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MDO_P1R44F-009 : Operator Manual

1. Informations

1.1 Release

			
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Specifications

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Description

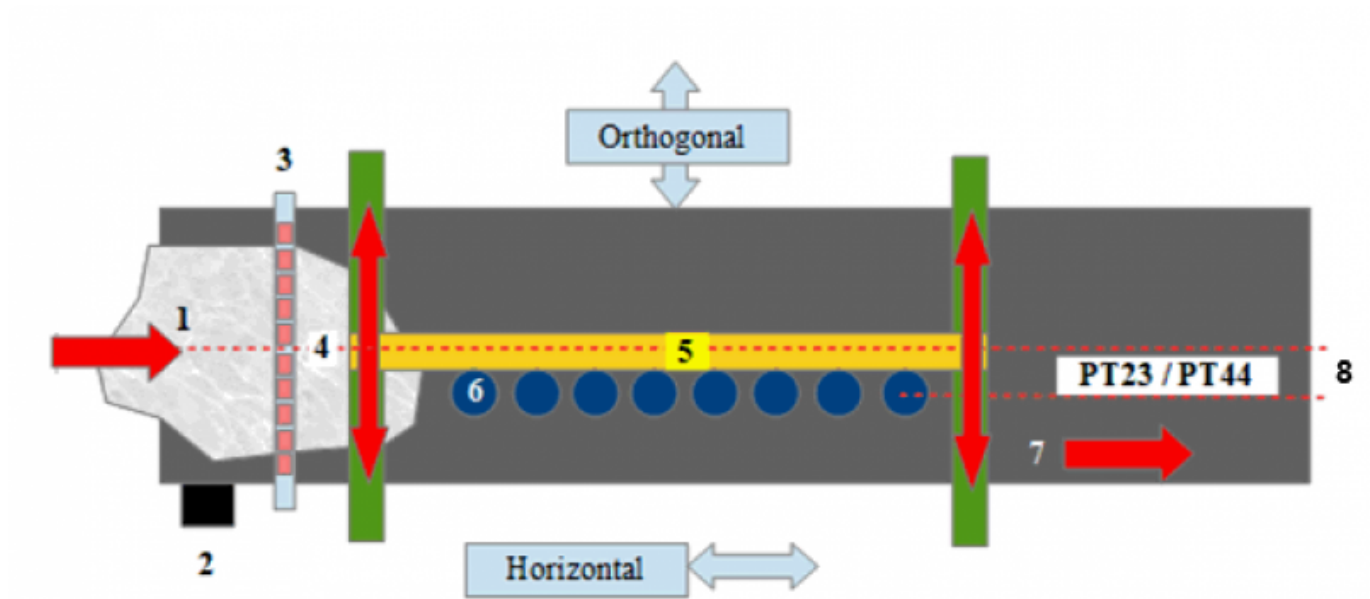
The application **P1R44F - 009** , installed in the hardware *Qmove C1-R41-FC30*, *Qpanel A1-HMI-QC104* and *RMC-3M remote I / O modules*, is designed to control a polishing machine for marble slabs with mobile bridge. Below there are the main features of the **P1R44F - 009** software.

Features implemented in the current proposal

- Bridge axis positioner, with “S” ramps
- Belt analogic command
- Heads ascent/descent, according to the speed of the belt
- Control of 22 polishing heads
- Brush command
- Slab acquisition with 64 sensors
- Numerous touchscreen functions, to obtain excellent smooth slabs
- Messages for operator help
- Alarm messages
- Alarm history
- Automatic lubrication

Functioning

Machine view from above:



n:	Description:
1	Raw slab
2	Belt Encoder
3	Limit sensor bar
4	Center of the sensors / centre of the bridge axis travel
5	Bridge
6	Polishing heads
7	Belt direction
8	Orthogonal Offset

Conventions adopted

The conventions adopted for the entire operator interface are:

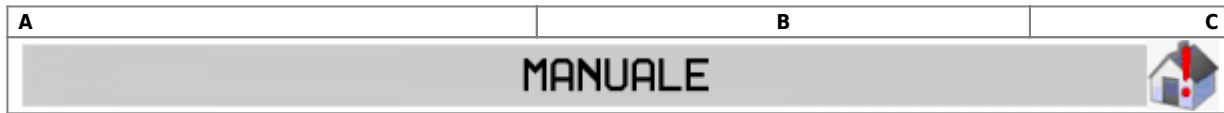
- The values with a background color different from the panel below can be modified by the operator. To change them, simply touch them and use the numeric keypad to enter the value.
- Some parameters can be specified by setting a word or an icon. In this case, the  key is used to select one of the options.

In the rest of the document, the touch areas of the touch screen will be referred to as “keys”.

Function keys

Key	Led	Function
	ON = automatic cycle running	-
	ON = conveyor belt enabled for movement	-
	ON = stop request active	-
	ON = conveyor belt on negative quotas	-
	ON BLINKING = preset not executed	Preset start (long press)
	ON BLINKING = active alarms	

Common bar



A

Logo.

B

MANUAL / AUTOMATIC state.

C

Bridge preset status.

Symbol	Meaning (these symbols appear on all operating pages)
	Preset (homing) not executed.
	Search for the preset sensor (homing) in progress.
	Preset (homing) executed.
	Flashing when at least one alarm is active. Appears to the left of the preset symbols.

Logo

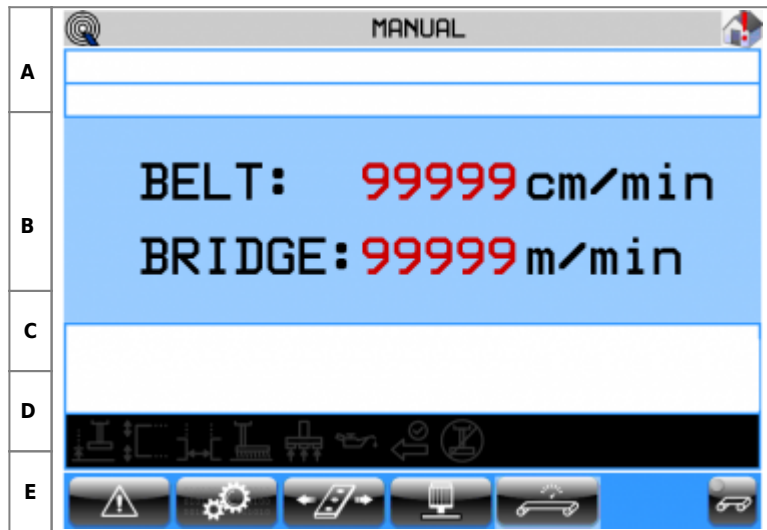


It is the first page displayed at power on. Report the software code to communicate to the supplier in case of assistance request.

After 3 seconds the main page will be automatically displayed.

Main page

The following page allows you to have a general view of the operation machine.



