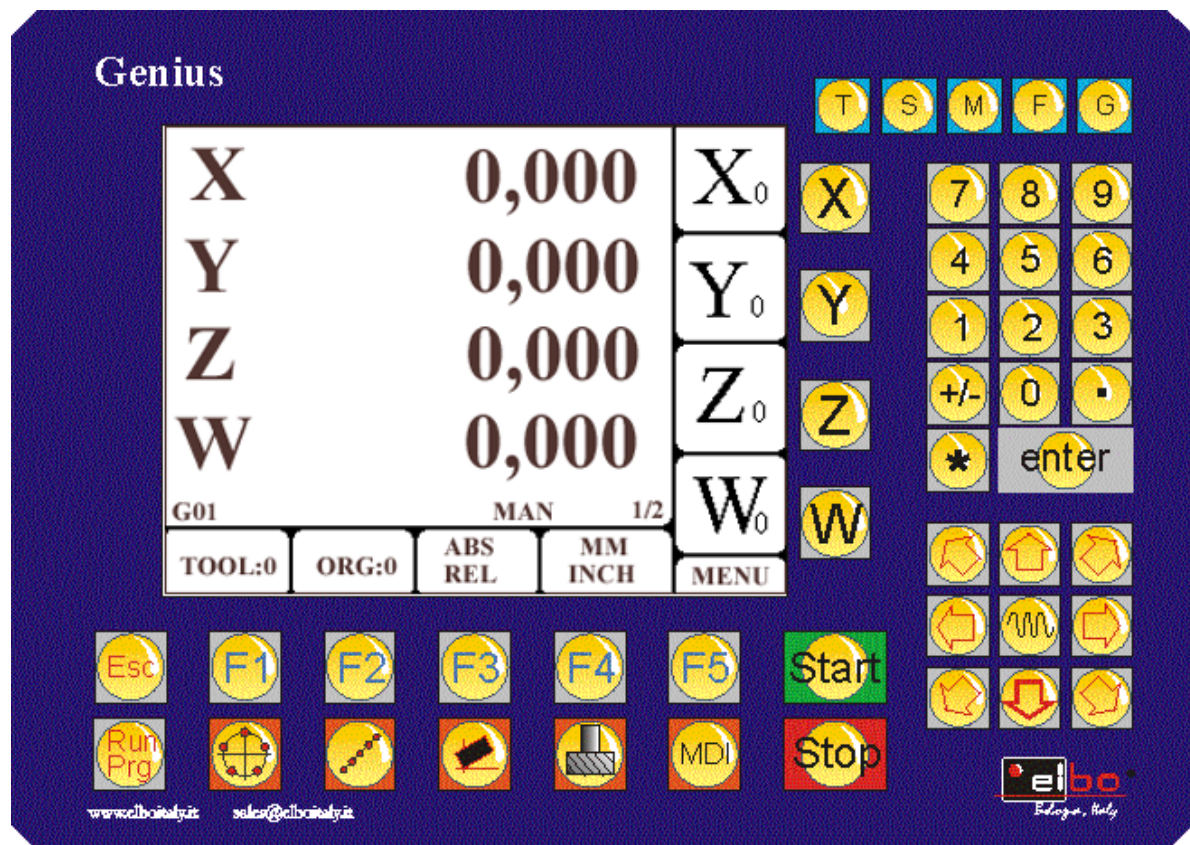


**GENIUS INSTALLATION HANDBOOK**  
**Version V2.5x**



Elbo Bologna – Italy  
December. 2008

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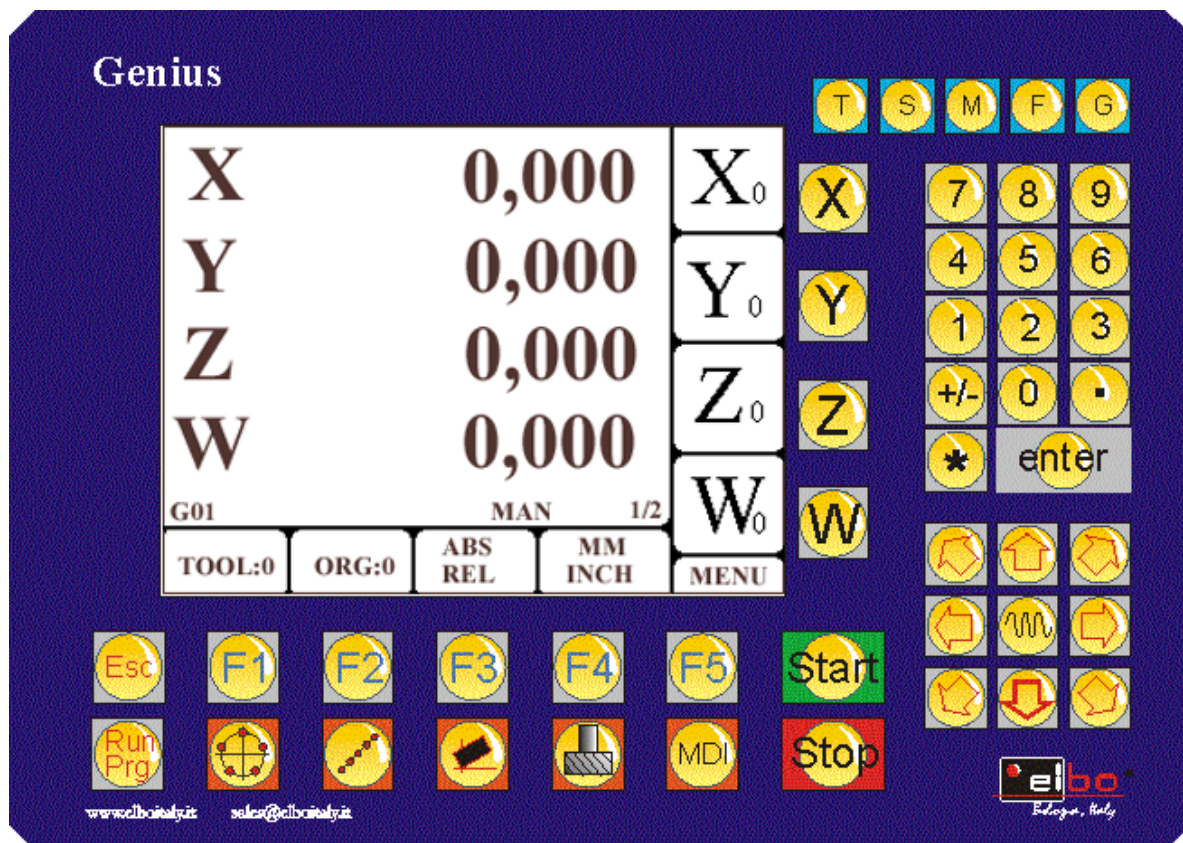
## Version definition

Before to turn on the tool, please check that the voltage is the same as the one selected with the selector (Nr.14 in the picture) that is one the back side of the tool.

You can check the version of the software installed in the tool, in the first screen that will appear, when you turn on the GENIUS.

This installation handbook regards the version: V1.5.

The GENIUS positioner has a graphical LCD and a keyboard. When you turn it on, you will see the following window:



## **GENERAL DESCRIPTION**

The GENIUS positioner is a very versatile tool for machine tools like milling machines.

It is able to move contemporary more axis and to reach the programmed position, BUT WITH NO CONSIDERING THE TRAJECTORY.

This means that the first axis that will reach the programmed point, will then await, the arrival and the finishing of the movements of the other axis.

It is possible to set up some alarms-time.

Setting up adequately their configuration parameters, it can be connected with different type of connection, as here below indicated:

- Machines with 3 and/or 4 axis. Every motor has to be connected to his driver (GENIUS can single out this configuration by the selection of the parameter: Mot+Inv=1+1. Please refer GENERAL CONFIGURATION, AXIS MOVEMENT.) In this configuration, it is not important that all the axis are motorized. For example: you can have X,Y and Z with three motors and three drivers and the fourth axis (W) is manual. In this way you will visualize 4 axis, of which three will be motorized and one is only manual. There is the possibility to have an analogical signal for the control of the rotation of the spindle and his speed control (but in this case it is not possible -X,Y,ZW- to visualize the speed of the rotation of the spindle).

Other example is X,Y,Z and S. In fact you can decide to visualize as the fourth axis, a linear axis like W or a rotative axis like S. In this case it will be generated a control signal for the rotation of the spindle and for his speed. It will be visualized the real speed. PAY ATTENTION: FOR THIS REASON IT HAS TO BE CONNECTED TO THE INPUT OF THE FOURTH AXIS (W/S), AN ENCODER.

You can decide to set up the movement of the axis SEQUENTIALY or SIMULTANEOUSLY (in this last case, the first axis that will reach for first the programmed point, will await the arrival of the others). It is possible to configure a delay-time between the execution of the movement of one axis and the one of another axis, so to adjust himself to electromechanical more or less fast. You can select drivers with analogical input from 0 to 10 V (called also unipolar) or  $\pm 10$  V (called also bipolar).

It is possible to set up mixed formulations, for instance one axis with unipolar driver and the other ones with bipolar drivers. In any case it will be supplied a digital output so to individualize the direction of the selected axis.

- Machines with 3 and/or 4 axis but with only one driver. GENIUS single out this configuration by selecting the parameter: Mot+Inv=1+3. Please refer to GENERAL CONFIGURATION, AXIS MOVEMENT. With this configuration, it is not important that all the axis are motorized. The movement of the axis is only SEQUENTIAL. For all the comments regarding the fourth axis (set up of W axis or S spindle), please refer to the previous paragraph. For the comments regarding the type of the drivers (bipolar or unipolar), please refer to the previous paragraph. In any case it will be supplied a digital output so to individualize, the direction of the selected axis.
- Machines with relè output: by switch ON the parameter USCITA RELE, it will be assigned two digital outputs for the connection of the GENIUS with machines

that have this kind of drivers. With this outputs, it will be indicated the rapid and medium speed. The output regarding the abilitation of the axis will indicate the minimal speed and in any case it will be always present a further digital output for the indication of the axis direction.

In the connector of the analogical, there are 4 analogical for the connection to the motor/driver group. They can be set up from 0 to 10 Volt or from +/- 10 Volt. Differently from the previous ones, this analogical is trough PWM generated and consequently can be not utilized for the spindle orientation. For this reason it is not possible to make operations like rigid tapping or the orientation of the spindle for the tool changement operation.

It is available a connector for the connection of a handwheel. In this connector there are available inputs for the abilitation of the spindle, of the axis that has to be moved and to indicate the feed parameter of the movement. It is also present the contact of the chain of the external emergency (for example for an eventual emergency push-button, that has to be mounted on the handwheel; in the case it should be not present, please remember to bypass this contacts. Otherwise the chain of the emergency can not be closed to allow the ignition of the machine) and the abilitation of the handwheel.

The emergency to the external machine has to be connected to the connector of the inputs of the GENIUS. The positioner has inside a relay that will be opened and consequently interrupts the chain of the emergency, every time it will be discovered from the tool faults or emergency conditions. To restore this internal relay, push more times the STOP key and then ESC.

## **AXIS CONFIGURATION MENU**

GENIUS positioner needs parameterization, that depends from the type of machine where this tool will be mounted.

As he can be connected with machine with different typologies, for instance three motors and three drivers, or three motors and one driver, it is necessary to pay very attention to the introduction of the parameters, so to optimize the work of the machine.



**Pressing** key, you can enter into the menu of the positioner.

1	PROGRAMS LIST
2	LIST OF ORIGIN
3	LIST OF THE TOOLS
4	SPECIAL FUNCTIONS
5	ZERO SEARCH
6	AXIS CONFIGURATION
7	GENERAL CONFIGURATION



**Pressing** key, you can enter into the menu for the configuration of the axis

**PLEASE NOTE: it is necessary to insert the PASSWORD to go ahead.**

**PASSWORD is: 9173**

**The only reason of the PASSWORD is to highlight that you are entering in a very delicate area and for this reason it is necessary to have some abilities to go ahead.**



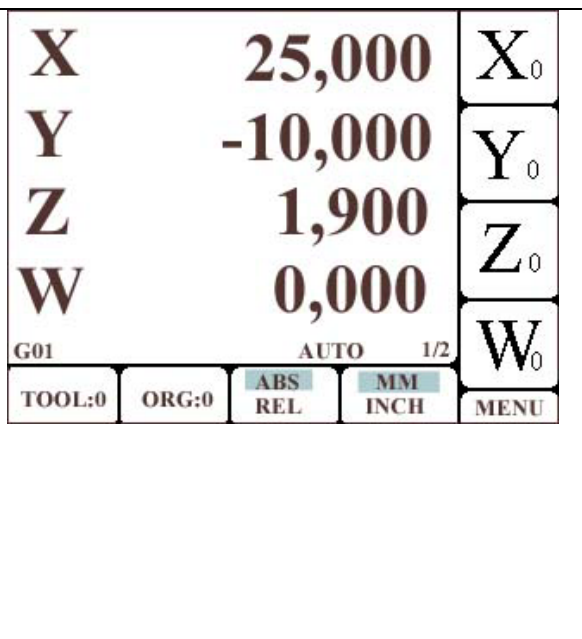










**After the insertion of the password, press the** key and it will appear the following table:




1	ENCODER
2	POSITIONING
3	SPEED
4	AXIS LIMIT AND SLOW DOWN POINT
5	NO LINEAR PARAMETERS
6	RS232 (DISABLED) PARAMETERS
7	RECOVERY OF THE PARAMETERS FROM FLASH
8	BACKUP ON FLASH



## ENCODER MENU

In the menu for the configuration of the encoder, you can insert the parameters regarding the input of the encoder and/or the measurement scales.

 <p> <b>X</b> 25,000 <b>X<sub>0</sub></b>  <b>Y</b> -10,000 <b>Y<sub>0</sub></b>  <b>Z</b> 1,900 <b>Z<sub>0</sub></b>  <b>W</b> 0,000 <b>W<sub>0</sub></b>  G01 AUTO 1/2  TOOL:0 ORG:0 ABS REL MM INCH MENU </p>	  + PASSWORD + ENTER 	PRESS  FOR X AXIS PRESS  FOR Y AXIS PRESS  FOR Z AXIS PRESS  FOR W AXIS PRESS  FOR S AXIS									
Pressing 		<table border="1"> <thead> <tr> <th colspan="3">ENCODER X PARAMETERS</th></tr> </thead> <tbody> <tr> <td colspan="3"> Risol.: 5  Div: 1.000000  Decimals: 3  Direz: DOWN  Enable: ON  VISIBLE: ON  Fatt. Corr.: 1.0000 </td></tr> <tr> <td>ACTIVE KEY &lt;0..9&gt; &lt;ARROW&gt;, &lt;ENTER&gt;</td><td>SAVE</td><td>CANCEL</td></tr> </tbody> </table>	ENCODER X PARAMETERS			Risol.: 5 Div: 1.000000 Decimals: 3 Direz: DOWN Enable: ON VISIBLE: ON Fatt. Corr.: 1.0000			ACTIVE KEY <0..9> <ARROW>, <ENTER>	SAVE	CANCEL
ENCODER X PARAMETERS											
Risol.: 5 Div: 1.000000 Decimals: 3 Direz: DOWN Enable: ON VISIBLE: ON Fatt. Corr.: 1.0000											
ACTIVE KEY <0..9> <ARROW>, <ENTER>	SAVE	CANCEL									
Pressing 		<table border="1"> <thead> <tr> <th colspan="3">ENCODER Y PARAMETERS</th></tr> </thead> <tbody> <tr> <td colspan="3"> Risol.: 5  Div: 1.000000  Decimals: 3  Direz: DOWN  Enable: ON  VISIBLE: ON  Fatt. Corr.: 1.0000 </td></tr> <tr> <td>ACTIVE KEY &lt;0..9&gt; &lt;ARROW&gt;, &lt;ENTER&gt;</td><td>SAVE</td><td>CANCEL</td></tr> </tbody> </table>	ENCODER Y PARAMETERS			Risol.: 5 Div: 1.000000 Decimals: 3 Direz: DOWN Enable: ON VISIBLE: ON Fatt. Corr.: 1.0000			ACTIVE KEY <0..9> <ARROW>, <ENTER>	SAVE	CANCEL
ENCODER Y PARAMETERS											
Risol.: 5 Div: 1.000000 Decimals: 3 Direz: DOWN Enable: ON VISIBLE: ON Fatt. Corr.: 1.0000											
ACTIVE KEY <0..9> <ARROW>, <ENTER>	SAVE	CANCEL									

Pressing 		ENCODER Z PARAMETERS		
		Risol.: 5 Div: 1.000000 Decimals: 3 Direz: DOWN Enable: ON VISIBLE: ON Fatt. Corr.: 1.0000		
		ACTIVE KEY <0..9> <ARROW>, <ENTER>	SAVE	CANCEL
Pressing 		ENCODER W PARAMETERS		
		Risol.: 5 Div: 1.000000 Decimals: 3 Direz: DOWN Enable: ON VISIBLE: ON Fatt. Corr.: 1.0000		
		ACTIVE KEY <0..9> <ARROW>, <ENTER>	SAVE	CANCEL
Pressing 		ENCODER S PARAMETERS		
		Risol.: 5 Div: 1.000000 Decimals: 0 Direz: UP Enable: ON Fatt. Corr.: 1.0000		
		ACTIVE KEY <0..9> <ARROW>, <ENTER>	SAVE	CANCEL

## **DESCRIPTION OF THE PARAMETERS FOR THE X, Y, Z AND W AXIS**

**Risol:** parameter that shows the resolution of the measurement system. To change the value, please go with the vertical arrows on the scale, write the new value and then push ENTER.

