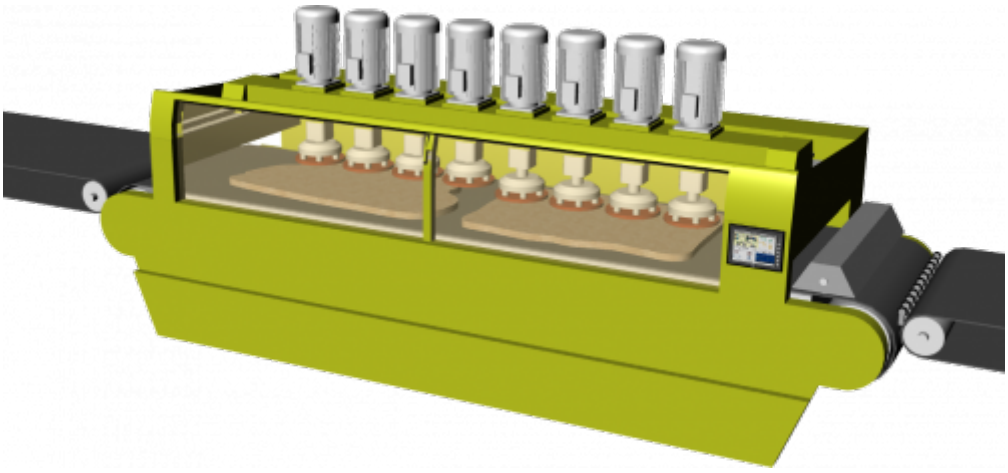
Sommario

Multi-head Polishing machine: Installation 3
Description 5
1. Hardware 6
1.1 I/O Resources 8
1.1.1 Digital Inputs (n. 109) 8
1.1.2 Digital Outputs (n. 48) 13
1.1.3 Two-way Encoder Count Inputs (n. 2) 15
1.1.4 Analog Inputs (n. 24) 15
1.1.5 Analog outputs (n. 14) 15
2. Electrical Connections 16
Standard Hardware manuals 16
3. Setup 17
3.1 General Setup 18
3.2 Beam Setup 20
3.2.1 Resolution 21
3.2.2 P.I.D. 22
3.3 Heads Setup 25
3.4 Head Spacing Setup 26
3.5 Abrasives Setup 27
3.6 Currents Setup 28
3.7 Valves Setup 29
3.8 Belt Setup 30
3.8.1 Calibration 31
3.9. Sensors Setup 32
3.10. Touchscreen Calibration 33

Multi-head Polishing machine: Installation



Document	**P1P51FC20-008Q**
Description	Connections
Drawn up	Riccardo Furlato
Approved	Gabriele Bazzi
Link:	http://www.qem.eu/doku/doku.php/en/strumenti/qmoveplus/j1p51/mdu_p1p51fc20-008/connections
Languages	English

Release	Description	Notes	Date
01	New Manual		31/07/14

Description

The **P1P51FC20 – 008Q** application, installed on the *Qmove+ J1-P51-FC20 and Remote I/O modules RMC-2M*, has been designed to control a marble slab polishing machine with mobile beam.

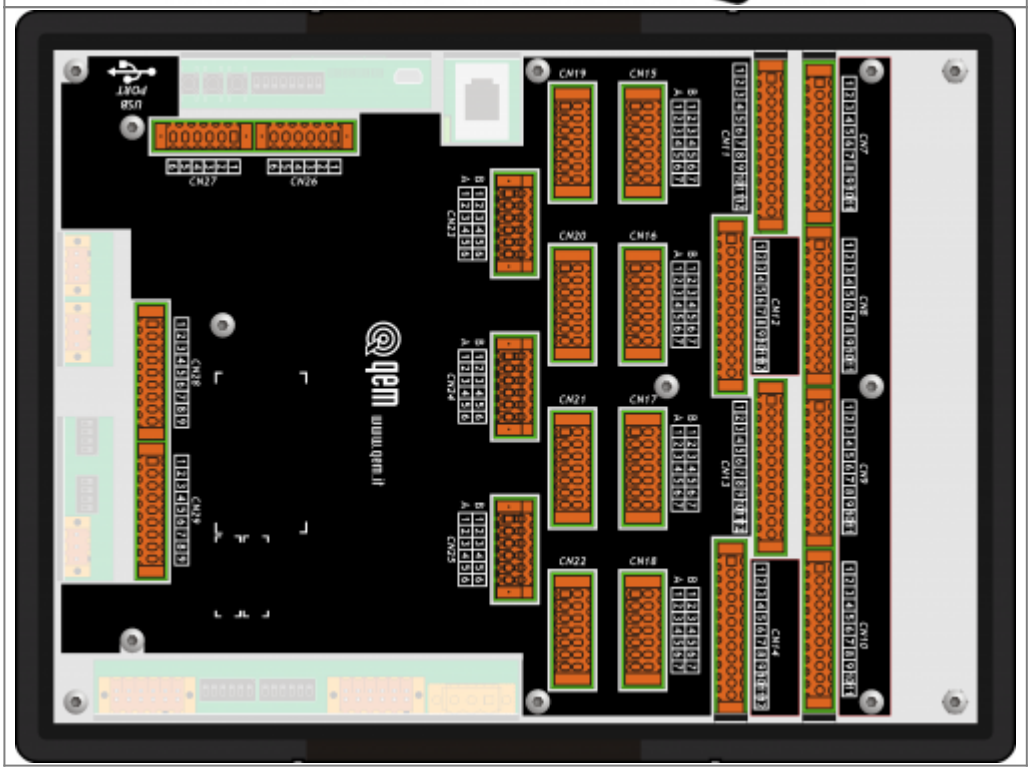
Salient Features of the control

- Control of 2 axes in analog (beam + belt)
- Control of up to 24 heads (depending on hardware)
- Control of accessories (brush, sprays)
- Slab sizing by Sensor bar
- Abrasive wear control and statistics
- Head pressure control with work programs
- Touchscreen functions for data settings and actions by buttons
- Staggered motor startup
- Operator help messages
- Alarm messages