The page is divided into:

A	Warning message display panel.												
B	Display of bridge and conveyor belt speeds.												
C	Cycle status display panel: no message , manual status, automatic ON status. STOP , automatic OFF status, flashing during prestart. STAND-BY , stand-by input during automatic ON status. SIMULATION , simulation option active.												
D	Display panel of the activated options. Touching this area move to the options selection page.												
E	Key panel for accessing other pages and actions. In detail: <table border="1"> <tr> <td></td><td>Access to the alarm page.</td></tr> <tr> <td></td><td>Access to the settings menu.</td></tr> <tr> <td></td><td>Access the bridge configuration page.</td></tr> <tr> <td></td><td>Access to the engine test page.</td></tr> <tr> <td></td><td>Access to the belt speed setting page</td></tr> <tr> <td></td><td>Forcing the movement of the conveyor belt and the conveyor rollers (only in manual mode).</td></tr> </table>		Access to the alarm page.		Access to the settings menu.		Access the bridge configuration page.		Access to the engine test page.		Access to the belt speed setting page		Forcing the movement of the conveyor belt and the conveyor rollers (only in manual mode).
	Access to the alarm page.												
	Access to the settings menu.												
	Access the bridge configuration page.												
	Access to the engine test page.												
	Access to the belt speed setting page												
	Forcing the movement of the conveyor belt and the conveyor rollers (only in manual mode).												

Warnings

Warnings displayed in [Main page](#) are:

WARNING	DESCRIPTION
BRIDGE: LS FORWARD!	the bridge is on the forward limit switch
BRIDGE: LS BACKWARD!	the bridge is on the backward limit switch
ABRASIVE CONSUMED!	consumed abrasive, it must be replaced
LINE TOO FAST!	belt too fast
PRESET BRIDGE NOT OK!	bridge homing not performed

SELECT MANUAL	command not possible in Automatic, select manual	
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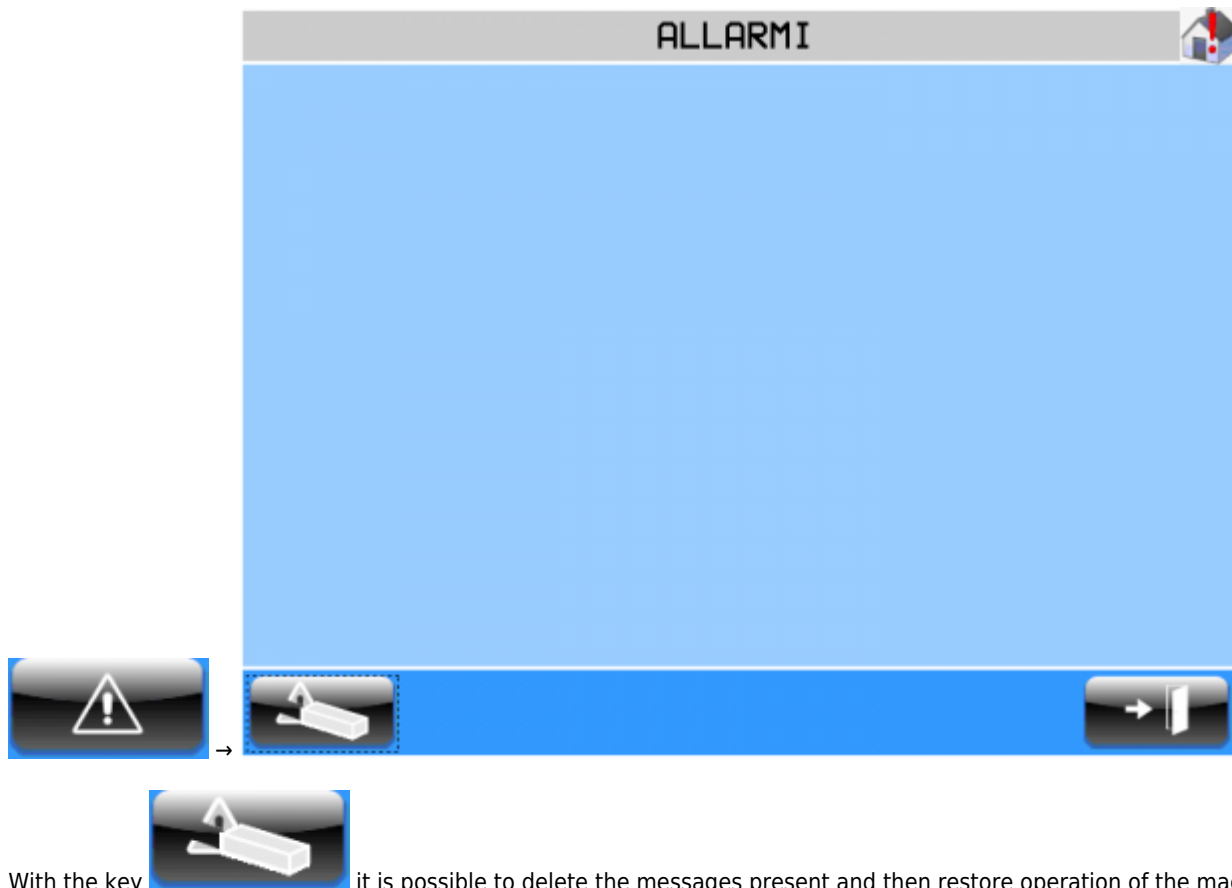
Options



This page displays all the options that can be set for machine operation.
It is possible to activate or deactivate the options simply by tapping on the relevant box.

SYMBOL	NAME	DESCRIPTION
	Enable Partial Lift	It allows the head to be stopped after a certain time the ascent has been activated, in order to remain always low and ready for use. These times can be set for each head in the area reserved for the installer.
	Enable Edges Revising	It manages the travel of the bridge by performing an additional pass on the edge. The size of the edge can be set on the page relating to the bridge.
	Enable Separation	It allows you to separate the incoming slabs, stopping the relative roller conveyor, through two special sensors.
	Enable Brush	Enables the up and down of the brush when there is a slab under it. For correct operation, it is essential to set the distance between the brush and the sensor bar on the page relating to center distances (interaxes).
	Enable Abrasive Ctrl	It allows you to display a warning message in relation to a special digital input that represents the state of abrasive consumed.
	Enable Lubrication	Activates the lubrication cycle through the appropriate digital output. The ON and OFF lubrication times can be set in the area reserved for the installer (generic parameters).
	Enable Previous Machine	Allows you to activate a specific digital output to give consent to any previous machine.
	Enable Simulation	Enable / disable the bridge movement, without polishing

Alarms



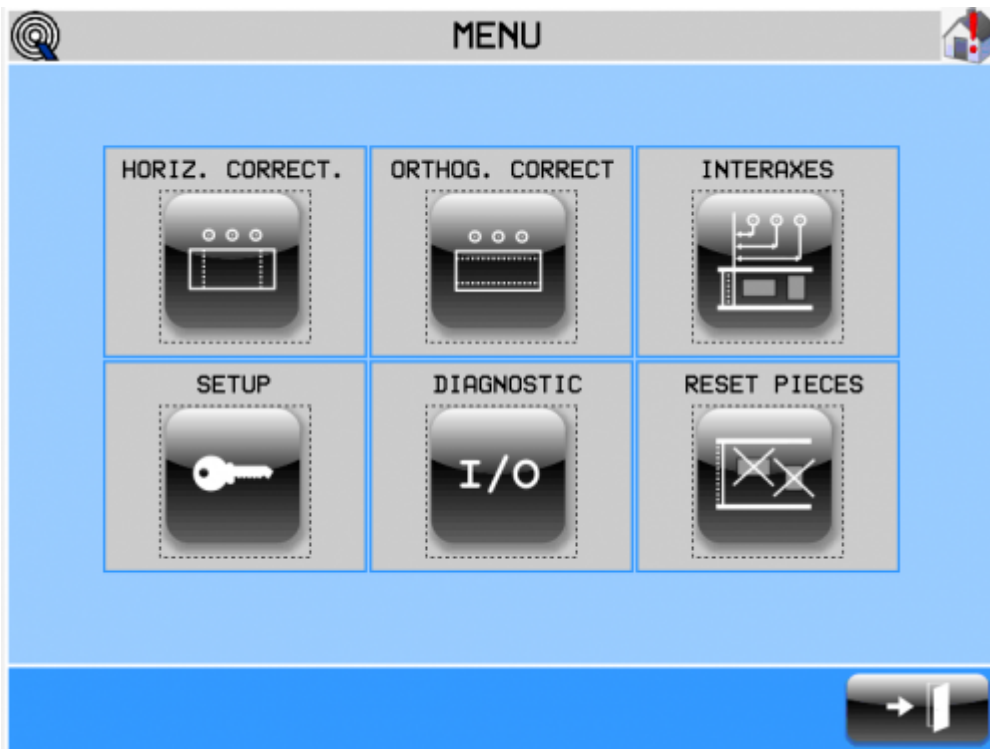
With the key  it is possible to delete the messages present and then restore operation of the machine after a few seconds of waiting.

