Sommario

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MDI_P1R44F-024: Installer Manual

1. Information

1.1 Release

Document:	mdi_p1r44f-024
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Approver:	Giuliano Tognon
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Language:	English

Document Release	Description	Notes	Date
01	New manual		12/22/2023

Specifications

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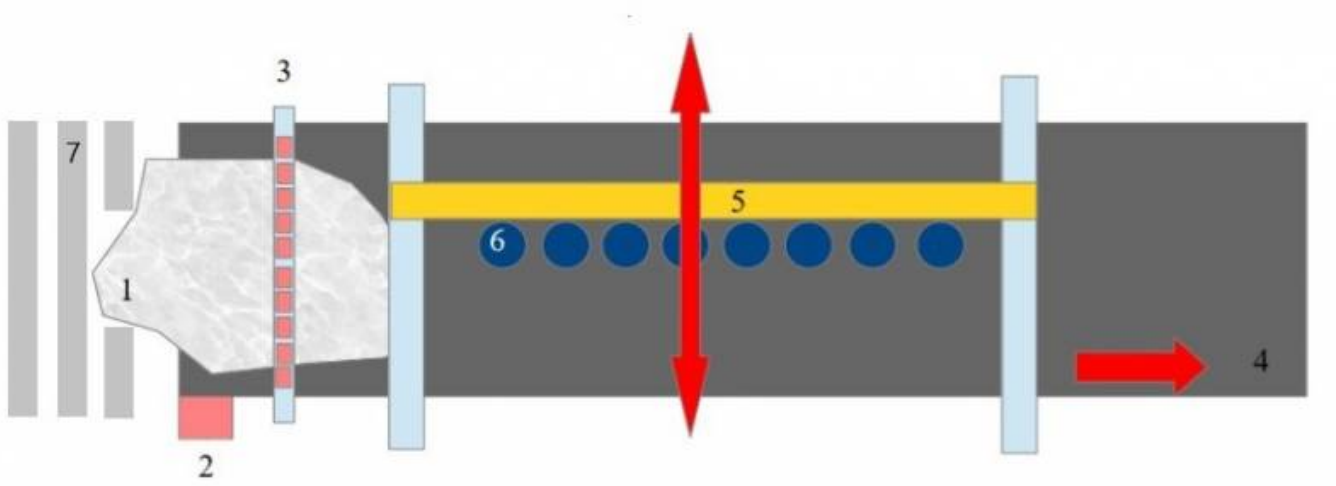
2. Setup

2.1 Machine Overview

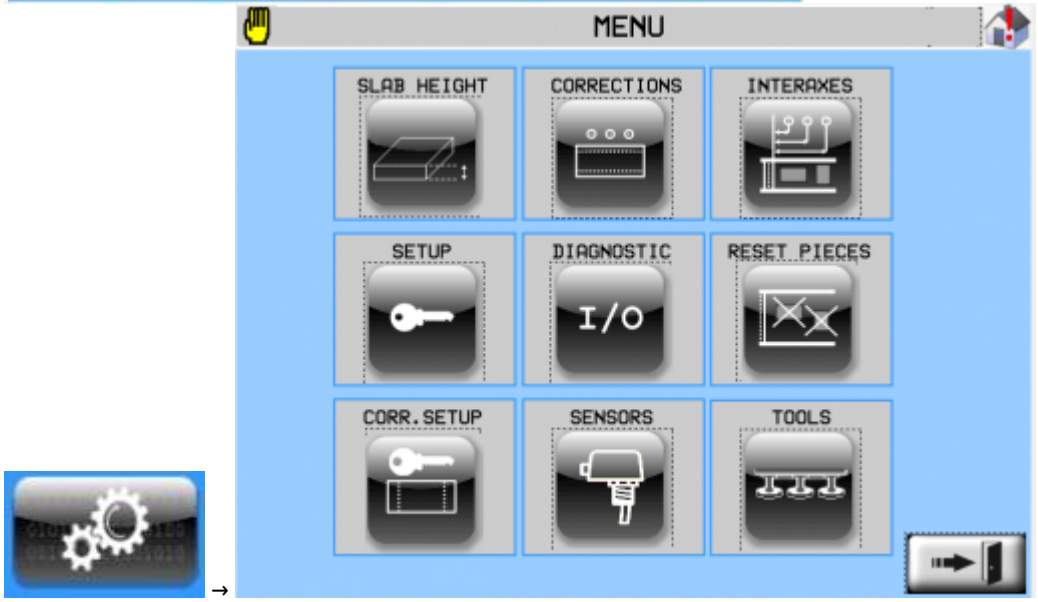
Machine top view:



n:	Description:
1	Raw Slab
2	Conveyor Belt Encoder
3	Limit Switch Bar
4	Conveyor Belt direction
5	Moving Bridge
6	Polishing Heads
7	Infeed Roller

2.2 Access to Setup

Access to the setup can be done from the MENU page by entering the password **035**.



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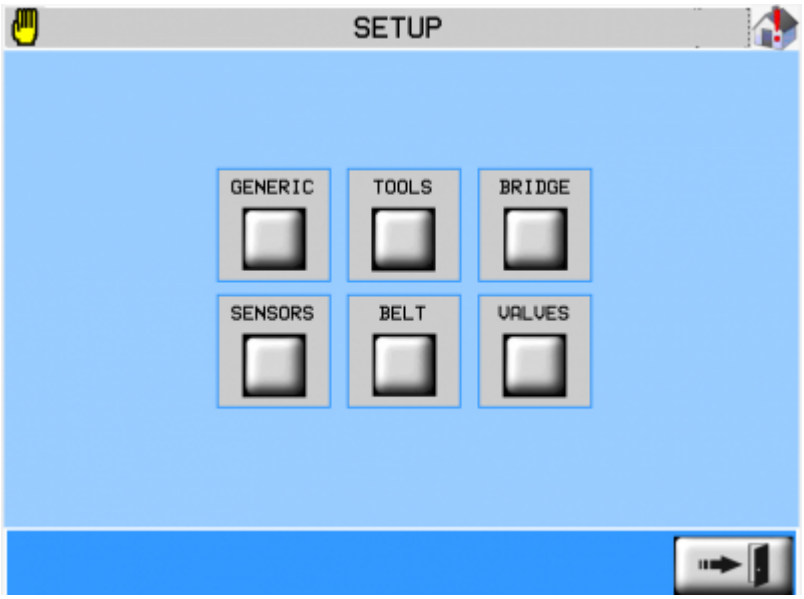

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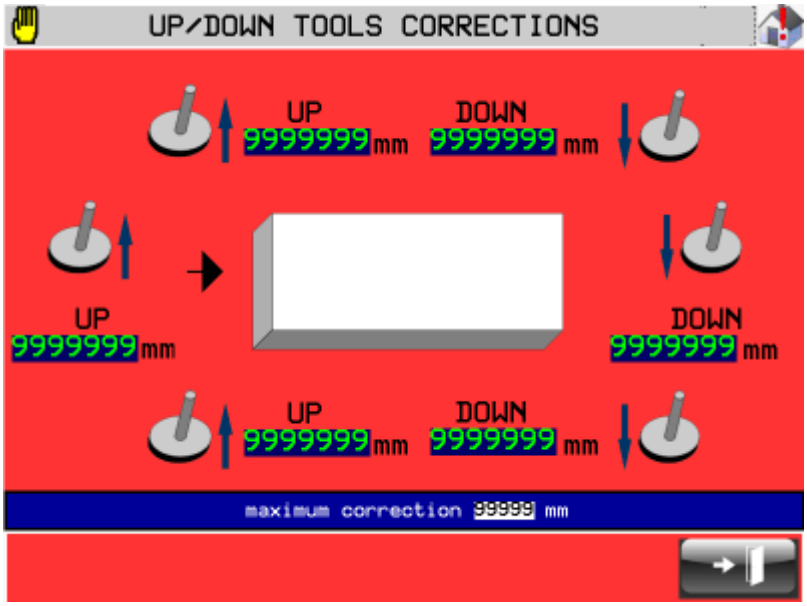
There is a dedicated setup for the correction of the head up/down movement, accessible by entering the password **123**.

