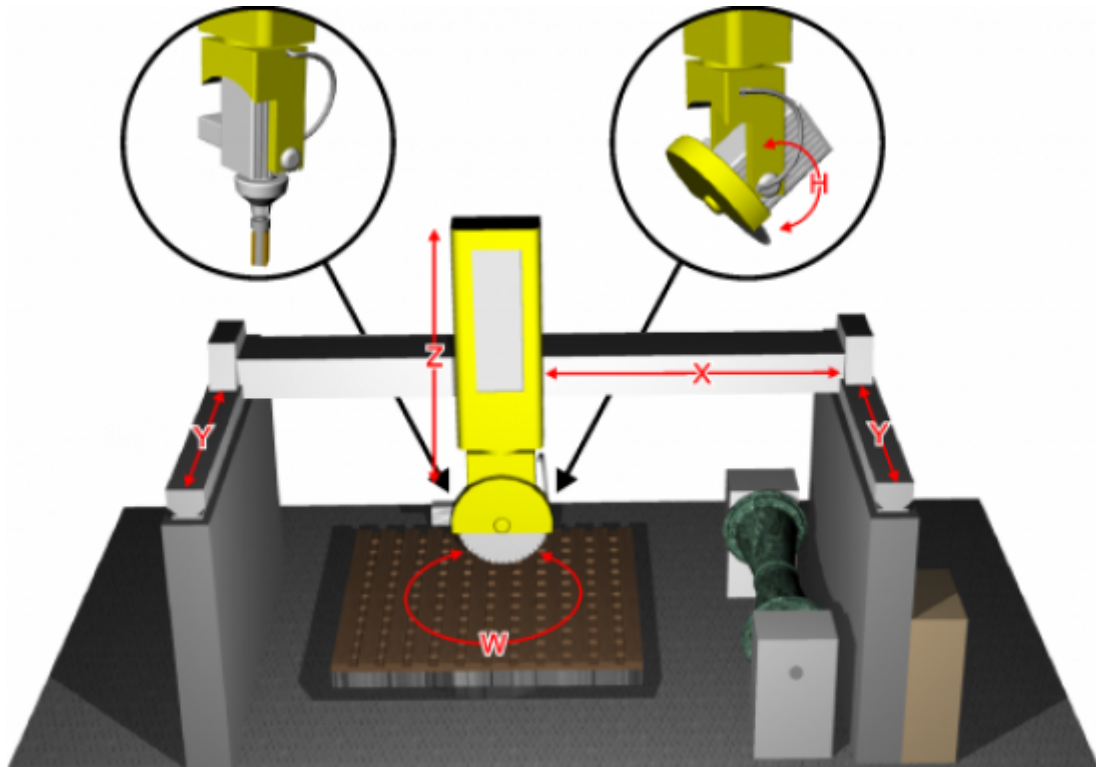


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P1K31FR30-001 - 3 axis bridge saw: Installation Manual



Quality in Electronic
Manufacturing

Document	P1K31FR30-001		
Description	User manual		
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Approved	Draft		
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Languages	English		
Release	Description	Notes	Date
01	New Manual		26/05/14

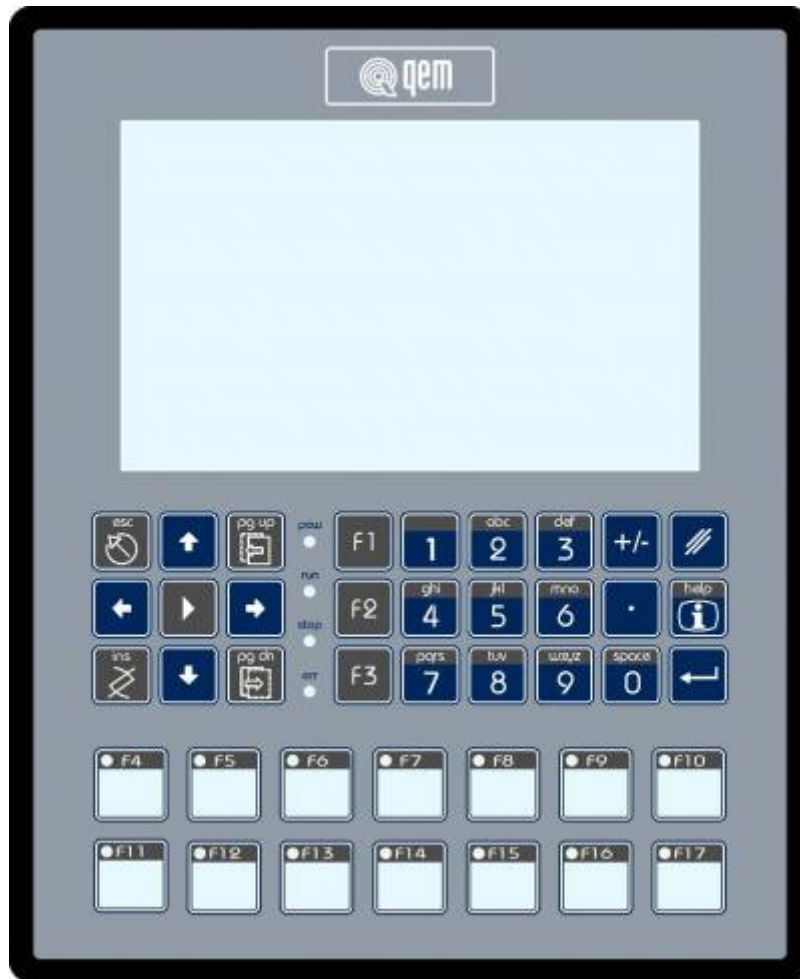
Indice

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- 4.1 CPU DATA
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- 5. Axis Calibration
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1. Hardware J1-K31-FR30