If some alarm causes are still present, the alarm messages will reappear.

If no active alarm is found, return to the main page after 2 seconds.

Message	Cause	Solution
Air pressure	Input from pressure switch (I05) deactivated or insufficient air pressure	Check pressure switch or connections
Thermal overload	Input (I01) from one of the thermal switches off	Check switches and wiring
Bridge inverter fault	Bridge inverter malfunction (I02 Off)	Check inverter or wiring
Belt inverter fault	Conveyor belt inverter Malfunction (I03 Off)	Check Inverter or Wiring
Roller inverter fault	Roller conveyor inverter malfunction (I04 Off)	Check inverter or wiring
Emergency button pressed	Emergency button (I13) pressed	Unlock button or check wiring
CANBUS communication error (RMC3M-DD)	Error in communication with node 1 of the CANOPEN network. Node 1 is represented by the RMC3M-DD I / O module which manages the outputs relating to the heads.	Remove and restore power to the system. If this is not enough, check the bus wiring.
CANBUS communication error (RMC3M-D5)	Error in communicating with node 2 of the CANOPEN network. Node 2 is represented by the RMC3M-D5 I / O module which manages the acquisition of the piece through the sensor bar.	Remove and restore power to the system. If this is not enough, check the bus wiring.
One of Interaxes exceded maximum lenght	The center distance of a head is too large for the set horizontal step Control active only with automatic cycle in progress	Check the center distances (interaxes) Increase the horizontal step (SETUP)
Break encoder BRIDGE	The encoder pulses of the bridge axis do not reach the instrument, following error	Check: - encoder, - axis movement, - wiring
Water pressure	Input from pressure switch (I06) off or water pressure insufficient	Check pressure switch or connections

Menu

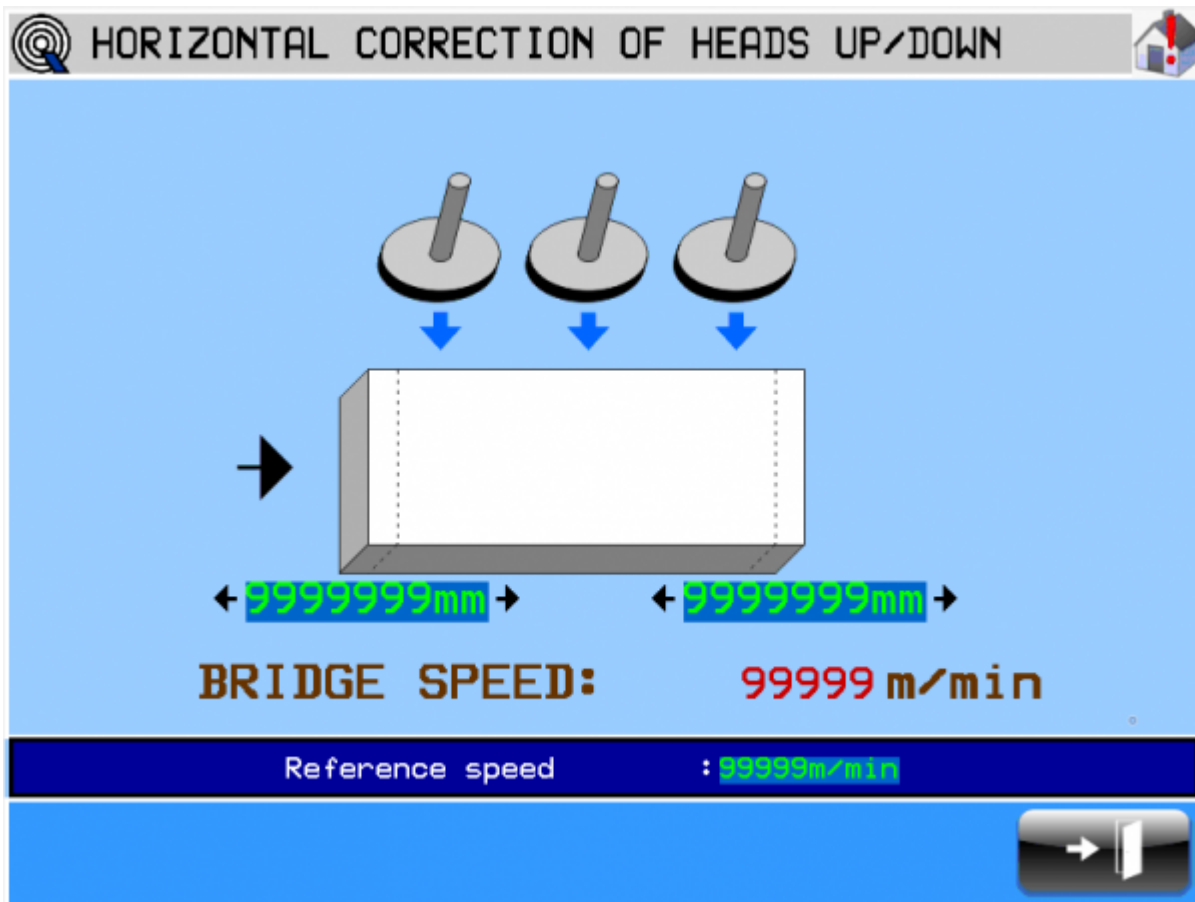


From this page you can access to:

	HORIZ. CORRECT. Horizontal correction of the heads.		ORTHOG. CORRECT Orthogonal correction of the heads.		INTERAXES Setting of the center distances of the heads.
	SETUP Access to confidential data. See specific manual.		DIAGNOSTICS Access to the diagnostics pages.		RESET PIECES Reset of the memorized pieces.