1. Hardware

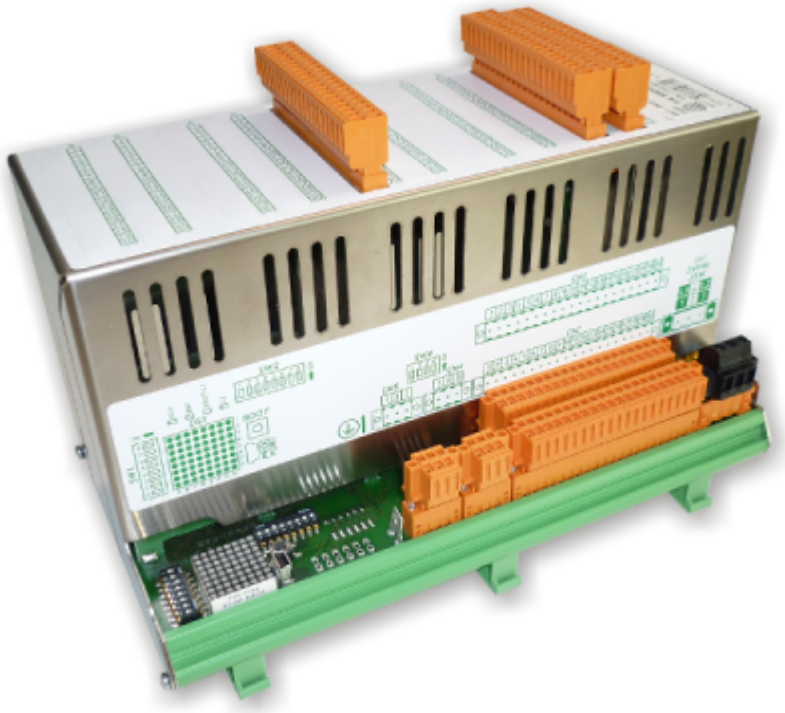
Operator Panel

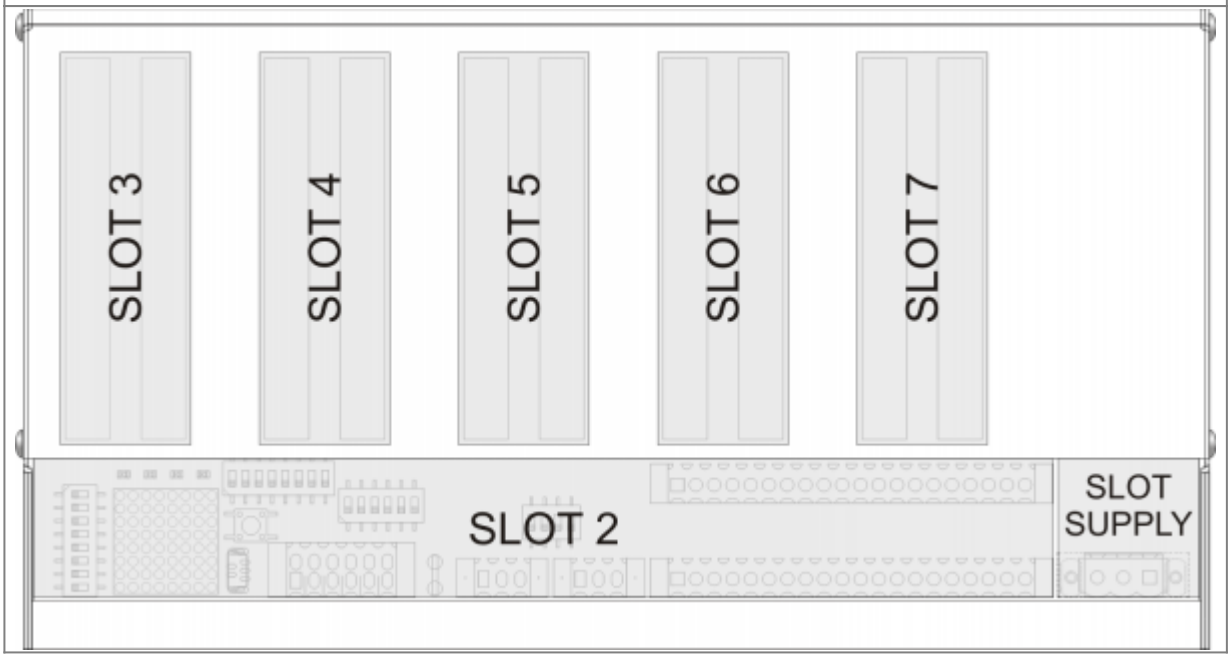
J1-P51-FC20/TP03



Remote modules inputs/outputs

[1] Cabinet :RMC-2MC01-D2/I32/I32/I32/0/0/24V
[2] Beam :RMC-2MC01-G6/A12/A12/G12/G12/P32/24V





1.1 I/O Resources

1.1.1 Digital Inputs (n. 109)

Name	Description	Logic	Terminal	Terminal Block	Hardware
I01	Emergency	NC		CN11	J1-P51
I02	Beam: Forward Jog	NO			
I03	Beam: Backward Jog	NO			
I04	*Not used*				
I05	*Not used*				
I06	START pushbutton	NO			
I07	STOP pushbutton	NO			
I08	Change Abrasive pushbutton	NO			
I09	MAN / AUTO selector	MAN = OPEN		CN12	
I10	STAND-BY	NO			
I11	Case	NC			
I12	Beam: Fault	NC			
I13	*Not used*				
I14	Belt: Fault	NC			
I15	Roller: Fault	NC			
I16	Air Pressure	NC			
I17	Water Pressure	NC		CN13	
I18	Beam: Forward LS	NC			
I19	Beam: Backward LS	NC			
I20	Beam: Zero sensor	NO			
I21	*Not used*				
I22	*Not used*				
I23	*Not used*				
I24	Change abrasive sensor	NO			
I25	Roller: Slab sensor at end	NO		CN14	
I26	Belt: Slab sensor at start	NO			
I27	*Not used*				
I28	*Not used*				
I29	*Not used*				
I30	*Not used*				
I31	*Not used*				
I32	*Not used*				

Name	Description	Terminal	Terminal Block	Hardware
I33	Head-1: Local Man/Aut		SLOT 2	**RMC-2M [1]cabinet**
I34	Head-1: Local Jog			
I35	Head-2: Local Man/Aut			
I36	Head-2: Local Jog			
I37	Head-3: Local Man/Aut			
I38	Head-3: Local Jog			
I39	Head-4: Local Man/Aut			
I40	Head-4: Local Jog			
I41	Head-5: Local Man/Aut			
I42	Head-5: Local Jog			
I43	Head-6: Local Man/Aut			
I44	Head-6: Local Jog			
I45	Head-7: Local Man/Aut			
I46	Head-7: Local Jog			
I47	Head-8: Local Man/Aut			
I48	Head-8: Local Jog			
I49	Head-9: Local Man/Aut			
I50	Head-9: Local Jog			
I51	Head-10: Local Man/Aut			
I52	Head-10: Local Jog			
I53	Head-11: Local Man/Aut			
I54	Head-11: Local Jog			
I55	Head-12: Local Man/Aut			
I56	Head-12: Local Jog			
I57	*Not used*			
I58	*Not used*			
I59	*Not used*			
I60	*Not used*			
I61	*Not used*			
I62	*Not used*			
I63	*Not used*			
I64	*Not used*			

Name	Description	Terminal	Terminal Block	Hardware
I65	*Not used*		SLOT 3 (I32)	**RMC-2M [1]cabinet**
I66	*Not used*			
I67	*Not used*			
I68	*Not used*			
I69	*Not used*			
I70	*Not used*			
I71	*Not used*			
I72	*Not used*			
I73	*Not used*			
I74	*Not used*			
I75	*Not used*			
I76	*Not used*			
I77	*Not used*			
I78	*Not used*			
I79	*Not used*			
I80	*Not used*			
I81	*Not used*			
I82	*Not used*			
I83	*Not used*			
I84	*Not used*			
I85	*Not used*			
I86	*Not used*			
I87	*Not used*			
I88	*Not used*			
I89	*Not used*			
I90	*Not used*			
I91	*Not used*			
I92	*Not used*			
I93	*Not used*			
I94	*Not used*			
I95	*Not used*			
I96	*Not used*			

Name	Description	Terminal	Terminal Block	Hardware
I97	Bar sensor 1		SLOT4 (I32)	**RMC-2M [1]cabinet**
I98	Bar sensor 2			
I99	Bar sensor 3			
I100	Bar sensor 4			
I101	Bar sensor 5			
I102	Bar sensor 6			
I103	Bar sensor 7			
I104	Bar sensor 8			
I105	Bar sensor 9			
I106	Bar sensor 10			
I107	Bar sensor 11			
I108	Bar sensor 12			
I109	Bar sensor 13			
I110	Bar sensor 14			
I111	Bar sensor 15			
I112	Bar sensor 16			
I113	Bar sensor 17			
I114	Bar sensor 18			
I115	Bar sensor 19			
I116	Bar sensor 20			
I117	Bar sensor 21			
I118	Bar sensor 22			
I119	Bar sensor 23			
I120	Bar sensor 24			
I121	Bar sensor 25			
I122	Bar sensor 26			
I123	Bar sensor 27			
I124	Bar sensor 28			
I125	Bar sensor 29			
I126	Bar sensor 30			
I127	Bar sensor 31			
I128	Bar sensor 32			

Name	Description	Terminal	Terminal Block	Hardware
I129	Bar sensor 33		SLOT5 (I32)	**RMC-2M [1]cabinet**
I130	Bar sensor 34			
I131	Bar sensor 35			
I132	Bar sensor 36			
I133	Bar sensor 37			
I134	Bar sensor 38			
I135	Bar sensor 39			
I136	Bar sensor 40			
I137	Bar sensor 41			
I138	Bar sensor 42			
I139	Bar sensor 43			
I140	Bar sensor 44			
I141	Bar sensor 45			
I142	Bar sensor 46			
I143	Bar sensor 47			
I144	Bar sensor 48			
I145	Bar sensor 49			
I146	Bar sensor 50			
I147	Bar sensor 51			
I148	Bar sensor 52			
I149	Bar sensor 53			
I150	Bar sensor 54			
I151	Bar sensor 55			
I152	Bar sensor 56			
I153	Bar sensor 57			
I154	Bar sensor 58			
I155	Bar sensor 59			
I156	Bar sensor 60			
I157	Bar sensor 61			
I158	Bar sensor 62			
I159	Bar sensor 63			
I160	Bar sensor 64			