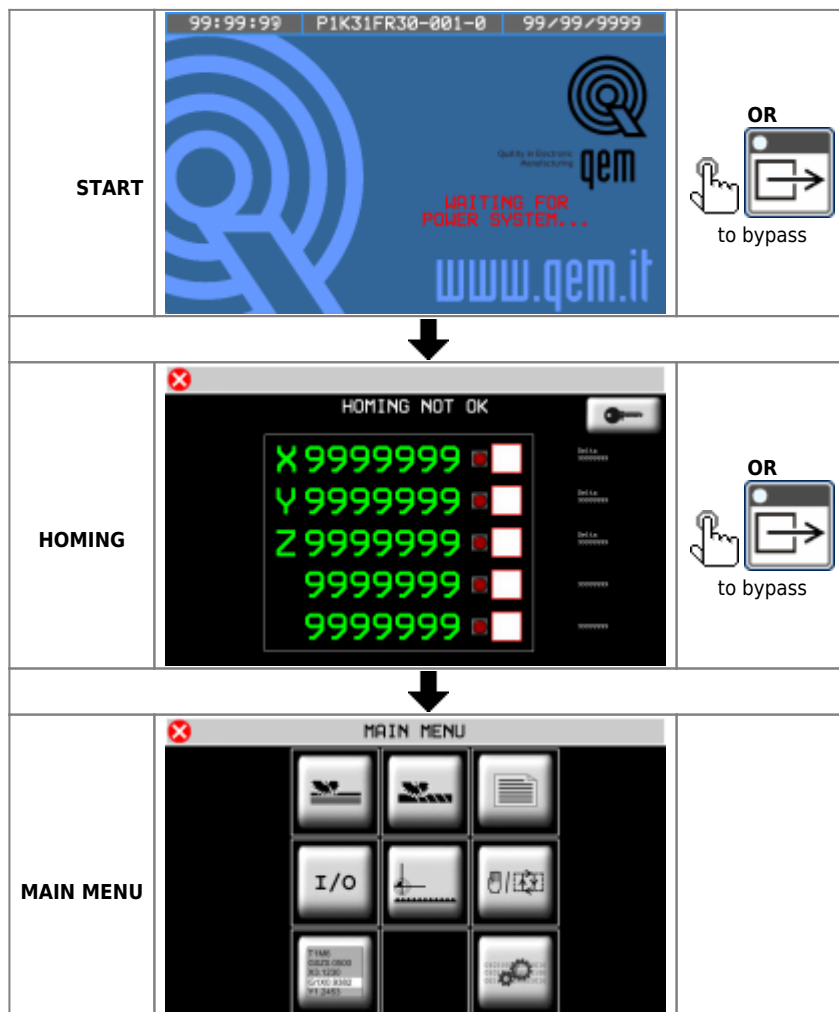
1.1 Function Keys and LEDs

Key	Icon	Function	Led	Key	Icon	Function	Led
F1...F3		Not Used					
F4		Enclosures	Enclosure open status	F5		Not used	
F6		Y Laser ON/OFF	Laser status	F7		X Laser ON/OFF	Laser status
F8		Water ON/OFF	Water status	F9		Alarm = ON	-
F10		Quit or prolonged MAIN	-	F11		Semiautomatic = ON	Semiautomatic status
F12		Table UP	Table up	F13		Table DOWN	Table Down
F14		Table Rotation Anticlockwise	-	F15		Table Rotation Clockwise	-
F16		Disk ON/OFF	Blink is starting, On is started	F17		Mill ON/OFF	Blink is starting, On is started
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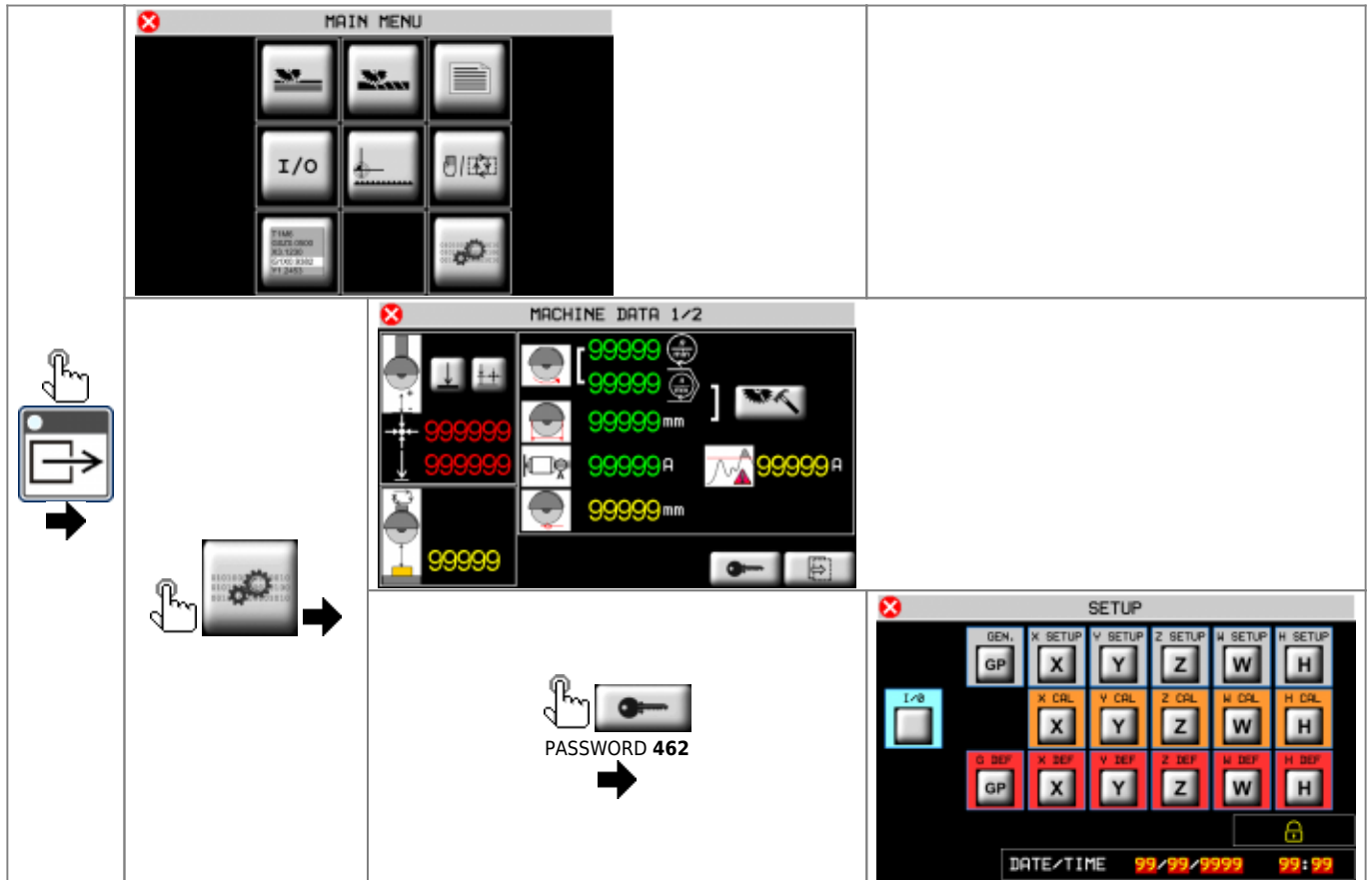
1.2 Symbols and Buttons

Button	Description	-----	Top Bar Symbol	Description
	Press to confirm			Manual
	Select			Emergency
	Previous screen			Automatic
	Next screen			Function mode
	Reserved Area			Not initialized
	Open file on SD card			Setup Locked/Unlocked
	Save			
	Work preview			
	Yellow settings can be changed			
-----	-----	-----	-----	-----