Horizontal correction

Look image [general view machine](#)

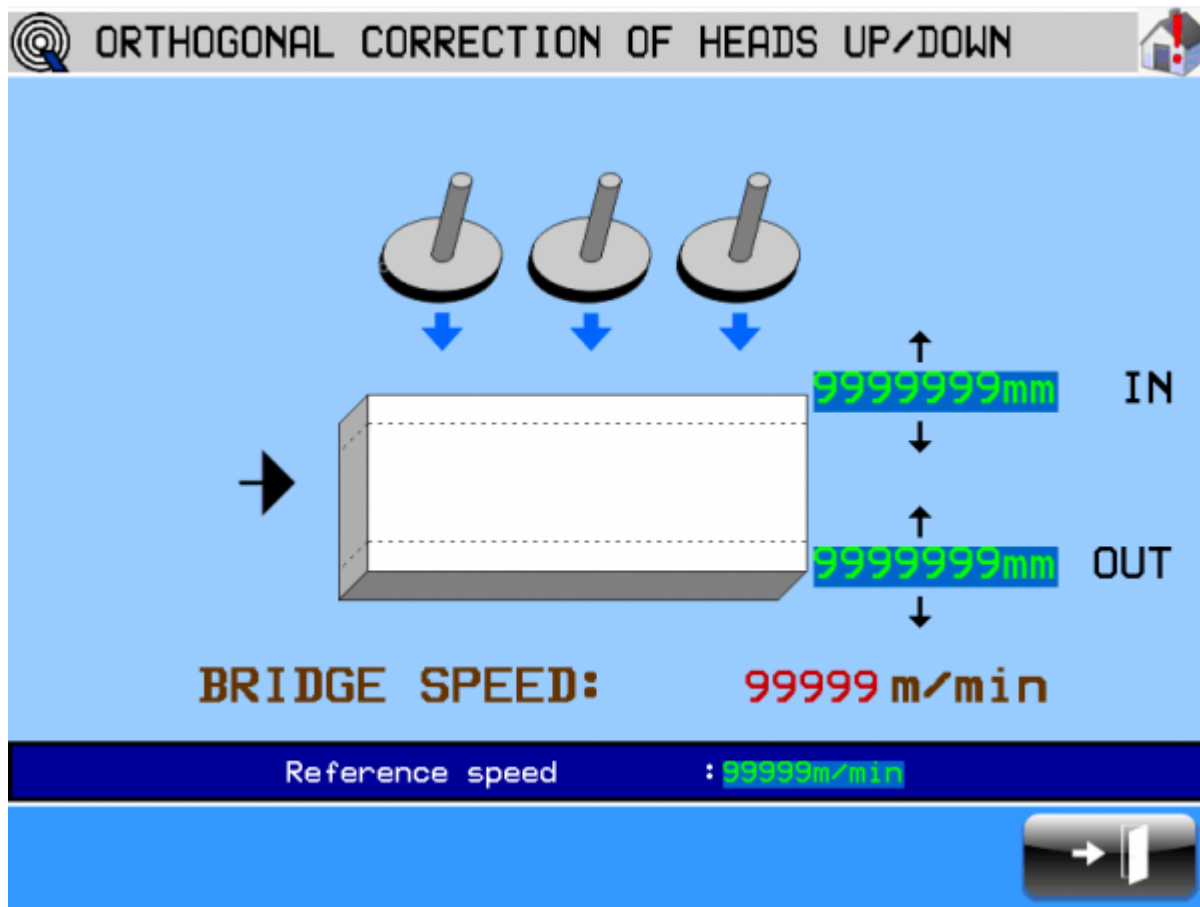


Parameter	Unit of measure	Range	Description
Head correction (on the left)	mm	-9999.9 ÷ 9999.9	Early (positive value) or delay (negative value) space compared to the start of the piece, use it to anticipate / postpone the activation of the head.
Tail correction (on the right)	mm	-9999.9 ÷ 9999.9	Early (positive value) or delay (negative value) space compared to the end of the piece, use it to anticipate / postpone the deactivation of the head.
Bridge speed	m / '	0 ÷ 999.9	Actual speed of the bridge
Reference speed	m / '	0 ÷ 999.9	Speed of the bridge which the correction values refer. As the speed changes, the correction values vary proportionally. With value = 0 the correction values remain constant at any speed.

Look in the [start up manual](#) how to best perform the procedures.

Orthogonal correction

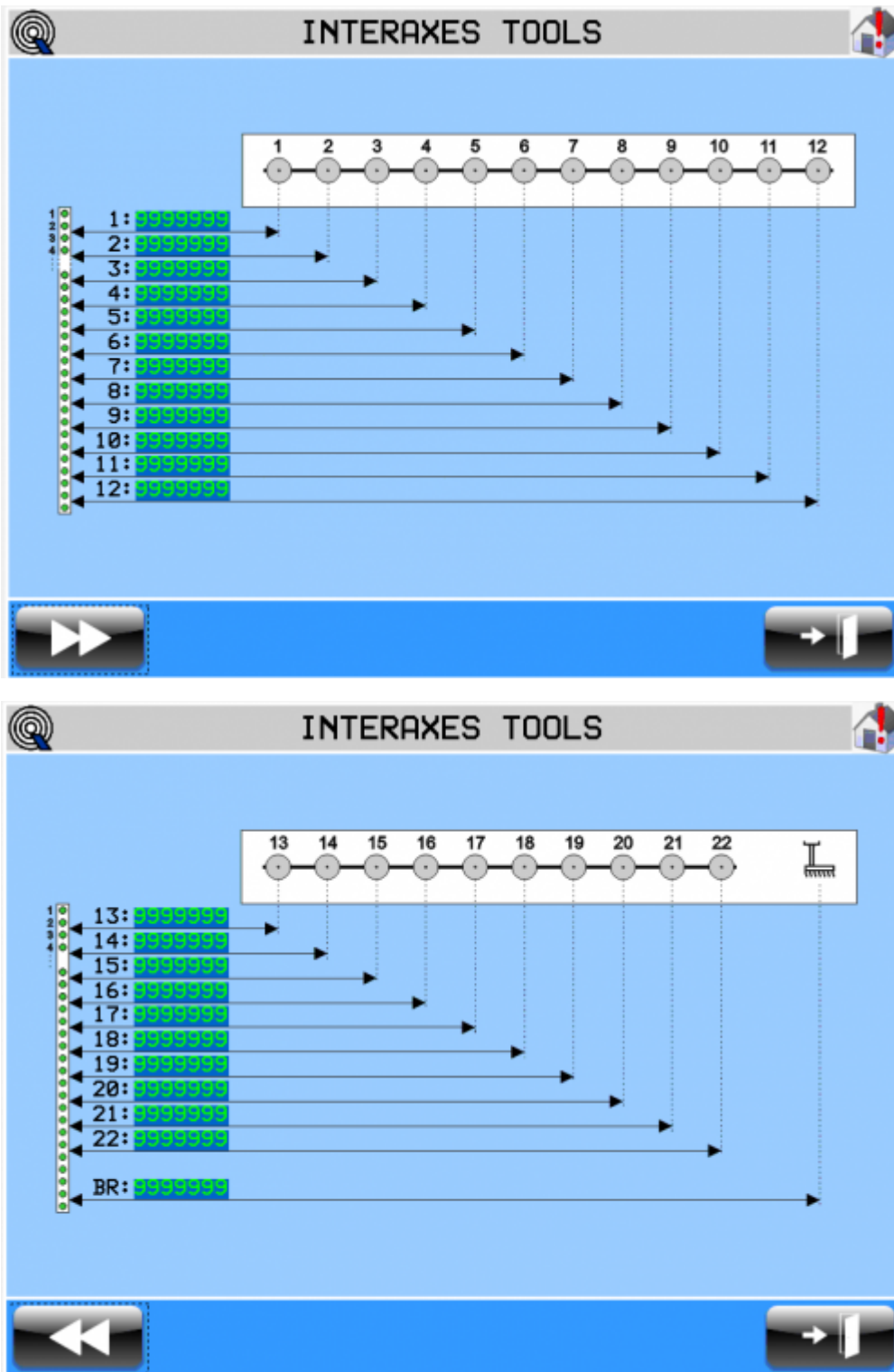
Look image [general view machine](#)



Parameter	Unit of measure	Range	Description
Correction IN (top)	mm	-9999.9 ÷ 9999.9	Early (positive value) or delay (negative value) compared to the leading edge of the piece, with which to anticipate / postpone the activation of the head.
Correction OUT (bottom)	mm	-9999.9 ÷ 9999.9	Advance space (negative value) or delay (positive value) compared to the outgoing edge of the piece, with which to anticipate / postpone the deactivation of the head.
Bridge speed	m / '	0 ÷ 999.9	Actual speed of the bridge
Reference speed	m / '	0 ÷ 999.9	Speed to which the correction values refer. As the speed changes, the correction values vary proportionally. With value = 0 the correction values remain constant at any speed.