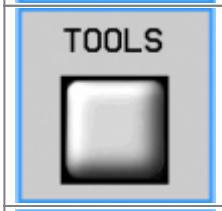
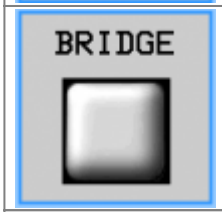
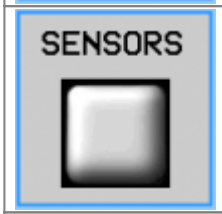
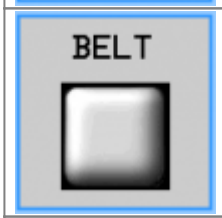
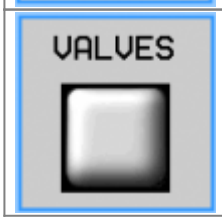

CORR. SETUP

→

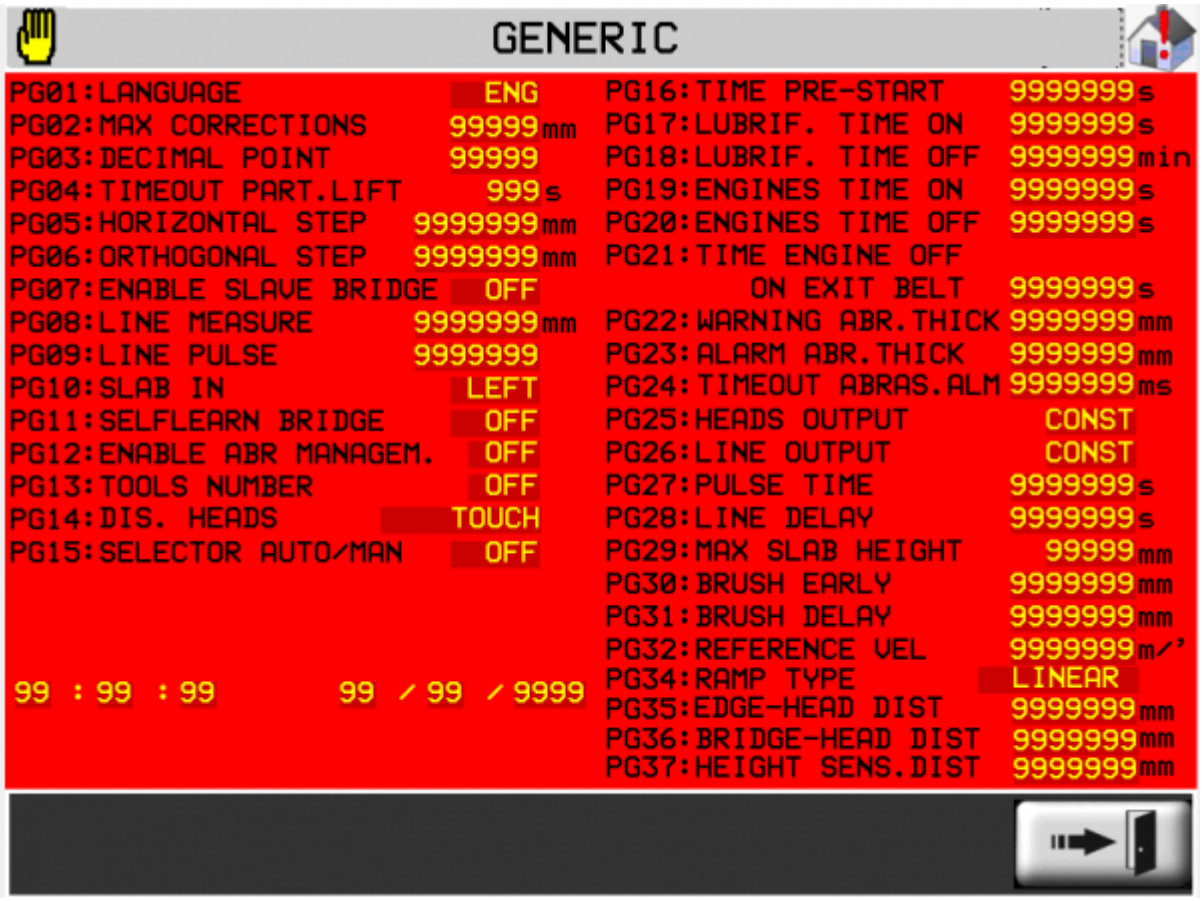

UP/DOWN TOOLS CORRECTIONS
UP
9999999 mm
DOWN
9999999 mm
UP
9999999 mm
DOWN
9999999 mm
UP
9999999 mm
DOWN
9999999 mm
maximum correction 99999 mm

2.2.1 Introduction to SETUP

List of parameters divided into

	general parameters
	parameters associated with the heads
	parameters associated with the bridge
	parameters associated with the sensor bar
	parameters associated with the conveyor belt
	parameters associated with the head up/down valves

2.3 Generic Setup



Parameter Name	***Unit of Measurement***	***Default***	***Range***	***Description***
PG01 : LANGUAGE	-	ITA	1 ÷ 2	1: ITALIAN 2: ENGLISH
PG02 : MAX CORRECTIONS	mm	0	0-9999	Maximum correction applicable for head up and down movement
PG03 : DECIMAL POINT	-	1	0 ÷ 3	It is the position of the decimal point in the display of measurements.
PG04 : PARTIAL LIFT TIMOUT	s	0	99.9	Timer after which the heads lift from a partial up movement.
PG05 : HORIZONTAL STEP	mm	50.0	-	Distance between the limit switches on the sensor bar. Allows detecting the shape of the slab.
PG06 : ORTHOGONAL STEP	mm	50.0	-	Space determined by the encoder. Allows detecting the shape of the slab.
PG07 : ENABLE BRIDGE SLAVE	-	OFF	ON - OFF	Enable/Disable slave bridge swing motor. Enable only if a second motor is used for bridge movement
PG08 : LINE MEASURE	mm	1	0 ÷ 999999	Indicates the distance, in measurement units, traveled by the conveyor belt to obtain the encoder pulses set in the *pulse* parameter.
PG09 : LINE PULSE	-	1	0 ÷ 999999	Indicates the pulses multiplied by 4 provided by the conveyor belt encoder to obtain the space set in the *measure* parameter. *The ratio between measure and pulse is the encoder resolution and must have values between 1 and 0.000935.*
PG10: SLAB ENTRY	-	LFT	LFT - RT	Indicates the slab entry position: LFT = slab enters the machine from the left RT = slab enters the machine from the right
PG11 : BRIDGE AUTO-LEARN	-	OFF	0 ÷ 1	Enables the option to automatically learn the minimum and maximum slab height to optimize bridge swing.
PG12 : ENABLE ABRASIVE MANAGEMENT	-	OFF	ON-OFF	Enables the reading of abrasive thickness and head height. Enable only if analog inputs are used for abrasive thickness measurement