1.3 Startup

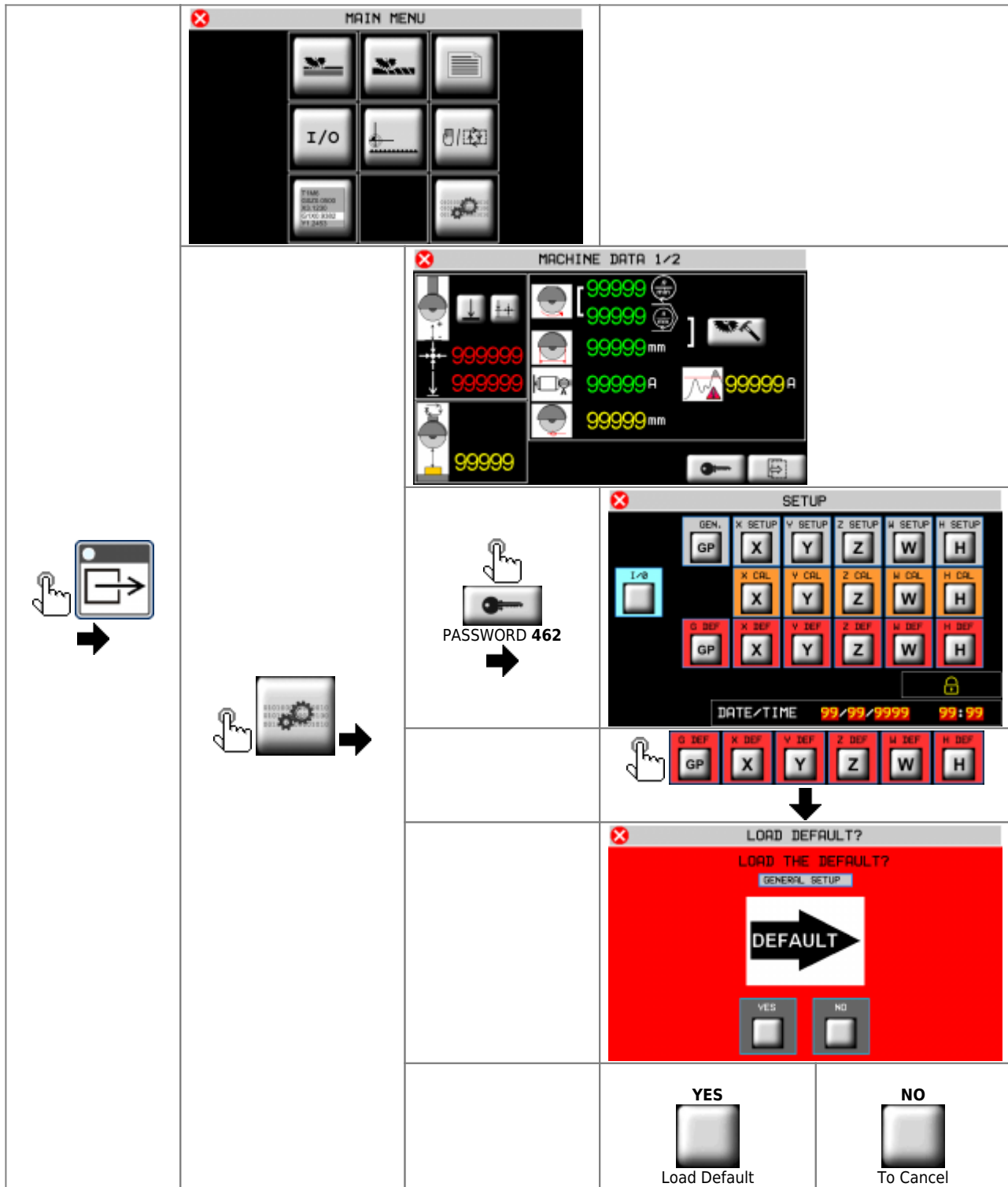


2. SETUP

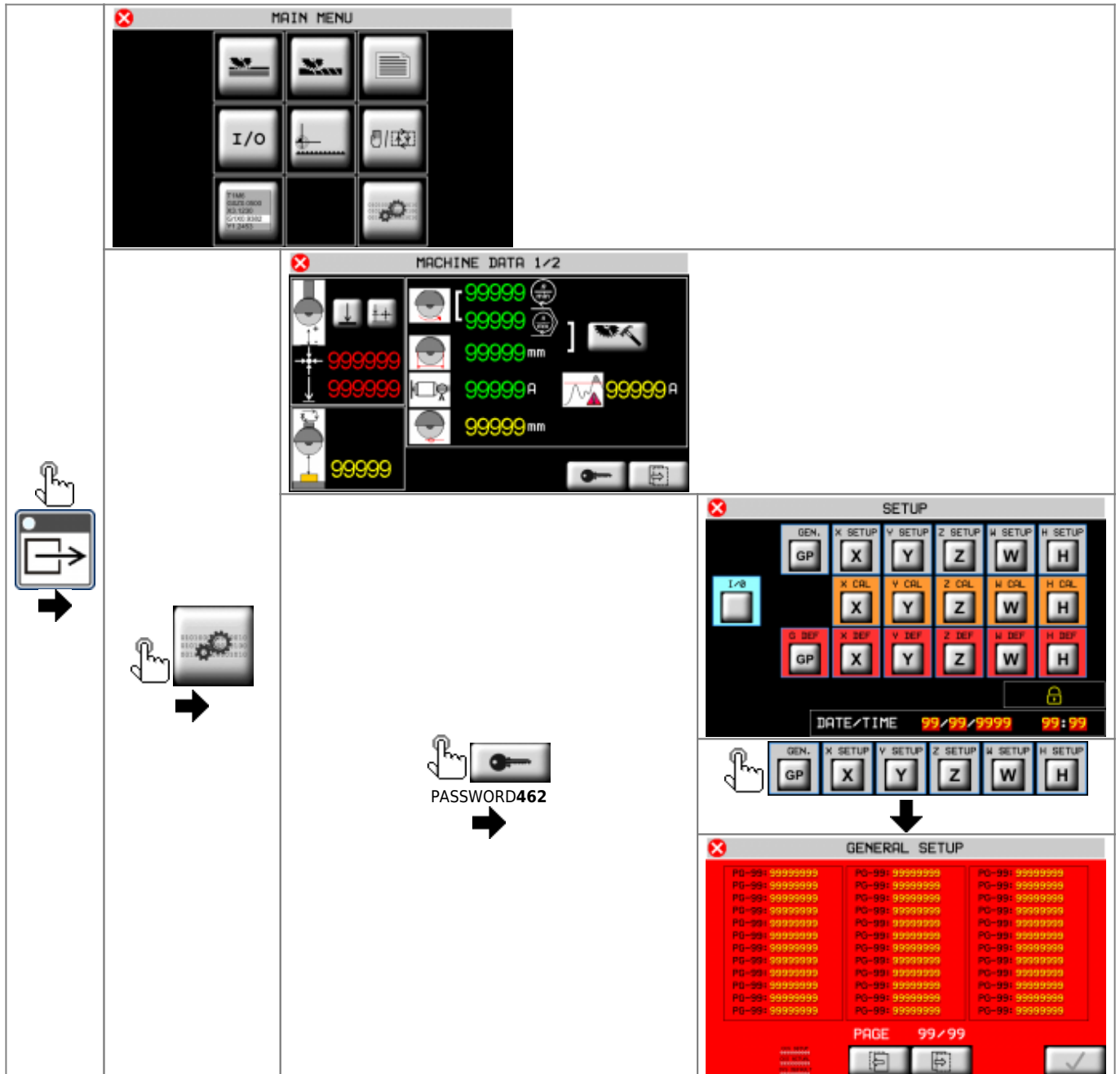


	SETUP parameters		
	Axis calibration		
	Load default parameters		
	Diagnostic		Table Center
	Unlock Setup Area No password for 24 hours		Lock Setup Area Password access only
	Set system Date and Time		