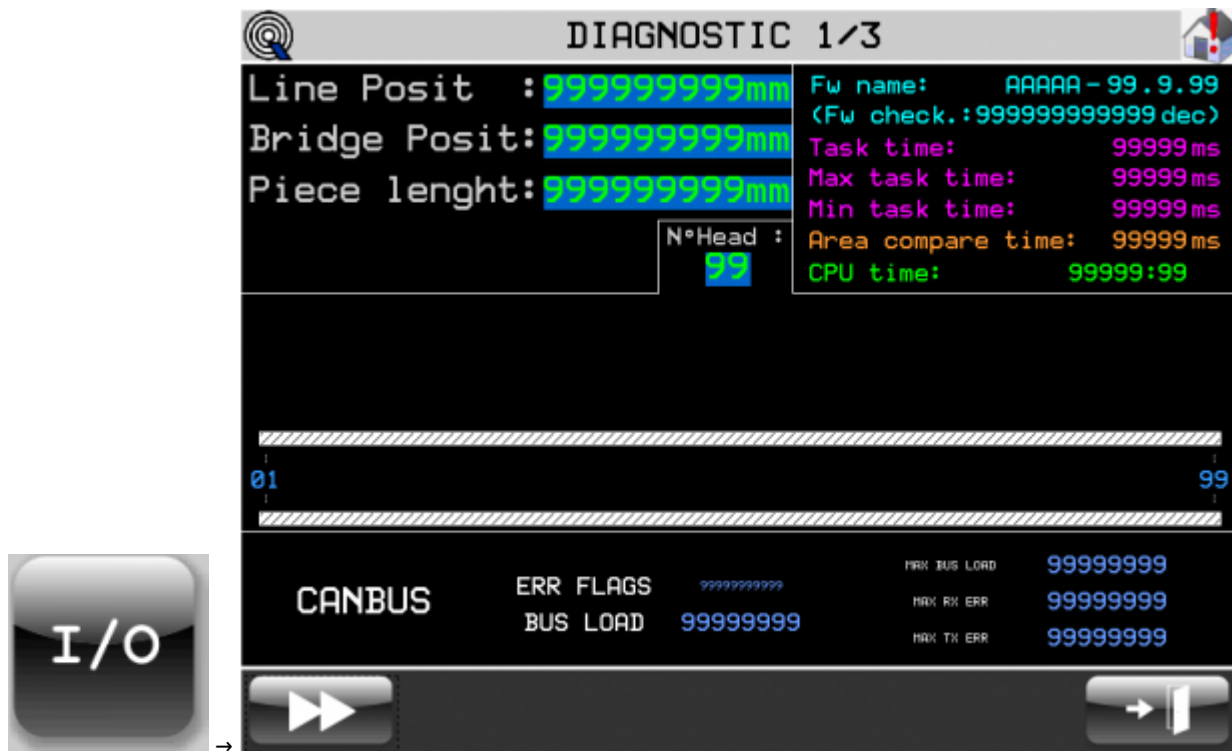
Look in the [commissioning manual](#) how to best perform the procedures.

Interaxes



In these 2 pages it is possible to set, for each head and for the scrubbing brush, the offset (mm) compared to the acquisition sensor bar.

General diagnostics



The page is divided into:

Line Posit : 99999999mm Bridge Posit: 99999999mm Piece lenght: 99999999mm	Conveyor belt (line), bridge and last piece measured display area.
Fw name: AAAAA - 99.9.99 <Fw check.:999999999999 dec> Task time: 99999ms Max task time: 99999ms Min task time: 99999ms Area compare time: 99999ms CPU time: 99999:99	Area related to the CPU of the C1R44 control. In detail: • Fw name : firmware present in the instrument and relative checksum; • Task time : average CPU cycle time with indications on Maximum and Minimum Scan Time; • Area compare time : average time the memorized zone of the status of the sensor bar is analyzed to decide whether a head must be at rest or at work; • CPU time : total time since the CPU is in RUN state (hh: mm).
N°Testat 01 99	Area relating to the status of the sensors on the bar and in the memory under each head. In the lower part the current status of what is present under the sensor bar is displayed. In the upper part it is possible to set the number of the head and view it the status and what the sensors detect in the vicinity of that specific head.
CANBUS ERR FLAGS 999999999 BUS LOAD 99999999 MAX BUS LOAD 99999999 MAX RX ERR 99999999 MAX TX ERR 99999999	Area relating to the status of the communication network between CANBUS instruments. In detail: • ERR FLAGS : error code represented as a series of bits; • BUS LOAD : network traffic load as a percentage; • MAX BUS LOAD : maximum percentage of traffic detected on the bus; • MAX RX ERR : maximum number of errors in reception; • MAX TX ERR : maximum number of errors in transmission.

Digital inputs diagnostics



This page displays the status of each digital input, relative to each electronic component.

Connector	PIN	ID	Description
C1R44			
CN 7	2	I01	Thermal heads (NC)
	3	I02	Fault Bridge (NC)
	4	I03	Fault Belt (NO)
	5	I04	Fault Roller conveyors (NO)
	6	I05	Air Pressure (NC)
	7	I06	Water Pressure (NC)
	8	I07	Limit switch forward Bridge (NC)
	9	I08	Limit switch backward Bridge (NC)
CN 6	2	I09	Zero bridge sensor (NO)
	3	I10	Slab presence sensor at the end of the roller conveyor (NO)
	4	I11	Slab presence sensor at the start of the belt (NO)
	5	I12	Consumed Abrasive Sensor (NO)
	6	I13	Emergency (NC)
QC104			
CN 11 / IQ023	5	I18	Jog Forward Bridge (NO)
	6	I19	Jog Backward Bridge (NW)
	7	I20	START button (NO)
	8	I21	STOP button (NO)
	9	I22	Abrasive change button (NO)
	10	I23	MAN / AUTO selector
	11	I24	STAND-BY input (NO)
C1R44 (QC104 INPUTS DUPLICATION)			
CN18	3	I18	Jog Forward Bridge (NO)
	4	I19	Jog Backward Bridge (NW)
	5	I20	START button (NO)
	6	I21	STOP button (NO)
	7	I22	Abrasive change button (NO)
	8	I23	MAN / AUTO selector
	9	I24	STAND-BY input (NO)
RMC3M-D5			
SLOTS 3/4/5/6		I33 ÷ I96	Barrier sensors 1 ÷ 64 Logic settable by software