Name	Description	Terminal	Terminal Block	Hardware
I161	Heads: cutouts	NC	SLOT 2	**RMC-2M [2]beam**
I162..	*Not used*			
..I192	*Not used*			

1.1.2 Digital Outputs (n. 48)

Name	Description	Terminal	Terminal Block	Hardware
O1	AUTOMATIC ON light		CN7	J1-P51
O2	ALARM light			
O3	PRE-START light			
O4	RUN light			
O5	Beam 1 enable			
O6	*Not used*			
O7	Belt start			
O8	Belt stop			
O9	Roller start		CN8	
O10	Brush Up/Down			
O11	Upline machine consensus			
O12	Lubrification			
O13	Spray On/Off			
O14	*Not used*			
O15	*Not used*			
O16	*Not used*			
O17	*Not used*		CN9	
O18	*Not used*			
O19	*Not used*			
O20	*Not used*			
O21	*Not used*			
O22	*Not used*			
O23	*Not used*			
O24	*Not used*			
O25	*Not used*		CN10	
O26	*Not used*			
O27	*Not used*			
O28	*Not used*			
O29	*Not used*			
O30	*Not used*			
O31	*Not used*			
O32	*Not used*			

Name	Description	Terminal	Terminal Block	Hardware
O33	Head 11: Start		SLOT5 (G12)	**RMC-2M beam [2]**
O34	Head 11: Up			
O35	Head 11: Down			
O36	Head 12: Start			
O37	Head 12: Up			
O38	Head 12: Down			
O39	*Not used*		SLOT6 (G12)	
O40	*Not used*			
O41	*Not used*			
O42	*Not used*			
O43	*Not used*			
O44	*Not used*			
O45	Head 1: Start		SLOT7 (P32)	
O46	Head 1: Up			
O47	Head 1: Down			
O48	Head 2: Start			
O49	Head 2: Up			
O50	Head 2: Down			
O51	Head 3: Start			
O52	Head 3: Up			
O53	Head 3: Down			
O54	Head 4: Start			
O55	Head 4: Up			
O56	Head 4: Down			
O57	Head 5: Start			
O58	Head 5: Up			
O59	Head 5: Down			
O60	Head 6: Start			
O61	Head 6: Up			
O62	Head 6: Down			
O63	Head 7: Start			
O64	Head 7: Up			
O65	Head 7: Down			
O66	Head 8: Start			
O67	Head 8: Up			
O68	Head 8: Down			
O69	Head 9: Start			
O70	Head 9: Up			
O71	Head 9: Down			
O72	Head 10: Start			
O73	Head 10: Up			
O74	Head 10: Down			
O75	*Not used*			
O76	*Not used*			

1.1.3 Two-way Encoder Count Inputs (n. 2)

Name	Description	Terminal	Terminal Block	Hardware
PHA1 PHB1	Beam		**CN15**	**J1-P51**
PHA2 PHB2	*Not used*		**CN16**	
PHA3 PHB3	Belt		**CN17**	
PHA4 PHB4	*Not used*		**CN18**	

1.1.4 Analog Inputs (n. 24)

Name	Description	Terminal	Terminal block	Hardware
AI1	*Not used*		CN28	**J1-P51**
AI2	*Not used*			
AI3	*Not used*		CN29	
AI4	*Not used*			

Name	Description	Terminal	Terminal Block	Hardware
AI5	Abrasive Wear Head-1		SLOT 3 (A12)	**RMC-2M [2]beam**
AI6	Abrasive Wear Head-2			
AI7	Abrasive Wear Head-3			
AI8	Abrasive Wear Head-4			
AI9	Abrasive Wear Head-5			
AI10	Abrasive Wear Head-6			
AI11	Abrasive Wear Head-7			
AI12	Abrasive Wear Head-8			
AI13	Abrasive Wear Head-9		SLOT 4 (A12)	
AI14	Abrasive Wear Head-10			
AI15	Abrasive Wear Head-11			
AI16	Abrasive Wear Head-12			
AI17	Motor Current Head-1			
AI18	Motor Current Head-2			
AI19	Motor Current Head-3			
AI20	Motor Current Head-4			
AI21	Motor Current Head-5		SLOT 5 (G12)	
AI22	Motor Current Head-6			
AI23	Motor Current Head-7			
AI24	Motor Current Head-8			
AI25	Motor Current Head-9		SLOT 6 (G12)	
AI26	Motor Current Head-10			
AI27	Motor Current Head-11			
AI28	Motor Current Head-12			

1.1.5 Analog outputs (n. 14)

Name	Description	Terminal	Terminal Block	Hardware
AO1	Beam speed control ±10Vdc		**CN26**	**J1-P51**
AO2	*Not used*			
AO3	Belt speed control ±10Vdc			
AO4	*Not used*			

Name	Description	Terminal	Terminal Block	Hardware
AO5	Push Head-1		SLOT 5 (G12)	**RMC-2M [2]beam**
AO6	Push Head-2			
AO7	Push Head-3			
AO8	Push Head-4			
AO9	Push Head-5			
AO10	Push Head-6			
AO11	Push Head-7		SLOT 6 (G12)	
AO12	Push Head-8			
AO13	Push Head-9			
AO14	Push Head-10			
AO15	Push Head-11			
AO16	Push Head-12			

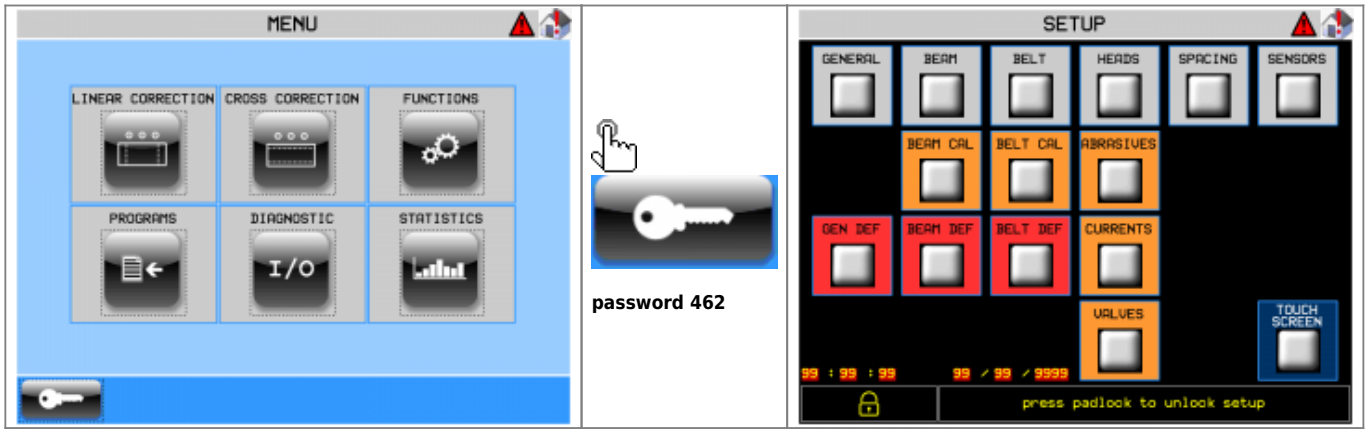
2. Electrical Connections

Standard Hardware manuals

J1-P51-FC20 link to manual: http://www.qem.eu/doku/doku.php/en/strumenti/qmoveplus/j1p51/mimj1p51fx_full