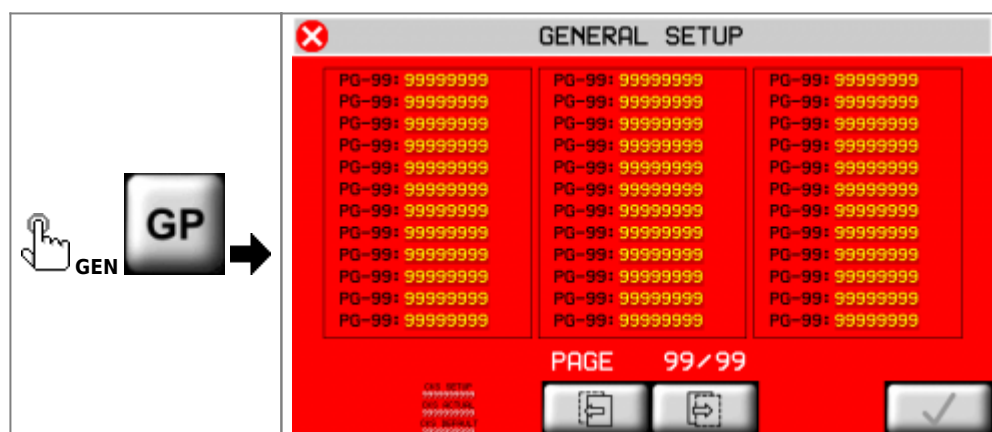
2.1 Load Default parameters



3. SETUP parameters

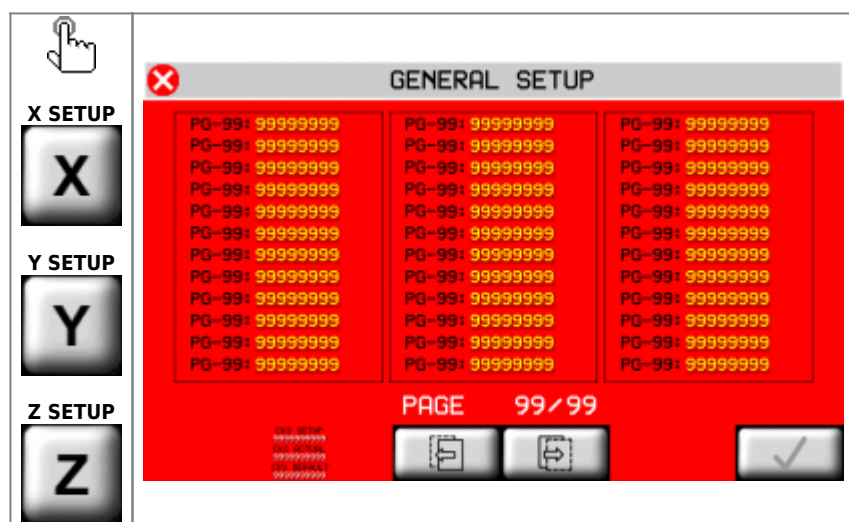


3.1 General Parameters



Parameter	U.M.	Default	Range	Description
PG-01 : DECIMAL POINT X/Y/Z	-	1	0 - 2	Number of decimal points for X, Y and Z axis positions <i>For inches the position is shown with "DECIMAL POINT + 1".</i>
PG-02 : DECIMAL POINT W	-	2	0 - 2	Number of decimal point for W axis position
PG-03 : DECIMAL POINT H	-	2	0 - 2	Number of decimal point for H axis position
PG-04 : MAX RPM DISK	rpm	2480	0 - 3000	Maximum setting of disk rpm.
PG-05 : LASER TIME	s	30	0 - 9999	If > 0 the laser is automatic with Y axis movement. When axis stops laser powers off after this time. If = 0 the laser can only be activated by F7 func key
PG-06 : WATER CONTROL TIME	s	5	0 - 9999	If there is a water fault, the alarm is given after this time.
PG-07 : DISABLE WATER CONTROL	-	0	0 - 1	0 : water control enabled; 1 : water control disabled.
PG-08 : BUZZER HMI	-	0	0 - 1	0 : buzzer enabled 1 : buzzer disabled.
PG-09 : ALARM SOUND TIME	s	10	0 - 999	Time the Alarm sounds when the machine is in an alarm state.
PG-10 : UNIT MEASURE	-	0	0 - 1	0 : mm 1 : inches <i>All setup parameters are given in mm.</i>
PG-11 : LANGUAGE	-	1	1 - 2	1 : ENGLISH 2 : ITALIAN
PG-12 : HOMING MODE	-	1	0 - 3	0 :Homing necessary to unlock all other operations; 1 :Homing not necessary, all functions are unlocked; 2 = Homing necessary for automatic cycle, without only manual movements are possible 3 :Homing necessary to unlock all other operations. The Homing starts automatically.
PG-13 : Not Used				
PG-14 : MIN ANALOG INPUT READING	bit	5	0 - 1000	If > = all analog inputs are forced to zero.
PG-15 : INTERPOLATION SPEED OVERRIDE	-	0	0 - 1	0 : override applied to calculated speed 1 : override applied to set speed
PG-16 : CORNER TYPE	-	0	0 - 1	0 : corner with smoothed center 1 : Not Used
PG-17 : CORNER ERROR	mm	0.5	0 - 999.9	Distance error from corner start and center.
PG-18 : RAPID SPEED	mm/min	1000	0 - 9999	Feedrate of straight traverse during work execution or G code execution
PG-19 : MAX CURRENT	A	100.0	0 - 100.0	Maximum analogic input for spindle current.
PG-20 : SPINDLE SPEED OK DELAY	s	0	0 - 99.999	0 : machine waits input I 15 for spindle speed ok >0 : machine only waits delay time
PG-21 : MILL MAX RPM	rpm	3000	0 - 3000	Maximum mill rpm.
PG-22 : HOMING SEQUENCE	-	0	0 - 1	0 : single axis homing; 1 : after Z axis homing, the others are together.

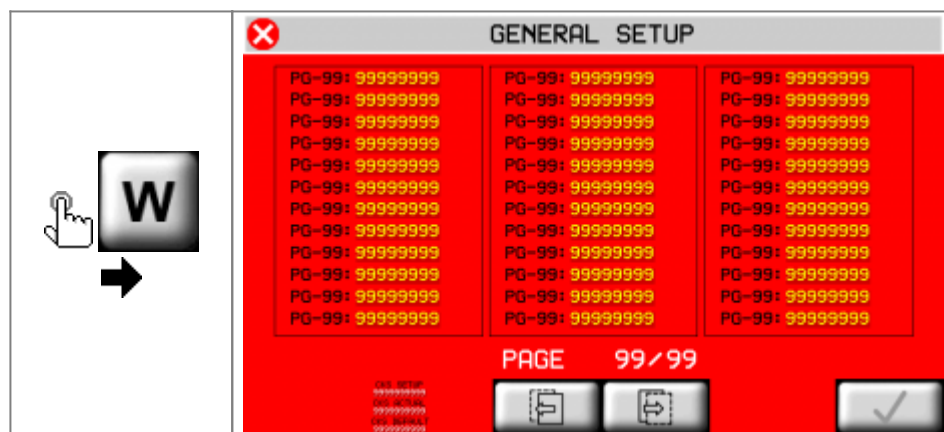
3.2 X, Y, Z axis setup



Parameter	U.M.	Default	Range	Description
PX-01 : MEASURE	mm	0.1	0 - 99999.9	Distance, in unit measure, of the axis movement to obtain the pulses set in PX-01.
PX-02 : PULSE	-	1	0 - 999999	Encoder pulses for the distance set in PX-1. <i>PX-01/PX-02 is the axis resolution. It must be 1 ~ 0.000935.</i>
PX-03 : TOLERANCE	mm	0.50	0 - 99.99	Distance around target position. If an axis stops inside this distance, the positioning is correct.
PX-04 : ENABLE TIME	s	0.200	0 - 9.999	Enable time before axis starts moving.
PX-05 : DISABLE TIME	s	0.200	0 - 9.999	Disable time after axis stops.
PX-06 : ENABLE AXIS OUTPUT	-	1	0 - 1	Enable axis output mode. 0: output ON before axis movement and OFF after axis stop in times set in PX-04 and PX-05. 1: output always ON when machine is not in alarm state.
PX-07 : JOG FUNCTION	-	1	0 - 1	Jog function type. 0: In jog, axis control is open loop. 1: In jog, axis control is closed loop.
PX-08 : MAXIMUM QUOTA	mm	99999.9	-99999.9 - 99999.9	Maximum quota for the axis. Software limit switch.(x)
PX-09 : MINIMUM QUOTA	mm	-99999.9	-99999.9 - 99999.9	Minimum quota for the axis. Software limit switch.(x)
PX-10 : HOMING OFFSET	mm	0	-99999.9 - 99999.9	Set position at the end of homing procedure.(x)
PX-11 : HOMING TYPE	-	0	0 - 3	0: Axis goes to homing sensor, inverts movement and goes to PX-10. 1: Axis goes to homing sensor, inverts movement and sets PX-10 position as encoder zero signal. 2: Axis homing without movement. Set PX-10 position on homing sensor signal. 3: homing disabled.
PX-12 : HOMING DIRECTION	-	0	0 - 1	0: forward; 1: backward.
PX-13 : HOMING FAST SPEED	mm/min	10	0 - 9999999	Homing sensor search speed.
PX-14 : HOMING SLOW SPEED	mm/min	10	0 - 9999999	Axis speed after inversion in homing.
PX-15 : HOMING SEQUENCE ENABLE	-	1	0 - 1	0: Axis not included in automatic homing sequence. 1: Axis included in automatic homing sequence.
PX-16 : ACCELERATION TIME IN AUTO	s	1.00	0 - 9.99	Time from 0 to axis maximum speed in automatic.
PX-17 : DECELERATION TIME IN AUTO	s	1.00	0 - 9.99	Time from axis maximum speed to 0 in automatic.
PX-18 : ACCELERATION TIME IN MAN	s	1.00	0 - 9.99	Time from 0 to axis maximum speed in manual.
PX-19 : DECELERATION TIME IN MAN	s	1.00	0 - 9.99	Time from axis maximum speed to 0 in manual.
PX-20 : WAIT TOLERANCE TIMER	s	0.50	0 - 99.99	Time between axis stop and tolerance control.
PX-21 : AUTOMATIC SPEED FORWARD	mm/min	10	0 - 9999999	Axis forward speed during automatic cycle.
PX-22 : AUTOMATIC SPEED BACKWARD	mm/min	10	0 - 9999999	Axis backward speed during automatic cycle.
PX-23 : MANUAL FAST SPEED	mm/min	10	0 - 9999999	Axis fast speed during manual jog movement.
PX-24 : MANUAL SLOW SPEED	mm/min	10	0 - 9999999	Axis slow speed during manual jog movement.
PX-25 : MINIMUM MOVEMENT	mm	0.1	0 - 999.9	Encoder fault control: minimum movement for the axis.
PX-26 : VOLTAGE THRESHOLD	V	1.0	0 - 10.0	Encoder fault control : minimum voltage to start encoder control.