Parameter Name	***Unit of Measurement***	***Default***	***Range***	***Description***
PG14 : HEADS ENABLE/DISABLE	-	TOUCH	TOUCH - SELECTORS	Mode of enabling/disabling heads: TOUCH = enable/disable heads via touchscreen SELECTORS = enable/disable heads via selectors
PG15 : AUTO/MANUAL SELECTOR	-	ON	0 ÷ 1	Enables manual/auto selector.
PG16 : PRESTART TIME	s	3.0	0 ÷ 9999.9	Time between start command and actual machine start (during this time, the warning signal is active). If less than the motor activation time, the greater of the two is applied.
PG17 : LUBRICATION TIME ON	s	0.0	0 ÷ 9999.9	Lubrication ON time.
PG18 : LUBRICATION TIME OFF	s	0.0	0 ÷ 9999.9	Lubrication OFF time.
PG19 : MOTORS TIME ON	s	1.000	0 ÷ 99.999	Pause time between the activation of one motor and the next (in sequential activation).
PG20 : MOTORS TIME OFF	s	0.200	0 ÷ 99.999	Pause time between the deactivation of one motor and the next (in sequential deactivation).
PG21 : BELT EXIT MOTOR TIME	s	0.000	0 ÷ 99.999	Wait time to start sequential motor deactivation, starting when there are no more pieces on the conveyor belt.
PG22 : ABRASIVE THICKNESS WARNING	mm	300	0 ÷ 999999	Minimum abrasive thickness measurement. If the abrasive thickness is less than or equal to the set value, a warning is displayed.
PG23 : ABRASIVE THICKNESS ALARM	mm	200	0 ÷ 999999	Minimum abrasive thickness measurement. If the abrasive thickness is less than or equal to the set value, an alarm is displayed.
PG24 : ABRASIVE ALARM TIMEOUT	ms	0	0 ÷ 999999	Timer for which if the abrasive thickness is below the warning or alarm value for the set time, the respective message appears.
PG25 : HEADS OUTPUT	-	CONST	CONST ÷ PULSE	Operating mode of the heads activation output. CONST = the output remains active for the entire head usage time, PULSE = the output remains active for a set time (PG27).
PG26 : BELT OUTPUT	-	CONST	CONST ÷ PULSE	Operating mode of the conveyor belt activation output. CONST = the output remains active for the entire conveyor belt usage time, PULSE = the output remains active for a set time (PG27).
PG27 : PULSE TIME	s	0.000	0 ÷ 99.999	Activation time of the heads and conveyor belt outputs if they are enabled as pulse outputs.
PG28 : BELT DELAY	s	0.000	0 ÷ 99.999	Delay time for activating the conveyor belt after the bridge starts.
PG29 : MAX SLAB HEIGHT	mm	-	0 ÷ 999.9	Maximum slab height on entry
PG30 : ANTICIPATION SPACE	mm	0.0	-9999.9 ÷ 9999.9	Anticipation space for the brush lowering.
PG31 : DELAY SPACE	mm	0.0	-9999.9 ÷ 9999.9	Delay space for brush lifting.
PG32 : REFERENCE SPEED	m/'	0.0	0 ÷ 9999.9	Reference speed for the use of brush anticipation and delay. If set to 0, no speed proportionality is applied, and the values are used in a constant manner.
PG34 : RAMP TYPE	-	1	0 ÷ 1	Ramp type. Logic level 0 = linear ramp Logic level 1 = S-shaped ramp
PG35 : EDGE-HEAD DISTANCE	mm	-	0 ÷ 99.999	Distance between the edge and the head center
PG36 : BRIDGE-HEAD DISTANCE	mm	-	0 ÷ 99.999	Distance between the bridge homing sensor and the head center
PG37 : SENSOR-HEIGHT DISTANCE	mm	-	0 ÷ 99.999	Distance between the sensor bar and the slab height reading sensor

