

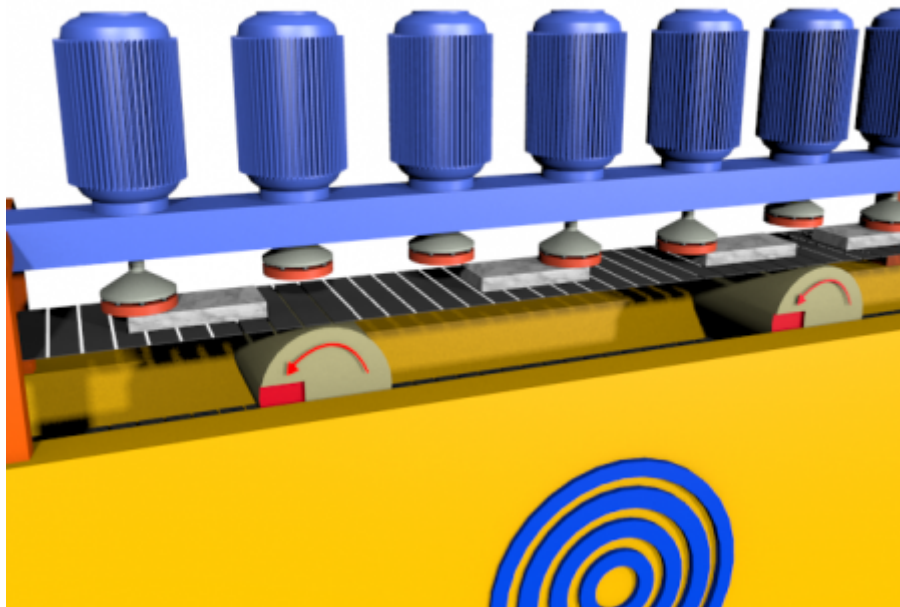
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# P1P20FH20 - 001 : Installation Manual

**PRELIMINARY**



Quality in Electronic  
Manufacturing

<b>Document</b>	<b>MDI_P1P20FH20-001</b>		
<b>Description</b>	Installation Manual		
<b>Drawn up by</b>	Michele Sandri		
<b>Approved by</b>	Gabriele Bazzi		
<b>Link</b>	<a href="http://www.qem.eu/doku/doku.php/en/strumenti/qmoveplus/j1p20/p1p20fh20-001/mdi_p1p20fh20-001">http://www.qem.eu/doku/doku.php/en/strumenti/qmoveplus/j1p20/p1p20fh20-001/mdi_p1p20fh20-001</a> <a href="http://www.qem.eu/doku/doku.php/strumenti/qmoveplus/j1p20/mimj1p20fx">http://www.qem.eu/doku/doku.php/strumenti/qmoveplus/j1p20/mimj1p20fx</a>		
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# 1. Description

Il software **P1P20FH20 - 001**, installato nell'hardware *Qmove J1-P20-FH20*, realizza l'automazione di macchine **levigatrici/levigabordi**.

## Caratteristiche principali

- lo strumento comanda **19 teste** di lavoro
- controlla l'**avviamento sequenziale dei motori** (per limitare l'eccessiva richiesta di corrente )
- gestisce l'eventuale **spostamento del ponte**
- per ogni testa di lavorazione è possibile impostare gli **anticipi e i ritardi di lavorazione**, sia all'**inizio**, sia alla **fine** del pezzo
- I comandi di salita/discesa delle teste di levigatura, vengono calcolati **automaticamente al variare della velocità** del nastro trasportatore.
- lo strumento conta i **metri lavorati** ed è in grado di lavorare fino a **30 pezzi** presenti contemporaneamente in macchina.