Digital output diagnostics



DIAGNOSTIC 3/3

- OUTPUTS



C1R44		RMC3M-DD	
CN9	CN25	SLOT3	SLOT5
001	043	025	041
002	046	026	042
003	049	027	043
004	052	028	044
005	055	029	045
006	058	030	046
007	061	031	047
008	064	032	048
CN8	CN20	SLOT4	SLOT6
017	067	033	049
018	070	034	050
025	073	035	051
028	076	036	052
031	079	037	053
034	082	038	054
037	085	039	055
040	088	040	056
		QC104	
		CN15	
		017	018
		019	020

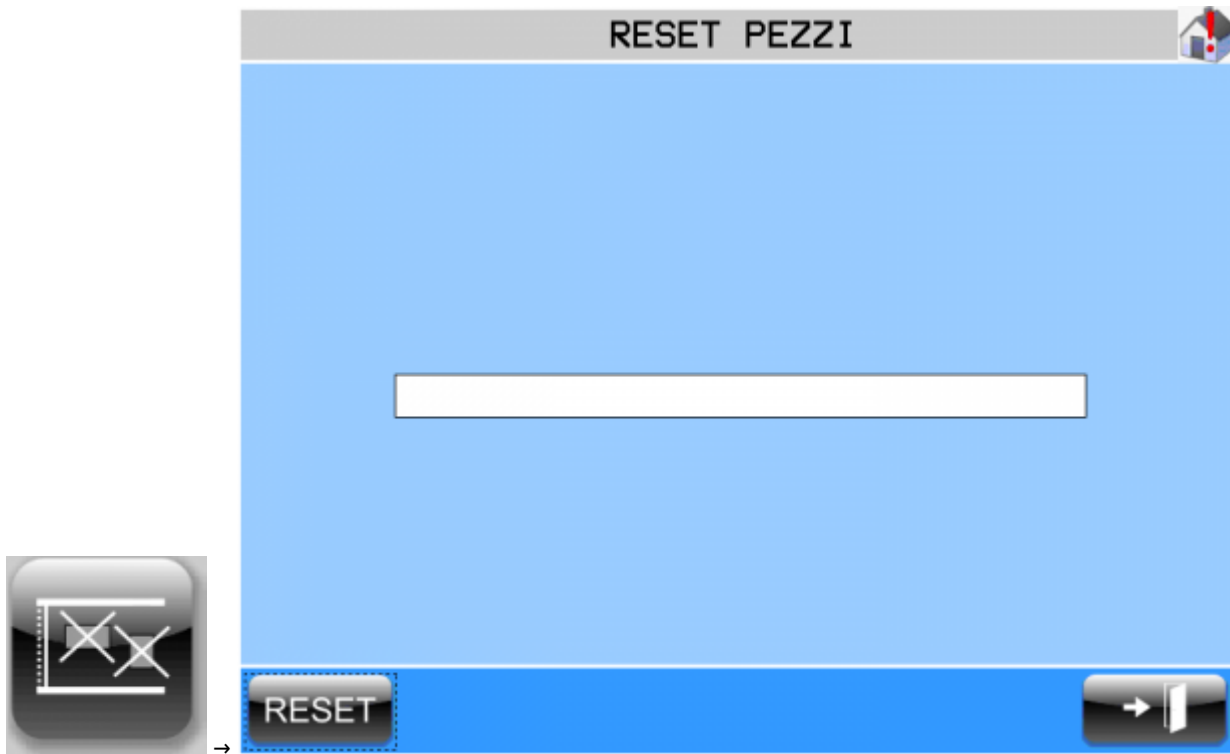
⏮

⏭

This page displays the status of each digital output, relative to each electronic component.

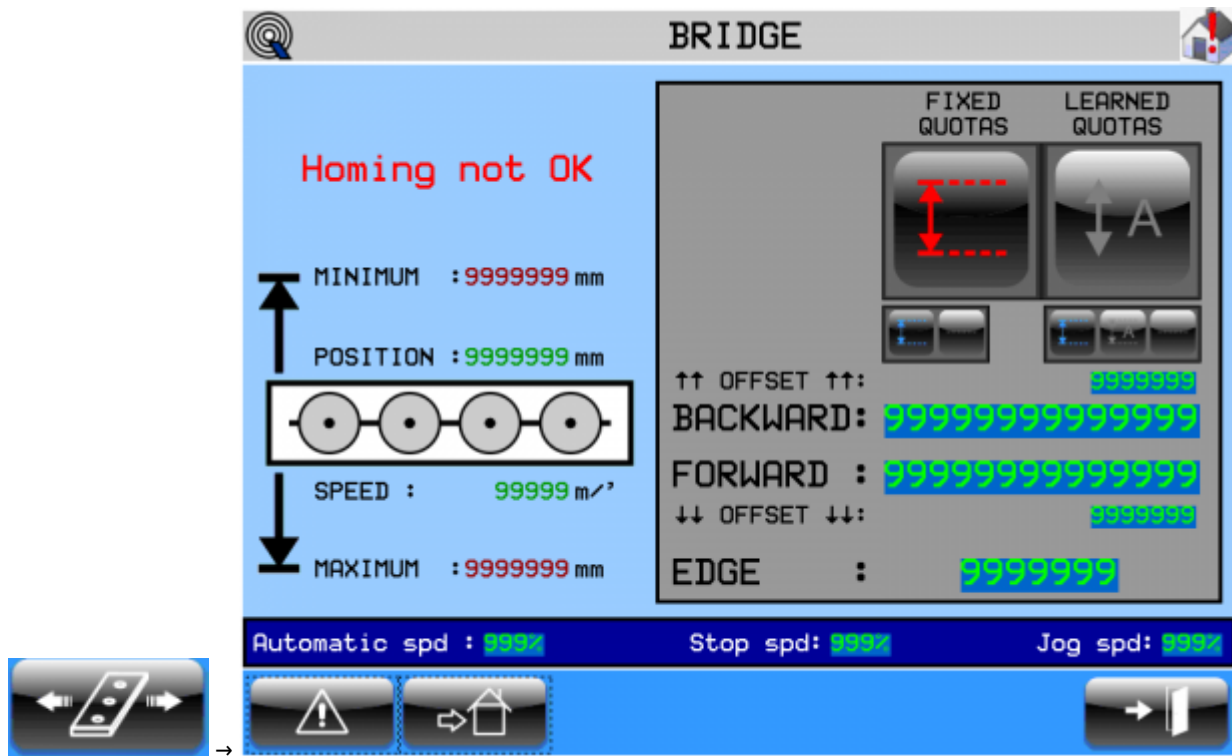
Connector	PIN	ID	Description
C1R44			
CN 9	2	O01	Enabling Bridge
	3	O02	Belt running
	4	O03	Roller Conveyor running
	5	O04	Ascent / Descent Brush
	7	O05	Enabling Previous Machine Run
	8	O06	Lubrication
	9	O07	Stop Belt
	10	O08	Alarm status (0 = alarm, 1 = ok)
QC104			
CN 15	2	O17	AUTOMATIC ON lamp
	3	O18	ALARM lamp
	5	O19	PRE-START lamp
	6	O20	RUN lamp
C1R44 (QC104 OUTPUTS DUPLICATION)			
CN 8	2	O17	AUTOMATIC ON lamp
	3	O18	ALARM lamp
RMC3M-DD			
SLOTS 3/4/5/6/7		O25, O26, O27	HEAD 1: Starting, Ascent, Descent
		O28, O29, O30	HEAD 2: Starting, Ascent, Descent
		O31, O32, O33	HEAD 3: Starting, Ascent, Descent
		O34, O35, O36	HEAD 4: Starting, Ascent, Descent
		O37, O38, O39	HEAD 5: Starting, Ascent, Descent
		O40, O41, O42	HEAD 6: Starting, Ascent, Descent
		O43, O44, O45	HEAD 7: Starting, Ascent, Descent
		O46, O47, O48	HEAD 8: Starting, Ascent, Descent
		O49, O50, O51	HEAD 9: Starting, Ascent, Descent
		O52, O53, O54	HEAD 10: Starting, Ascent, Descent
		O55, O56, O57	HEAD 11: Starting, Ascent, Descent
		O58, O59, O60	HEAD 12: Starting, Ascent, Descent
		O61, O62, O63	HEAD 13: Starting, Ascent, Descent
		O64, O65, O66	HEAD 14: Starting, Ascent, Descent
		O67, O68, O69	HEAD 15: Starting, Ascent, Descent
		O70, O71, O72	HEAD 16: Starting, Ascent, Descent
		O73, O74, O75	HEAD 17: Starting, Ascent, Descent
		O76, O77, O78	HEAD 18: Starting, Ascent, Descent
		O79, O80, O81	HEAD 19: Starting, Ascent, Descent
		O82, O83, O84	HEAD 20: Starting, Ascent, Descent
		O85, O86, O87	HEAD 21: Starting, Ascent, Descent
		O88, O89, O90	HEAD 22: Starting, Ascent, Descent
C1R44 (DUPLICATION STARTING HEADS)			
CN 8	4÷10	O25÷O40	HEADS 1÷6: Starting
CN 25	2÷10	O43÷O64	HEADS 7÷14: Starting
CN 20	2÷10	O67÷O88	HEADS 15÷22: Starting