**Div:** multiplicative/divisor factor for the adapting of the number of the impulses of the measurement system to the real shift of the axis. To change the value, please go with the vertical arrows on the scale, write the new value and press ENTER.

**Decimals:** Number that indicates the position of the comma in the representation of the numerical value. To change the value, go with the vertical arrows on the scale, write the new value and push ENTER. The maximal value that can be set up is 3.



**Direz:** It allows to choose the direction of the counting. It can have two values UP or DOWN. Pressing ENTER you can commute between the two values.

**Enable:** It allows to start up the counting of the measurement system. It can have two values ON or OFF. If it is OFF, the axis is visualized but the measurement transducer (measurement scale or encoder) is not activated. If you press ENTER you can commute between the two values.

**Visible:** It allows to visualize or not the axis on the principal page. You can have two value ON or OFF. If it is OFF, the axis is NOT visualized but the measurement transducer (measurement scale or encoder) is activated. You can in this way, hide one axis from the normal visualization, activate the summation, and make to add the sensor that is connected to the no visualized axis, with another axis. Pressing ENTER you can commute between the two values.

**Fatt. Corr:** It is a numerical value to apply, so to make the linear compensation of the selected axis.

## **DESCRIPTION OF THE PARAMETERS FOR THE S AXIS**

**Risol:** Parameter that indicates the resolution of the measurement system. To change the value go with the vertical arrows on the scale, write the new value and press ENTER.

**Div:** multiplicative/divisor factor that allows to adapt the number of the impulses of the measurement system to the real shift of the axis. To change the value, go with the vertical arrows on the scale, write the new value and press ENTER.

**Decimal:** Number that indicates the position of the comma in the representation of the numerical value. To change the value, go with the vertical arrows on the scale, write the new value and push ENTER.

**Direz:** It allows to choose the direction of the counting. It can have two value UP or DOWN. Pressing ENTER you can commute between the two values.

**Enable:** It allows to activate the counting of the measurement system. It can have two values ON or OFF. If it is OFF, the axis is visualized but the measurement transducer (measurement scale or encoder) is not activated. Pressing ENTER you can commute between the two values.

**Fatt. Corr:** It is a numerical value to apply, so to make the linear compensation of the selected axis.



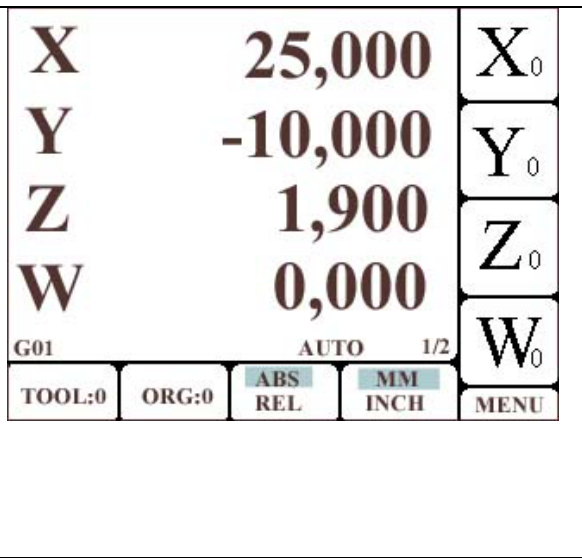








**PLEASE NOTE: PRESS**





**OR TO CANCEL THE INTRODUCED CHANGES**

## **POSITIONING MENU**

In the menu of the configuration of the positioning, you can insert the parameters regarding the precision of the positioning, the points of beginning of the ramp, the slope of the ramp in acceleration and the one in slow down, the signal of the analogical, and the digital calibration of the offset of the kinematics chain (positioner + external driver).

 <p> <b>X</b> 25,000 <b>X<sub>0</sub></b>  <b>Y</b> -10,000 <b>Y<sub>0</sub></b>  <b>Z</b> 1,900 <b>Z<sub>0</sub></b>  <b>W</b> 0,000 <b>W<sub>0</sub></b>  G01 AUTO 1/2  TOOL:0 ORG:0 ABS REL MM INCH MENU </p>	 + PASSWORD + ENTER 	PRESS  FOR X AXIS PRESS  FOR Y AXIS PRESS  FOR Z AXIS PRESS  FOR W AXIS									
Pressing 		<table border="1"> <thead> <tr> <th colspan="3">POSITIONING X PARAMETERS</th> </tr> </thead> <tbody> <tr> <td colspan="3"> Prec. (-) : 0.010  Prec. (+): 0.010  In Pos. (-) : 0.090  In Pos. (+): 0.090  Dist.1 (-): 5.000  Dist.1 (+): 5.000  Ramp Acc.: 8  Ramp Dec. : 1.00  Analog. (+): UP  Offset: 0 </td> </tr> <tr> <td>ACTIVE KEY &lt;0..9&gt; &lt;ARROW&gt;, &lt;ENTER&gt;</td> <td>SAVE</td> <td>CANCEL</td> </tr> </tbody> </table>	POSITIONING X PARAMETERS			Prec. (-) : 0.010 Prec. (+): 0.010 In Pos. (-) : 0.090 In Pos. (+): 0.090 Dist.1 (-): 5.000 Dist.1 (+): 5.000 Ramp Acc.: 8 Ramp Dec. : 1.00 Analog. (+): UP Offset: 0			ACTIVE KEY <0..9> <ARROW>, <ENTER>	SAVE	CANCEL
POSITIONING X PARAMETERS											
Prec. (-) : 0.010 Prec. (+): 0.010 In Pos. (-) : 0.090 In Pos. (+): 0.090 Dist.1 (-): 5.000 Dist.1 (+): 5.000 Ramp Acc.: 8 Ramp Dec. : 1.00 Analog. (+): UP Offset: 0											
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POSITIONING Y PARAMETERS											
Prec. (-) : 0.010 Prec. (+): 0.010 In Pos. (-) : 0.090 In Pos. (+): 0.090 Dist.1 (-): 5.000 Dist.1 (+): 5.000 Ramp Acc.: 8 Ramp Dec. : 1.00 Analog. (+): UP Offset: 0											
ACTIVE KEY <0..9> <ARROW>, <ENTER>	SAVE	CANCEL									

Pressing 		POSITIONING Z PARAMETERS		
		Prec. (-) : 0.010 Prec. (+): 0.010 In Pos. (-) : 0.090 In Pos. (+): 0.090 Dist.1 (-): 5.000 Dist.1 (+): 5.000 Ramp Acc.: 8 Ramp Dec. : 1.00 Analog. (+): UP Offset: 0		
		ACTIVE KEY <0..9> <ARROW>, <ENTER>	SAVE	CANCEL
Pressing 		POSITIONING W PARAMETERS		
		Prec. (-) : 0.010 Prec. (+): 0.010 In Pos. (-) : 0.090 In Pos. (+): 0.090 Dist.1 (-): 5.000 Dist.1 (+): 5.000 Ramp Acc.: 8 Ramp Dec. : 1.00 Analog. (+): UP Offset: 0		
		ACTIVE KEY <0..9> <ARROW>, <ENTER>	SAVE	CANCEL

## **DESCRIPTION OF THE PARAMETERS FOR THE X, Y,Z, AND W AXIS**

**Prec.(-):** It indicates the distance that is less, respect of the ideal positioning point. When the axis is included between the point indicated with this parameter and the corresponding Prec. (+) one, the positioner considers that the programmed position is reached. To change the value, go with the vertical arrows on the scale, write the new value and press ENTER.

**Prec. (+):** It indicates the distance that is more, respect of the ideal positioning point. When the axis is included between the point indicated with this parameter and the corresponding Prec. (-) one, the positioner considers that the programmed position is reached. To change the value, go with the vertical arrows on the scale, write the new value and press ENTER.

**In Pos. (-):** for the use in the future

**In Pos. (+):** for the use in the future

**Dist.1 (-):** Insert in this parameter the distance (that is less) from the programmed point from where begins the deceleration ramp. To change the value, go with the vertical arrows on the scale, write the new value and press ENTER.

**Dist.1 (+):** Insert in this parameter the distance (that is more) from the programmed point, from where begins the deceleration ramp. To change the value, go with the vertical arrows on the scale, write the new value and press ENTER.

**Ramp Acc.:** It is the value that is utilized to increment the ramp during the accelerations. It is an integer between 0 and 255. To change the value, go with the vertical arrows on the scale, write the new value and press ENTER.

**Ramp Dec.:** It indicates the value of the deceleration factor utilized during the approaching to the programmed points. It is a factor comprehensive between 0 and 10. With the value 1, you have a neutral behaviour. With a bigger value, the slope of the braking will be increased but the distance between the beginning ramp point (Dist.1) and the programmed point will remain unchanged. Essentially the slowing down is more rapid.

With a value less than 1, the braking becomes more soft and slow, with more possibility to overstep the programmed quote. To change the value, go with the vertical arrows on the scale, write the new value and press ENTER.

**Analog. (+):** It indicates the direction of the analogical value. It can have two values, UP and DOWN and you can change them choosing the scale and pressing ENTER. This parameter together with the direction parameter in the part regarding the configuration of the ENCODER, allows to configure the machine in all the 4 quadrants.











**Offset:** This parameter allows to make up for eventual offset in the kinematics chain by digital mode. To change the value, go with the vertical arrows on the scale, write the new value and press ENTER. The maximal value that you can set up is 127.




PLEASE NOTE: PRESS  TO CONFIRM THE CHANGES, PRESS  OR , TO CANCEL THE CHANGEMENTS

**NOTE: In this menu there are no parameters for S axis**

## **SPEED MENU**

In the menu for the configuration of the speed, you can insert the parameters regarding the speed of the axis of the machine, the type of the analogical that is generated from the servo drivers or inverter, the parameters for the Zero searching, the sequenz of the movement for the Zero searching, if it results that the axis is motorized.

<div> <div> X 25,000 X<sub>0</sub>  Y -10,000 Y<sub>0</sub>  Z 1,900 Z<sub>0</sub>  W 0,000 W<sub>0</sub> </div> <div> G01 AUTO 1/2  TOOL:0 ORG:0 ABS REL MM INCH MENU </div> </div>	<div>   </div> <div>+ PASSWORD + ENTER</div> <div>  </div>	<div> PRESS  FOR X AXIS  PRESS  FOR Y AXIS  PRESS  FOR Z AXIS  PRESS  FOR W AXIS  PRESS  FOR S AXIS </div>									
<div> Pressing  </div>		<table border="1"> <thead> <tr> <th colspan="3">VELOCITY X PARAMETERS</th> </tr> </thead> <tbody> <tr> <td colspan="3"> Vel. Max.: 3000  Vel. Min: 30  Invert. :bip.  Vel. Zero 1: 200  Vel. Zero 2: 100  Anal. Z1 (+): MAN  Ord. Seq. X: 0  Motor: ON </td> </tr> <tr> <td>ACTIVE KEY &lt;0..9&gt; &lt;ARROW&gt;, &lt;ENTER&gt;</td> <td>SAVE</td> <td>CANCEL</td> </tr> </tbody> </table>	VELOCITY X PARAMETERS			Vel. Max.: 3000 Vel. Min: 30 Invert. :bip. Vel. Zero 1: 200 Vel. Zero 2: 100 Anal. Z1 (+): MAN Ord. Seq. X: 0 Motor: ON			ACTIVE KEY <0..9> <ARROW>, <ENTER>	SAVE	CANCEL
VELOCITY X PARAMETERS											
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VELOCITY Y PARAMETERS											
Vel. Max.: 3000 Vel. Min: 30 Invert. :bip. Vel. Zero 1: 200 Vel. Zero 2: 100 Anal. Z1 (+): MAN Ord. Seq. X: 0 Motor: ON											
ACTIVE KEY <0..9> <ARROW>, <ENTER>	SAVE	CANCEL									

Pressing 		VELOCITY Z PARAMETERS		
		Vel. Max.: 3000 Vel. Min: 30 Invert. :bip. Vel. Zero 1: 200 Vel. Zero 2: 100 Anal. Z1 (+): MAN Ord. Seq. X: 0 Motor: ON		
		ACTIVE KEY <0..9> <ARROW>, <ENTER>	SAVE	CANCEL
Pressing 		VELOCITY W PARAMETERS		
		Vel. Max.: 3000 Vel. Min: 30 Invert. :bip. Vel. Zero 1: 200 Vel. Zero 2: 100 Anal. Z1 (+): MAN Ord. Seq. X: 0 Motor: ON		
		ACTIVE KEY <0..9> <ARROW>, <ENTER>	SAVE	CANCEL
Pressing 		VELOCITY S PARAMETERS		
		Invert. :bip. Vel. Max: 3000 M41 Max: 300 M42 Max: 1000 M43 Max: 2000 M44 Max: 3000		
		ACTIVE KEY <0..9> <ARROW>, <ENTER>	SAVE	CANCEL

## **DESCRIPTION OF THE PARAMETERS FOR THE X, Y, Z, AND W AXIS**

**Vel. Max:** It indicates the max speed that the axis can reach when his driver or the alimentation system is a the top. When, during the programmation, it is commanded a rapid shift, the positioner will generate an analogical tension corresponding to +/- 10 Volt (in case of bipolar drivers) or + 10 V (in case of unipolar drivers). Check that in this condition, the inserted value in this parameter, should be the nearest possible one, to the real shift. It would be useful for you to check the movement of the axi, after the selection of the second page of the visualization, put the machine in manual mode, commute the page of the visualization on page 2 and move the axis in speed. His real velocity is indicated on the side of the inscription Vx (for the X axis), Vy (for the Y axis), Vz (for the Z axis) and Vw (for the W axis). To change the value, go with the vertical arrows on the scale, write the new value and press ENTER.



**Vel. Min:** It indicates the minimal speed of the axis, considered as the inferior limit under which it is not possible to go down, and it results activated during the deceleration ramp when the positioner makes a movement. During the approaching phase, the positioner carries out a ramp which slope depends from the deceleration factor (refer to RAMPA DEC. on the previous chapter). It could happen that in some case, even if the programmed point is still not reached, the value of the analogical generated from the tool reach a so low value that it is not possible for the driver and motor to go ahead with the movement.

This situation will be considered as an alert situation because the driver is abilited but the axis results stopped and it is not possible to rach the desired point. The inferior threshold of minimal speed, is to avoid this stalemate. In fact, during the approaching phase, i.e. during the generation of the ramp, it will be physically sent to the driver/motor group always and in any case the bigger tension choosen between the one calculated from the ramp or the one definied from the threshold of the minimal speed. In this way, it will be always possible, by operating with the value of the minimal speed, to positioning on the desired point.

**Invert.:** It is possible to choose the type of analogical generated from the positioner, to move one axis. It can have two values, **bip.** and **unip.**. You can change them choosing the scale and pressing ENTER. If you choose the option **bip.**, the tool generates an analogical comprehensive between -10V and +10V. If you choose **unip.**, the tool generates an analogical always positive and is comprehensive between 0V and +10V. It is possible to have mixed combinations, for example to the axis a bipolar driver and to the others, unipolar drivers. Furthermore, it is always at disposal together with the analogical, also a digital output, for every axis corresponding to the direction of the movement.