Parameter	U.M.	Default	Range	Description
PX-27 : END CYCLE PARKING	-	0	0 - 1	Enable Parking position at the end of automatic cycle. 0 : disabled 1 : enabled
PX-28 : MAXIMUM SPEED	mm/min	100	0 - 9999999	Axis maximum speed with 10Vdc applied.
PX-29 : FEEDFORWARD	%	100.0	0 - 200.0	Feed-forward register for PID regulation.
PX-30 : PROPORTIONAL GAIN	-	0	0 - 9.999	Proportional gain register for PID regulation.
PX-31 : INTEGRAL TIME	s	0	0 - 9.999	Integral register for PID regulation.
PX-32 : DERIVATIVE TIME	s	0	0 - 9.999	Derivative register for PID regulation.
PX-33 : MAX FOLLOWING ERROR	mm	9999.99	0 - 9999.99	Maximum error between calculated and real axis position.
PX-34 : OFFSET	V	0	-99.9999 - 99.9999	Analogic output offset for drive compensation.
PX-35 : MAX INTERPOLATION SPEED	%	80.0	0 - 100.0	Maximum interpolation speed. Percentage of maximum speed in PX-28.
PX-36 : HOMING SENSOR LOGIC	-	0	0 - 1	0 : Sensor NO (normally open). 1 : Sensor NC (normally close).
Pulse position mode				
PX-37 : APPROACH POSITION	mm	10.0	0 - 999.9	If > 0 pulse positioning enabled. Position before target to start pulse positioning.
PX-38 : PULSE AMPLITUDE	V	0.1	0 - 10.0	Pulse amplitude in Volt.
PX-39 : PULSE TIME	s	0.20	0 - 99.99	Time of a single pulse step.
PX-40 : PULSE DELAY	s	0.20	0 - 99.99	Time between two steps.
PX-41 : PULSE TIMEOUT	s	0	0 - 99	Pulse positioning maximum time.
Parameters valid only for X axis				
PX-42 : TABLE CENTER COORDINATE	mm	1000.0	-99999.9 - 99999.9	Axis coordinate of the rotary table.
PX-43 : OFFSET DRILL-DISK	mm	0.0	-99999.9 - 99999.9	Distance between disk center and drill center.
PX-44 : RAMP TYPE	-	0	0 - 1	0 : Linear ramps. 1 : Epicyclic ramps.
Parameters only for Y axis				
PY-42 : TABLE CENTER COORDINATE	mm	1000.0	-99999.9 - 99999.9	Axis coordinate of the rotary table.(x)
PY-43 : TOLERANCE ALARM DISABLE	-	0	0 - 1	0 : alarm enabled 1 : alarm disabled
PY-44 : OFFSET DRILL-DISK	mm	100.0	-99999.9 - 99999.9	Distance between disk center and drill center.
PY-45 : RAMP TYPE	-	0	0 - 1	0 : Linear ramps. 1 : Epicyclic ramps.
Parameters only for Z axis				
PZ-42 : TOLERANCE ALARM DISABLE	-	0	0 - 1	0 : alarm enabled 1 : alarm disabled
PZ-43 : RAMP TYPE	-	0	0 - 1	0 : Linear ramps. 1 : Epicyclic ramps.

3.3 W axis setup



Parameter	U.M.	Default	Range	Description
PW-01 : AXIS ENABLE	-	0	0 - 1	0 : axis disabled 1 : axis enabled
PW-02 : MEASURE	°	0.1	0 - 99999.9	Distance, in unit measure, of the axis movement to obtain the pulses set in PX-01.
PW-03 : PULSE	-	1	0 - 999999	Encoder pulses for the distance set in PX-1. <i>PX-01/PX-02 is the axis resolution. It must be 1 ~ 0.000935.</i>
PW-04 : TOLERANCE	°	0.50	0 - 99.99	Distance around target position. If an axis stops inside this distance, the positioning is correct.
PW-05 : ENABLE TIME	s	0.200	0 - 9.999	Enable time before axis starts moving.
PW-06 : DISABLE TIME	s	0.200	0 - 9.999	Disable time after axis stops.
PW-07 : SLOW POSITION	°	5.00	0 - 99.99	Target position when axis has slow speed before the final target.
PW-08 : FORWARD INERTIA	°	0	0 - 99.999	Inertia space at the end of forward movements.
PW-09 : BACKWARD INERTIA	°	0	0 - 99.999	Inertia space at the end of backward movements.
PW-10 : INERTIA MODE	-	0	0 - 2	At the end of positioning: 0 : inertia not calculated 1 : calculated if out of tolerance 2 : always calculated
PW-11 : WAIT TOLERANCE TIMER	s	1.000	0 - 9.999	Time between axis stop and tolerance control.
PW-12 : BACKLASH MODE	-	0	0 - 4	0 : no backlash 1 : forward backlash 2 : backward backlash 3 : forward backlash without speed slow down 4 : backward backlash without speed slow down
PW-13 : OVER POSITION	°	0	0 - 999.99	Over quota for backlash.
PW-14 : AUTOMATIC FAST SPEED	%	10.0	0 - 100.0	Axis fast speed during automatic cycle.
PW-15 : AUTOMATIC SLOW SPEED	%	5.0	0 - 100.0	Axis slow speed during automatic cycle.
PW-16 : MANUAL FAST SPEED	%	10.0	0 - 100.0	Axis fast speed during manual jog movement.
PW-17 : MANUAL SLOW SPEED	%	5.0	0 - 100.0	Axis slow speed during manual jog movement.
PW-18 : HOMING FAST SPEED	%	10.0	0 - 100.0	Homing sensor search speed.
PW-19 : HOMING SLOW SPEED	%	1.0	0 - 100.0	Axis speed after inversion in homing.
PW-20 : AXIS IN AUTO HOMING	-	1	0 - 1	0 : Axis not included in automatic homing sequence. 1 : Axis included in automatic homing sequence.
PW-21 : HOMING OFFSET	°	0	-99999.9 - 99999.9	Set position at the end of homing procedure.
PW-22 : HOMING TYPE	-	0	0 - 3	0 : Axis goes to homing sensor, inverts movement and goes to PW-22. 1 : Axis searches the homing sensor, inverts movement and set PW-22 quota on encoder zero signal. 2 : Axis homing without movement. Set PW-22 quota on homing sensor signal. 3 : homing disabled.
PW-23 : HOMING DIRECTION	-	1	0 - 1	0 :forward; 1 :backward.
PW-24 : MAXIMUM QUOTA	°	9999.99	-9999.99 - 9999.99	Maximum quota for the axis. Software limit switch.
PW-25 : MINIMUM QUOTA	°	-9999.99	-9999.99 - 9999.99	Minimum quota for the axis. Software limit switch.
PW-26 : MINIMUM SHIFT	°	0.10	0 - 99.99	Encoder fault control: minimum shift for the axis.
PW-27 : MINIMUM TIMER	s	2.000	0 - 99.99	Encoder fault control : sample time to check minimum shift.
PW-28 : BRAKE LOGIC	-	1	0 - 1	0 : Brake output N.O. 1 : Brake output N.C.
PW-29 : BRAKE TIMER	s	1.000	0 - 9.999	Enable time before axis starts moving and after axis stop.
PW-30 : ACCELERATION	V/s	20.00	0 - 99.99	Acceleration value.

Parameter	U.M.	Default	Range	Description
PW-31 : DECELERATION	V/s	20.00	0 - 99.99	Deceleration value.
Pulse position mode				
PW-32 : PULSE ENABLE	-	0	0 - 1	0 : Pulse positioning disable. 1 : Pulse positioning enable.
PW-33 : APPROACH QUOTA	°	0.30	0 - 999.99	Quota before target where pulse positioning begins.
PW-34 : PULSE TIME	s	0.100	0 - 9.999	Time of a single pulse step.
PW-35 : PULSE DELAY	s	0.100	0 - 9.999	Time between two steps.
PW-36 : PULSE NUMBER	-	40	0 - 9999	Maximum number of pulse step.
PW-37 : PULSE AMPLITUDE	V	0.1	0 - 10.0	Pulse amplitude in volt.
Table position locks				
PW-38 : ENABLE LOCK	-	0	0 - 1	0 : lock engage disable 1 : lock engage enable.
PW-39 : LOCK DELAY	s	0.200	0 - 9.999	Time between lock engage and brake output
PW-40 : LOCK 1 POSITION	°	0	-9999.99 - 9999.99	Position for lock 1
PW-41 : LOCK 2 POSITION	°	90.00	-9999.99 - 9999.99	Position for lock 2
Linearization				
PW-42 : ENABLE CONVERSION	-	0	0 - 1	0 : position linear conversion disable. 1 : position linear conversion enable.
PW-43 : REAL POSIT 2	°	45.00	-9999.99 - 9999.99	Axis real position in sector 2
PW-44 : CONV. POSIT 2	°	45.00	-9999.99 - 9999.99	Axis converted position in sector 2
PW-45 : REAL POSIT 3	°	90.00	-9999.99 - 9999.99	Axis real position in sector 3
PW-46 : CONV. POSIT 3	°	90.00	-9999.99 - 9999.99	Axis converted position in sector 3
PW-47 : REAL POSIT 4	°	135.00	-9999.99 - 9999.99	Axis real position in sector 4
PW-48 : CONV. POSIT 4	°	135.00	-9999.99 - 9999.99	Axis converted position in sector 4
PW-49 : REAL POSIT 5	°	180.00	-9999.99 - 9999.99	Axis real position in sector 5
PW-50 : CONV. POSIT 5	°	180.00	-9999.99 - 9999.99	Axis converted position in sector 5
PW-51 : REAL POSIT 6	°	225.00	-9999.99 - 9999.99	Axis real position in sector 6
PW-52 : CONV. POSIT 6	°	225.00	-9999.99 - 9999.99	Axis converted position in sector 6
PW-53 : REAL POSIT 7	°	270.00	-9999.99 - 9999.99	Axis real position in sector 7
PW-54 : CONV. POSIT 7	°	270.00	-9999.99 - 9999.99	Axis converted position in sector 7
PW-55 : REAL POSIT 8	°	315.00	-9999.99 - 9999.99	Axis real position in sector 8
PW-56 : CONV. POSIT 8	°	315.00	-9999.99 - 9999.99	Axis converted position in sector 8