2.4 Belt Setup

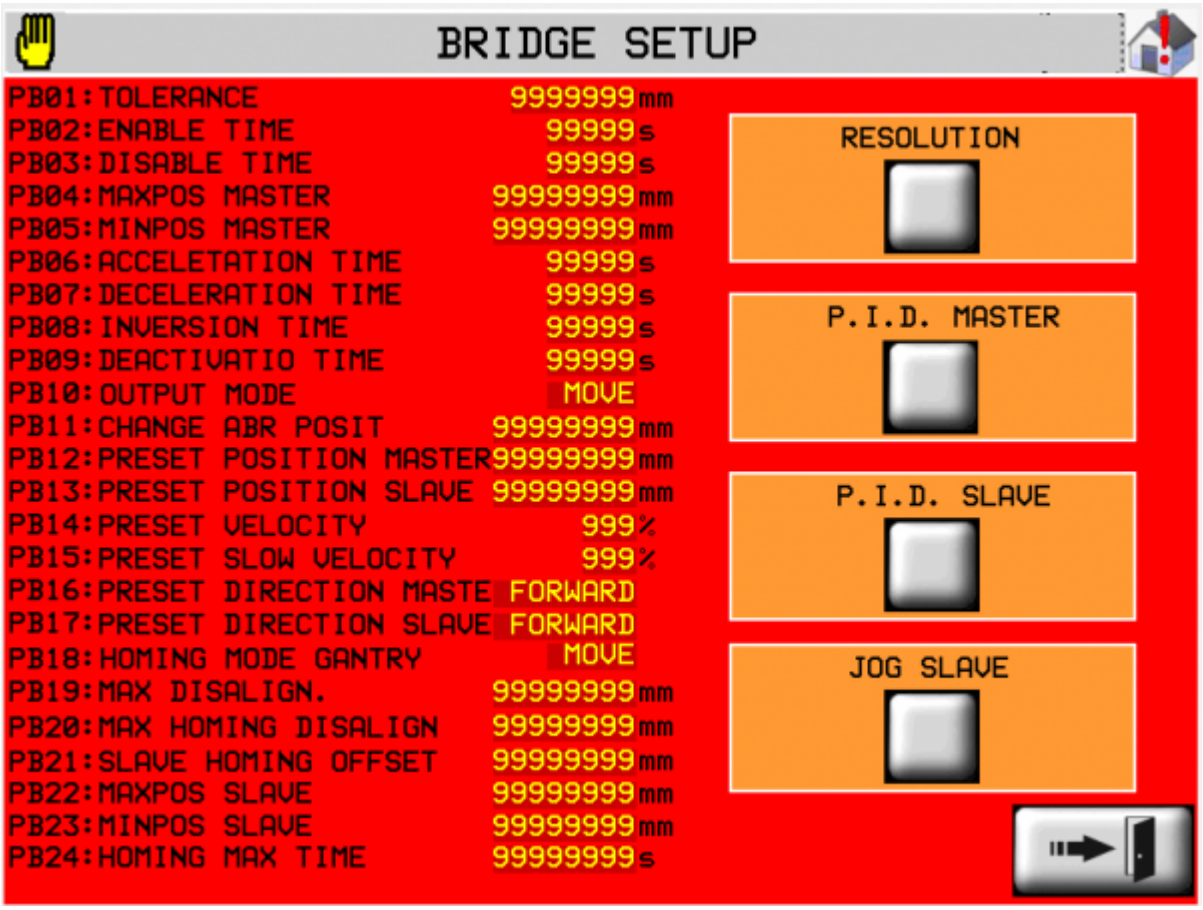
Belt Axis Resolution

Parameter Name	Unit of Measure	Default	Range	Description	
MEASURE	mm	0.1	0 to 99999.9	Indicates the space, in units of measurement, traveled by the belt to obtain the encoder pulses set in the *pulse* parameter.	
PULSE	-	1	0 to 999999	Indicates the pulses multiplied by 4 provided by the belt encoder to obtain the space set in the measure parameter. The ratio between measure and pulse is the encoder resolution and must have values between 1 and 0.000935.	
+	JOG FORWARD				
-	JOG BACKWARD				

2.5 Bridge Setup

= GANTRY ENABLED (master and slave bridge move together)

= GANTRY DISABLED (master and slave bridge move independently)



Parameter Name	Unit of Measure	Default	Range	Description
PB01: TOLERANCE	mm	5.0	0 to 99999.9	Defines a tolerance range around the positioning dimensions. If the positioning falls within this range, it is considered correct.
PB02: ENABLE TIME	s	0.200	0.000 to 9.999	Advance enabling of the bridge movement.
PB03: DISABLE TIME	s	0.200	0.000 to 9.999	Delay in disabling the bridge movement.
PB04: MAX MASTER POSITION	mm	99999.9	-99999.9 to 99999.9	Maximum position reachable by the master bridge.
PB05: MIN MASTER POSITION	mm	-99999.9	-99999.9 to 99999.9	Minimum position reachable by the master bridge.
PB06: ACCELERATION TIME	s	1.00	0.00 to 9.99	Time required to go from speed 0 to maximum speed.
PB07: DECELERATION TIME	s	1.00	0.00 to 9.99	Time required to go from maximum speed to speed 0.
PB08: REVERSAL TIME	s	0.50	0.00 to 9.99	Used to prevent mechanical stress due to too rapid changes in direction of movement.
PB09: DEACTIVATION TIME	s	0	0 to 99999	Rest time of the bridge beyond which the axis enabling output is deactivated.
PB10: OUTPUT MODE	-	STILL	MOVE, STILL	Axis enabling output operation mode.\ MOVE: The output activates before axis movement and deactivates after it has finished, following the timing set in parameters PB04 and PB05.\ STILL: The output activates before movement and deactivates only when the state enters emergency.
PB11: ABRASIVE CHANGE POSITION	mm	0.0	-99999.9 to 99999.9	Bridge positioning when requested to interrupt the cycle for abrasive change.
PB12: MASTER PRESET POSITION	mm	0.0	-99999.9 to 99999.9	Position loaded into the count when the axis activates and then releases the Homing sensor (master).

Parameter Name	Unit of Measure	Default	Range	Description
PB13: SLAVE PRESET POSITION	mm	0.0	-99999.9 to 99999.9	Position loaded into the count when the axis activates and then releases the Homing sensor (slave).
PB14: PRESET SPEED	%	5	1 to 100	Speed for the homing sensor search.
PB15: SLOW PRESET SPEED	%	2	1 to 100	Speed for releasing the homing sensor.
PB16: MASTER PRESET DIRECTION	-	BACKWARD	FORWARD, BACKWARD	Direction in which to search for the homing sensor (master).
PB17: SLAVE PRESET DIRECTION	-	BACKWARD	FORWARD, BACKWARD	Direction in which to search for the homing sensor (slave).
PB18: GANTRY HOMING MODE	-	2	1 to 2	Gantry homing mode only if 2 motors are used for bridge movement (one master and one slave) Homing mode 1: positioning will be done by disengaging the slave axis Homing mode 2: positioning will be done with master and slave axes always engaged Refer to the operator's manual for more information
PB19: MAX MISALIGNMENT	mm	1	0 to 999999.9	Maximum misalignment (mm) between master bridge axis and slave bridge axis before sending an alarm signal.
PB20: MAX HOMING MISALIGNMENT	mm	1	0 to 999999.9	Maximum misalignment (mm) between master bridge axis and slave bridge axis before sending an alarm signal during the homing phase.
PB21: SLAVE HOMING OFFSET	mm	0	-99999.9 to 99999.9	Displacement (mm) that the slave bridge axis must perform after homing.
PB22: MAX SLAVE POSITION	mm	99999.9	-99999.9 to 99999.9	Maximum position reachable by the slave bridge (slave).
PB23: MIN SLAVE POSITION	mm	99999.9	-99999.9 to 99999.9	Minimum position reachable by the slave bridge (slave).
PB24: MAX HOMING TIME	s	.	99999	Maximum time for performing homing.

2.5.1 Bridge Buttons / Settings

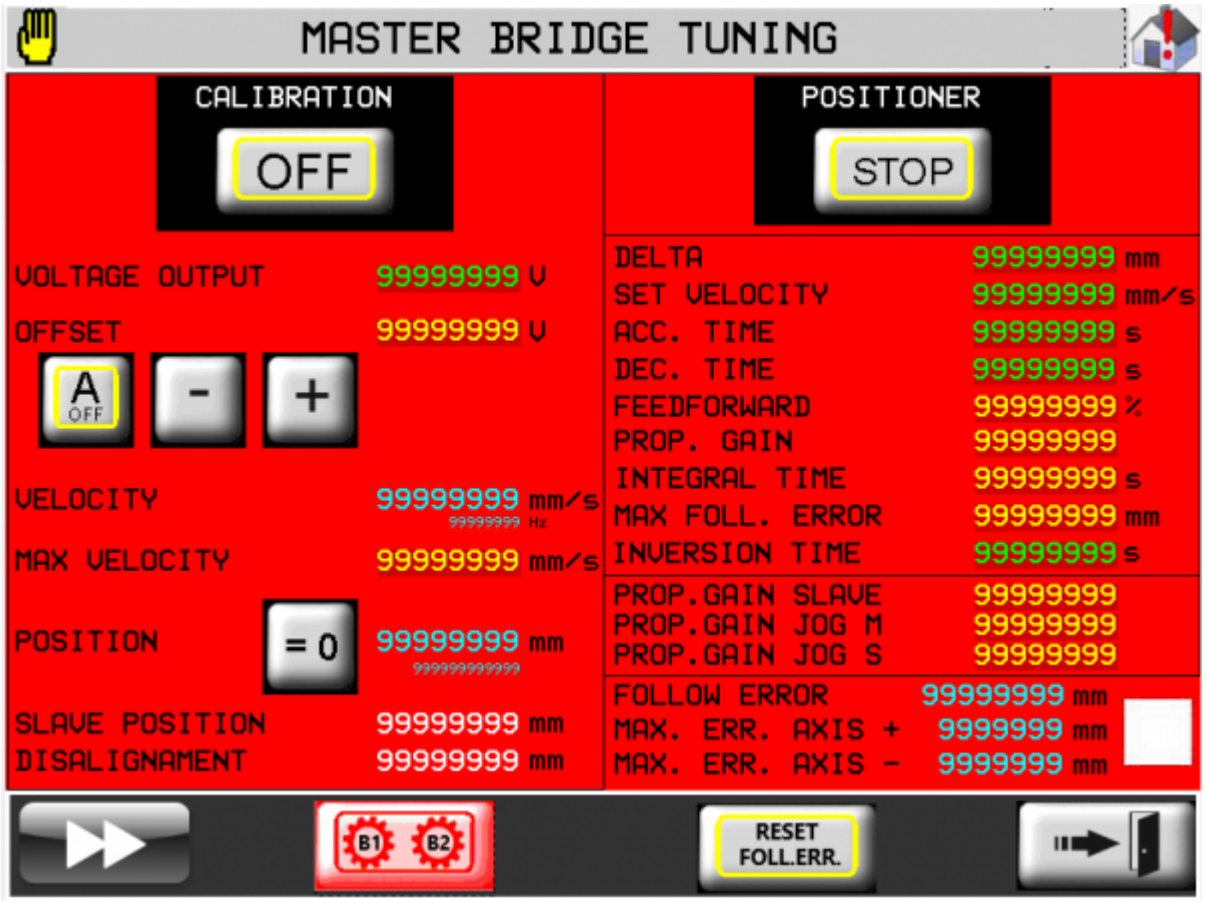
Calibration pages are divided into:

	setting the resolution of the master and slave axis
	calibration procedure for the master axis to adjust feedback and set offset and maximum speed
	calibration procedure for the slave axis to adjust feedback and set offset and maximum speed\ Enabled only if parameter PG 07 = ON
	manual jog procedure forward/backward for the slave axis Enabled only if parameter PG 07 = ON

Bridge Axis Resolution

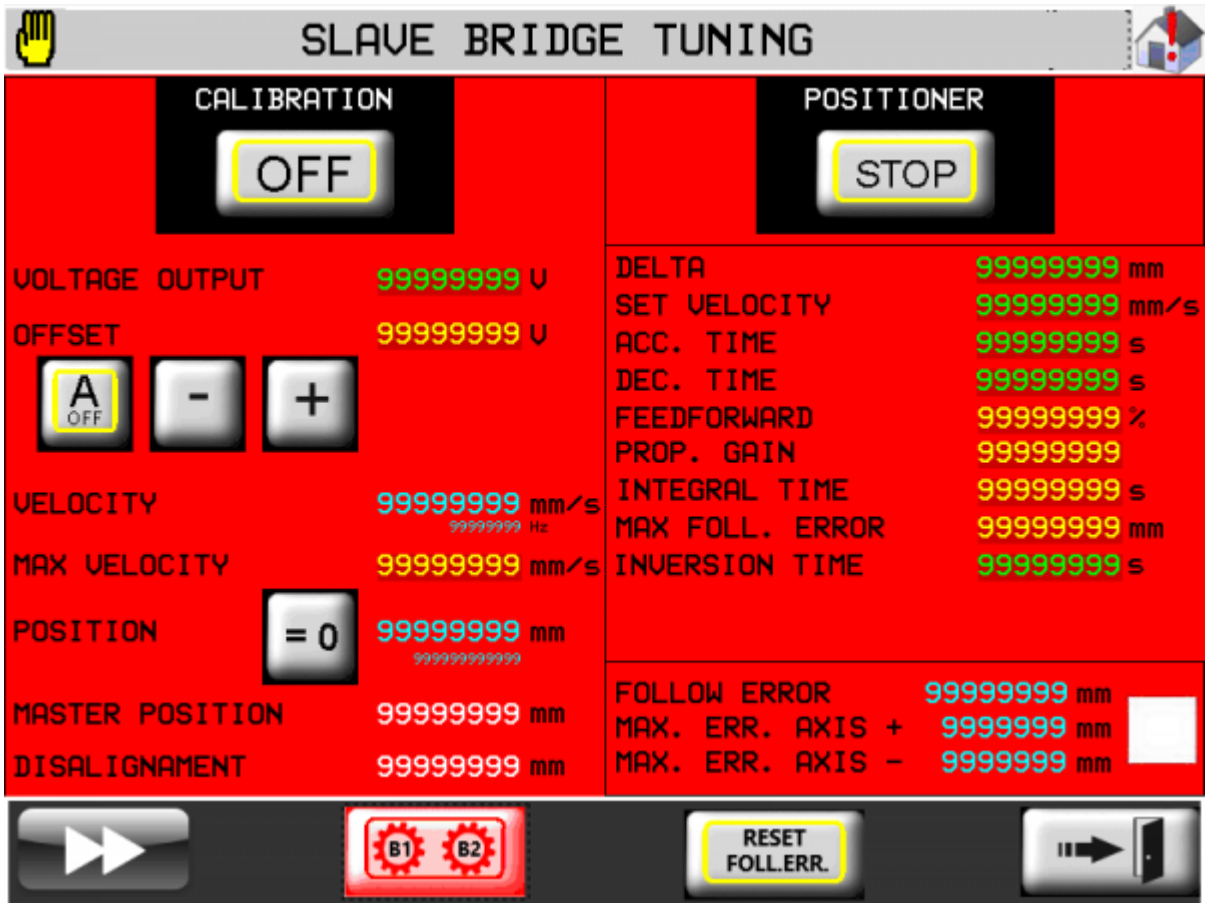
Parameter Name	Unit of Measure	Default	Range	Description
MEASURE	mm	0.1	0 to 99999.9	Indicates the space, in units of measurement, traveled by the bridge to obtain the encoder pulses set in the *pulse* parameter.
PULSE	-	1	0 to 999999	Indicates the pulses multiplied by 4 provided by the bridge encoder to obtain the space set in the measure parameter. The ratio between measure and pulse is the encoder resolution and must have values between 1 and 0.000935.
	Gantry (master/slave connection) enable/disable button. Usable only if parameter PG 07 = ON			