## Altre Caratteristiche


- HMI con touchscreen
- Tasti funzione
- Programmi di lavoro
- Messaggi di allarme
- Messaggi di warning
- Reset dei pezzi difettosi
- Reset di tutti i pezzi in lavorazione
- Compensazione dell'offset del finecorsa di presenza pezzo
- Modo di lavorazione delle teste
  1. Levigatura
  2. Fresatura
  3. Molatura
  4. Spazzolatura
  5. Getto d'acqua

## Opzioni e caratteristiche di possibile futura implementazione

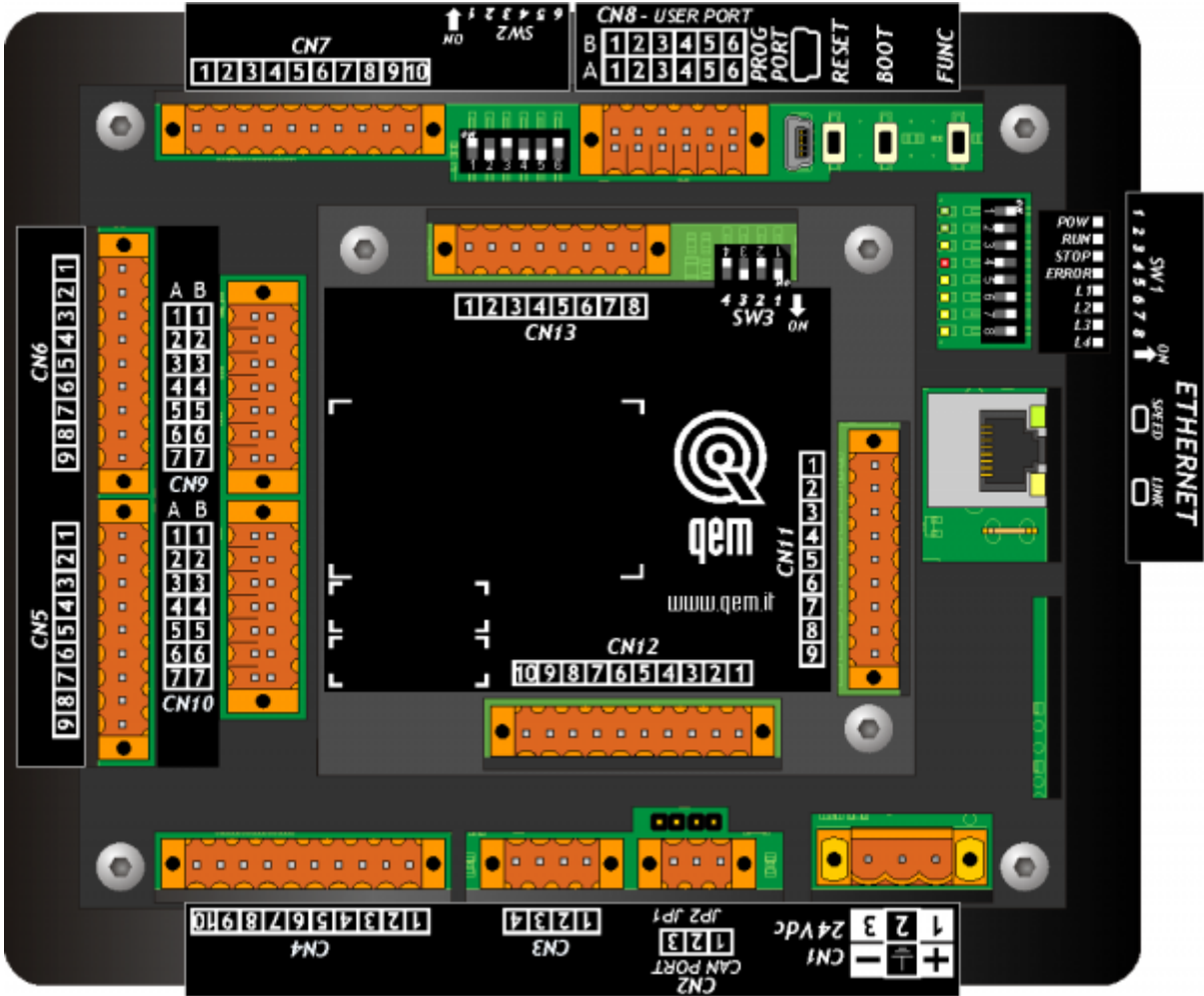
- Con l'installazione dei moduli RMC1XX sarà possibile automatizzare **2 o 4 calibratori**
- Con l'installazione dei moduli RMC1YY sarà possibile leggere la **corrente di ogni testa**
- E' possibile dotare lo strumento del software necessario per realizzare delle **lavorazioni di bocciardatura**
- E' possibile dotare lo strumento di funzionalità software di **abilitazione/disabilitazione di ogni singola testa**
- E' possibile dotare lo strumento di porta **Ethernet, che consente di trasmettere i dati della macchina** agli uffici di programmazione della produzione .
- **Risparmio energetico** : accensione dei motori solo durante la lavorazione  
**Nota** : in questo caso si dovrà utilizzare un modulo di espansione degli I/O