3.4 H axis setup



Parameter	U.M.	Default	Range	Description
PH-01 : INCLINATION TYPE	-	1	0 - 1	0 : axis inclination with Z axis 1 : axis inclination only head
PH-02 : MOTOR	-	0	0 - 2	0 : axis without encoder and motor 1 : axis with only encoder 2 : axis with encoder and motor
PH-03 : empty	-	-	-	-
PH-04 : MEASURE	°	0.01	0 - 9999.99	Distance, in unit measure, of the axis shift to obtain the pulses set in parameter <i>PULSE</i> .
PH-05 : PULSE	-	1	0 - 999999	Pulses of the encoder corresponding to the distance set in parameter <i>MEASURE</i> . <i>Measure/Pulse</i> is axis resolution. It has to be between 1 and 0.000935.
PH-06 : TOLERANCE	°	0.050	0 - 99.999	Interval around target quota. If axis stops in this interval , the positioning is correct.
PH-07 : ENABLE TIME	s	0.200	0 - 9.999	Enable time before axis starts moving.
PH-08 : DISABLE TIME	s	0.200	0 - 9.999	Disable time after axis stops.
PH-09 : SPACE IN SLOW	°	5.00	0 - 99.99	Space in slow speed. Target quota when axis speed slows down before final target.
PH-10 : FORWARD INERTIA	°	0	0 - 99.999	Inertia space at the end of forward movements.
PH-11 : BACKWARD INERTIA	°	0	0 - 99.999	Inertia space at the end of backward movements.
PH-12 : INERTIA MODE	-	0	0 - 2	At the end of positioning: 0 : inertia not calculated 1 : calculated if out of tolerance 2 : always calculated
PH-13 : WAIT TOLERANCE TIMER	s	1.000	0 - 9.999	Time between axis stop and tolerance control.
PH-14 : BACKLASH MODE	-	0	0 - 4	0 : no backlash 1 : forward backlash 2 : backward backlash 3 : forward backlash without speed slow down 4 : backward backlash without speed slow down
PH-15 : OVER POSITION	°	0	0 - 999.99	Over quota for backlash.
PH-16 : AUTOMATIC FAST SPEED	%	10.0	0 - 100.0	Axis fast speed during automatic cycle.
PH-17 : AUTOMATIC SLOW SPEED	%	5.0	0 - 100.0	Axis slow speed during automatic cycle.
PH-18 : MANUAL FAST SPEED	%	10.0	0 - 100.0	Axis fast speed during manual jog movement.
PH-19 : MANUAL SLOW SPEED	%	5.0	0 - 100.0	Axis slow speed during manual jog movement.
PH-20 : HOMING FAST SPEED	%	10.0	0 - 100.0	Axis speed at the start of homing.
PH-21 : HOMING SLOW SPEED	%	1.0	0 - 100.0	Axis speed after movement inversion in homing.
PH-22 : HOMING SEQUENCE ENABLE	-	1	0 - 1	0 : Axis not included in automatic homing sequence. 1 : Axis included in automatic homing sequence.
PH-23 : HOMING OFFSET	°	0	-9999.99 - 9999.99	Set position at the end of homing procedure.
PH-24 : HOMING TYPE	-	0	0 - 3	0 : Axis searches the homing sensor, inverts movement and set PH-24 quota. 1 : Axis searches the homing sensor, inverts movement and set PH-24 quota on encoder zero signal. 2 : Axis homing without movement. Set PH-24 quota on homing sensor signal. 3 : homing disabled.
PH-25 : HOMING DIRECTION	-	1	0 - 1	0 :forward; 1 :backward.
PH-26 : MAXIMUM QUOTA	°	9999.99	-9999.99 - 9999.99	Maximum quota for the axis. Software limit switch.
PH-27 : MINIMUM QUOTA	°	-9999.99	-9999.99 - 9999.99	Minimum quota for the axis. Software limit switch.
PH-28 : MINIMUM SHIFT	°	0.10	0 - 99.99	Encoder fault control: minimum shift for the axis.
PH-29 : MINIMUM TIMER	s	2.000	0 - 99.999	Encoder fault control : sample time to check minimum shift.

Parameter	U.M.	Default	Range	Description
PH-30 : BRAKE LOGIC	-	1	0 - 1	0 : Brake output N.O. 1 : Brake output N.C.
PH-31 : BRAKE TIMER	s	1.000	0 - 9.999	Enable time before axis starts moving and after axis stop.
PH-32 : ACCELERATION	V/s	20.00	0 - 99.99	Acceleration value.
PH-33 : DECELERATION	V/s	20.00	0 - 99.99	Deceleration value.
Pulse position mode				
PH-34 : PULSE ENABLE	-	0	0 - 1	0 : Pulse positioning disable. 1 : Pulse positioning enable.
PH-35 : APPROACH POSITION	°	0.30	0 - 999.99	Position before target where pulse positioning begins.
PH-36 : PULSE TIME	s	0.100	0 - 9.999	Time of a single pulse step.
PH-37 : PULSE DELAY	s	0.100	0 - 9.999	Time between two steps.
PH-38 : PULSE NUMBER	-	40	0 - 9999	Maximum number of pulse step.
PH-39 : PULSE AMPLITUDE	V	0.1	0 - 10.0	Pulse amplitude in volt.
Axe position locks				
PH-40 : ENABLE SPINE	-	0	0 - 1	0 : Conic spine insertion disable. 1 : Conic spine insertion enable.
PH-41 : LOCK DELAY	s	0.200	0 - 9.999	Time between spine insertion and brake output.
PH-42 : LOCK 1 POSITION	°	0	-9999.99 - 9999.99	Position for lock 1
PH-43 : LOCK 2 POSITION	°	90.00	-9999.99 - 9999.99	Position for lock 2
Linearization				
PH-44 : ENABLE CONVERSION	-	0	0 - 1	0 : position linear conversion disable. 1 : position linear conversion enable.
PH-45 : REAL POSIT 2	°	22.50	-9999.99 - 9999.99	Axis real position in sector N°2.
PH-46 : CONV. POSIT 2	°	22.50	-9999.99 - 9999.99	Axis converted position in sector N°2.
PH-47 : REAL POSIT 3	°	45.00	-9999.99 - 9999.99	Axis real position in sector N°3.
PH-48 : CONV. POSIT 3	°	45.00	-9999.99 - 9999.99	Axis converted position in sector N°3.
PH-49 : REAL POSIT 4	°	67.50	-9999.99 - 9999.99	Axis real position in sector N°4.
PH-50 : CONV. POSIT 4	°	67.50	-9999.99 - 9999.99	Axis converted position in sector N°4.
PH-51 : REAL POSIT 5	°	90.00	-9999.99 - 9999.99	Axis real position in sector N°5.
PH-52 : CONV. POSIT 5	°	90.00	-9999.99 - 9999.99	Axis converted position in sector N°5.
PH-53 : REAL POSIT 6	°	0	-9999.99 - 9999.99	Axis real position in sector N°6.
PH-54 : CONV. POSIT 6	°	0	-9999.99 - 9999.99	Axis converted position in sector N°6.
PH-55 : REAL POSIT 7	°	0	-9999.99 - 9999.99	Axis real position in sector N°7.
PH-56 : CONV. POSIT 7	°	0	-9999.99 - 9999.99	Axis converted position in sector N°7.
PH-57 : REAL POSIT 8	°	0	-9999.99 - 9999.99	Axis real position in sector N°8.
PH-58 : CONV. POSIT 8	°	0	-9999.99 - 9999.99	Axis converted position in sector N°8.