Reset pieces



Pressing RESET, the slabs will be deleted from memory

Bridge



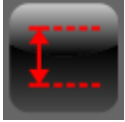
This page has the function of displaying and setting the main variables relating to the operation of the bridge.

On the left side are displayed generic data of interest of the bridge:

NAME	DESCRIPTION
POSITION	Current position of the bridge [mm].
SPEED	Current speed of the bridge [m / min].
MINIMUM	Minimum position reachable from the bridge [mm].
MAXIMUM	Maximum position reachable from the bridge [mm].

On the right side are displayed data regarding the positioning of the bridge.

In turn there is a subdivision relating to the method applied to the bridge positions: set (FIXED QUOTAS) or self-learned (LEARNED QUOTAS).



“FIXED QUOTAS”:

NAME	DESCRIPTION
 and 	Behavior of the bridge when there is no piece in the machine. The first button maintains the set positions, the second move and maintain the bridge on a central level.
BACKWARD	Settable value, representing the minor point of the travel of the bridge [mm].
FORWARD	Settable value, representing the greatest point of the travel of the bridge [mm].
EDGE	Settable size of the piece edge [mm], used when the edges revising option is active. See on Options .



“LEARNED QUOTAS”:

 and 	Behavior of the bridge when there is no piece in the machine. The first button keeps the set positions, the second keeps the last learned positions, the third moves and keeps the bridge on a central level.
BACKWARD	Self-learned and non-modifiable quota representing the calculated minor point of the pieces position present in the machine [mm].
?? OFFSET ??	Settable offset for the correction of the BACKWARD travel of the bridge, negative to increase the travel, positive to reduce it.
FORWARD	Self-learned and non-modifiable quota representing the calculated highest point of the pieces position present in the machine [mm].
?? OFFSET ??	Settable offset for the correction of the FORWARD travel of the bridge, positive to increase the travel, negative to reduce it.
EDGE	Settable size of the piece edge [mm], used when the edges revising option is active. See on Options .

The lower part displays the speeds relating to the positioning of the bridge:

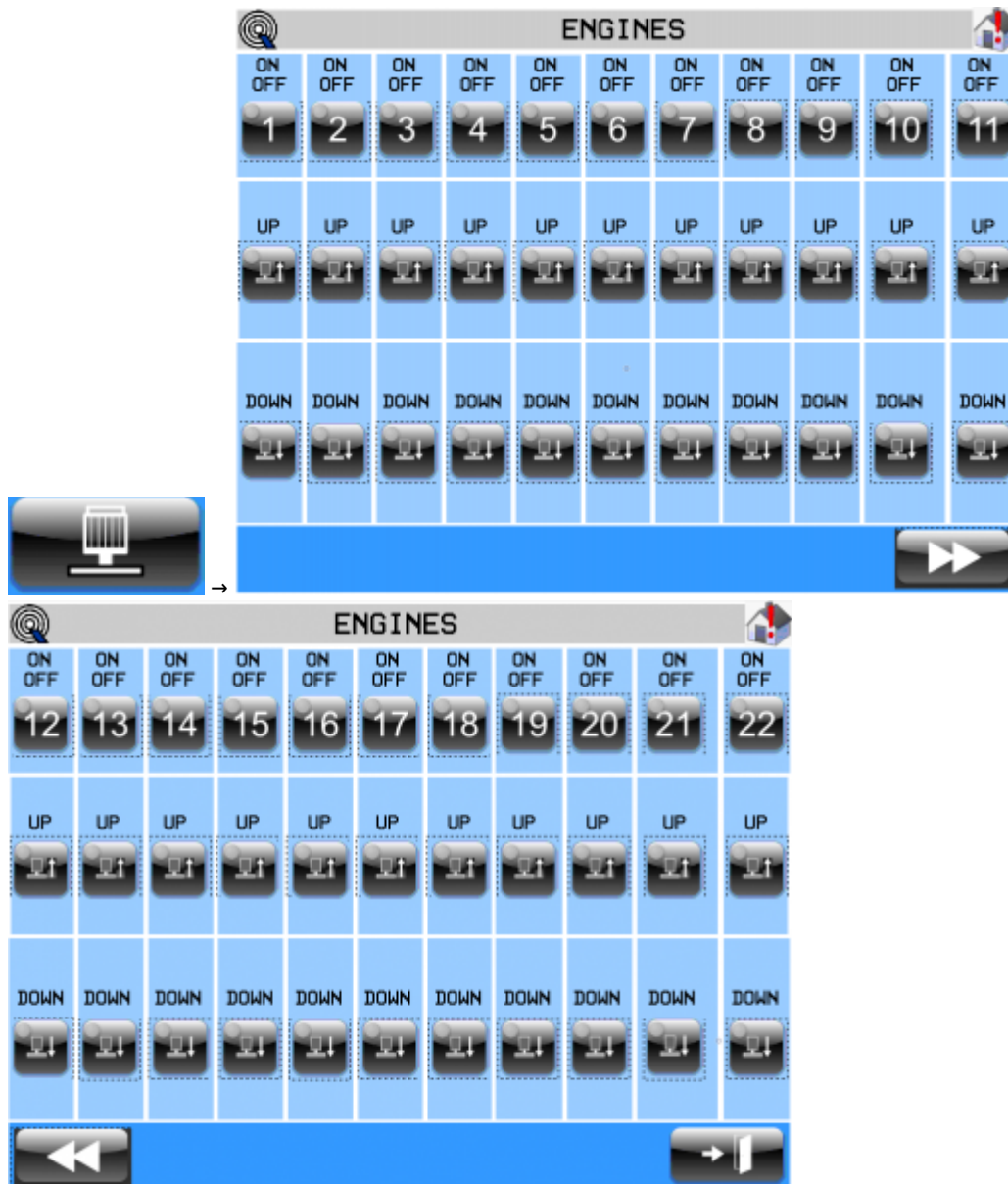
NAME	DESCRIPTION
Automatic speed	Processing speed expressed as a percentage of the maximum.
Stop speed	Positioning speed at the end of the cycle expressed as a percentage of the maximum.
Jog speed	Speed relative to manual movements expressed as a percentage of the maximum.