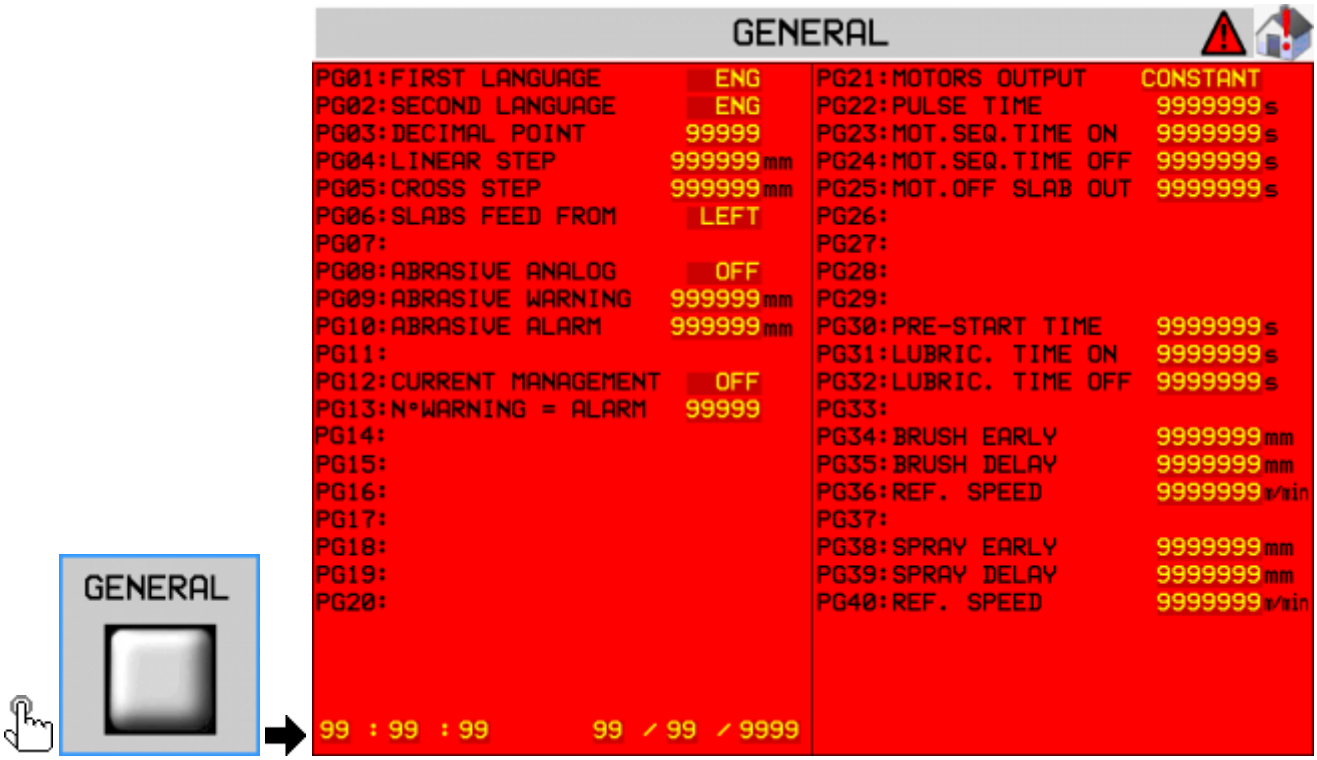
RMC 2M link to manual: http://www.qem.eu/doku/doku.php/en/strumenti/moduli/rmc2m/mimrmc2m