**Vel. Zero 1:** It is the speed value that the positioner sets up during the first search phase of the Zero point. In fact, when in the parameter Anal. Z1(+) the search is in UP or DOWN (if you have choose the MAN option, the Zero search has to be executed moving the manually the axis), the machine makes the movement of the axis until touching the end of the travel, to search the point Zero. The direction of this movement is definied from the parameter UP or DOWN. After the touch of the end-travel for the Zero search, the positioner inverts the direction of the axis movement and changes the speed going to the value indicated from the parameter Vel. Zero2.

**Vel. Zero 2:** It is the speed value of the axis during the second search phase, of the Zero point (i.e. the phase after the touch of the end-travels of Zero search). During this movement, it appears near the letter corresponding the axis that is in movement, a symbol that identifies the phase of the Zero search. The first Zero point obtained from the measurement sensor, stops the axis and fix this mechanical point as the ZERO MACHINE or ABSOLUT ZERO. If the search phase is set up also for the other axis, after the fixing of the ABSOLUT ZERO for this axis, the positioner will repeat the same operation also for the other axis.

**Anal. Z1(+):** It allows to set up the modality of the Zero search, i.e. the direction of the movement during the first phase of the procedure until to activate the micro of the Zero search (parameter UP or DOWN) or to activate the manual Zero search (parameter

MAN). This parameter can so take three values, respectively UP, DOWN and MAN. You can choose them, going on it and pressing ENTER.

**Ord. Seq. X:** With this parameter you set up the order for the axis search when the automatical Zero search is activated. The value can be a number comprehensive between

0 and 4. With the 0 we mean that for the axis it is not necessary to make any Zero search. The numerical value 1 associated to one axis, indicates that this axis is the first that has to move during the complete Zero search (when we say "complete Zero search" we mean that the search will be made for all the axis correctly configured). The axis with the value nr.2, will begin the search phase, when the axis nr.1 has finished his search.

ATTENTION: IT IS NOT POSSIBLE TO PUT OR TO CONFIGURATE TWO AXIS WITH THE SAME SEQUENCE NUMBER. IT COULD BE HAPPEN MOVEMENT OR BEHAVIOURS NOT FORESEEABLE.

ATTENTION: IF IN THE PENSILE THERE IS THE DEMONSTRATIVE JUMPER THAT CONNECTS THE END OF PROGRAMM OUTPUT TO THE START STEP/START PROGRAMM INPUT, DON'T EXECUTE THE ZERO SEARCH. FIRST REMOVE THIS CONNECTION.

**Motor:** It is a parameter that can be ON or OFF. If it is ON, the positioner considers that the axis is motorized and so he activates the necessary functions to move it, when it is programmed. If the parameter is OFF, the functions regarding the movement are not possible. For example, you can set up three axis (X, Y, Z) with the parameter ON and the W axis with OFF. In this way, during a self-learning program creation, you will memorize only the quotes that regards the movement of the axis which parameter is ON.

ATTENTION: DURING AN ORDER MDI OF ONE AXIS MOVEMENT, WHICH PARAMETER IS OFF, IT IS NOT POSSIBLE TO MAKE ANY SHIFT.

ATTENTION: DURING THE VISUALIZATION OF ONE PIECE PROGRAMM, WHEN THE POSITIONER IS SET UP IN THE MANUAL MODALITY (IT IS WRITTEN "MAN" ON THE BOTTOM, ON THE RIGHT SIDE), IF ONE AXIS HAS THE MOTOR PARAMETER THAT IS SET UP IN OFF, IT WILL NOT APPEAR ANY SIMBOL REGARDING THE MOVEMENT. IN FACT THIS SIMBOL SHOWS TO THE OPERATOR, WHICH AXIS IS TO MOVE, TAKING IT TO ZERO; IN THIS CASE, IF THIS AXIS IS NOT CONFIGURED FOR THE MOVEMENT, IT WILL ALSO BE , THAT THIS SIMBOL WILL NOT APPEAR.

## **DESCRIPITON OF THE PARAMETERS FOR THE S AXIS**

**Invert.:** It is possible to choose the type of the analogical generated from the positioner to move one axis. It can have two values, **bip.** and **unip.** and you can change them choosing the scale and pressing ENTER. Choosing the **bip.** option, the tool generates an analogical comprehensive between -10V and +10V. Choosing the **unip.** option, the tool generates always a positive analogical and that is comprehensive between 0V and +10V.

It is possible to make mixed combinations, for instance, to one axis a bipolar driver and for the other axis, all unipolar drivers. Furthermore, it is always at disposal together with the analogical, also a digital output, for every axis corresponding to the direction of the movement.

**Vel. Max:** It is the max speed of the spindle rotation when his driver or the supply system is at the top. When we set up a rotation with the S order, the positioner will generate an analogical tension that corresponds to +/- 10 Volt (in case of bipolar drivers) or +10 Volt (in case of unipolar drivers).  
To change the value go with the vertical arrows on the scale, write the new value and press ENTER.

**M41 Max:** It represents the max spindle rotation value, when it is set up the code M41 inside the piece programm. When it is activated, both the outputs will have the logical value of 0 (ATTENTION: YOU HAVE TO ACTIVATE THE OPTION M41\_44:ON)

**M42 Max:** It represents the max spindle rotation when it is set up the code M42 inside the program piece. When it is activated, the output corresponding to LENTO is 1, and the output corresponding to RAPIDO will be 0. (ATTENTION: YOU HAVE TO ACTIVATE THE OPTION M41\_44:ON)

**M43 Max:** It represents the max spindle rotation when it is set up the code M43 inside the program piece. When it is activated, the output corresponding to LENTO is 0, and the output corresponding to RAPIDO will be 1. (ATTENTION: YOU HAVE TO ACTIVATE THE OPTION M41\_44:ON)

**M44 Max:** It represents the max spindle rotation when it is set up the code M44 inside the program piece. When it is activated, the output corresponding to LENTO is 1, and the output corresponding to RAPIDO will be 1. (ATTENTION: YOU HAVE TO ACTIVATE THE OPTION M41\_44:ON)




PLEASE NOTE: PRESS  TO CONFIRM THE CHANGES AND PRESS   
OR  TO CANCELL THE CHANGES WITHOUT THE SAVING

## AXIS LIMIT MENU AND SLOW DOWN POINTS

In this menu you will insert the parameters regarding the software limits (implemented from the next versions) and the distances regarding the slowing down points that has to be executed when the modality "USCITA RELE" is activated in the positioner.

The parameter **Ack.Dly** is for options available in the future. The parameter **Alarm**, expressed in seconds, represents the slot in which the axis can be in movement with not retroaction of the axis counting. **WAIT POS** is a parameter expressed in tenths of second, it represents the time period that has to be spent with the axis in position, the analogical reference null and the driver allowed. After this period the driver will be disconnected as long as the axis is still within the tolerance windows that was set up; otherwise, it will be supplied again a new tension reference so to repositioning the axis within the definite tolerances.

<div> <div>X 25,000 X<sub>0</sub></div> <div>Y -10,000 Y<sub>0</sub></div> <div>Z 1,900 Z<sub>0</sub></div> <div>W 0,000 W<sub>0</sub></div> <div> <div>G01</div> <div>AUTO 1/2</div> </div> <div> <div>TOOL:0</div> <div>ORG:0</div> <div>ABS REL</div> <div>MM INCH</div> </div> <div>MENU</div> </div>	<div> <div>F5</div> <div>6</div> </div> <div>+ PASSWORD</div> <div>+ ENTER</div> <div>4</div>	<div> <div>PRESS</div> <div>F1</div> <div>FOR X AXIS</div> </div> <div> <div>PRESS</div> <div>F2</div> <div>FOR Y AXIS</div> </div> <div> <div>PRESS</div> <div>F3</div> <div>FOR Z AXIS</div> </div> <div> <div>PRESS</div> <div>F4</div> <div>FOR W AXIS</div> </div>
<div>Pressing</div> <div>F1</div>		<div> <div>AXIS X LIMIT PARAMETERS</div> <div> <div>Lim. (-) : -999999,000</div> <div>Lim. (+) : 999999,000</div> <div>Rap./Med. X : 40,000</div> <div>Med./Slow X : 10,000</div> <div>Ack. Dly (s) : 2</div> <div>Alarm (s) : 2</div> <div>WAIT POS(S): 10</div> </div> <div> <div>ACTIVE KEY &lt;0..9&gt;</div> <div>&lt;ARROW&gt;, &lt;ENTER&gt;</div> </div> <div> <div>SAVE</div> <div>CANCEL</div> </div> </div>

Pressing 		<b>AXIS Y LIMIT PARAMETERS</b>  <b>Lim. (-) : -999999,000</b> <b>Lim. (+) : 999999,000</b> <b>Rap./Med. Y : 40,000</b> <b>Med./Slow Y : 10,000</b> <b>Ack. Dly (s) : 2</b> <b>Alarm (s) : 2</b> <b>WAIT POS(S): 10</b>		
		<b>ACTIVE KEY &lt;0..9&gt;</b> <b>&lt;ARROW&gt;, &lt;ENTER&gt;</b>	<b>SAVE</b>	<b>CANCEL</b>
Pressing 		<b>AXIS Z LIMIT PARAMETERS</b>  <b>Lim. (-) : -999999,000</b> <b>Lim. (+) : 999999,000</b> <b>Rap./Med. Z : 40,000</b> <b>Med./Slow Z : 10,000</b> <b>Ack. Dly (s) : 2</b> <b>Alarm (s) : 2</b> <b>WAIT POS(S): 10</b>		
		<b>ACTIVE KEY &lt;0..9&gt;</b> <b>&lt;ARROW&gt;, &lt;ENTER&gt;</b>	<b>SAVE</b>	<b>CANCEL</b>
Pressing 		<b>AXIS W LIMIT PARAMETERS</b>  <b>Lim. (-) : -999999,000</b> <b>Lim. (+) : 999999,000</b> <b>Rap./Med. W : 40,000</b> <b>Med./Slow W : 10,000</b> <b>Ack. Dly (s) : 2</b> <b>Alarm (s) : 2</b> <b>WAIT POS(S): 10</b>		
		<b>ACTIVE KEY &lt;0..9&gt;</b> <b>&lt;ARROW&gt;, &lt;ENTER&gt;</b>	<b>SAVE</b>	<b>CANCEL</b>

## **DESCRIPTION OF THE PARAMETERS FOR X, Y, Z AND W AXIS**

**Lim. (-):** It represents the absolute value of the negative direction limit as regards to the zero machine, beyond which the positioner stops the movement of the axis. It will be available from the next version of the firmware on.

**Lim. (+):** It is the absolute value of the positive direction limit as regards to the zero machine, beyond which the positioner stops the movement of the axis. It will be available from the next version of the firmware on.

**Rap./Med. X:** If the positioner is set up with the option "USCITA RELE" ON, this value represents the distance from the arrival point, where it has to be changed the feed speed from RAPID to MEDIUM.

**Med./Slow X:** If the positioner is set up with the option "USCITA RELE" ON, this value represents the distance from the arrival point, where it has to be changed the feed speed from MEDIUM to SLOW. The speed of SLOW is defined from the output of the driver abilitation.




**Ack. Div (S):** It is a value expressed in tenths of seconds and it is the time that the Genius will take between the activation of the axis abilitation and the analogical output. With this parameter it is possible to set a delay between the abilitation and the movement of the axis in the machines equipped with electromechanical change gear or clutch, in which it is necessary a while of time for the engagement of the mechanics. If this parameters is below than 120, it represents a time between the output enable and the output of the analog reference. In this condition, if the Genius gets a acknowledge signal from the machine, the timer is stopped and the analog come out immediately. If this parameter is upper than 120, then the Genius will wait FOREVER until the feedback input from the acknowledge signal arrives.

**Alarm (S):** It is a value expressed in second and it is the time within which it is necessary to make the retroaction of the counting from the encoders, during the movement of one axis. If, with the allowed axis, the positioner will not receive the impulses of the counting for a period that is more than the one that is indicated with this parameter, there will be an alarm situation and the positioner will open the emergency chain so that the abilitation and the power of the machine will be stopped. This means that the axis is moving without the checking of the direction or position (because the reader head is broken or it is not able to send the impulses), or the driver/motor are not able to move the axis (max value that can set up is 127), even tough they are activated.

**WAIT POS (S):** It is a value in tenths of seconds and it is the time of wait for the verification of the maintenance of the desired position within the positioning window, with the null analogical reference but the driver activated. After this period, the activation of the driver will be taked away and the positioning operation will be considered settled.

Vice versa if the axis is out respect the positioning window, a tension reference will be generated so to repositioning again the axis within the limit defined from the positioning window. The max value that can be set up is 127.

**Boost:** This value is a factor to increase the analogue output when it is necessary to move one axis. If the machine must execute very small moviment, it may happens that the analogue is so small (in voltage) that the axis can not move. With this parameter it is possible to increase the analogue voltage so that the axis can be moved. When Genius detect some pulse from the linear scale that let him understand that the axis is moving, then it disable this factor, and the analog go down to the programmed value. This parameter work with BOOST AXIS parameter.

PLEASE NOTE: PRESS  TO CONFIRM THE CHANGES AND PRESS   
OR  TO CANCELL THE CHANGES WITHOUT THE SAVING

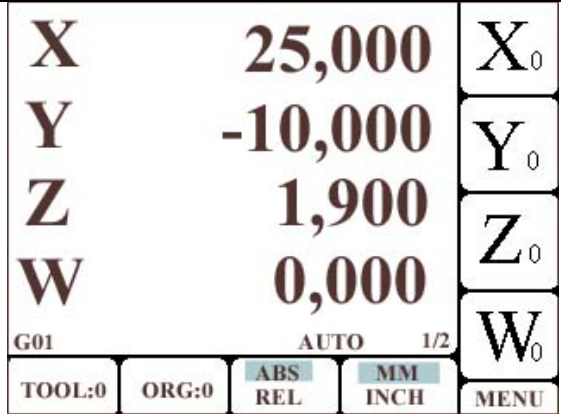













## **NON LINEAR PARAMETERS MENU**

The introduction of no linear parameters allows to offset the no linearity, that could be present eventually on the axis of the machine.

ATTENTION: EVERY TIME THAT YOU ACTIVATE THE NO LINEAR COMPENSATION, ALSO FOR ONLY ONE AXIS, IT IS OBLIGATORY TO EXECUTE THE SEARCH OF THE ZEROS FOR ALL THE AXIS WHEN THE POSITIONER WILL BE TURNED ON. IN FACT, THERE WILL BE A MEMORY WINDOW TO REMEMBER YOU TO MAKE THIS PARTICULAR OPERATION.

ATTENTION: BEFORE TO START THE PROCEDURE FOR THE SET UP OF THE NO LINEAR PARAMETERS, IT IS OBLIGATORY TO MAKE THE ZERO SEARCH OF THE MACHINE.

 <p> <b>X</b> 25,000 <b>X<sub>0</sub></b>  <b>Y</b> -10,000 <b>Y<sub>0</sub></b>  <b>Z</b> 1,900 <b>Z<sub>0</sub></b>  <b>W</b> 0,000 <b>W<sub>0</sub></b>  G01 AUTO 1/2  TOOL:0 ORG:0 ABS REL MM INCH MENU </p>	  + PASSWORD + ENTER 	PRESS  FOR THE X AXIS PRESS  FOR THE Y AXIS PRESS  FOR THE Z AXIS PRESS  FOR THE W AXIS									
Pressing 		<table border="1"> <thead> <tr> <th colspan="3">AXIS X NON LINEAR PARAMETERS</th> </tr> </thead> <tbody> <tr> <td colspan="3">           Nr. Steps: 0            Width: 10.000            Comp : OFF            INS : OFF         </td> </tr> <tr> <td>ACTIVE KEY &lt;0..9&gt; &lt;ARROW&gt;, &lt;ENTER&gt;</td> <td>SAVE</td> <td>CANCEL</td> </tr> </tbody> </table>	AXIS X NON LINEAR PARAMETERS			Nr. Steps: 0 Width: 10.000 Comp : OFF INS : OFF			ACTIVE KEY <0..9> <ARROW>, <ENTER>	SAVE	CANCEL
AXIS X NON LINEAR PARAMETERS											
Nr. Steps: 0 Width: 10.000 Comp : OFF INS : OFF											
ACTIVE KEY <0..9> <ARROW>, <ENTER>	SAVE	CANCEL									

Pressing 		AXIS Y NON LINEAR PARAMETERS		
		Nr. Steps: 0 Width: 10.000 Comp : OFF INS : OFF		
		ACTIVE KEY <0..9> <ARROW>, <ENTER>	SAVE	CANCEL
Pressing 		AXIS Z NON LINEAR PARAMETERS		
		Nr. Steps: 0 Width: 10.000 Comp : OFF INS : OFF		
		ACTIVE KEY <0..9> <ARROW>, <ENTER>	SAVE	CANCEL
Pressing 		AXIS W NON LINEAR PARAMETERS		
		Nr. Steps: 0 Width: 10.000 Comp : OFF INS : OFF		
		ACTIVE KEY <0..9> <ARROW>, <ENTER>	SAVE	CANCEL

## **DESCRIPTION OF THE PARAMETERS FOR THE X, Y, Z AND W AXIS**

**Nr. Steps:** It is the number of steps with which we want to do the compensation. The max number that you can set up is 200 points for every axis.