**Note** Se il cliente è interessato a queste opzioni e caratteristiche, oppure altre di Sua scelta, contattare l'Ufficio Commerciale della QEM ( [info@qem.it](mailto:info@qem.it) )
















2. Hardware J1-P20-FH20




F1	MAIN MENU
F2	RESERVED SETUP (enter password)
F3	WORK PROGRAMS
F4	RESET ALL SLABS
F5	RESET SELECTED SLABS
F6	ALARMS
F7	ESC TO PREVIOUS SCREEN



## • 2.1 Standard Symbols & Buttons

Button	Description	-----	Top Bar Symbol	Description
	Confirm Popup entry			Manual
	Popup Select			Alarm
	Previous screen & Next screen			Automatic
	Scroll list			Function mode
	Reserved Area			Not initialized
	Quit without saving			Setup Locked/Unlocked
	Confirm setting			Calibration
	<b>Green settings can be changed</b>			
-----	-----	-----	-----	-----

## 2.2 MAIN SCREEN

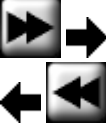


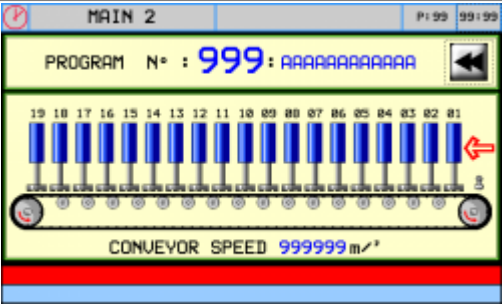
**Top Bar** (grey)

- Machine State
- Page name
- Page number
- Time

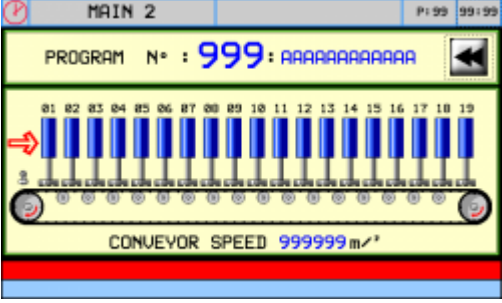
**Bottom Bars**

- Alarms (red)
- Warnings (light blue)