3. Setup



	Password requested
	No password requested

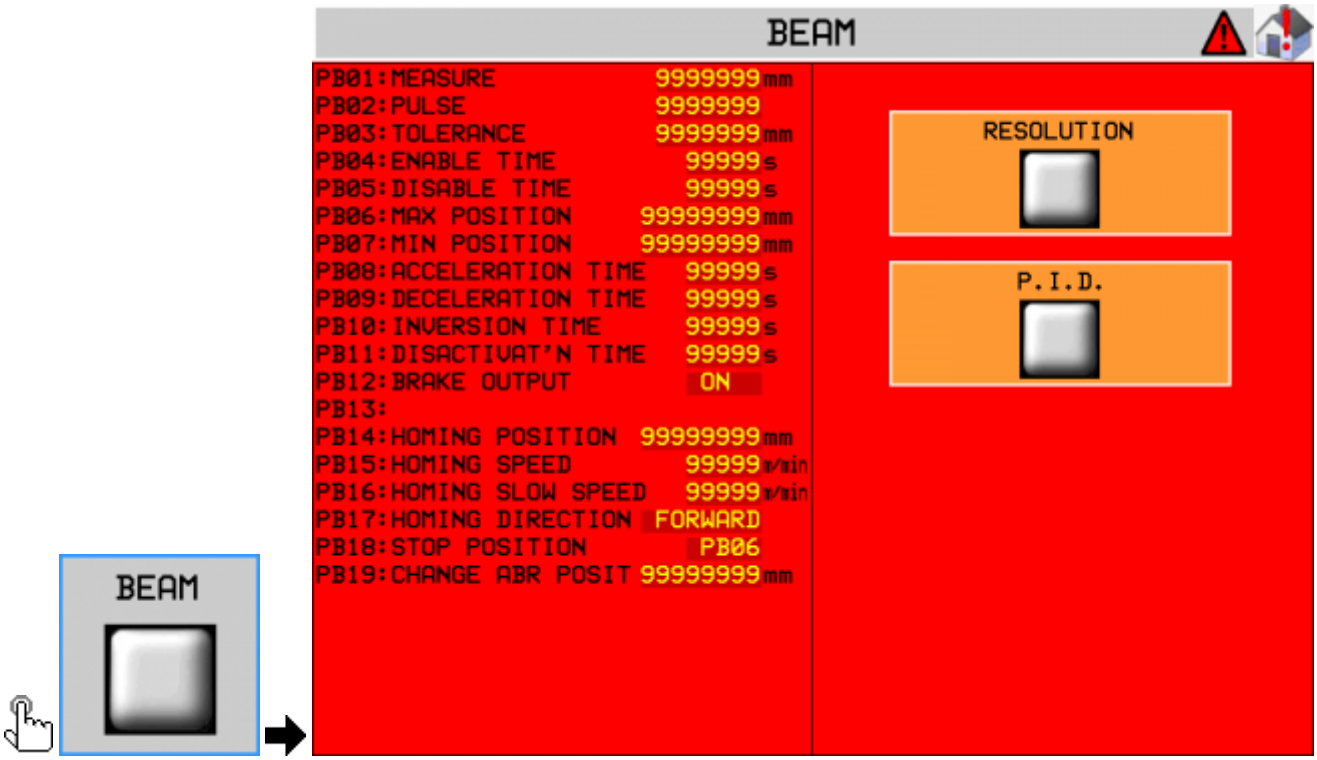
3.1 General Setup



Parameter	*Unit measure*	*Default*	*Range*	*Description*
PG01 : FIRST LANGUAGE	-	ENG	-	**ENG** = ENGLISH **ITA** = ITALIAN **FRA** = FRENCH **POR** = PORTUGUESE **SPA** = SPANISH **DEU** = GERMAN **TUR** = TURKISH **CHI** = CHINESE **EGY** = EGYPTIAN **POL** = POLISH **RUS** = RUSSIAN
PG02 : SECOND LANGUAGE	-	ITA	-	
PG03 : DECIMAL POINT	-	1	0 – 2	Number of decimals shown for distance measures
PG04 : LINEAR STEP	mm	50.0	1.0 – 9999.9	Linear read spacing. Distance between readings on the Scan bar state
PG05 : CROSS STEP	mm	50.0	1.0 – 9999.9	Cross read spacing. Distance between the sensors on the Scan bar
PG06 : SLABS FEED FROM	-	LEFT	LEFT – RIGHT	Which side the display is installed
PG08 : ABRASIVE ANALOG	-	OFF	OFF – ON	Enable analog IN for abrasive control
PG09 : ABRASIVE WARNING	mm	0.0	0.0 – 9999.9	Abrasive low warning thickness
PG10 : ABRASIVE ALARM	mm	0.0	0.0 – 9999.9	Abrasive low alarm thickness
PG12 : CURRENT MANAGEMENT	-	OFF	OFF – READ – CTRL	READ = read only no control CTRL = read and control
PG13 : N°WARNING = ALARM	-	10	0 – 99999	Number of warning events to generate an alarm
PG21 : MOTORS OUTPUT	-	CONSTANT	CONSTANT – PULSE	Head operating mode CONSTANT = always active when heads are operating PULSE = active for a set time (PG22).
PG22 : PULSE TIME	s	0.000	0 – 99.999	Heads active time, if operation set to PULSE
PG23 : MOT.SEQ.TIME ON	s	1.000	0 – 99.999	Delay between the startup of one motor and another (startup sequence)
PG24 : MOT.SEQ.TIME OFF	s	0.200	0 – 99.999	Delay between the shutoff of one motor and another (stop sequence)
PG25 : MOT.OFF SLAB OUT	s	0.000	0 – 99.999	Delay before the motor shutoff sequence, when no slabs are on the belt
PG30 : PRE-START TIME	s	3.0	0 – 9999.9	Delay after Start for machine to start working (there is a warning during this time). If less than the motor startup time, the greater is counted.
PG31 : LUBRIC. TIME ON	s	0.0	0 – 9999.9	Lubrication time.
PG32 : LUBRIC. TIME OFF	s	0.0	0 – 9999.9	Lubrication off time.
PG34 : BRUSH EARLY	mm	0.0	0 – 9999.9	Brush down anticipation

Parameter	*Unit measure*	*Default*	*Range*	*Description*
PG35 : BRUSH DELAY	mm	0.0	0 – 9999.9	Brush up delay
PG36 : REF. SPEED	m/min	0.0	0 – 9999.9	Speed reference for the brush corrections Proportional correction varies with the speed change Setting = 0 Constant correction at any speed
PG38 : SPRAY EARLY	mm	0.0	0 – 9999.9	Spray on anticipation
PG39 : SPRAY DELAY	mm	0.0	0 – 9999.9	Spray off delay
PG40 : REF. SPEED	m/min	0.0	0 – 9999.9	Speed reference for the spray corrections Proportional correction varies with the speed change Setting = 0 Constant correction at any speed

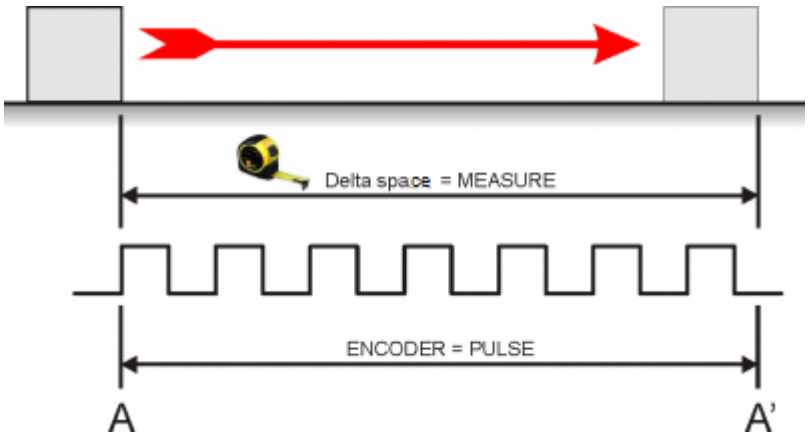
3.2 Beam Setup

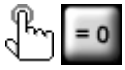


Parameter	***Unit measure***	***Default***	***Range***	***Description***
PB01 : MEASURE	mm	0.1	0 – 99999.9	Distance in unit measures, made by the Beam for the encoder pulses at the parameter *pulse*.
PB02 : PULSE	-	1	0 – 999999	Beam encoder pulses, multiplied by 4 to get the distance at the parameter *measure*. *The measure to pulse ratio, is the encoder resolution and must be between 1 and 0.000935.*
PB03 : TOLERANCE	mm	5.0	0 – 99999.9	Maximum deviation of the count around the positioning, for it to be considered correct
PB04 : ENABLE TIME	s	0.200	0.000 – 9.999	Time before starting the Beam movement
PB05 : DISABLE TIME	s	0.200	0.000 – 9.999	Time after ending the Beam movement
PB06 : MAXPOS	mm	99999.9	-99999.9 – 99999.9	Maximum Beam position
PB07 : MINPOS	mm	-99999.9	-99999.9 – 99999.9	Minimum Beam position
PB08 : ACCELERATION TIME	s	1.00	0.00 – 9.99	Time from 0 to maximum speed
PB09 : DECELERATION TIME	s	1.00	0.00 – 9.99	Time from maximum to 0 speed
PB10 : INVERSION TIME	s	0.50	0.00 – 9.99	Anti-stress protection against rapid direction changes
PB11 : DISACTIVAT'N TIME	s	0	0 – 99999	Maximum delay for the Beam, before the axis enable output is disactivated
PB12 : BRAKE OUTPUT	-	OFF	ON – OFF	Enable mode for the axis output **ON**: Output ON before axis movement and OFF at end, see parameters PB04 and PB05 **OFF**: Output ON before axis movement and OFF only in emergency
PB14 : HOMING POSITION	mm	0.0	-99999.9 – 99999.9	Axis Homing position
PB15 : HOMING SPEED	%	5	1 – 100	Axis speed, when searching for the homing sensor
PB16 : HOMING SLOW SPEED	%	2	1 – 100	Speed for disengaging the homing sensor.
PB17 : HOMING DIRECTION	-	FORWARD	FORWARD – BACKWARD	Axis direction for Homing
PB18 : STOP POSITION	-	PB06	PB06 – PB07	Beam position, when the cycle is stopped PB06 = maximum position, PB07 = minimum position
PB19 : CHANGE ABR POSITION	mm	0.0	-99999.9 – 99999.9	Beam position when changing abrasive

3.2.1 Resolution

Procedure

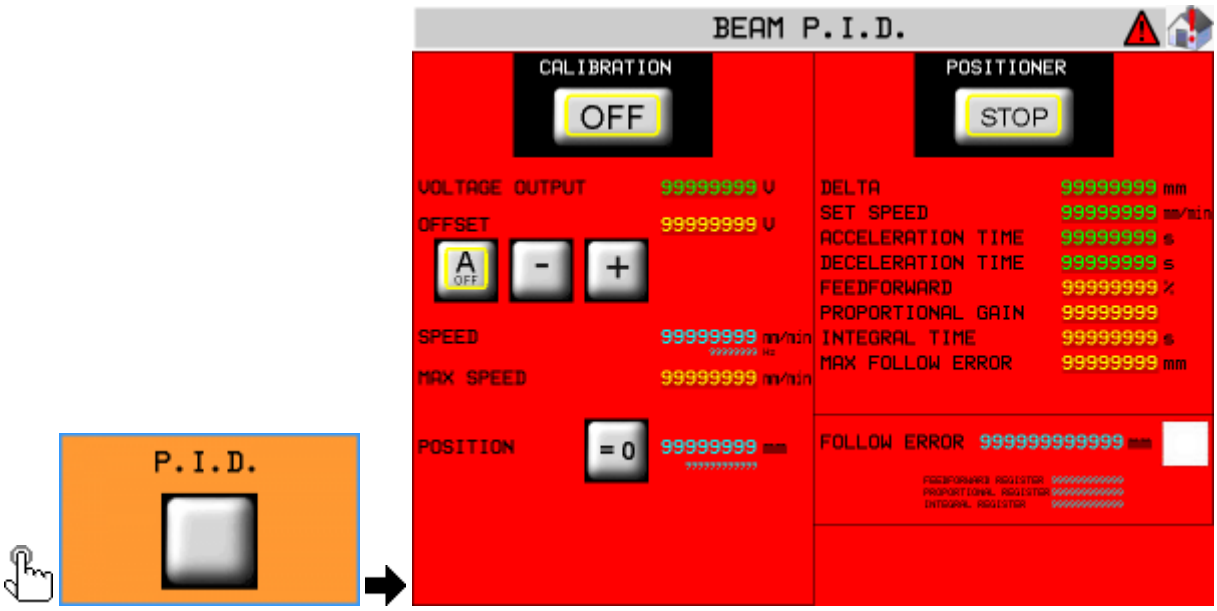


-  and check ENCODER increases (Analog out +1 Volt)
-  and check ENCODER decreases (Analog out -1 Volt)
- A - A' = Maximum MEASURE
- Note the start position (A)
-  Zero-set ENCODER
- Move the axis from A to A'
- Note the ENCODER reading and enter it in PULSE
- Measure the distance from A to A' = **space delta**
- Enter the A - A' **space delta** in MEASURE