Bridge Calibration



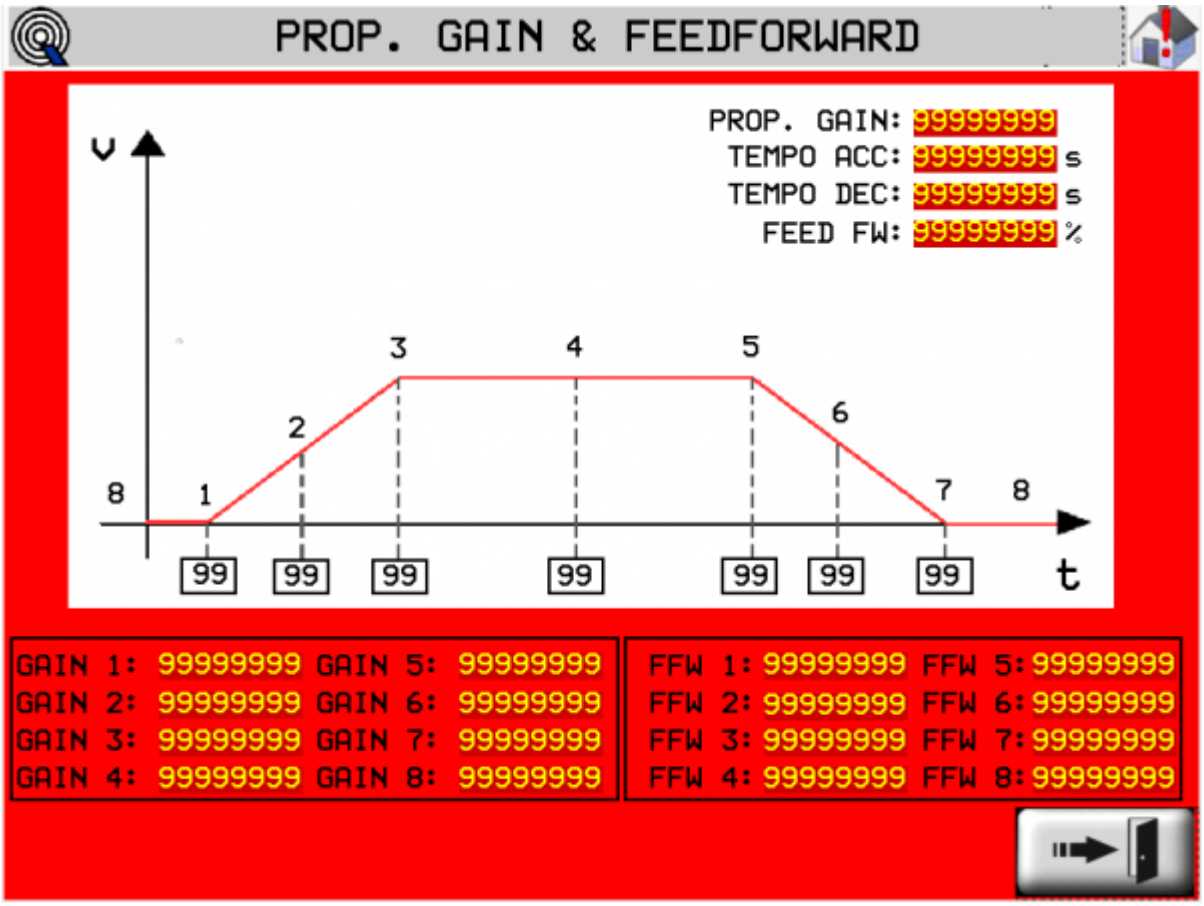
Parameter Name	Unit of Measure	Default	Range	Description
OUT VOLTAGE	V	0.0	-10.0 to 10.0	Inverter/Driver control voltage
OFFSET	V	0.0000	-99.9999 to 99.9999	Voltage value to obtain 0 Volts from the analog output
SPEED	mm/'	-	-	Bridge speed
MAX SPEED	mm/'	5000	0 to 9999999	Bridge speed with 10 Volt command
POSITION	mm	-	-	Master bridge position
MASTER POSITION	mm	-	-	Master bridge position
MISALIGNMENT	mm	-	-	Current misalignment between master and slave
DELTA	mm	0.0	-	Bridge pendulum space
SET SPEED	mm/'	0	-	Bridge speed
ACCELERATION TIME	s	0.00	-	Acceleration time
DECELERATION TIME	s	0.00	-	Deceleration time
FEEDFORWARD	%	100.0	0.0 to 200.0	The percentage coefficient that, multiplied by the speed, generates the feed-forward part of the control output.
PROP. GAIN	-	0.000	0.000 to 9.999	The coefficient that, multiplied by the tracking error, generates the proportional part of the control output during automatic master movement.
INTEGRAL TIME	s	0.000	0.000 to 9.999	The time that produces the integral coefficient of tracking error.\ The integration of this error multiplied by this coefficient generates the integral part of the control output.
MAX TRACKING ERROR	mm	99.9	0.0 to 99999.9	Defines the maximum acceptable deviation between the theoretical position and the actual position of the axis, beyond which an alarm is generated.
REVERSAL TIME	s	1.0	1.0	Defines the axis reversal time during calibration.
TRACKING ERROR	mm	-	-	The instantaneous value of the tracking error.
MAX AXIS ERROR +	Not-modifiable. Indicates in mm the maximum tracking error of the axis during positive movement.			
MAX AXIS ERROR -	Not-modifiable. Indicates in mm the maximum tracking error of the axis during negative movement.			

Parameter Name	Unit of Measure	Default	Range	Description
	Gantry (master/slave connection) enable/disable button. Usable only if parameter PG 07 = ON			



Parameter Name	Unit of Measure	Default	Range	Description
OUT VOLTAGE	V	0.0	-10.0 to 10.0	Inverter/Driver control voltage
OFFSET	V	0.0000	-99.9999 to 99.9999	Voltage value to obtain 0 Volts from the analog output
SPEED	mm/'	-	-	Bridge speed
MAX SPEED	mm/'	5000	0 to 9999999	Bridge speed with 10 Volt command
POSITION	mm	-	-	Master bridge position
SLAVE POSITION	mm	-	-	Slave bridge position
MISALIGNMENT	mm	-	-	Current misalignment between master and slave
DELTA	mm	0.0	-	Bridge pendulum space
SET SPEED	mm/'	0	-	Bridge speed
ACCELERATION TIME	s	0.00	-	Acceleration time
DECELERATION TIME	s	0.00	-	Deceleration time
FEEDFORWARD	%	100.0	0.0 to 200.0	The percentage coefficient that, multiplied by the speed, generates the feed-forward part of the control output.
PROP. GAIN	-	0.000	0.000 to 9.999	The coefficient that, multiplied by the tracking error, generates the proportional part of the control output during automatic master movement.
INTEGRAL TIME	s	0.000	0.000 to 9.999	The time that produces the integral coefficient of tracking error.\ The integration of this error multiplied by this coefficient generates the integral part of the control output.
MAX TRACKING ERROR	mm	99.9	0.0 to 99999.9	Defines the maximum acceptable deviation between the theoretical position and the actual position of the axis, beyond which an alarm is generated.
REVERSAL TIME	s	1.0	1.0	Defines the axis reversal time during calibration.
PROP.GAIN SLAVE	-			The coefficient that, multiplied by the tracking error, generates the proportional part of the control output during automatic slave movement.
PROP.GAIN JOG M	-			The coefficient that, multiplied by the tracking error, generates the proportional part of the control output during master jog movement.