**Width:** It is the distance between the utilized points for the no linear compensation. The value, obtained from the addition of this distance and of the numbers of steps, fix the total length where the no linear compensation is activated.

**Comp:** The parameter that start up or deactivates the compensation of the parameters for the no linear compensation. It can be ON or OFF and you can change them, choosing the scale and pressing ENTER. For the activation of the compensation parameters, first you have to set up the values and then set ON.

**INS:** Parameters that activates or deactivates the set up of the parameters for the no linear compensation. It can be ON or OFF and you can change them, choosing the scale and pressing ENTER. If you activate it and you save the configuration, you can go back to the principal window, from where there is possible to execute the set up of the correction values.

## **PROCEDURE FOR THE SET UP OF THE NO LINEAR COMPENSATION PARAMETERS OF ONE AXIS:**

- By turn on of the positioner, make the zero search for all axis
- Go to the no linear compensation menu (the one mentioned in this paragraph)
- Choose the axis, set up the numbers of steps and the desired width
- In the parameter INS (introduction), activate ON
- Save with F4 and go back on the home page
- If the machine is set up for a manual movement, near the display regarding the choosen axis, there will appear an arrow in movement
- In the bottom there will appear a message that says to positioning the axis on the extreme left side (direction where the numbers decrease and becomes negative) and then set up Zero, with the pressure of the key of the mentioned axis
- Move the axis toward the positive numbers for a value corresponding, or lightly more, to the value that is set up in the width parameter
- For every step, reached from the axis, insert the value regarding the verified error
- For instance: the value indicated on the display is 10.000 mm but the comparator shows 10.020 mm, it means that the error is 20mm. So you have to insert 20. If the comparator shows 9.080, it means that the error is -20 and so you have to insert -20.
- Move the axis to the next point (20.000) and insert again the error.
- Moving back the axis, it is possible to see again the values that you have set up during the previous steps. If you insert a new value, this value will substitute the old one.

- Pressing ENTER, or when you have reached the last point, the positioner ends this function
- **Attention:** if you interrupt the execution of this function, it is necessary to go to the **INS** parameter and set it in **OFF**
- **Attention:** The introduction of the error will be always converted in impulses. So if the axis resolution is 5 micron and the error in one step is 17 micron, the tool will round off this value in a number that is more near in defect, in this case 15 micron
- Finished the introduction of the correction parameters, for its activation it is necessary to set the **COMP** parameter in **ON**.

PLEASE NOTE: PRESS  TO CONFIRM THE CHANGES AND PRESS  
 OR  TO CANCEL THE CHANGES WITHOUT THE SAVING

## **RS232 MENU**

The RS232 is available using an external software for communication.

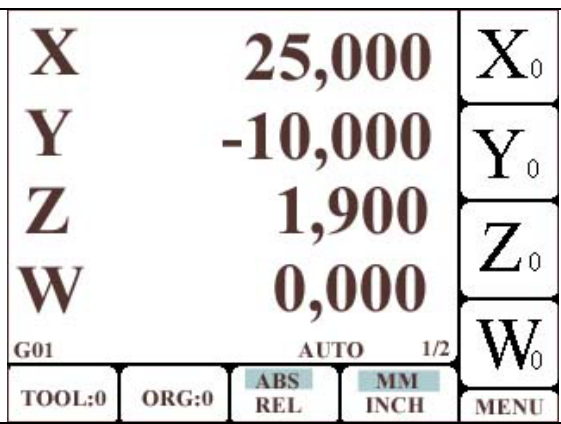





ELBO will give a program , included together with Genius, or available by email, to copy inside a PC, to download configuration parameters to the PC.

With this software, called "FLASH\_SERIALE.EXE", it is possible to execute the following command:

1. Copy the Genius parameters to the PC, to execute an external backup of them.
2. Upload the parameters from the PC to the Genius.
3. Upgrade the Genius firmware, according the new release of implemented feature.

## **MENU FOR THE RECOVERY OF THE PARAMETERS FROM FLASH**

In case it is necessary to reset the previous saved parameters in the flash memory inside the tool, you have to do the following procedure:

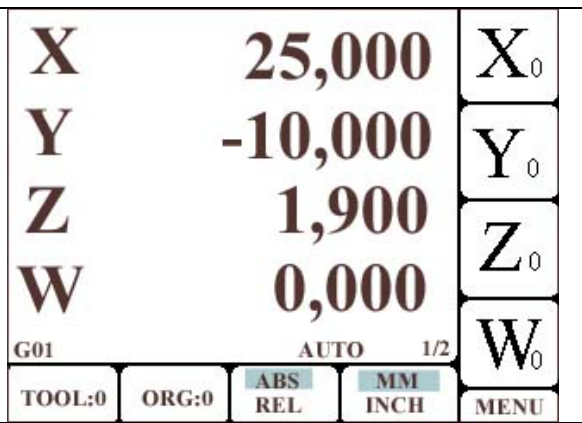





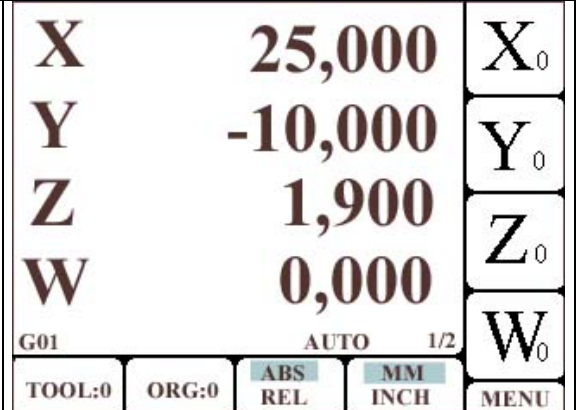
	  + PASSWORD + ENTER  	<p align="center"><b>ATTENTION: RELOADING FLASH DATAS</b></p> <p align="center">Press ENTER to ACCEPT  <u>Press ESC to DELETE</u></p>
Press  to accept		<p align="center"><b>AT THE END OF THE RELOADING OF THE PARAMETERS, YOU WILL GO BACK TO THE AXIS CONFIGURATION PAGE</b></p>
Press  to delete the operation		<p align="center"><b>YOU WILL GO BACK TO THE AXIS CONFIGURATION PAGE</b></p>

**Attention:** to re-activate the reloaded parameters, it is necessary to turn off and then again turn on the positioner.



## **MENU FOR THE BACKUP ON THE FLASH**

This procedure allows to save the statements of the positioner in his internal memory. In this way, if the buffer memory loose the statements regarding the positioner, or will be for an error modified, it is possible to re-set up the memorized values.

	  + PASSWORD + ENTER 	<p align="center"><b>ATTENTION:</b>  <b>RECORDING DATAS IN THE FLASH</b>  <b>MEMORY</b></p> <p align="center">Press ENTER to ACCEPT  <u>Press ESC to DELETE</u></p>
Press  to accept		<p align="center"><b>AT THE END OF THE</b>  <b>MEMORIZING OF THE</b>  <b>PARAMETERS, YOU WILL GO</b>  <b>BACK TO THE AXIS</b>  <b>CONFIGURATION PAGE</b></p>
Press  to delete the operation		

## **PROCEDURE TO EXECUTE THE EXTERNAL BACKUP**

We suggest to execute the parameters backup on an external computer, using the following procedure.

ATTENTION: This procedure will transfer to the external PC the parameters that are in the memory FLASH. So before executing this procedure, be sure to execute **first** the procedure to execute the backup in the memory FLASH.

1. Copy all the files that are in the floppy in a folder of the PC that will be used for the backup procedure.

2. Switch off the Genius, connect the RS232 cable, on the Genius and on the PC and switch on the Genius again.
3. Switch on the Genius and do not touch any keys on its keyboard.
4. In the PC, execute with a double click the program FLASH\_SERIALE.EXE.
5. Select the tab "IMPOSTA PORTA SERIALE", and select the serial port in which the cable is connected.
6. Select the tab "PARAMETRI MACCHINA".
7. Select the version to backup GENIUS (1.x o 2.x).
8. Press the button "ABILITA COPIA PARAMETRI DA GENIUS".
9. Press the button "SCARICA COPIA PARAMETRI GENIUS->PC".
10. The transferring procedure will start.
11. When transmission end, it will appear a dialog window to select the folder in which save the parameters.

### **PROCEDURE TO RELOAD THE PARAMETERS FROM EXTERNAL BACKUP**

1. Be sure to have with you the PC with the parameters file to download to the Genius.
2. Switch off the Genius, connect the RS232 cable, and switch on the Genius again.
3. In the PC, execute with a double click the program FLASH\_SERIALE.EXE.
4. Select the tab "IMPOSTA PORTA SERIALE", and select the serial port in which the cable is connected
5. Select the tab "PARAMETRI MACCHINA".
6. Select the version to Backup GENIUS (1.x o 2.x).
7. Press the button "ABILITA COPIA DI PARAMETRI PC -> GENIUS".
8. Press the button "SCARICA I PARAMETRI VERSO IL GENIUS".
9. It will appear a dialog box:: browse your folder to select the parameters file to download to the Genius.
10. The transferring procedure will start.
11. When finished, execute in the Genius the procedure to restore parameters from the FLASH.
12. For this, follow the instruction reported in the "MENU FOR THE RECOVERY OF THE PARAMETERS FROM FLASH".
13. Switch off and on the Genius.

### **PROCEDURE TO UPDATE THE GENIUS FIRMWARE**

It is possible to upgrade the firmware in the Genius device. The procedure is very easy, and it will take from 3 up to 10 minutes to be concluded.

The procedure uses the serial port in the back of the Genius, and it is executed by the same program used for the parameters backup. By upgrading the Genius to the newest version, it will give two advantage:

1. The producer can develop more function or increase features in the function that are present.
2. The customer can directly upgrade the device by himself. It is only necessary to have a computer.

It is necessary to pay attention to the following note:

**DURING THE UPGRADING PROCEDURE, NEVER SWITCH OFF THE DEVICE OR THE COMPUTER. IT IS VERY IMPORTANT THAT DURING THIS PROCEDURE THE POWER (220Volt) NEVER DISAPPEAR.**

1. **FIRST**, be sure to execute the procedure to execute the parameters backup in the FLASH memory and on the external PC.
2. Switch off the Genius, connect the cable on the serial port in the Genius and in the PC, switch on the Genius.
3. In the PC, execute with a double click the program FLASH\_SERIALE.EXE.
4. Select the tab "IMPOSTA PORTA SERIALE", and select the serial port in which the cable is connected.
5. Select the tab "AGGIORNAMENTO FIRMWARE".
6. Press the button "ALLOCA MEMORIA FLASH".
7. Press the button "RIPRISTINA FLASH". It will appear a dialog windows to select the first file to upload. Browse for the file to upload to the Genius.
8. The upgrade firmware will be available by email, and the file name will be identified by a date and by a postfix number. The first file to browse and select has the number 0.
9. The upgrading starts and the program will show the status with a blu bar. The upgrading is executed by downloading the software in severals parts. Every time that a parts is correctly dowloaded, a label "OK" will appear below the button "PROGRAM FLASH".
10. The procedure goes on automatically, and when finished, it will appear a message to indicate that the procedure is completed.
11. After this message, switch off and on the Genius, and check the version number when appears the construction logo.

## **GENERAL CONFIGURATION**



Pressing the  key, you can enter into the tool menu.

1	PROGRAMM LIST
2	ORIGIN LIST
3	TOOL LIST
4	SPECIAL FUNCTIONS
5	ZERO SEARCH
6	AXIS CONFIGURATION
7	GENERAL CONFIGURATION



Pressing the  key, you can enter into the menu for the general configuration.

**Note:** it is necessary to insert the **PASSWORD** to go ahead.  
The password is: **9173**

The function of the password is to remind you that you are entering in a delicate data area and it is necessary to have some competence to go ahead.






After the introduction of the password, press the  key and it will appear the table that you can see here below

1	AXIS MOVEMENT
2	SPINDLE PARAMETERS
3	KEYBOARD PARAMETERS
4	DIAGNOSTICS
5	FUNCTIONS CONFIGURATION
6	SET LANGUAGE
7	MIN. VELOCITY CORRECTOR

## AXIS MOVEMENT

With this page it is possible to set up the positioner for the adaptation to the different configurations.

<b>X</b> 25,000	<b>X<sub>0</sub></b>	  + PASSWORD + ENTER 	<b>MACHINE MOVIMENT</b>			
<b>Y</b> -10,000	<b>Y<sub>0</sub></b>		Delay: 2000 MOVIM: CONT Inv+Mot: 1+1 4 Asse : W OUTPUT RELE: OFF M6(PGR) : OFF M6(MACRO): OFF M41_44: ON POS. MOB. : OFF			
<b>Z</b> 1,900	<b>Z<sub>0</sub></b>					
<b>W</b> 0,000	<b>W<sub>0</sub></b>					
G01	AUTO 1/2					
TOOL:0	ORG:0	ABS REL	MM INCH	MENU		
				ACTIVE KEY <0,9> <ARROW>, <ENTER>	SAVE	CANCEL

**Delay:** It is a value expressed in seconds, and it is the time that the positioner will take between the end of the movement of one axis, and the activation and movement of the following axis. This parameter allows you to adapt the positioner to slow electromechanics that needs a delay between a movement and the successive one, so to allow, for instance, the correct introduction of a clutch or a mechanical gear.

**MOVIM:** It shows the type of movement that the positioner is executing during his movements. It can have two values: CONT and SEQ. With the CONT parameter, the positioner moves the axis contemporary in paraxial mode and the first axis that reaches the programmed point waits that the other axis complete their movements. With the SEQ. parameter the positioner makes the movements allowing the axis one by one sequentially. First the X axis, then the Y, Z and at last W (if it is configured as an axis and if it is motorized).

**Inv+Mot.:** With this parameter it is possible to define the type of relation between the motors and the drivers of the machine. It is possible to set up two values: **1+1** and **1+3**.

With the first one we mean that for every motor there is connected a servo/inverter/driver and with **1+3** we mean that all the motors that are in the machine, are commuted and connected to an only inverter/driver. With the **1+1** configuration it is possible to set up as type of movement, the sequential one or the contemporaneous one. If you choose the **1+3** configuration, the only allowed movement is the sequential one.

**4 Asse:** It allows to choose as the 4° axis, a linear one called W, or a rotative one called S.

**OUTPUT RELE:** When this parameter is ON, the positioner is set up to execute the movement with steps output. You have to set up the sequential movement (SEQUENTIAL – please refer to the previous paragraph) and two digital outputs will fix the speed of the considered axis. There will be also activated the outputs to fix the axis to move and also his direction. Use the axis abilitation signal to activate the driver and let it move at the MINIMAL speed. For the slowing down points and the speed

changement (RAPID/MEDIUM and MEDIUM/SLOW) set up correctly the SLOW DOWN points as shown in the previous paragraphs. When you want to connect the positioner using the analogicals, you have to set up this parameter in OFF.

**M6 (PGR):** If you put this parameter ON, the positioner will execute the movement to make the positioning, for the tool change when there will be the Tn code inside the piece programm.

For example: X 100  
              T5  
              M3  
              Z 100

When the positioner reads the code T5 inside the piece programm, if the parameter M6(PGR) is activated, there will be executed the movement able to allow the operator to do the tool change. After the changement, the operator will permit, pushing START, that the positioners goes ahead with the execution of the programm. GENIUS will begin again with the reading of the steps programm and will automatically charge the dimensional parameters of the new tool.

If this parameter is OFF, the positioner will not execute any movement able to allow the operation, and will also not stop. GENIUS will only go ahead with the charge of the dimensional values of the new tool.

**M6 (MACRO):** If you put this parameter ON, the positioner will execute the movement to make a positioning for the tool change, in case of during the execution of a macro, it will be readen a different tool respect to the actually one.