Important:

- PULSE must always be greater than MEASURE (recommended MEASURE x 10 = PULSE)
- Enter MEASURE in the set **unit measure** format. e.g. unit measure = 0.1 mm and **space delta** = 133.5mm, enter 1335 in MEASURE

3.2.2 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)

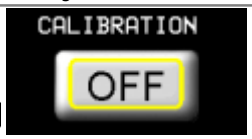
IMPORTANT! Essential conditions for the all procedures:

 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

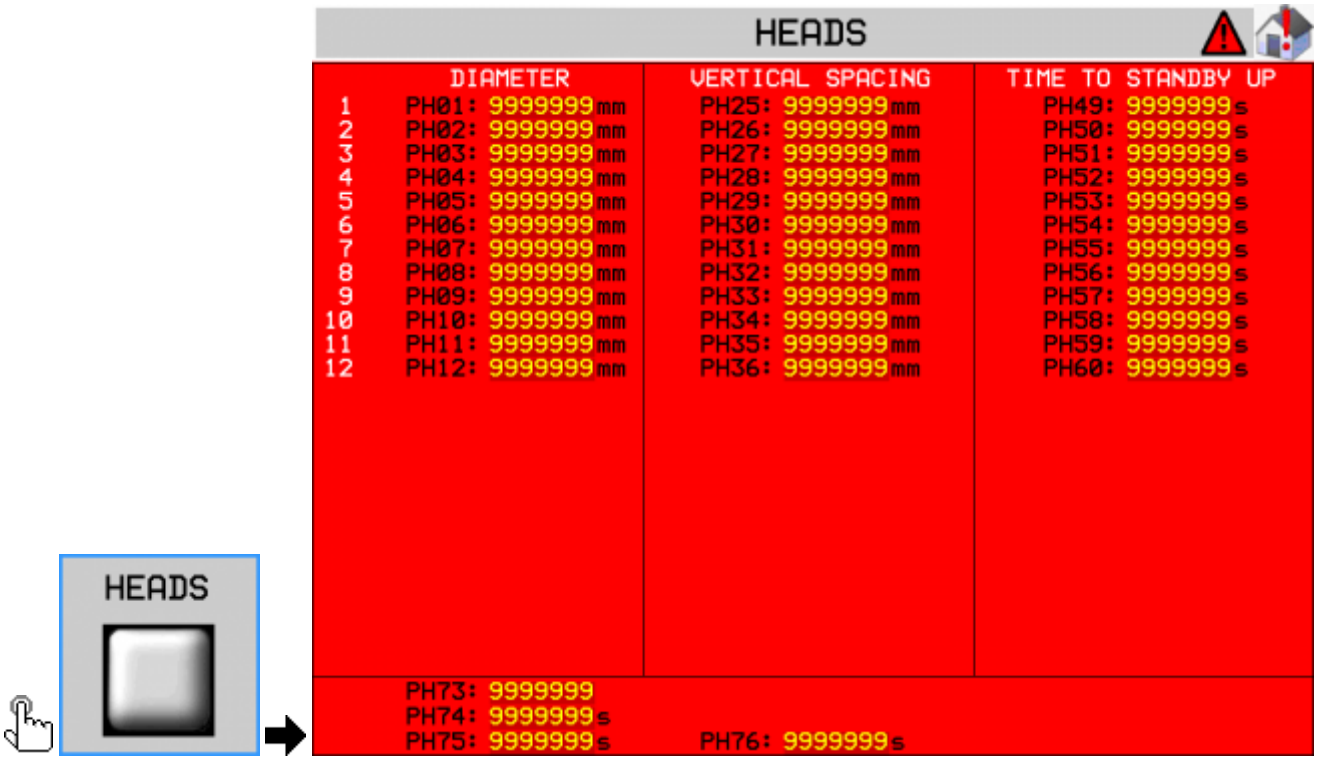
OFFSET	
1	 to start calibration
2	Set OUT VOLTAGE = 0
3	Regulate the OFFSET (directly by  , or automatically ) so that **POSITION** does not vary (or varies very slowly)
4	 to quit calibration

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**

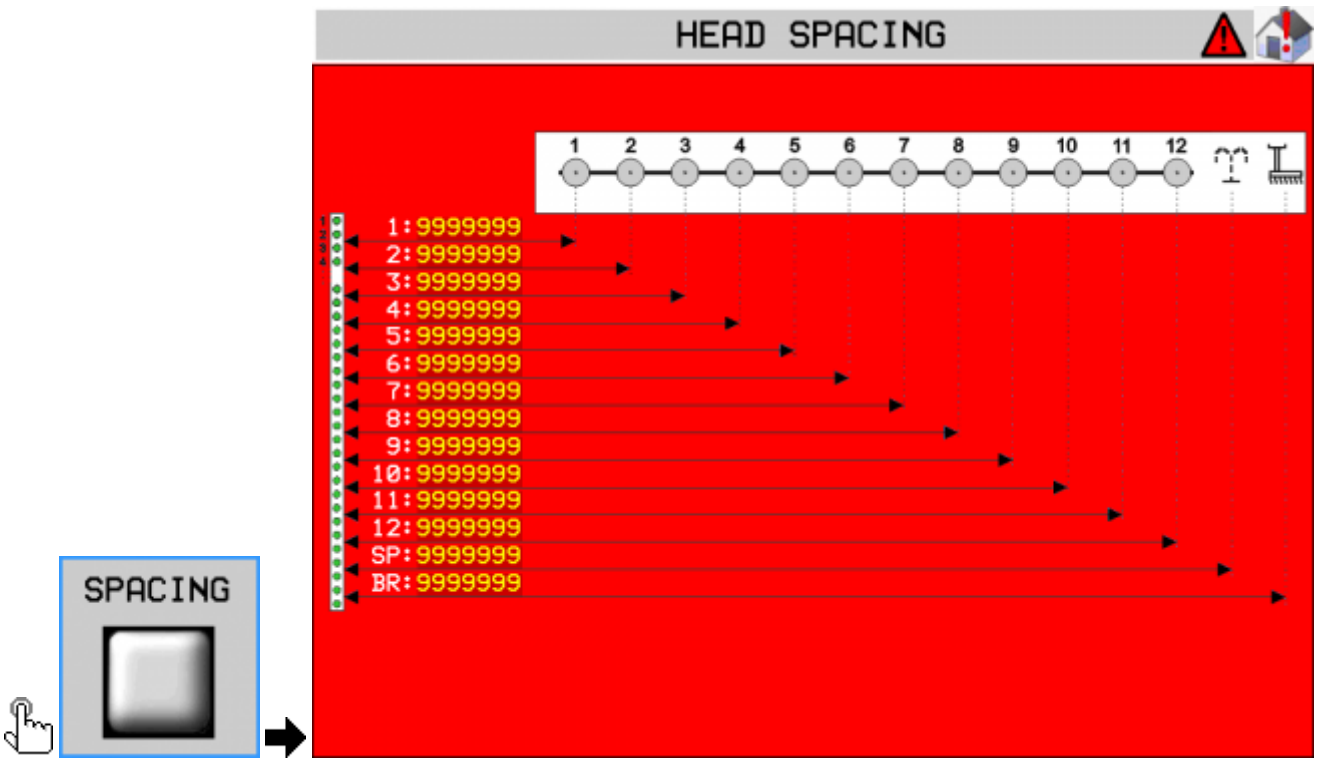
Space Feedback	
Important: first complete all previous procedures	
1	Enter **FEEDFORWARD** = 100.0
2	Enter **PROP. GAIN** = minimum setting (0.001)
3	If **FOLLOW ERR** is not 0, now this reading will reduce with an axis movement
4	Enter **DELTA** = any distance and **SET SPEED** = a speed (nearly **MAX 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
8	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 • Rule for varying **FEEDFORWARD** **FOLLOW ERR.** / **>0** / **<0** **Direction** / **Forward**: Increase FEEDFORWARD / Reduce FEEDFORWARD **Direction** / **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