Parameter Name	Unit of Measure	Default	Range	Description
PROP. GAIN JOG S	-			The coefficient that, multiplied by the tracking error, generates the proportional part of the control output during slave jog movement.
TRACKING ERROR	mm	-	-	The instantaneous value of the tracking error.
MAX AXIS ERROR +	Not-modifiable. Indicates in mm the maximum tracking error of the axis during positive movement.			
MAX AXIS ERROR -	Not-modifiable. Indicates in mm the maximum tracking error of the axis during negative movement.			
	Gantry (master/slave connection) enable/disable button. Usable only if parameter PG 07 = ON			

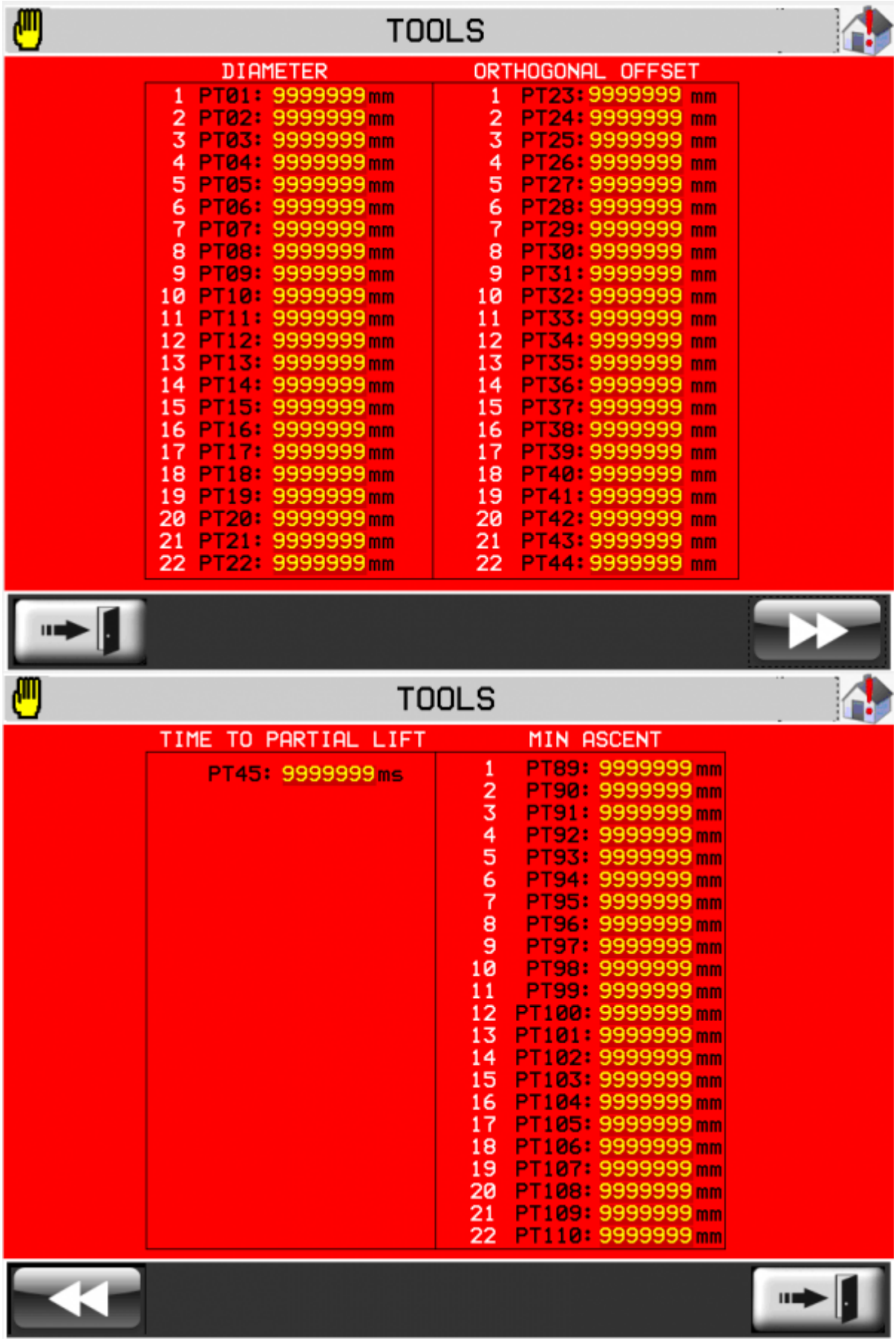


The following page is for **exclusive** use by technical support. On this page, you can adjust the gain and feedforward at different points along the axis position.
Default values at 0.

Jog bridge slave

Parameter name	*Unit of measure*	*Default value*	*Range*	*Description*
VEL JOG	%	0.0	0 to 100	Jog command speed in percentage
SLAVE POSITION	mm	-	-	Position of the slave bridge
MASTER POSITION	mm	-	-	Position of the master bridge
DISALIGNAMENT	mm	-	-	Current misalignment between master and slave
	Enable/disable gantry button (master/slave connection). Usable only if parameter PG 07 = ON			

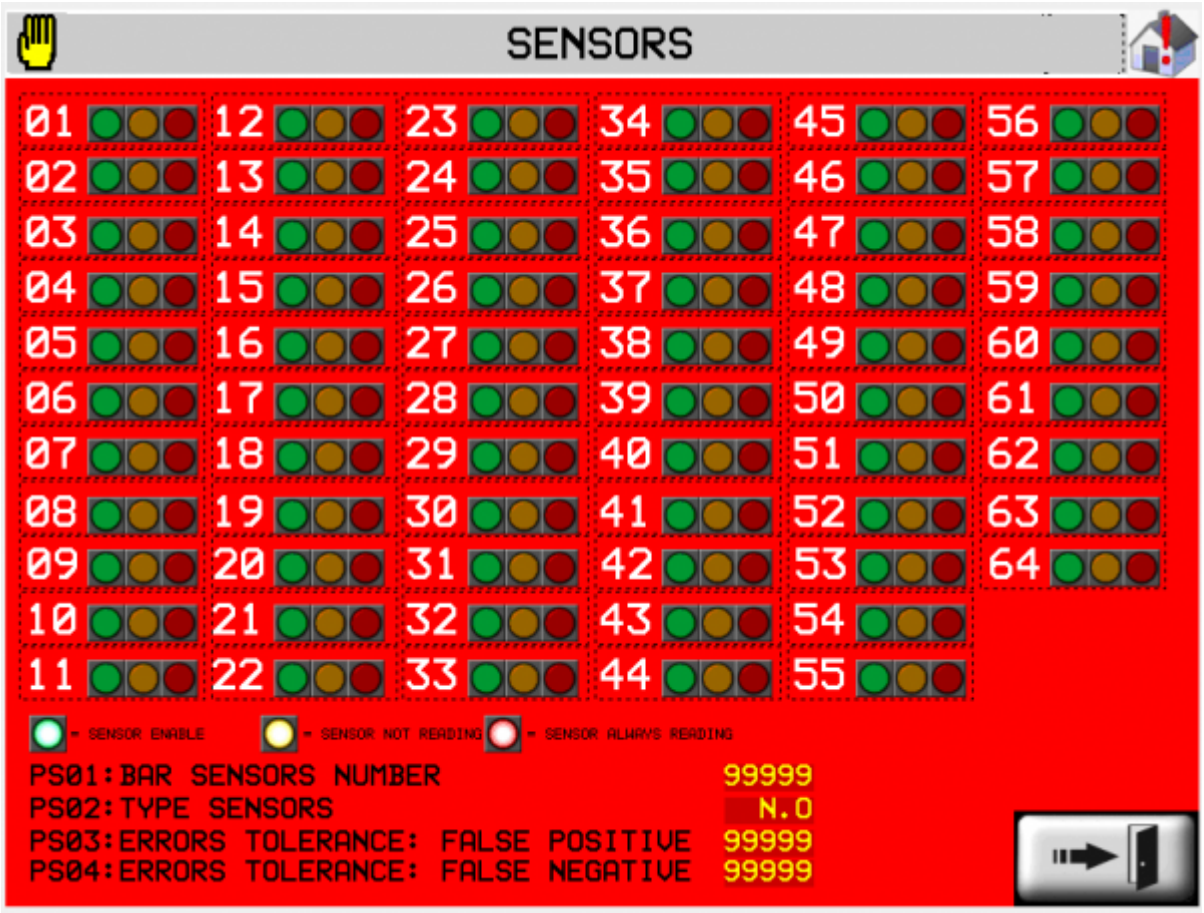
2.6 Setup Heads



Parameter Name	***Unit of Measure***	***Default Value***	***Range***	***Description***
PT01 / PT22 : DIAMETER	mm	0.0	0 to 99999.9	Diameter of the head.
PT23 / PT44 : ORTHOGONAL OFFSET	mm	0.0	0 to 99999.9	It is the distance between the working head and the bridge's centerline.