For example: X 100  
              SIMPLE FLANGE 1 (WITH TOOL 5)  
              Z 100

When the positioner reads the macro code, if it was memorized with a different tool from the actually one and if the parameter M6(MACRO) is ON, there will be done movements able to allows the operator to make the tool change. After the changement, the operator with the pressure of START will give the ok for the prosecution of the programm. The positioner will go ahead with the macro execution and will charge automatically the dimensional parameters of the new tool.

If this parameter is OFF, the positioner will not execute any movement able to allow this operation and will also not stop. The positioner will only charge the dimensional values of the new tool.



## **MOVEMENTS EXECUTED DURING THE TOOL CHANGE**

**ATTENTION:** FOR THE CORRECT OPERATION OF THE TOOL CHANGE, IT IS NECESSARY TO EXECUTE THE ZERO SEARCH AFTER THE TURNING ON OF THE POSITIONER

**ATTENTION:** FOR THE CORRECT OPERATION OF THE TOOL CHANGE, IT IS NECESSARY TO MEMORIZE IN THE G54.99 ORIGIN, THE POSITION OF THE AXIS IN WHICH THE MACHINE HAS TO POSITIONING FOR THE TOOL CHANGE.

Every time that the GENIUS finds that it is necessary to make the movements able to permit the tool change, it will execute a fixed sequence, as shown here below:

- Memorizing of the spindle rotation status so that it will be re-established at the same conditions, when the operation of the tool change will be at the end.
- Memorizing of the active origin so to permit the re-establishment at the end of the operation.
- Stop of the spindle and the eventual refrigeration.
- Activation of the parameters regarding the 0 tool (it is the preferential tool and it is intended for the tool change procedure)
- Activation of the G54.99 origin. It is the origin in which you have to memorize previously the position, where the operator will execute the tool change.
- The positioner will move the axis to the activated origin.
- It appears the message for the operator to make the tool change.
- When the operator press START, the values of the new tool will be charged, the origin will be re-established, the codes of the spindle will be reactivated (eventual M3 or M4) and the parameters that were active before the tool change operation.
- Reading of the next step to execute.

**M6 (MACRO):** It allows to choose as the 4° axis, a linear axis called W or a rotative axis called S.

**M41 44:** parameter that commutes the operation of two logical outputs. When it is OFF, the outputs of RAPID and MEDIUM are controlled from the positioner to manage the approaching, when it is set up for the OUTPUT RELE. Vice versa when it is ON, the RAPIDO and MEDIO outputs are for the activation of an external gamma change. If in the piece program you insert the code M41, this outputs will be both zero; with M42 the MEDIO output will be high and the RAPIDO will be low; with M43, the MEDIO output will be low and the RAPIDO output will be high; with M44, the MEDIO output will be high and the RAPIDO output will be high; it is possible to select an external changement so to adapt the spindle rotation speed to the needs of the processing. It is necessary to set up the OUTPUT RELE parameter in OFF so to avoid conflicts. IT IS NOT POSSIBLE TO USE THE GAMMA CHANGE, TOGETHER WITH THE CONFIGURATION FOR THE RELE OUTPUTS.

**POS. MOB:** When this parameters is setted to OFF, the Genius will use the parameters DIST.1(+) e Dist.1(-) both in G00 mode (rapid) and G01 mode (Wok) to execute the positioning.

When this parameter is setted to ON, the Genius will use the parameters DIST.1(+) e Dist.1(-) in G00 mode (rapid). In G01 mode (Wok) to Genius will calculate a different

distance from the target to starting the deceleration. In this case Genius will optimise the deceleration space according to the speed of the axis.

Example: Dist.1 = 9.00 mm, max speed = 3000, Pos. Mob: OFF

G00 -> Deceleration starts at 9 mm from the target

G01 and F2000 -> Deceleration begins 9 mm from target

G01 and F1000 -> Deceleration begins 9 mm from target

Example: Dist.1 = 9.00 mm, max speed = 3000, Pos. Mob: ON

G00 -> Deceleration starts at 9 mm from the target

G01 and F2000 -> Deceleration begins 6 mm from target




G01 and F1000 -> Deceleration begins 3 mm from target

**PLEASE NOTE: PRESS  TO CONFIRM THE CHANGES AND**

**PRESS  OR  TO CANCELL THE CHANGES WITHOUT THE SAVING**

## **HANDWHEEL PARAMETERS**

For the installation of the handwheel, please set up the parameters for the correct using of it.

<b>X</b> 25,000 <b>X<sub>0</sub></b> <b>Y</b> -10,000 <b>Y<sub>0</sub></b> <b>Z</b> 1,900 <b>Z<sub>0</sub></b> <b>W</b> 0,000 <b>W<sub>0</sub></b>		  + PASSWORD + ENTER 	<b>HANDWHEEL PARAMETERS</b> HANDWHEEL: OFF FATT. P: 300 FATT. D: 0 FATT. I: 0 Ins. Err. : 1.000 Cost. Hnd.: 0.005
G01 AUTO 1/2 TOOL:0 ORG:0 ABS REL MM INCH MENU		ACTIVE KEY <0.9> <ARROW>, <ENTER>	
		SAVE CANCEL	

**HANDWHEEL:** Set this parameter to ON to enables the handwheel connector.

**FATT. P:** It is the proportional factor for the manage of the PID, for the handwheel. Don't go beyond the value of 400. If the movement of the machine should be unsteady, reduce this value to 200 or less.

**FATT. D:** Derivative factor for the manage of the PI, for the handwheel. In case of unstableness, reduce this value till zero.

**FATT. I:** Integrative factor for the manage of the PID, for the handwheel. In case of unstableness of the machine movement, reduce this value till zero.

**Ins. Err.:** It is the max. following error when the handwheel is enabled. In case the error exceeded this value while using the handwheel, an alarm message appears in the Genius, and emergency output is activated.

**Const. Hnd.:** This is the parameter to adjust the handwheel encoder resolution.

**Max. Pulse.:** Setting this parameter to a value, let the Genius do not accept more pulse from the handwheel than this value. All the pulse exceeding this value that will be sent to the Genius by the handwheel, will not be processed.

PLEASE NOTE: PRESS  TO CONFIRM THE CHANGES AND

PRESS  OR  TO CANCELL THE CHANGES WITHOUT THE SAVING









## KEYBOARD PARAMETERS

It is possible to set up again the movement of the axis, giving different functions to the keys of the arrows, that are in the keyboard.

For exampl, it is possible to assign towards right the movement of the X table at the arrow that represents the vertical or the lateral direction. It is therefore possible to put the operator in excellent works conditions.

<b>X</b> 25,000 <b>X<sub>0</sub></b> <b>Y</b> -10,000 <b>Y<sub>0</sub></b> <b>Z</b> 1,900 <b>Z<sub>0</sub></b> <b>W</b> 0,000 <b>W<sub>0</sub></b>		<b>F5</b> <b>7</b> + PASSWORD + ENTER <b>3</b>	<b>KEYBOARD PARAMETERS</b> right: 1 up_r: 2 up: 3 up_l: 4 left: 5 left_d: 6 down: 7 down_r: 8
G01 AUTO 1/2 TOOL:0 ORG:0 ABS REL MM INCH MENU			ACTIVE KEY <0..9> <ARROW>, <ENTER>

The configuration will be, trough the assignation of a numerical value to the keys, that corresponds to a movement and to the direction of one axis, as shown here below:

	RIGHT
	UP_R
	UP
	UP_L
	LEFT
	LEFT_D
	DOWN
	DOWN_R

1	X+ AXIS
2	Y+ AXIS
3	Z+ AXIS

4	W+ AXIS
5	X- AXIS
6	Y- AXIS
7	Z- AXIS
8	W- AXIS

On the basis of the correspondance KEY-NUMERICAL VALUE, it is possible to associate a movement of one axis to the desired key.


**PLEASE NOTE: PRESS  TO CONFIRM THE CHANGES AND**




**PRESS  OR  TO CANCELL THE CHANGES WITHOUT THE SAVING**

## DIAGNOSTICS


With this function it is possible to check the inputs and outputs status.



**ATTENTION:** pressing the  key, the positioner will allow cyclically all the outputs, so to permit to control the operation status.

<b>X</b> 25,000 <b>X<sub>0</sub></b> <b>Y</b> -10,000 <b>Y<sub>0</sub></b> <b>Z</b> 1,900 <b>Z<sub>0</sub></b> <b>W</b> 0,000 <b>W<sub>0</sub></b>				  + PASSWORD + ENTER 	<b>DIAGNOSTICS IN OUT</b> <b>In1:</b> 1111111111111111 <b>In2:</b> 1001100000101001  <b>Out:</b> 0000000000000000	
G01 AUTO 1/2 TOOL:0 ORG:0 ABS REL MM INCH MENU				Press T to activate the test		



Press the  key so to go out from the diagnostics page.




In1	Bit 1	START PROGRAM	PIN 1 (Connector Input.)
	Bit 2	INPUT EMERGENCY	PIN 2 (Connector Input.)
	Bit 3	INPUT MICRO Y	PIN 3 (Connector Input.)
	Bit 4	INPUT MICRO W	PIN 4 (Connector Input.)
	Bit 5	INPUT ACK X	PIN 5 (Connector Input.)
	Bit 6	INPUT ACK Y	PIN 6 (Connector Input.)
	Bit 7	INPUT ACK Z	PIN 7 (Connector Input.)
	Bit 8	INPUT ACK W	PIN 8 (Connector Input.)
	Bit 9	FUTURE USE FROM ELBO	PIN 9 (Connector Input.)
	Bit 10	FUTURE USE FROM ELBO	PIN 10 (Connector Input.)
	Bit 11	FUTURE USE FROM ELBO	PIN 11 (Connector Input.)
	Bit 12	STOP PROGRAM	PIN 12 (Connector Input.)
	Bit 13	INPUT MICRO Z	PIN 16 (Connector Input.)
	Bit 14	INPUT MICRO X	PIN 15 (Connector Input.)
	Bit 15	INPUT NEXT STEP	PIN 14 (Connector Input.)
	Bit 16	SELECTOR MANUAL / AUTOMATICO	PIN 13 (Connector Input.)

In2	Bit 1	SELECTOR PULSE HANDWHEEL (MAX. 5Volt)	PIN 3 (Connector Handwheel)
	Bit 2	SELECTOR PULSE HANDWHEEL (MAX 5Volt)	PIN 11 (Connector Handwheel)
	Bit 3	AXIS SELECTION HANDWHEEL (MAX 5Volt)	PIN 4 (Connector Handwheel)
	Bit 4	AXIS SELECTION HANDWHEEL (MAX 5Volt)	PIN 12 (Connector Handwheel)
	Bit 5	FUTURE USE FROM ELBO	Pin 6 (Connector Handwheel)
	Bit 6	HANDWHEEL ENABLE (MAX 5 Volt)	PIN 5 (Connector Handwheel)
	Bit 7	FUTURE USE FROM ELBO	PIN 14 (Connector Handwheel)
	Bit 8	FUTURE USE FROM ELBO	Xxx
	Bit 9	INPUT MICRO SEARCH ZERO W	PIN 24 (Connector Input.)
	Bit 10	INPUT MICRO SEARCH ZERO Z	PIN 23 (Connector Input.)
	Bit 11	INPUT MICRO SEARCH ZERO Y	PIN 22 (Connector Input.)
	Bit 12	INPUT MICRO SEARCH ZERO X	PIN 21 (Connector Input.)
	Bit 13	FUTURE USE FROM ELBO	xxx
	Bit 14	FUTURE USE FROM ELBO FUTURO DA ELBO	xxx
	Bit 15	FUTURE USE FROM ELBO	xxx
	Bit 16	FUTURE USE FROM ELBO	xxx

OUT1	Bit 1	OUTPUT ENABLE W	PIN 19 (Output)
	Bit 2	OUTPUT ENABLE Z	PIN 6 (Output)
	Bit 3	OUTPUT ENABLE Y	PIN 18 (Output)
	Bit 4	OUTPUT ENABLE X	PIN 5 (Output)
	Bit 5	M4	PIN 4 e PIN 17 (Output)
	Bit 6	M3	PIN 3 e PIN 16 (Output)
	Bit 7	M6 / M10	PIN 2 e PIN 15 (Output)
	Bit 8	M8	PIN 1 e OIN 14 (Output)
	Bit 9	DIRECTION X -	PIN 20 (Output)
	Bit 10	DIRECTION Y -	PIN 8 (Output)
	Bit 11	DIRECTION Z -	PIN 21 (Output)
	Bit 12	DIRECTION W -	PIN 9 (Output)
	Bit 13	END OF THE STEP	PIN 22 (Output)
	Bit 14	END OF PROGRAM	PIN 10 (Output)
	Bit 15	OUTPUT RELE MEDIUM SPEED / OUTPUT CHANGE GEAR SPINDLE	PIN 23 (Output)
	Bit 16	OUTPUT RELE RAPID SPEED / OUTPUT CHANGE GEAR SPINDLE	PIN 11 (Output)

## **FUNCTIONS CONFIGURATION**

It is possible to set up some functions of the positioner for our needs.

<b>X</b> 25,000 <b>X<sub>0</sub></b> <b>Y</b> -10,000 <b>Y<sub>0</sub></b> <b>Z</b> 1,900 <b>Z<sub>0</sub></b> <b>W</b> 0,000 <b>W<sub>0</sub></b>		  + PASSWORD + ENTER 	<b>SPECIAL FUNCTION CONFIGURATION</b> (Z) ABS->REL: OFF Reenter: 2.000 HOR. SPINDLE: OFF VIS. ASS. : ON ADV. TEACH: OFF TOLL. TEACH: 1.000 EMERG. ENC.: ON LCD Pos. : OFF
G01      AUTO      1/2 TOOL:0      ORG:0 <b>ABS</b> <b>MM</b> REL      INCH      MENU		ACTIVE KEY <0..9> <ARROW>, <ENTER>      SAVE      CANCEL	

**(Z) ABS->REL:** This parameter can be ON or OFF. When it is ON, with the commutation of the keyboard from absolute to incremental, the axis are not zeroized. Vice versa when this parameter is ON, with the commutation of the keyboard from absolute to relative, the GENIUS automatically put to zero the display, showing in this way the zero value for all the axis.

**Reenter:** It is a parameter that is activated in the deep hole cycle. In fact during this cycle, the tool follows an approaching in the material with the Fz speed that is set up from the operator. Then it executes a discharge till the quote of the material with a rapid movement, then it executes a return in the material with a rapid speed till the previous quote, minus the correspondent value of the return parameter. After this, he executes a successive approaching in the material with a speed like to Fz.

**HOR. SPINDLE:** When this parameter is ON, the output associated to M10 can be used to enable an horizontal spindle (Only on and OFF). In this mode, by entering M10 in the program, this output is enable.

This output will be disable according to the following situation:

- M30
- M11
- When Genius detects some conditions that require the Emergency to be activated.

**VIS. ASS.:** When this parameter OFF, while executing a program the Genius will display the distance to the target position.

When this parameter is ON, while executing a program the Genius will display the ABSOLUTE position.

**ADV. TEACH & TOLL. TEACH:** This parameters work together. The first enable the mode of Advanced teach, while the second enter the tolerance of this mode.

See description of this special modality in the user manual (How to memorize a program in self-learning chapter)

**EMERG. ENC.:** When this parameter ON, in case of an alarm message due to axis encoder, the EMERGENCY OUTPUT is OPENED.



When this parameter OFF, in case of an alarm message due to axis encoder, the EMERGENCY OUTPUT is NOT OPENED.  
By default this parameter is ON.

**LCD Pos.:** When this parameter ON, the LCD will be painted in the reverse way (DARK on LIGHT). In this mode the flashing cursor is not available. This feature is activated after switching on the Genius.

**PLEASE NOTE: PRESS  TO CONFIRM THE CHANGES AND**  
**PRESS  OR  TO CANCEL THE CHANGES WITHOUT THE SAVING**

## SET LANGUAGE

It is possible to select one of the language supported by Genius.