3.3 Heads Setup



Parameter	*Unit measure*	*Default*	*Range*	*Description*
PH01 / **PH12** : DIAMETER	mm	0.0	0 – 99999.9	Head diameter
PH25 / **PH48** : VERTICAL SPACING	mm	0.0	0 – 99999.9	Distance from the head and central point of the bridge
PH49 / **PH72** : TIME TO STANDY UP	s	0.500	0 – 999.999	The up movement time for the standby up
PH73 : BRAKE MODE	-	Out Off Brake activated	Out Off – Out On Brake activated	Brake output state when activated
PH74 : UP DELAY	s	0.000	0 – 999.999	Delay time for the total up of the heads
PH75 : READ DELAY	s	1.000	0 – 999.999	Delay from head down and reading
PH76 : READ AGAIN	s	5.000	0 – 999.999	Repeat read time with head down

3.4 Head Spacing Setup



Set the distance from the Scan bar to the Center of each Head, Spray and Brush

3.5 Abrasives Setup

Parameter	*Unit measure*	*Default*	*Range*	*Description*
READING	bit	-	-	Analog input reading
REAL DISTANCE	mm	-	-	Conversion of bit in mm
HEAD UP				
SETTING	bit	0	0 – 4095	Enter READING as the setting
	-	-	-	Auto setting of READING
DISTANCE	mm	0	0 – 9999.9	Set measured distance between head and belt
HEAD DOWN				
SETTING	bit	0	0 – 4095	Enter READING as the setting
	-	-	-	Auto setting of READING
DISTANCE	mm	0	0 – 9999.9	Set measured distance of abrasive + slab

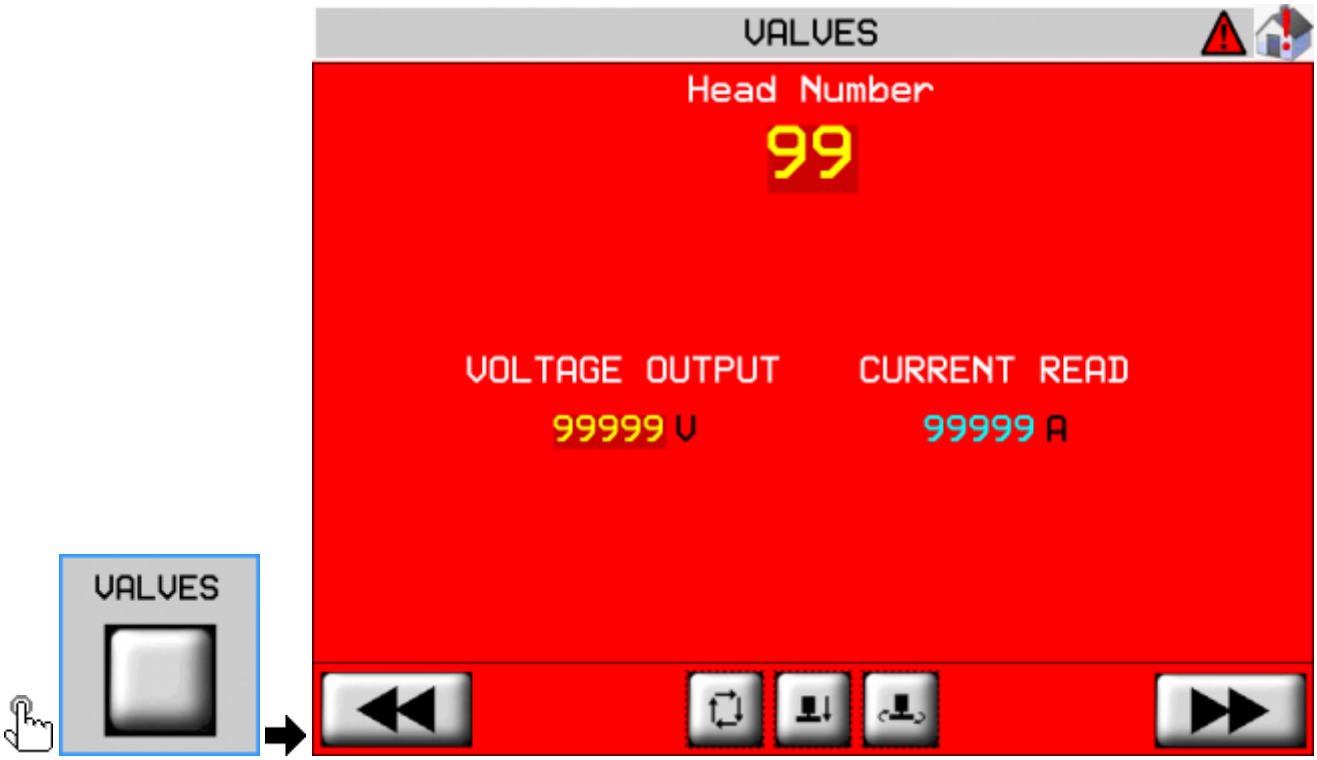
	Auto OFF		Auto ON
	Head UP		Head DOWN
	Motor OFF		Motor ON

3.6 Currents Setup

Parameter	*Unit measure*	*Default*	*Range*	*Description*
READING	bit / mA	-	-	Analog input reading
REAL CURRENT	A	-	-	Conversion of bit in A
MIN CURRENT DRAW				
SETTING	bit	800	0 – 4095	Enter READING as the setting
	-	-	-	Auto setting of READING
CURRENT	A	0.0	0 – 9999.9	Set minimum current
MAX CURRENT DRAW				
SETTING	bit	4095	0 – 4095	Set maximum bit
CURRENT	A	20.0	0 – 9999.9	Set maximum datasheet current