Parameter Name	***Unit of Measure***	***Default Value***	***Range***	***Description***
PT45 : PARTIAL RISE TIME	s	0.500	0 to 999.999	It is the excitation time of the output for partial rise. Valid for all heads.
PT89 / PT110 : MINIMUM RISE	s	0.000	0 to 999.999	Minimum rise value. Generates an alarm if the head performs a partial rise below the set value.

2.7 Sensor Setup



 Enabled sensor

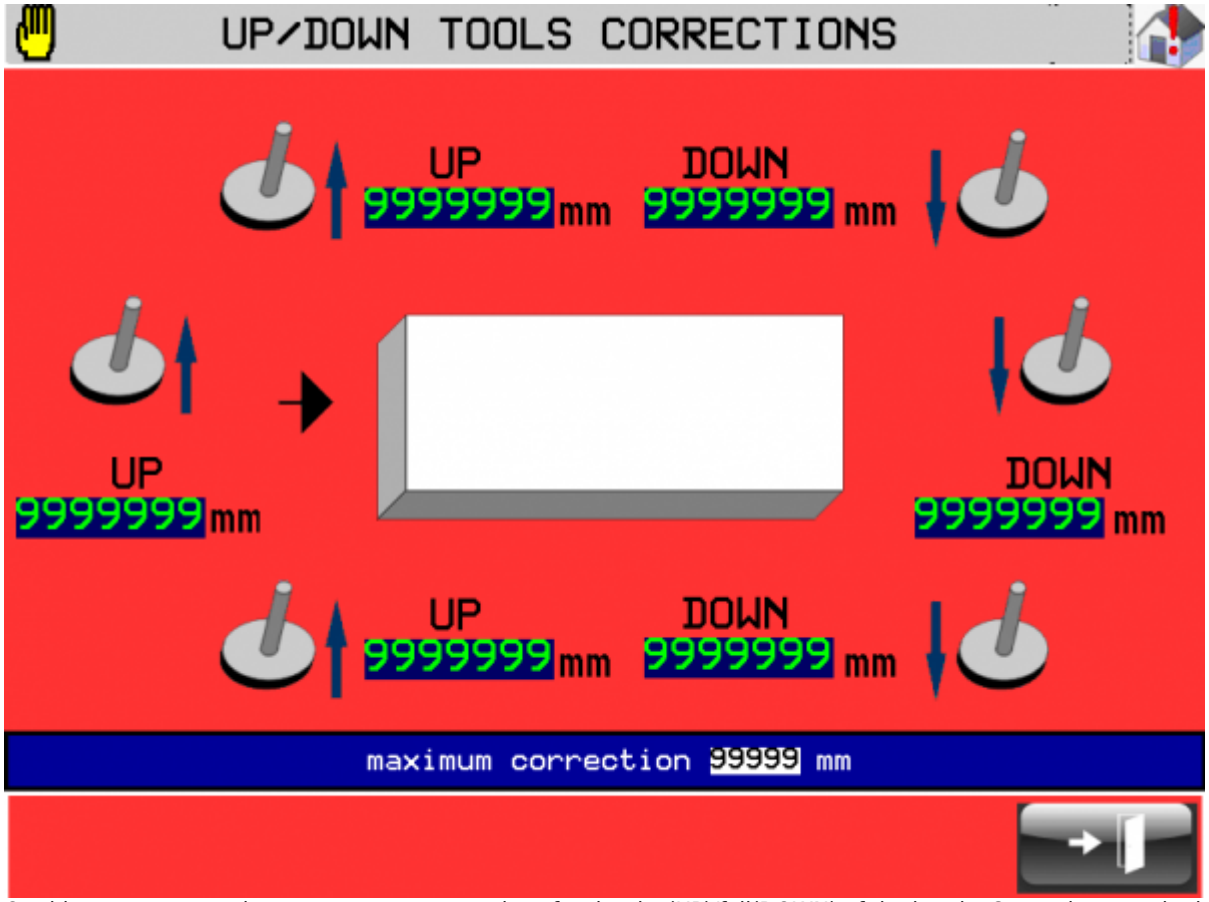
 Faulty sensor, reads 0 while the two adjacent sensors read 1

 Faulty sensor, reads 1 while the two adjacent sensors read 0

On this page, you can disable a sensor by clicking on it. A sensor should be disabled (green LED off) if it reads 1 instead of 0 (always active).
Caution: During each machine startup after a shutdown, all sensors are automatically enabled. Faulty sensors should be fixed as soon as possible.

Parameter Name	***Unit of Measure***	***Default Value***	***Range***	***Description***
PS01 : NUMBER OF SENSORS	-	32	8 to 64	Number of sensors on the acquisition bar.
PS02 : SENSOR TYPE	-	NO	NO to NC	Logic of the plate acquisition inputs. NO = Normally Open NC = Normally Closed
PS03 : FALSE POSITIVE ERROR TOLERANCE	-	0	0 to 1000	Indicates the number of steps or scans required in the case of a serious error (sensor reads 1 instead of 0) before an alarm is triggered. Zero tolerance is a special value indicating that error checking is not performed, so with a value = 0, there will never be an alarm.
PS04 : FALSE NEGATIVE ERROR TOLERANCE	-	0	0 to 1000	Indicates the number of steps or scans required in the case of a solvable error (sensor reads 0 instead of 1) before a warning is triggered. Zero tolerance is a special value indicating that error checking is not performed, so with a value = 0, a warning will never occur.

2.8 Corrections Setup



On this page, you can input permanent corrections for the rise(UP)/fall(DOWN) of the heads. Corrections can be horizontal or vertical, affecting all edges of the material.

Positive values for rise	the head will rise later to polish the material
Negative values for rise	the head will rise earlier to polish the material
Positive values for fall	the head will descend earlier to polish the material
Negative values for fall	the head will descend later to polish the material
Maximum correction	value to input to determine the maximum achievable correction

3. Support

For supplying you fast service, at the lowest cost, we need your support.

	
Follow all instructions provided in the MIMAT manual	If the problem remains, fill out the “Request Form for assistance” on the page Contacts at www.qem.it site. Our technicians will get elements essential for the understanding of your problem.

Repair

To provide you with an efficient service, please read and adhere to the instructions given here

Shipping

It is recommended to pack the instrument with materials that are able to cushion any falls.

		
Use the original package: it must protect the instrument during transport.	Attach: 1. A description of the anomaly; 2. A part of the electric scheme where the equipment is inserted 3. The planning of the equipment (set up, quotas of job, parameters...). 4. Request a quote for repair; if not required, the cost will be calculated in the final balance.	A full description of the problem, will help identify and resolve your problems fast. A careful packaging will avoid further inconveniences.