<p><b>X</b> 25,000 <b>X<sub>0</sub></b></p> <p><b>Y</b> -10,000 <b>Y<sub>0</sub></b></p> <p><b>Z</b> 1,900 <b>Z<sub>0</sub></b></p> <p><b>W</b> 0,000 <b>W<sub>0</sub></b></p> <p>G01 AUTO 1/2</p> <p>TOOL:0 ORG:0 ABS REL MM INCH MENU</p>	<p><b>F5</b> <b>7</b></p> <p>+ PASSWORD + ENTER</p> <p><b>6</b></p>	<p><b>SET LANGUAGE</b></p> <p>1 - ITALIAN</p> <p>2 - ENGLISH</p> <p>3 - PUBLICK CECK</p> <p>4 - FRENCH</p> <p>ATTENTION: STORE THIS SETTING ON FLASH TO MEMORIZE IT</p> <p>PRESS A KEY TO CHOICE PRESS ESC TO EXIT</p>
	<p><b>Esc</b></p>	<p><b>X</b> 25,000 <b>X<sub>0</sub></b></p> <p><b>Y</b> -10,000 <b>Y<sub>0</sub></b></p> <p><b>Z</b> 1,900 <b>Z<sub>0</sub></b></p> <p><b>W</b> 0,000 <b>W<sub>0</sub></b></p> <p>G01 AUTO 1/2</p> <p>TOOL:0 ORG:0 ABS REL MM INCH MENU</p>




Select a number to change the language. After this selection the language will be activated.

But after switching off and on the Genius, the default language will be restored.

To let the new language be resident, select it and the execute the procedure to backup parameters on the flash.

By pressing Esc from inside this menu, Genius will return to main window.

## MIN. VELOCITY CORRECTOR

<b>X</b> 25,000 <b>X<sub>0</sub></b> <b>Y</b> -10,000 <b>Y<sub>0</sub></b> <b>Z</b> 1,900 <b>Z<sub>0</sub></b> <b>W</b> 0,000 <b>W<sub>0</sub></b>				  + PASSWORD + ENTER 		<b>MIN. VELOCITY CORRECTION</b>  ENABLE: OFF Vel. Min(-> X-): 0.000 Vel. Min(-> Y-): 0.000 Vel. Min(-> Z-): 0.000 Vel. Min(-> W-): 0.000  ATTENTION: ONLY VALUE >=-1,000	
G01      AUTO      1/2 TOOL:0      ORG:0      ABS REL      MM INCH      MENU						ACTIVE KEY <0..9> <ARROW>, <ENTER>      SAVE      CANCEL	

By setting this parameters OFF, the Minimum velocity for each is the same when reaching the target from left or right. This Minimum velocity is entered in the SPEED MENU section.

By enabling this parameters, it is possible to have two different minimum speed. One is fixed and its value is in the Min. value for each axis. This value will be used from the genius when reaching the target from positive direction.

But when reaching the target from the negative direction, the Genius will use a different minimum speed, according to the following rules:

Vel. Min (-> X)	Vel. Min. in SPEED MENU	Vel. Min used when positioning in + direction	Vel. Min used when positioning in - direction
0	40	40	40
1	40	40	80
-0.5	40	40	20
-1	40	40	0

**Boost AXIS:** Enter a value to enable the boost of the analogue voltage when starting to move a axis. Use the binary code to enable this function on the axis you want.

EXAMPLE: 1 is for X  
               2 is for Y  
               4 is for Z  
               8 is for W

So if you want to enable this boost for X and Y, the value to enter here is 1 (for X) + 2 (for Y)= 3

So if you want to enable this boost for X, Y and Z, the value to enter here is 1 (for X) + 2 (for Y) + 4 (for Z)= 7

## **GENERAL RESET OF THE DEVICE**

The tool has his own initialization procedure that has to be executed directly from the constructor during his first turning on.

Even this, as we have provided previously to make a copy of the parameters (in the internal memory or on a external support trough which, you can enter thanks a communication programm for PC.), it is possible to repeat this procedure and reset all the positioner.

It is enough to follow the indications that are here below:

1. Turn off the Genius



2. Turn on the Genius and press the key, when the logo of the constructor will appear. This procedure will load the parameters and will save the programs work. If the Genius doesn't start, switch it off and goes to the next step.



3. Turn on the Genius and press the key, when the logo of the constructor will appear. This procedure will loose the programs work that are in the Genius. This procedure act as a TOTAL RESET of the device.
4. Re-establish the parameters, charging them from the internal flash memory or from the external support that you have previously prepared thanks to the communication program for PC.

**Please note that this program is included in the supply.**

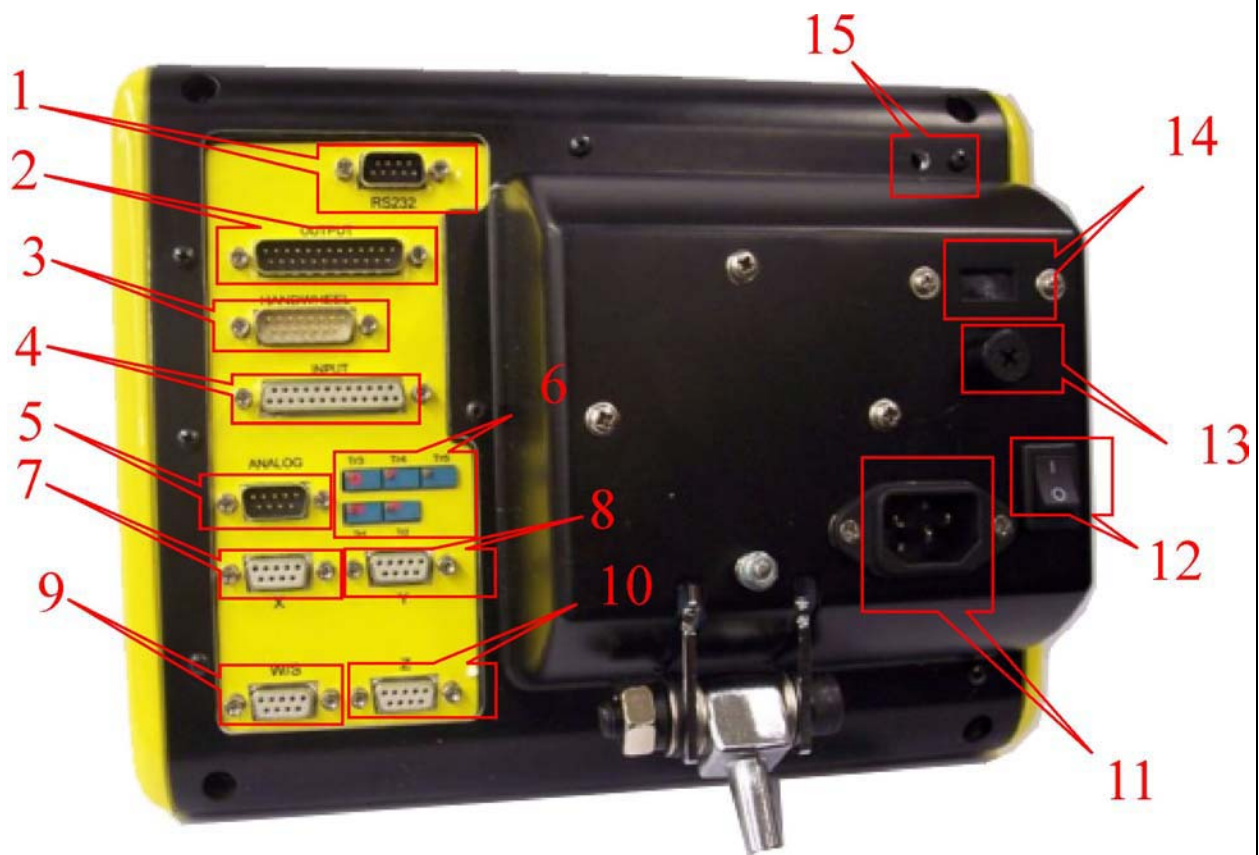
5. If you don't have the first or the second case, you have to go ahead with the manual configuration of the parameters regarding the axis.

## **TROUBLE SHOOTING**

Problems	Solution
GENIUS do not switch on	<ul style="list-style-type: none"> <li>• Check the power connector</li> <li>• Check the fuse in the back panel</li> <li>• Check the selector of powering voltage</li> </ul>
The Axis do not count when moving	<ul style="list-style-type: none"> <li>• Check the resolution factor is correct</li> <li>• Check the axis ENABLE parameter is ON</li> <li>• Unplug the other axis connector to exclude some external short circuit</li> <li>• Connect to the input that do not count a different encoder to test if the problem is in the encoder or in the Genius Input</li> </ul>
Machine DO NOT START	<ul style="list-style-type: none"> <li>• Be sure the Genius Display AUTO message in the right bottom</li> <li>• Be sure the 24V input is FILTERED.</li> <li>• Be sure to connect the EMERGENCY contact in the proper mode.</li> <li>• You must have a connector in the handwheel that close the external emergency circuit.</li> </ul>
Analog output is not present.	<ul style="list-style-type: none"> <li>• Check that the Movim. Parameter is according to the type of the machine.</li> <li>• Check the parameters WAIT (according to this value, the Genius may wait or not for an acknowledge signal).</li> <li>• Check that OUTPUT relay parameters is OFF</li> </ul>
The LCD has menu but no numbers	<ul style="list-style-type: none"> <li>• Execute the reset following the procedure</li> <li>• Restore parameters</li> </ul>
The LCD Contrast is not comfortable.	<ul style="list-style-type: none"> <li>• Adjust it by moving the little screw in the back of the panel</li> </ul>
During positioning the message “alarm encoder y” appears	<ul style="list-style-type: none"> <li>• The axis is over limit</li> <li>• The minimum speed to reach the target is to low. Increase it.</li> </ul>
During the final positioning of a step the x moves rapidly around the target.	<ul style="list-style-type: none"> <li>• The minimum speed for that axis is to high. Decrease it.</li> </ul>
Using Self-Learning the Genius do not store some quote	<ul style="list-style-type: none"> <li>• Check the parameter ADV. TEACH is ON; in this case the Genius store movement that are greater than this value.</li> <li>• Check that in the Velocity menu, the parameter MOTOR is ON</li> </ul>
The program executed is different from the PGR stored	<ul style="list-style-type: none"> <li>• First check if the PGR contains the quote you want</li> <li>• Check if Macro inside this PGR are correct.</li> <li>• Check if this movimed may depend on Enabled or disabled of the parameters for activating the movement for executing the changing tool sequence.</li> <li>• Press RUN/PGR, select the PGR and press ENTER. Look if the PGR is what you want to execute. Go with the cursor on the first line, and press START</li> </ul>

## **DESCRIPTION OF THE REAR CONNECTORS OF THE POSITIONER**

The rear side is shown in the picture



1	Connector for the serial connection. DB9 Male
2	Connector for the digital outputs connection. DB25 Male
3	Connector for the handwheel connection . DB15 Male.
4	Connector for the digital inputs connection. DB25 Female
5	Connector for the analogical outputs DB9 Male
6	Trimmer for the analogical regulations
7	Connector for scale/encoder X axis. DB9 Female
8	Connector for scale/encoder Y axis. DB9 Female
9	Connector for scale/encoder W/S axis. DB9 Female
10	Connector for scale/encoder Z axis. . DB9 Female
11	Connector for the supply of the positioner.
12	Switch for the turn on of the GENIUS
13	Fuse
14	Selector for the 220/110V electrical supply
15	Trimmer for the regulation of the LCD contrast

## **DESCRIPTION OF THE CONNECTORS**

Connector 1: Connection to RS232 serial standard port

Connector 2: DIGITAL OUTPUT (DB25 MALE).

Pin 1	Output Collector 1 (M8)
Pin 2	Output Collector 2 (M10)
Pin 3	Output Collector 3 (M3)
Pin 4	Output Collector 4 (M4)
Pin 5	Output to enable the servodriver X
Pin 6	Output to enable the servodriver Z
Pin 7	Input 24 VDC
Pin 8	Digital output for direction Y
Pin 9	Digital output for direction W
Pin 10	Digital output for END CYCLE
Pin 11	Coded output for M41, M42, M43, M44 or Output for Rapid/Medium for movement with relè positioning (the signal of the enabling servodriver has to be used to move the motor at SLOW velocity)
Pin 12	External emergency circuit
Pin 13	NC
Pin 14	Output Emitter 1 (M8)
Pin 15	Output Emitter 2 (M10)
Pin 16	Output Emitter 3 (M3)
Pin 17	Output Emitter 4 (M4)
Pin 18	Output to enable the servodriver Y
Pin 19	Output to enable the servodriver W
Pin 20	Digital output for direction X
Pin 21	Digital output for direction Z
Pin 22	Digital output for End of Step
Pin 23	Coded output for M41, M42, M43, M44 or Output for Medium/Slow for movement with relè positioning (the signal of the enabling servodriver has to be used to move the motor at SLOW velocity)
Pin 24	External emergency circuit
Pin 25	NC

Connector 3: HANDWHEEL INPUT (DB15 FEMALE).

Pin 1	5 Volt for powering the handwheel
Pin 2	Input Channel B
Pin 3	Input Selector FEED 1
Pin 4	Input Selector AXIS 1
Pin 5	Input MANUAL / AUTOMATIQUE
Pin 6	Input free
Pin 7	Input for Emergency Button
Pin 8	Zero Volt for Input (Connect to PIN 10)
Pin 9	Input Channel A
Pin 10	Power GND
Pin 11	Input Selector FEED 2
Pin 12	Input Selector AXIS 2

Pin 13	Input to enable the HandWheel (24V= ON; 0V= OFF)
Pin 14	Input free
Pin 15	Input for Emergency Button

Connector 4: DIGITAL INPUT (DB25 FEMALE).

Pin 1	SIGNAL INPUT for START PROGRAM
Pin 2	EXTERNAL PROTECTION CIRCUIT ENABLED
Pin 3	Input Micro Switch Protection for Axis Y
Pin 4	Input Micro Switch Protection for Axis W
Pin 5	Input Acknowledge axis X enabled (Possible to not connect)
Pin 6	Input Acknowledge axis Y enabled (Possible to not connect)
Pin 7	Input Acknowledge axis Z enabled (Possible to not connect)
Pin 8	Input Acknowledge axis W enabled (Possible to not connect)
Pin 9	Optoisolated Input 1 (free)
Pin 10	Optoisolated Input 2 (free)
Pin 11	Optoisolated Input 3 (free)
Pin 12	SIGNAL INPUT for STOP PROGRAM / STEP
Pin 13	Input to Select Manual/Automatique Mode (0V= Manual; 24V= Automatique)
Pin 14	Input Start STEP
Pin 15	Input Micro Switch Protection for Axis X
Pin 16	Input Micro Switch Protection for Axis Z
Pin 17	Future Application (NC)
Pin 18	Future Application (NC)
Pin 19	Input 0 Volt for the Probe
Pin 20	Signal Input for the Probe
Pin 21	Micro Switch Input for enabling the zero reference search on Axis X
Pin 22	Micro Switch Input for enabling the zero reference search on Axis Y
Pin 23	Micro Switch Input for enabling the zero reference search on Axis Z
Pin 24	Micro Switch Input for enabling the zero reference search on Axis W
Pin 25	0 Volt common for the input signal (GND).

Connector 5: ANALOG OUTPUT (DB9 MALE).