4. Diagnostics

4.1 CPU DATA

CPU DATA		
Fw name:	AAAAA - 99.9.99	Fw name : firmware code and relative checksum
(Fw check.:	999999999999 dec)	Task time : average CPU cycle time
Task time:	99999 ms	Maximum Time and Minimum Time indexing for the scan
Max task time:	99999 ms	CPU time : total time CPU is in RUN state (hh:mm)
Min task time:	99999 ms	
CPU time:	99999:99	

4.2 Inputs

INPUTS	State of digital inputs																				Analog input readings				BOURNS input reading
	 																								

Legend:  = OFF,  = ON

BOURNS input reading: 

4.3 Outputs

OUTPUTS	State of the digital outputs.																			
	 																			

Legend:  = OFF,  = ON

4.4 Encoder Counts

COUNTS	COUNTERS										Axis position	
	 											

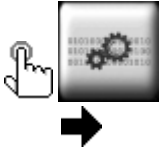
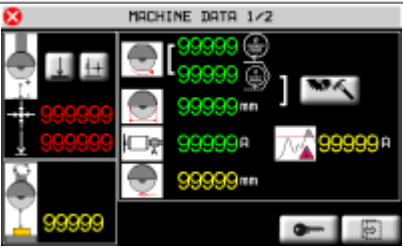
Legend:  = OFF,  = ON

FOLLERR: = realtime following error
MAX: POS:/NEG: = min - max follow errors

4.5 Analog outputs

ANALOG OUTS	ANALOG OUTPUTS				Analog output voltage
	 				

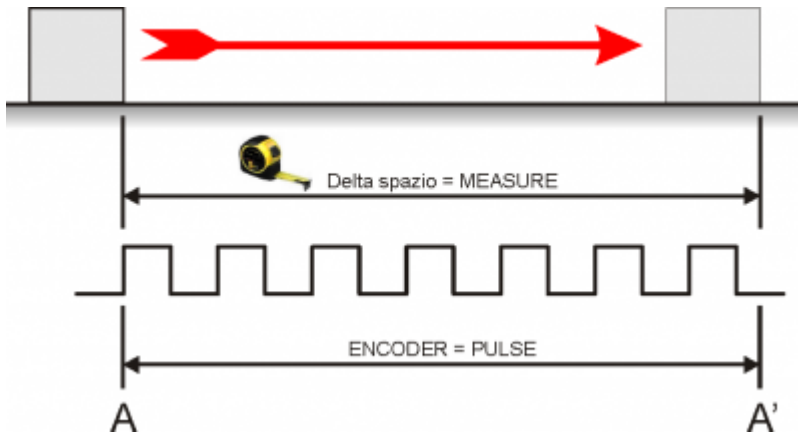
5. Axis Calibration

		
		
	 PASSWORD:462	
		 
	 RESOLUTION	
	 P.I.D.	
	 LINEARIZATION	

5.1 Resolution



Procedure

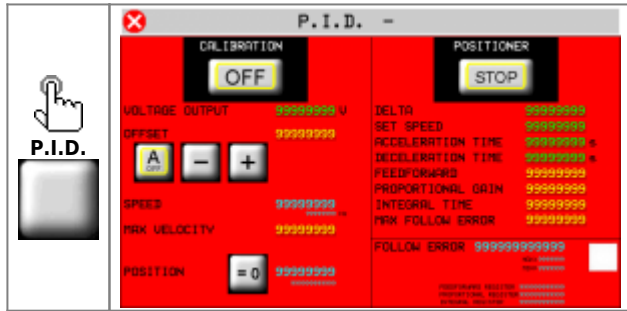


- Press  and check the ENCODER box increases (Analog out +1 Volt)
- Press  and check the ENCODER box decreases (Analog out -1 Volt)
- A - A' = The maximum space
- Take note of the start position (A)
- Zero-set the **ENCODER**: 
- Move the axis from A to A'
- Take note of the reading in **ENCODER** box and write it in the **PULSE** box
- Measure the distance from A to A' = **space delta**
- Enter the A - A' **space delta** in the **MEASURE** box

Important:

- **PULSE** must always be greater than **MEASURE** (the best is "MEASURE x 10 = PULSE")
- Enter **MEASURE** in the selected **unit measure**. E.G. if a unit measure of 1/10mm is selected and the **space delta** is 133.5mm, enter 1335 in the **MEASURE** box

5.2 P.I.D.



The PI + FF calibration procedure:

Space feedback corrects the axis position according to the follow error reading.

Settings in yellow can be modified for the calibration.

Service data is in green and only used for the setup procedure.

Parameter name	Unit measure	Default	Range	Description
VOLTAGE OUT	V	0.0	-10.0 – 10.0	Output voltage, with 0.1V precision, sent directly to the device
OFFSET	V	0.0000	-99.9999 – 99.9999	Voltage added to the analog output to compensate any supply voltage irregularities
SPEED	mm/min	-	-	The real axis speed
MAX SPEED	mm/'	1000	0 – 9999999	Axis speed at an analog output of 10V
POSITION	mm	-	-	The real axis position
DELTA	mm	0.0	-	Delta space between two positions
SET SPEED	mm/'	0	-	Axis speed during positioning
ACC. TIME	s	1.00	-	Acceleration time during positioning
DEC. TIME	s	1.00	-	Deceleration time during positioning
FEEDFORWARD	%	100.0	0.0 – 200.0	Percentage speed multiplier to generate the feed-forward quota of the analog output
PROP. GAIN	-	0.010	0.000 – 9.999	The follow error multiplier to generate the proportional quota of the analog output
T INTEGRAL	s	0.000	0.000 – 9.999	The integration time coefficient of the follow error. The error integration multiplier to generates the integral quota of the analog output
MAX FOLLOW ERR.	mm	99999.9	0.0 – 99999.9	The maximum drift between the calculated axis position and real axis position
FOLLOW ERR.	mm	-	-	The real follow error reading

First complete the following procedures:

- RESOLUTION: set the resolution.
- MAX POSITION: enter a very large positive setting (e.g. 99999.9 mm)
- MIN POSITION: enter a very large negative setting (e.g. - 99999.9 mm)

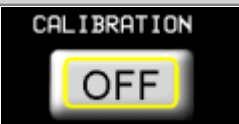
IMPORTANT! Essential conditions for the all procedures:



Ensure that the emergency button shuts off the power to the motors so that the machine can be put in a safety condition.

All emergency conditions on the machine must be eliminated.

Procedures

OFFSET	
1	  to start calibration
2	Set OUT VOLTAGE = 0

OFFSET

3 Regulate the OFFSET (directly by  , or automatically ) so that **POSITION** does not vary (or varies very slowly)

4   to quit calibration

Rotation direction and count

An output voltage > 0 increases POSITION

1   to start calibration

2 Enter VOUT = 1.0

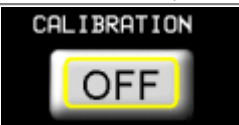
3 Check that POSITION increases

4   to exit calibration and check that **VOUT** goes to 0 immediately

5  If the motor does not rotate in the correct direction, change the drive setup or cabling

Maximum speed

Setting the maximum axis speed (10V output)

1   to enter calibration

2 Enter **VOUT** > 1.0 (as close to 10V as possible)

3 Note the **SPEED** reading

4 Calculate the MAX SPEED: **MAX SPEED = (10 x SPEED) / VOUT**

5   to exit calibration and check that **VOUT** goes to 0 immediately

6 Enter the above calculation result in **MAX SPEED**

Space Feedback

Important: first complete all previous procedures

1 Enter **FEEDFORWARD** = 100.0**2** Enter **PROP. GAIN** = minimum setting (0.001)**3** If **FOLLOW ERR** is not 0, now this reading will reduce with an axis movement**4** Enter **DELTA** = any distance and **SET SPEED** = a speed (nearly **MAX SPEED**)

5   to start the axis movements

6 The axis moves forward by the distance in **DELTA** at the speed in **SET SPEED****7** The axis then returns to the start position and repeats the movement

During the movements note the **FOLLOW ERR** reading and vary **FEEDFORWARD** and **PROP. GAIN** to keep it as low as possible.
Setting rules

- Gradually increase **PROP. GAIN** until the axis does not vibrate when stopped. Then slightly reduce the setting to until ok
-

8 Rule for varying **FEEDFORWARD**

		FOLLOW ERR.	
		>0	<0
Direction	Forward	Increase FEEDFORWARD	Reduce FEEDFORWARD
	Backward	Reduce FEEDFORWARD	Increase FEEDFORWARD