Right IN



Left IN

## • 3. Startup

### Important



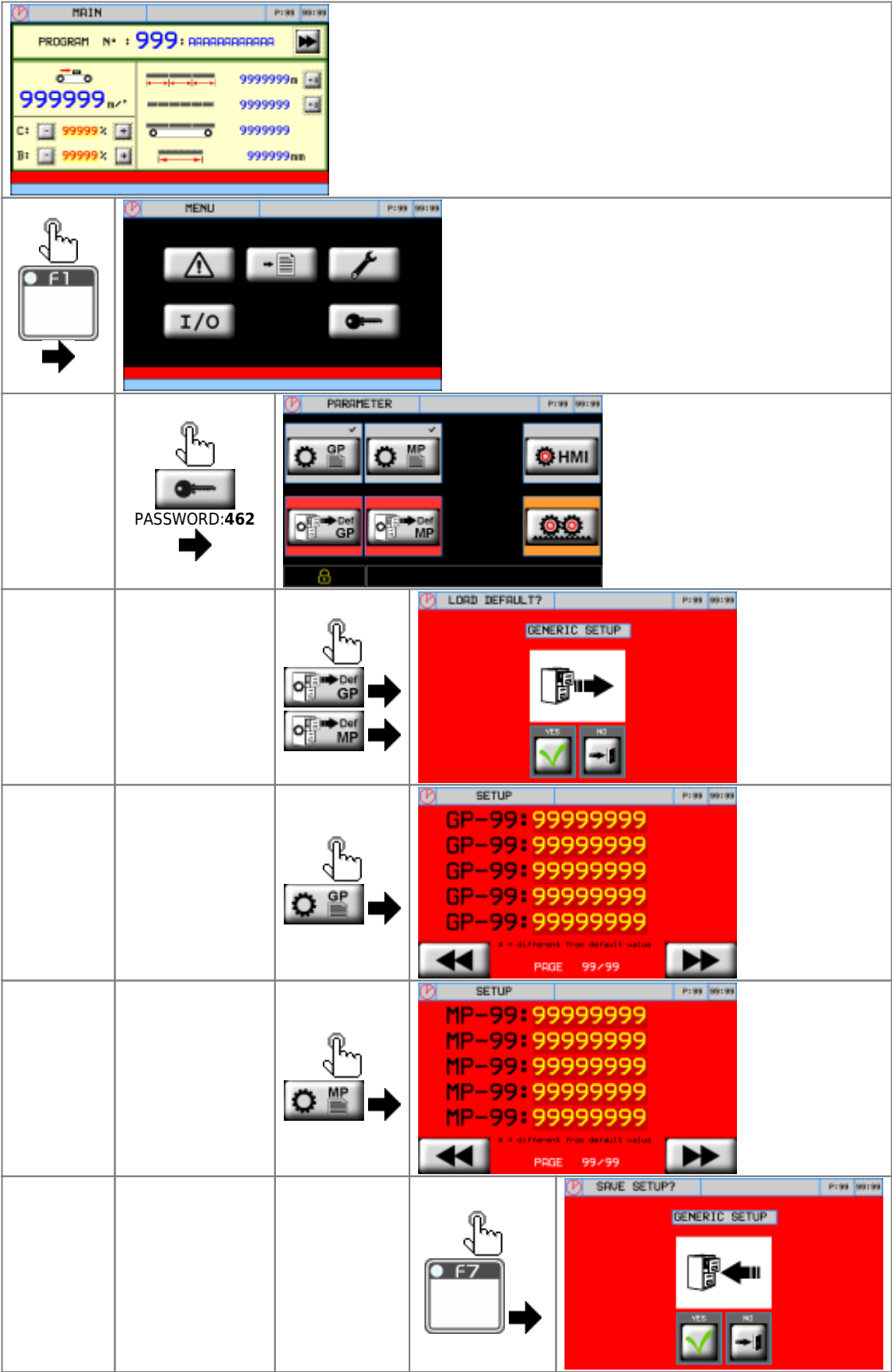
hardware, wiring, general info, system info: [Hardware manual](#)

★Per una corretta messa in funzione della macchina, si raccomanda di seguire l'ordine delle attività di seguito descritte e illustrate