Pin 1	Analog output for Spinale (PWM)
Pin 2	Analog output W
Pin 3	Analog output Z
Pin 4	Analog output Y
Pin 5	Analog output X
Pin 6	Gnd Analog Spinale and W
Pin 7	Gnd Analog Z
Pin 8	Gnd Analog Y
Pin 9	Gnd Analog X

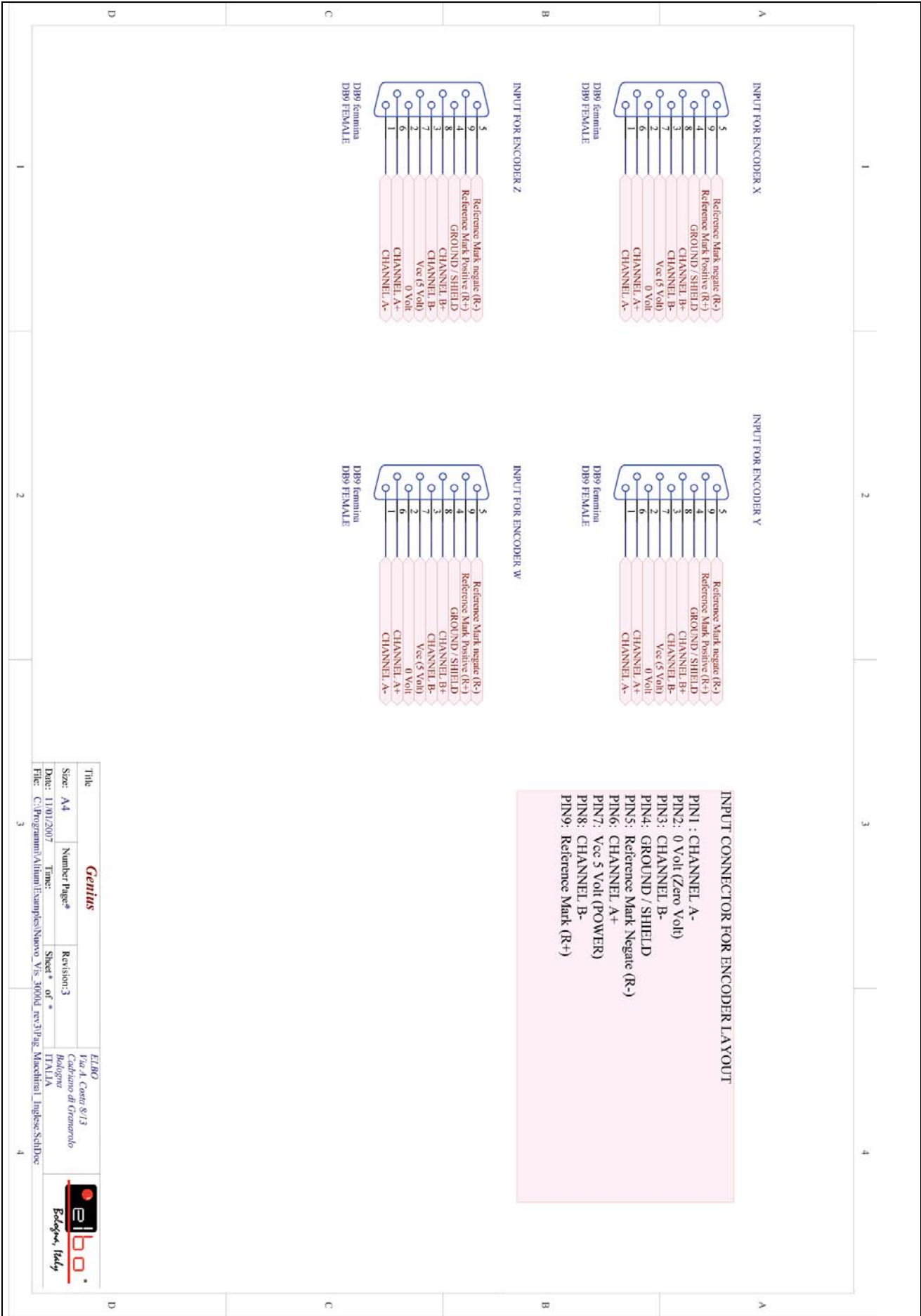
Connectors 7,8,9,10: ENCODER INPUT (DB9 FEMALE).

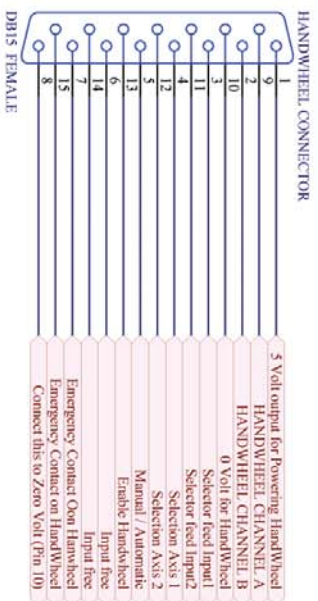
Pin 1	Channel A Neg.
Pin 2	0 Volt
Pin 3	Channel B Neg.
Pin 4	Shield
Pin 5	Zero rif. neg



Pin 6	Channel A
Pin 7	Vcc (5 Volt)
Pin 8	Channel B
Pin 9	Zero Rif.

**SCHEMATIC ELECTRIC (CONNECTORS)**





IF THE HANDWHEEL IS NOT INSTALLED, BE SURE TO CONNECT PIN 7 TO PIN 15. OTHERWISE THE EXTERNA PROTECTIO CIRCUIT CAN NOT BE ACTIVATED

#### CONNECTOR FOR HANDWHEEL LAYOUT

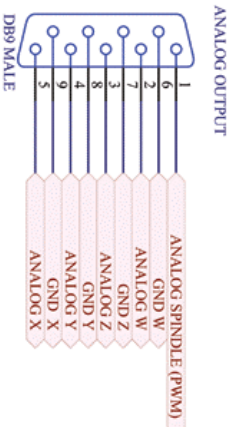
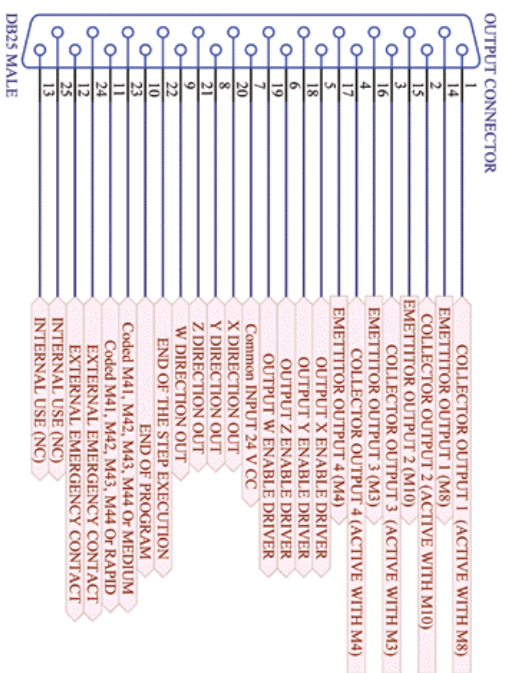
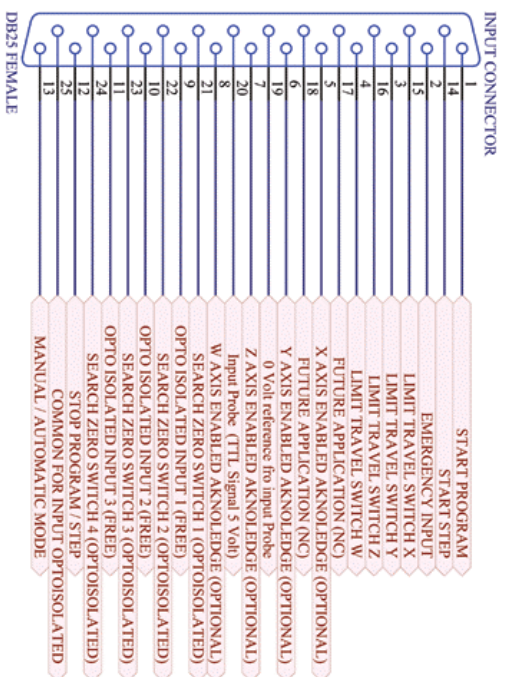
PIN1 : Vcc 5 Volt (POWER)  
 PIN2: CHANNEL B  
 PIN3: Selector 1 for feed input (TTL signal, max 5 Volt)  
 PIN4: Selector for Axis 1  
 PIN5: Manual / Automatic Mode  
 PIN6: Input free (Available for future use)  
 PIN7: External Emergency contact on Handwheel  
 PIN8: Connect externally this pin to PIN 10  
 PIN9: CHANNEL A  
 PIN10: 0 Volt  
 PIN11: Selector 2 for feed input (TTL signal, max 5 Volt)  
 PIN12: Selector for Axis 2  
 PIN13: Input free enabling Handwheel (5 Volt: Enabled)  
 PIN14: Input free (Available for future use)  
 PIN15: External Emergency contact on Handwheel

#### FEED SELECTION DESCRIPTION

X1 feed Selection : PIN3: 0 Volt; PIN11: 0 Volt;  
 X10 feed Selection : PIN3: 5 Volt; PIN11: 0 Volt;  
 X100 feed Selection : PIN3: 0 Volt; PIN11: 5 Volt;  
 X1000 feed Selection : PIN3: 5 Volt; PIN11: 5 Volt;

#### AXIS SELECTION DESCRIPTION

X AXIS : PIN4: 0 Volt; PIN12: 0 Volt  
 Y AXIS : PIN4: 5 Volt; PIN12: 0 Volt  
 Z AXIS : PIN4: 0 Volt; PIN12: 5 Volt  
 W AXIS : PIN4: 5 Volt; PIN12: 5 Volt



OUTPUT CONNECTOR FOR ANALOG SIGNAL

PIN1: ANALOG SPINDLE (ONLY PWM)

PIN2: ANALOG W OUTPUT VOLTAGE AND SPINDLE

PIN3: ANALOG Z OUTPUT VOLTAGE

PIN4: ANALOG Y OUTPUT VOLTAGE

PIN5: ANALOG X OUTPUT VOLTAGE

PIN6: Gnd for W analog

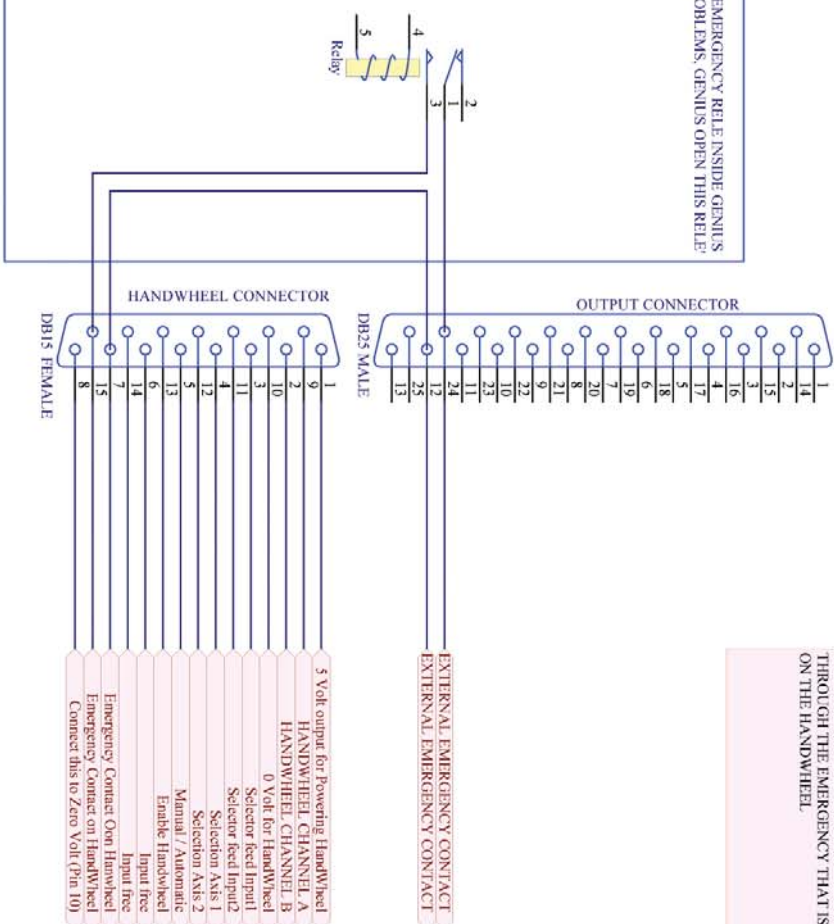
PIN7: Gnd for Z analog

PIN8: Gnd for Y analog

PIN9: Gnd for X analog

ATTENTION: THE EMERGENCY LINK PASS THROUGH THE EMERGENCY THAT IS PRESENT ON THE HANDWHEEL.