With the cycle stopped, by pressing the key  the preset (homing) procedure is performed.

It is however possible to execute this function on each page of the application by holding down the function key .

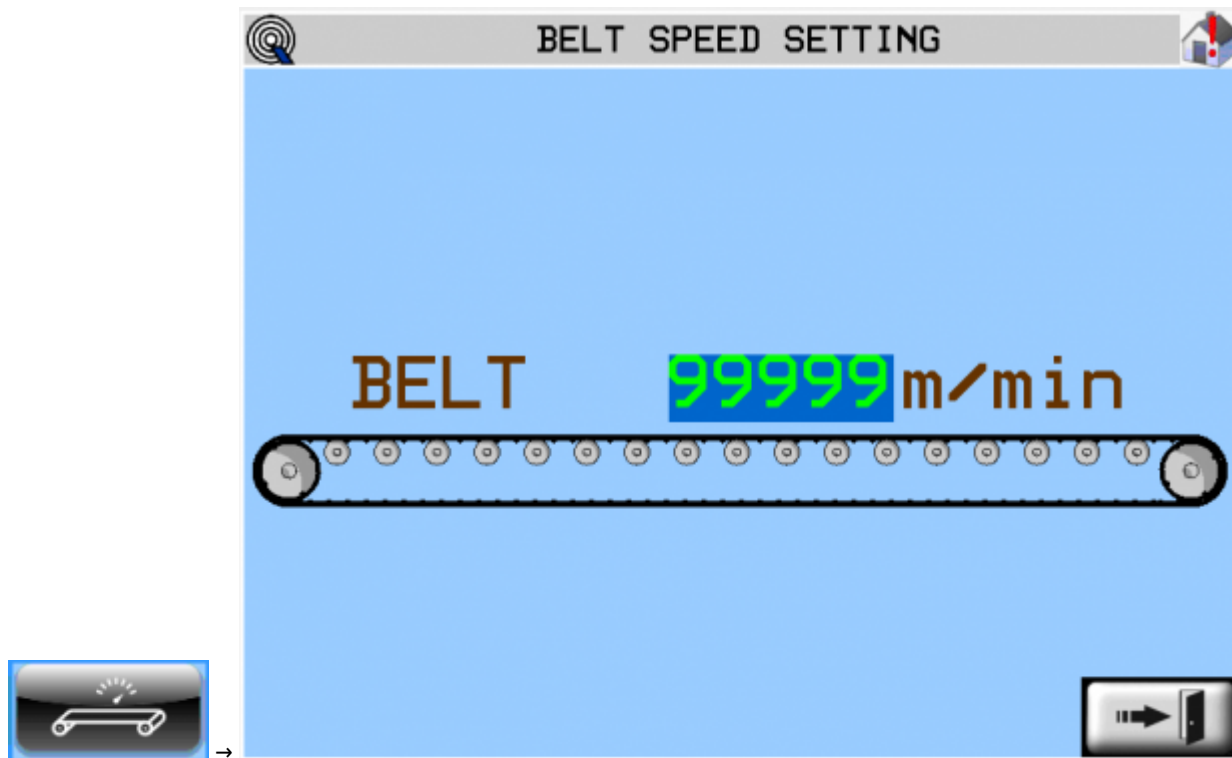
Motors



In this page it is possible to force the activation outputs of the head's motors, the descent and ascent of the heads. It required to be in manual mode.

To do this, press on the key with the number of the head you want to activate. The led indicates the status. If

Belt



In this page it is possible to set the speed of the conveyor belt. Max and min values are setted in generic parameters (PG 36 PG 37). If the machine is in **MANUAL** state:

press button  to activate O3: ROLLERS RUN,

press button  to activate O2 "BELT RUN"

Usage

MANUAL	
1	Turn the selector to MANUAL.
2	Check that there are no active alarms. Resolve the alarm conditions.
3	Launch the preset (homing) procedure Once the bridge reaches the zero sensor, any preset messages must disappear.
4	Make sure there are no pieces in the machine, otherwise discharge it and reset the pieces using the appropriate page. It is however possible to start with some pieces already stored in the machine in the previous start-up.
5	Set the FORWARD and BACKWARD quotas on the page relating to the bridge. If self-learning is active, set both positions to a central value in relation to the first piece in input.
AUTOMATIC	
1	Turn the selector to AUTOMATIC.
2	Press the START button. after a prestart time, dedicated to the sequential activation of the heads, the automatic cycle begins.
3	It is possible to stop the cycle using the ABRASIVE CHANGE button. The bridge will end its run by moving to the quota set for the abrasive change.
4	By pressing the STOP button: the bridge will end its run, the belt will stopped, the heads go OFF and high position, the bridge moves towards the position setted in PG13. Press START to start again.
5	It is possible to stop the belt and the heads, but not the bridge, activating the STAND-BY input.
6	By pressing the emergency, the cycle stops and an alarm condition is generated. The belt is stopped, the heads go OFF and high position, the bridge stops. When the cycle resumes, the work resumes as it was interrupted.
7	It is possible to interrupt the cycle instantly by turning the selector to MANUAL(0). The belt is stopped, the heads go OFF and high position, the bridge stops. When the cycle resumes, after the heads have been activated, work resumes as it was interrupted.
8	It is possible to avoid the working of the pieces on the belt, through 2 possible operations: Enable the SIMULATION option Delete from the memory the data acquired in the RESET PIECES page.
9	It is possible to: activate options, modify corrections and dimensions related to the bridge, change the speed of the bridge.

Standby

The Stand-by input sets the “belt forward” output to OFF and deactivates the heads, positioning them high. The stand-by status ends by disabling its input.

During the stand-by status the “belt stop” output is not activated, it is only used in the cycle stop procedure or in the abrasive change procedure.

Support

Request for assistance

In order to be able to provide you a quick service, at the minimum cost, we need your help.

	
Follow all the instructions provided in the manual MIMAT	If the problem persists, fill in the “Assistance request form” on the page Contacts of the site www.qem.it. Our technicians will obtain essential elements for understanding your problem.

Repair

In order to provide you with an efficient service, please read and follow the instructions here [reported](#)

Shipping

It is recommended to pack the instrument with materials that can absorb any falls.

		
Use the original packaging: it must protect the instrument during transport.	Attach: 1. A description of the anomaly; 2. Part of the wiring diagram where the instrument is inserted 3. Programming the instrument (set up, work quotas, parameters ...).	A thorough description of the problem will allow us to quickly identify and resolve your problem. Careful packaging will avoid further inconveniences.

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