9  When the axis movement overshoots **MAX FOLLOW ERROR** you will see the warning symbol , it does not create an alarm stop

10   to quit the procedure

5.3 Linearization

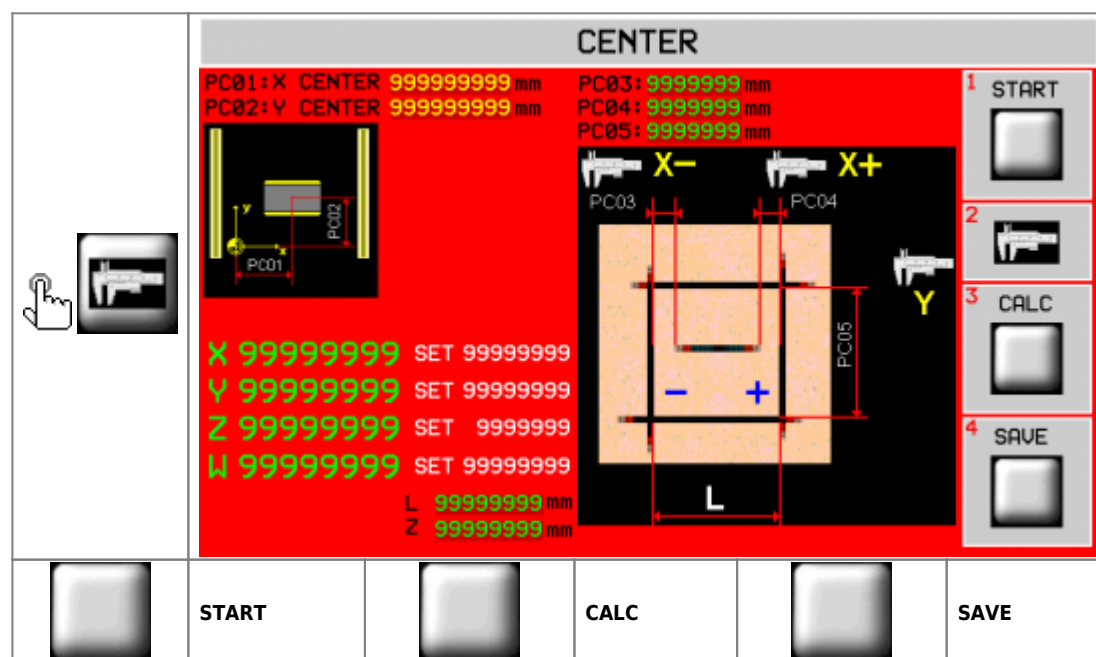

LINEARIZATION


✖ LINEARIZATION -

ENABLE	99999999		
	REAL ANGLE		LINEARIZED
01	0.00 °		0.00 °
02	99999999 °		99999999 °
03	99999999 °		99999999 °
04	99999999 °		99999999 °
05	99999999 °		99999999 °
06	99999999 °		99999999 °
07	99999999 °		99999999 °
08	99999999 °		99999999 °

if the mechanics is not linear in this page you can fill a conversion chart between positions read from the transducer (real angle) and posizon correct (linearized).

5.3.0.1 Table Center Correction

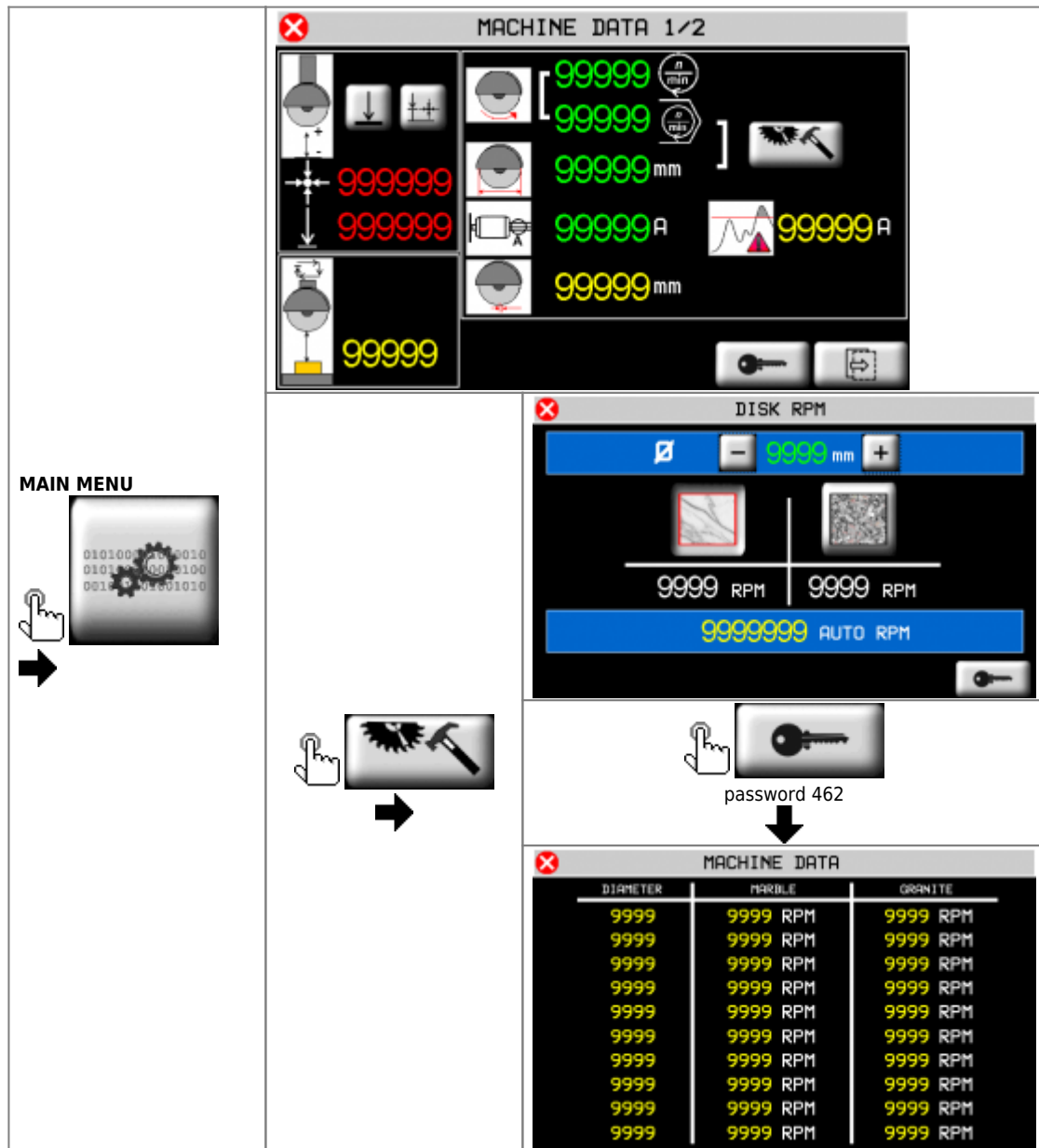


Center Correction Procedure

1. Select Manual mode.
2. Zero-set the Z axis on the slab top.
3. Power the disk and wait until it reaches set speed.
4. **START** to make the 5 cuts as shown. The cuts are made at 5 mm depth.
5. Measure the 3 distances (X-, X+, Y) and enter them in PC03, PC04, PC05.
6. **CALC** to make the corrections. PC01 and PC02 will change reading. **CALC** can only be used once, to repeat exit the screen and enter again.
7. **SAVE** to save the corrections.
8. Exit and enter this screen again to repeat points 1, 2 and 3.
9. Check that PC03 = PC04 and PC05 = L mm.

Parameter	Unit Measure	Default	Range	Description
PC01 : X CENTER	mm	1699.10	0 - 999999.99	Copy of X table center
PC02 : Y CENTER	mm	1765.60	0 - 999999.99	Copy of Y table center
PC03 :	mm	0.00	-999.99 ~ 999.99	Measure as shown for the X center correction
PC04 :	mm	0.00	-999.99 ~ 999.99	
PC05 :	mm	0.00	0 ~ 9999.99	Measure as shown for the Y center correction
L:	mm	200.00	0 ~ 999999.99	L = side of the cut
Z:	mm	5.00	0 ~ 999999.99	Depth of the cuts

6. Disk RPM Chart



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