EMERGENCY RELE INSIDE GENIUS IN CASE OF PROBLEMS, GENIUS OPEN THIS RELE

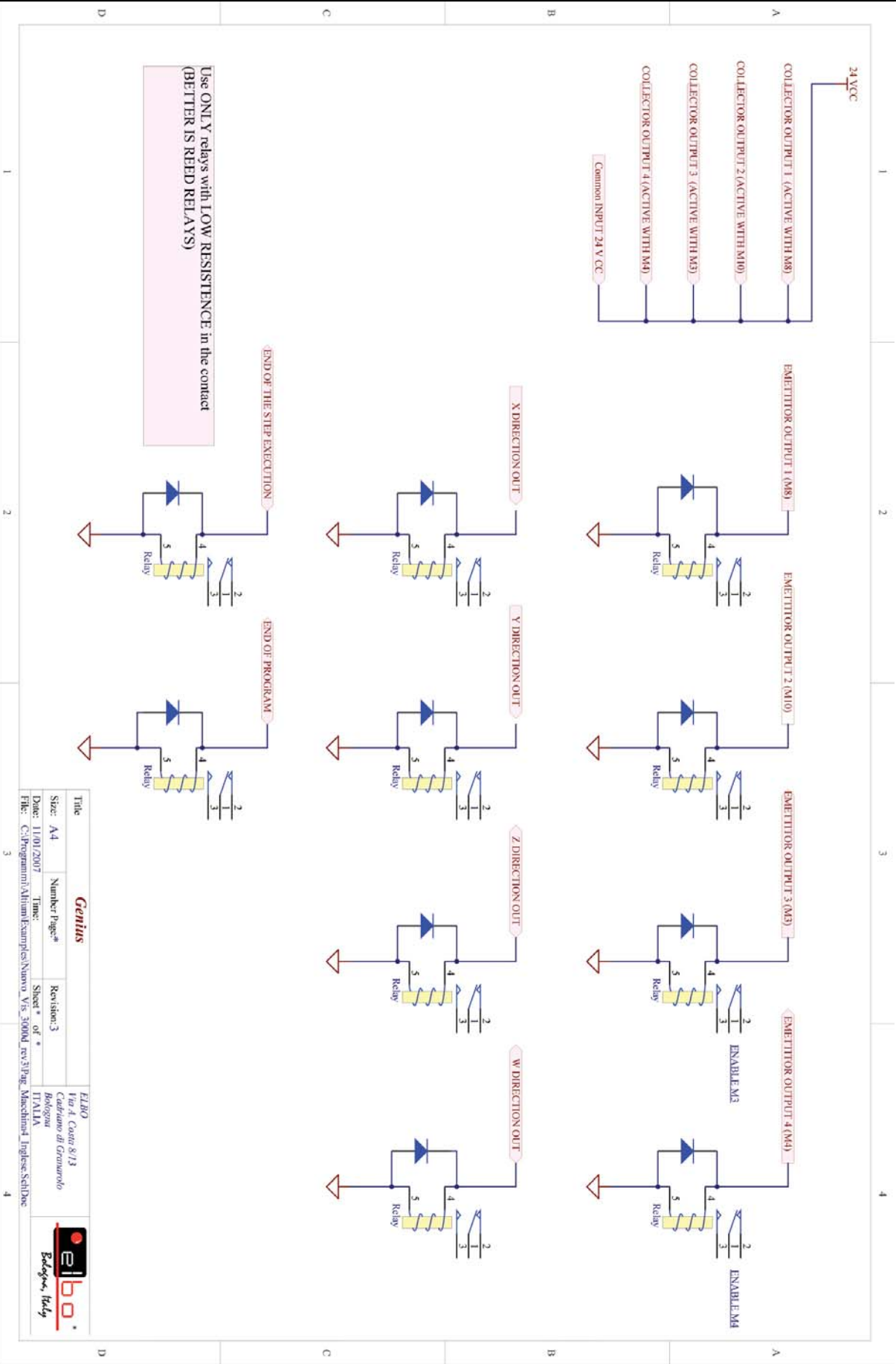


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Size: A4			Number Page: 3		Via A. Costa 8/13	
Date: 11/01/2007			Revision: 3		Caffaro di Cravotto	
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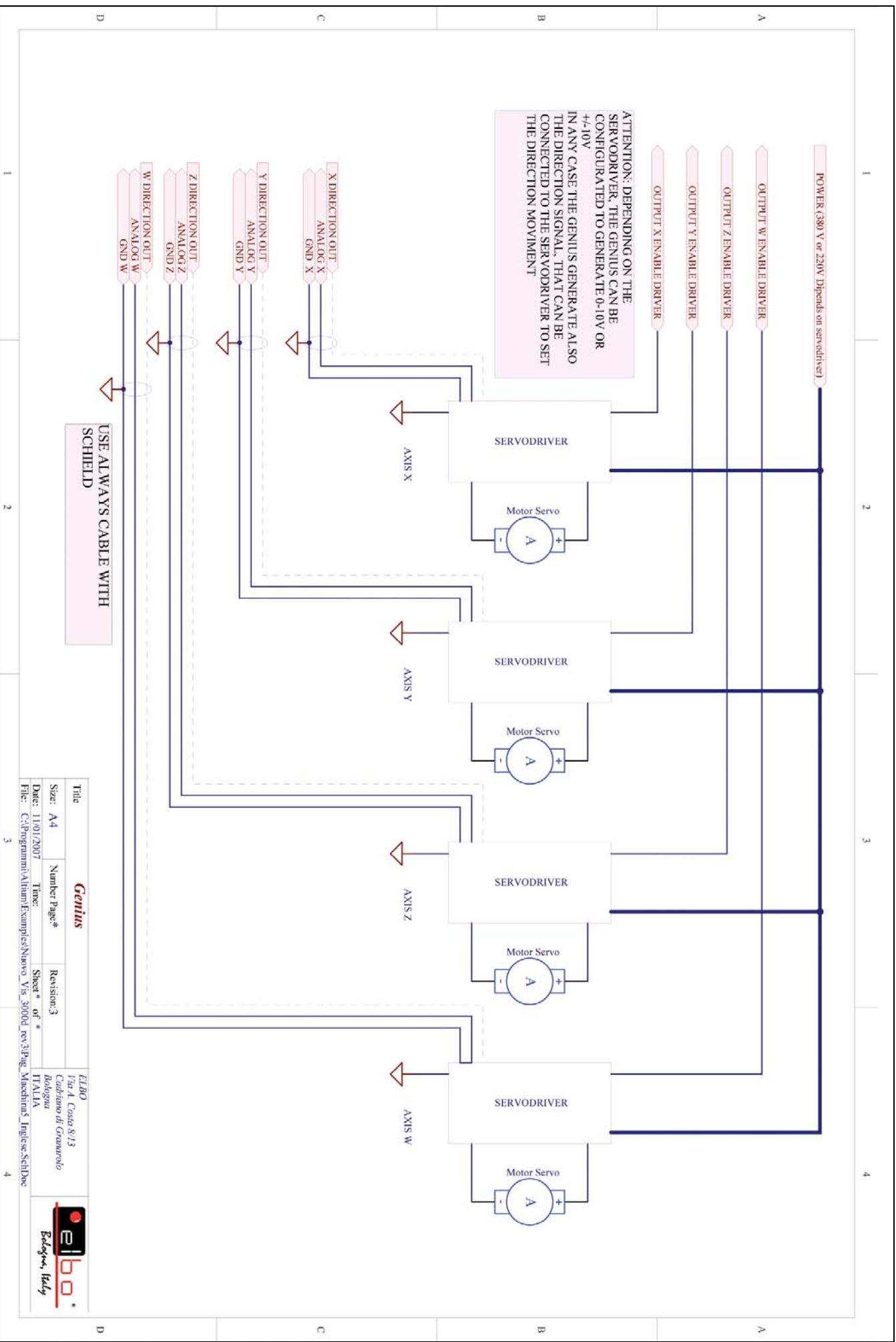


# ELECTRIC SCHEMATIC 1

(APPLICATION FOR MACHINE WITH 3 MOTOR AND 3 INVERTER)

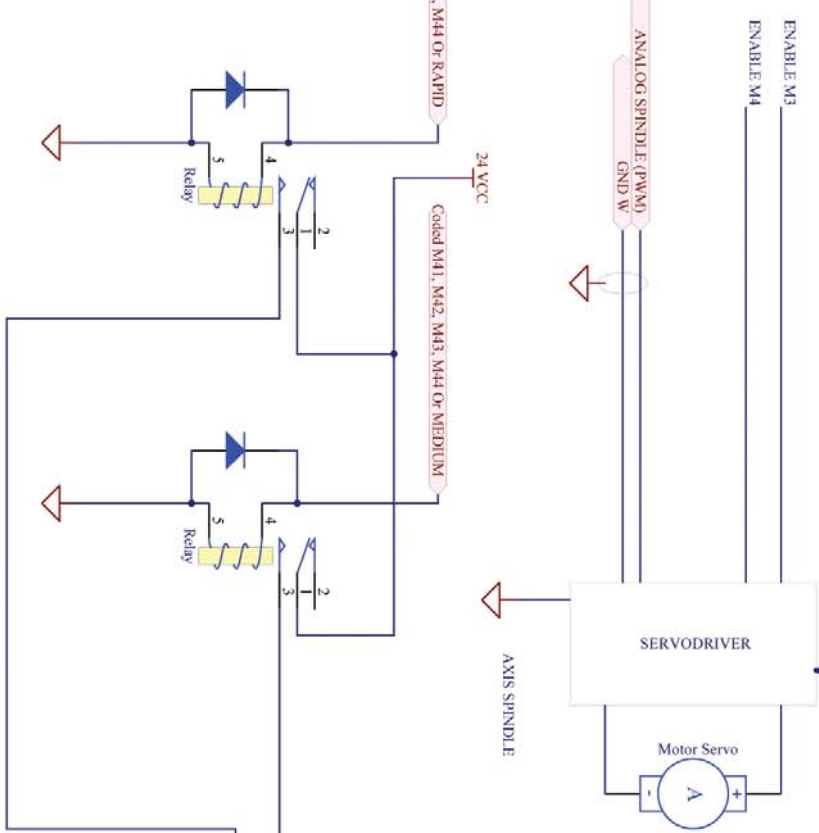






POWER (380 V or 230V Depends on servodriver)

CONNECT THE M3 AND M4 ENABLE OUTPUT TO THE SPINDLE SERVODRIVER TO SET THE DIRECTION AND THE ENABLE OF THE MOTOR



DUAL FUNCTION OUTPUT  
1: WHEN PARAMETER FOR M4\_M44 IS ON THESE TWO OUTPUT ARE PROGRAMMED TO ENABLE AN EXTERNAL GEAR.  
2: WHEN THE PARAMETER OUTPUT RELAY IS ON, THESE TWO OUTPUT ARE PROGRAMMED TO SEND SIGNAL FOR RAPID/MEDIUM VELOCITY AND MEDIUM/SLOW VELOCITY

Function1  
CODE M41= OUTPUT 0 0  
CODE M42= OUTPUT 0 1  
CODE M43= OUTPUT 1 0  
CODE M44= OUTPUT 1 1

Function 2 (ONLY PARAXIALS MOVEMENT)  
RAPID VELOCITY = OUTPUT 1 1 (SLOW  
DOWN POINT RAPID/MEDIUM)  
MEDIUM VELOCITY = OUTPUT 0 1 (SLOW  
DOWN POINT MEDIUM/EXT)  
SLOW VELOCITY = USE ENABLE AXIS TO  
MOVE SLOWLY THE AXIS

Title **Genius**

Size: A4 Number Page: 3

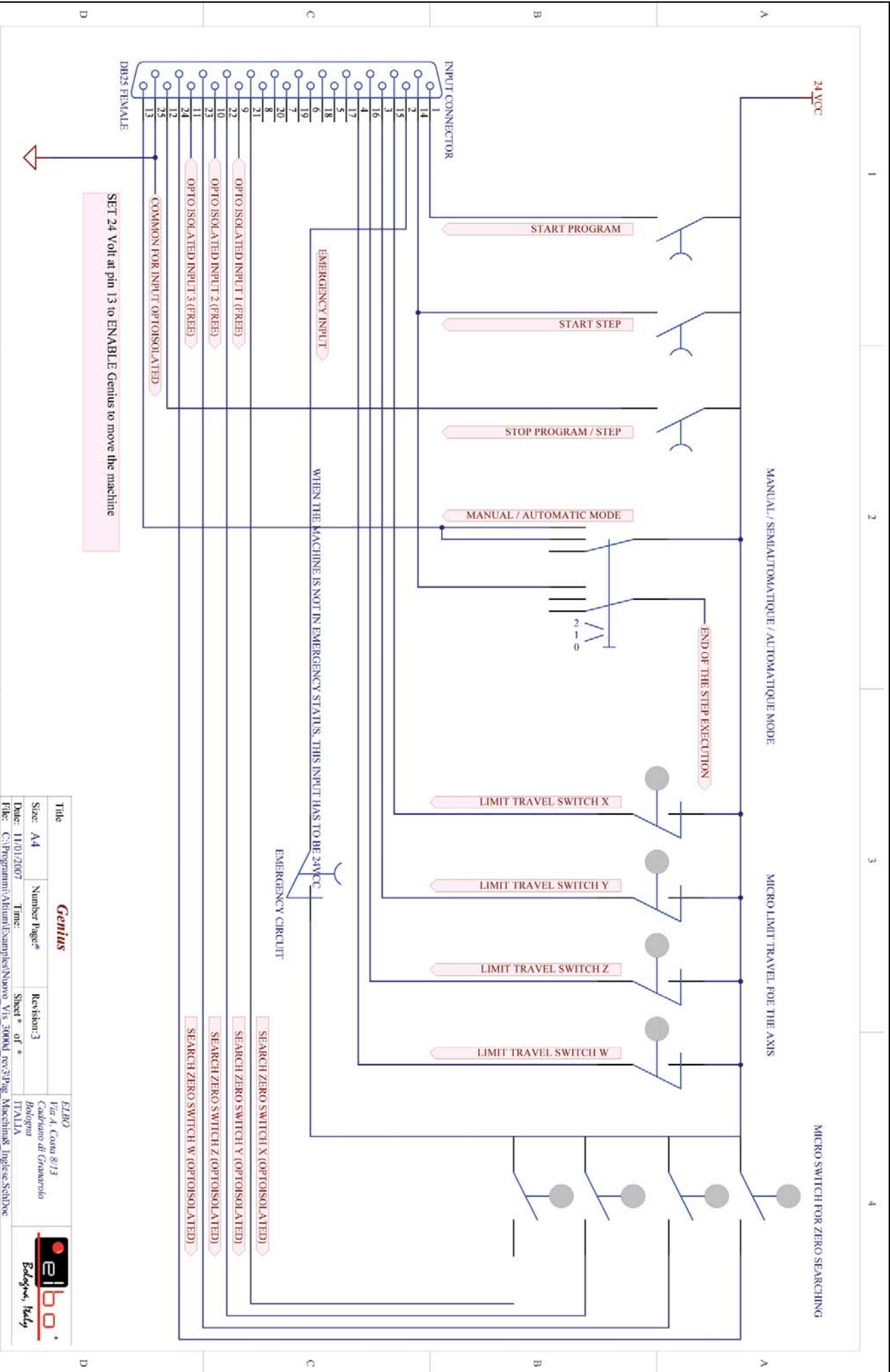
Date: 11/01/2007 Time: Revision: 3

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ELBO  
Via A. Costa 8/13  
Codignone di Granoletto  
Bologna  
ITALIA

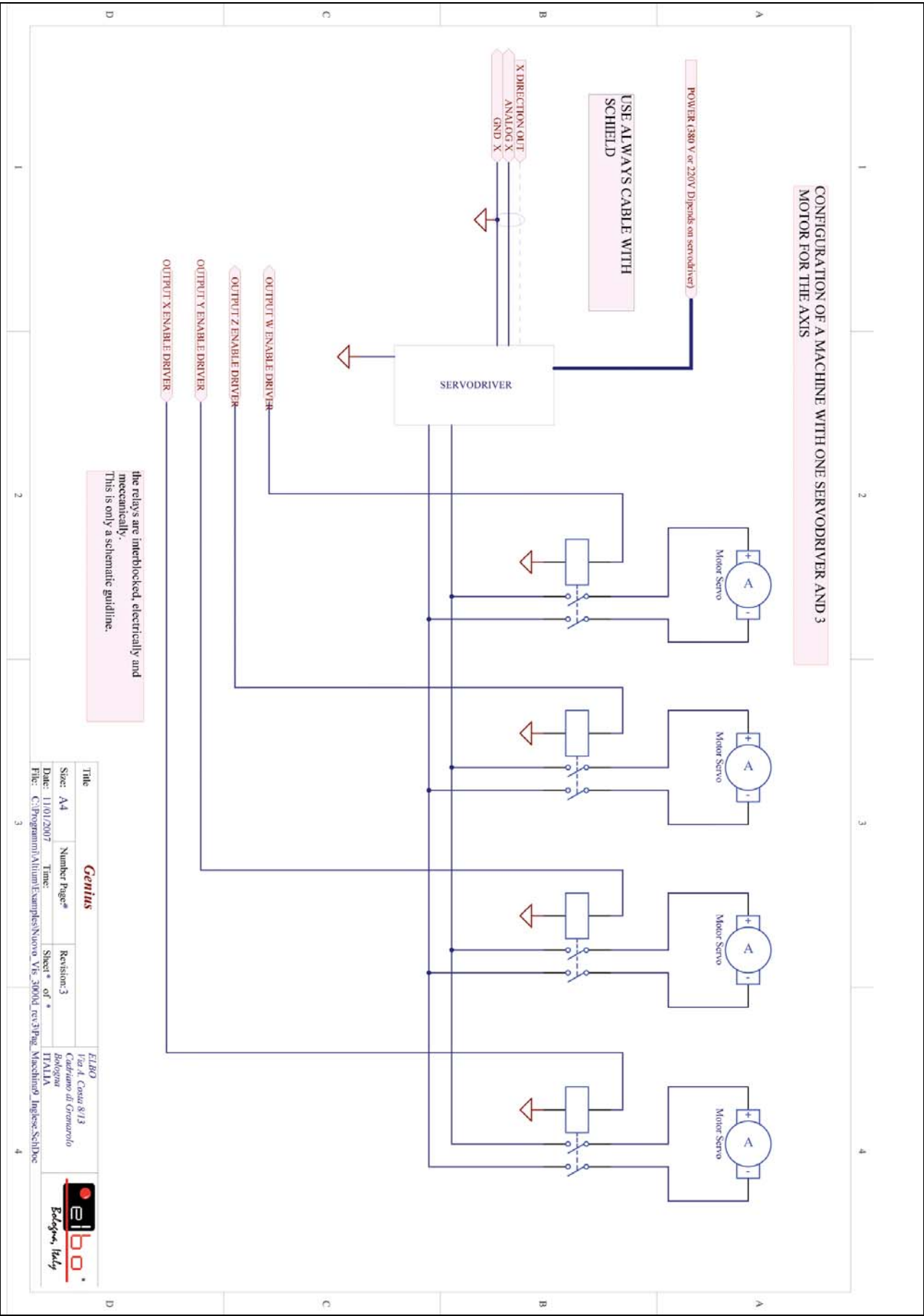






ELECTRIC SCHEMATIC 2

(APPLICATION OR MACHINE WITH 3 MOTOR AND 1 INVERTER)



DICHIARAZIONE DI CONFORMITÀ  
(in accordo alla guida 22 ISO/IEC e alla norma EN 45014)

Costruttore: ELBO s.r.l.  
Via Andrea Costa, 8/11  
40057 - Cadriano di Granarolo - BOLOGNA  
Tel.: (051) 766.228 - 766.258 - Fax: (051) 765.352

DICHIARA CHE IL SEGUENTE APPARATO

Nome dell'apparato: GENIUS  
Tipo di apparato: Visualizzatore e posizionatore di quote  
Opzioni:..  
Anno di costruzione: 2005

É CONFORME AI REQUISITI DI EMC DEFINITI DALLE SEGUENTI NORME:

Emissione EN 50081 - 2  
-EN 61000-6-3 Condotte 30MHz-1GHz  
-EN 61000-6-3 Radiate 150kHz-30MHz  
Immunità EN 50082 - 2  
-EN 61000-4-3 3 V/m 80÷1000mHz Mod. AM 80% 1kHz  
-EN 61000-4-6 linee AC – 3V/rms 0.15 – 80 MHz Mod. AM 80%  
-EN 61000-4-2 8kV in aria - 4kV contatto  
-EN 61000-4-4 linee AC = 2,0kV - linee I/O = 1.0/2.0 kV

L'apparato é stato provato nella configurazione tipica di installazione e con periferiche conformi alla direttiva EMC.

L'apparato sopra descritto soddisfa i requisiti EMC definiti dalla direttiva 89/336/CEE sulla compatibilità elettromagnetica e successive modifica 92/31/CEE e 93/68/CEE

É CONFORME AI REQUISITI DELLA LVD DEFINITI DALLE SEGUENTI NORME:

-EN 60204 - 1

L'apparato sopra descritto soddisfa i requisiti LVD definiti dalla direttiva 73/23/CEE e modifica 93/68/CEE

Cariano: Ottobre 2005  
Responsabile delle misure  
Ing. Biavati Giampaolo

Direttore Tecnico  
Bassi Dario