	Auto OFF		Auto ON
	Head UP		Head DOWN
	Motor OFF		Motor ON

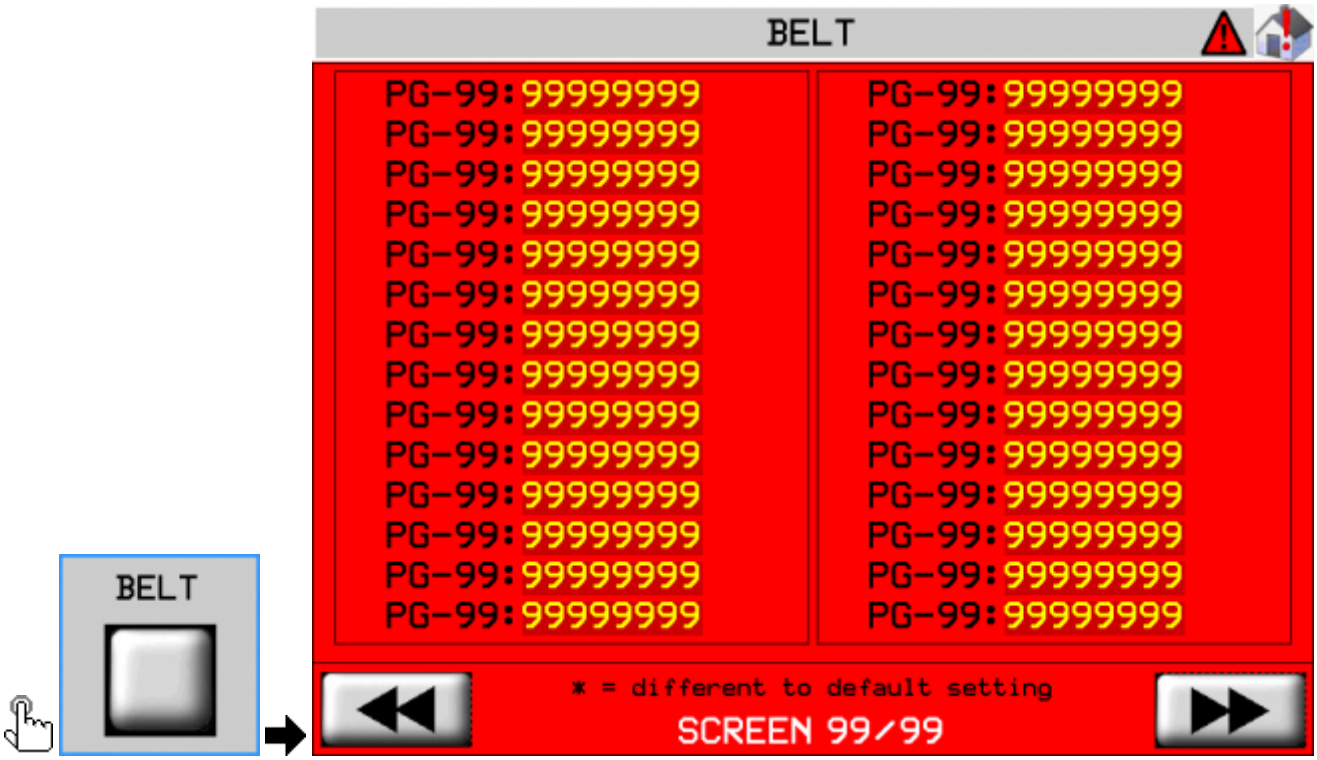
3.7 Valves Setup



Parameter	*Unit measure*	*Default*	*Range*	*Description*
VOLTAGE OUTPUT	V	0.0	0 – 10.0	Enter a voltage output for testing
CURRENT READ	A	-	-	Result of voltage output setting

	Auto OFF		Auto ON
	Head UP		Head DOWN
	Motor OFF		Motor ON

3.8 Belt Setup

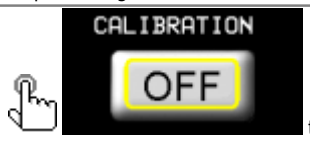


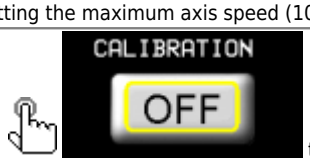
Parameter name	*Unit measure*	*Default*	*Range*	*Description*
PB51 : MEASURE	mm	0.1	0 – 99999.9	The space, in the unit measure, travelled by the Beam to obtain the encoder pulses, set at the parameter *pulse*.
PB52 : PULSE	-	1	0 – 999999	The pulses supplied by the Beam encoder, multiplied by 4 to obtain the space, set at the parameter *measure*. *The measure to pulse ratio, is the encoder resolution and must be between 1 and 0.000935.*
PB54 : BELT SPEED BY	-	DISPLAY	DISPLAY	Only display mode
PB55 : 10V SPEED	m/min	5.0	0 – 999.9	Speed at 10V analog output
PB56 : MAX SET SPEED	m/min	0.0	0 – 999.9	Max speed limit
PB57 : MIN SET SPEED	m/min	0.0	0 – 999.9	Min speed limit
PB58 : BELT OUTPUT	-	CONSTANT	CONSTANT – PULSE	Belt operating mode CONSTANT = always active when belt is operating PULSE = active for a set time (PB59)
PB59 : PULSE TIME	s	0.0	0 – 9.999	Belt active time, if operation set to PULSE
PB60 : BELT DELAY	s	0.0	0 – 9.999	Belt start delay after all heads ON

3.8.1 Calibration

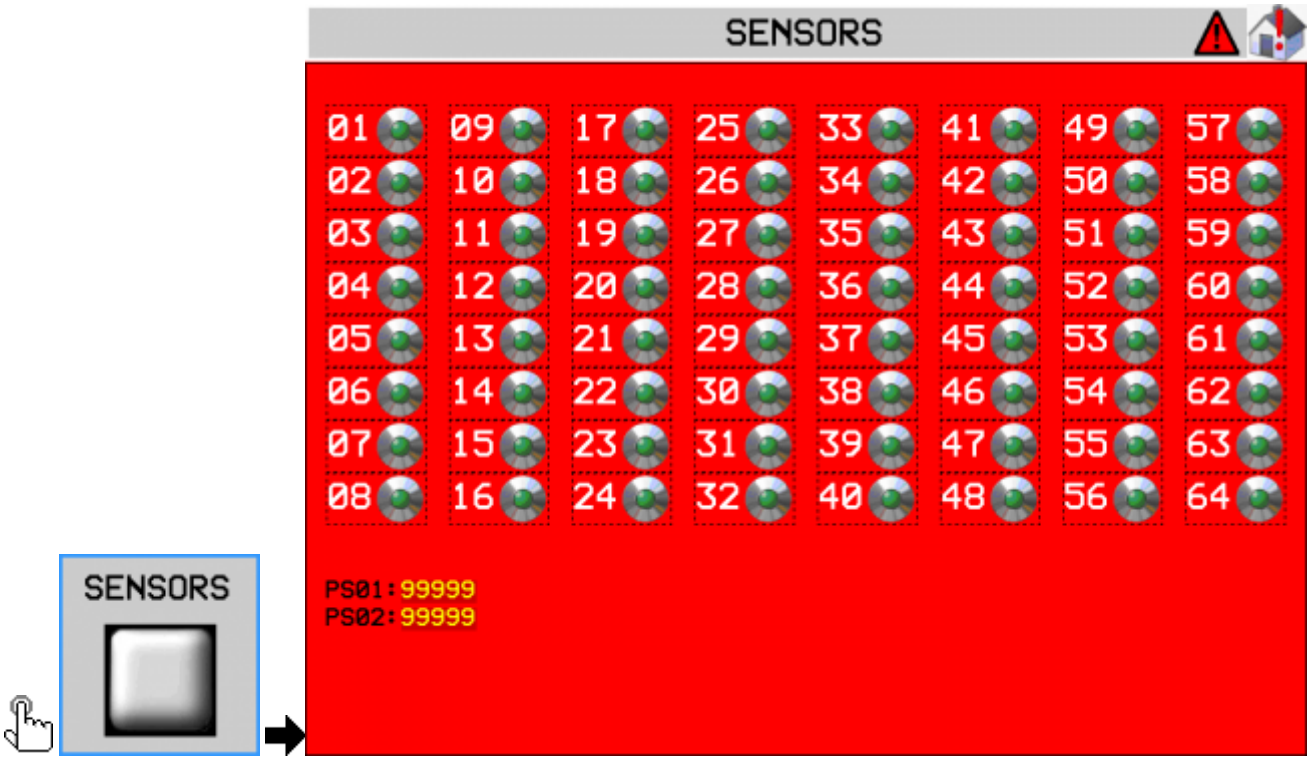
Parameter name	*Unit measure*	*Default*	*Range*	*Description*
VOLTAGE OUT	V	0.0	-10.0 – 10.0	Output voltage, with 0.1V precision, sent directly to the device
OFFSET	V	0.0000	-99.9999 – 99.9999	Voltage added to the analog output to compensate any supply voltage irregularities
SPEED	mm/min	-	-	The real axis speed
MAX SPEED	mm/'	1000	0 – 9999999	Axis speed at an analog output of 10V
POSITION	mm	-	-	The real axis position

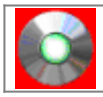
OFFSET	
1	 to start calibration
2	Set OUT VOLTAGE = 0
3	Regulate the OFFSET (directly by  , or automatically ) so that **POSITION** does not vary (or varies very slowly)
4	 to quit calibration

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**

3.9. Sensors Setup



	Sensor enabled		Sensor disabled

N.B. Two adjacent sensors cannot be disabled. Only disable alternate sensors.

Parameter	*Unità di misura*	*Default*	*Range*	*Description*
PS01 : NUMBER OF SENSORS	-	32	8 – 64	Number of sensors on the Sensor Bar
PS02 : SENSOR TYPE	-	N.O.	N.O. – N.C.	Scan bar input logic **N.O.** = Normally Open **N.C.** = Normally Closed

3.10. Touchscreen Calibration