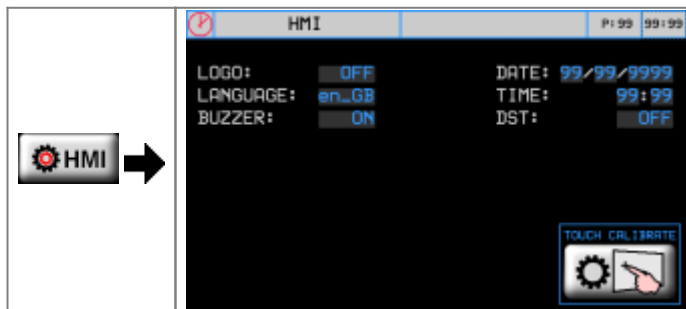
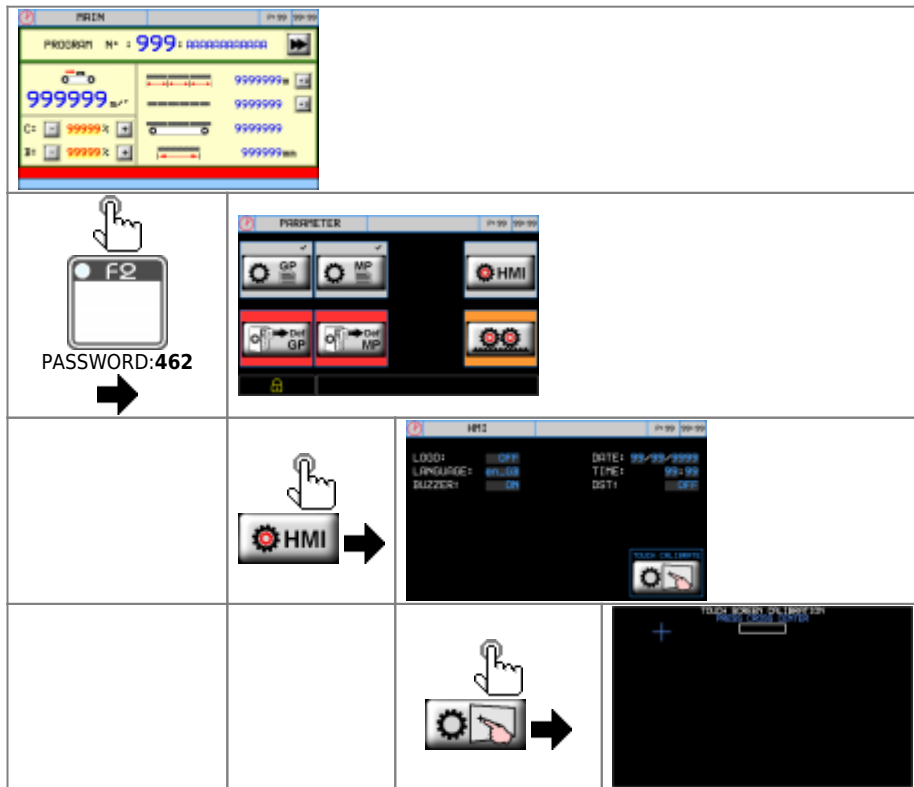
1. Control the application software code in the **Start screen**
2. Controllare la funzionalità del Touch in **HMI Setup**
3. Load the **Default Parameters**
4. Control the **General Parameters - GP** and **Machine Parameters - MP**
5. Check the **wiring** in **Diagnostic** (see **Typical Wiring Diagram**)
6. Check the **Beam direction** forward/backward in the Manual screen
7. Go to **Calibration**
  1. Check the count direction and calibrate the Belt resolution in **Belt Resolution**
  2. Calibrate the **Maximum Belt Speed Calibration**
  3. Calibrate the **Slab IN limit switch offset**
  4. Calibrate the **Head Calibration**
    1. Work diameter
    2. Set the **head distances from the slab IN limit switches**
    3. Set the **Dynamic head Up/Down correction** to the Belt speed
  8. Carry out the **Backup Procedure**
  9. Carry out the **Archiving Procedure**



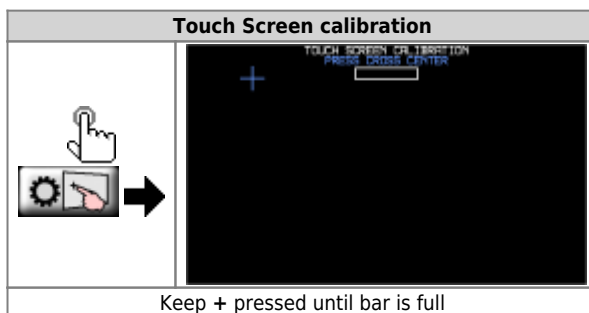
1. 4. Setup



## 1. 4.1 HMI Setup



Parameter	Default	Range	Description
LOGO	ON	OFF ~ ON	<b>OFF:</b> No logo <b>ON:</b> logo
LANGUAGE	en_GB	-	<b>en_GB :</b> English <b>it_IT :</b> Italiano
BUZZER	ON	OFF ~ ON	<b>OFF:</b> no buzzer <b>ON:</b> buzzer
DATE	-	-	Set the date
TIME	-	-	Set the time
GMT TIME	OFF	OFF ~ ON	<b>OFF:</b> no legal time <b>ON:</b> legal time



## 1. 4.2 General Parameters - GP



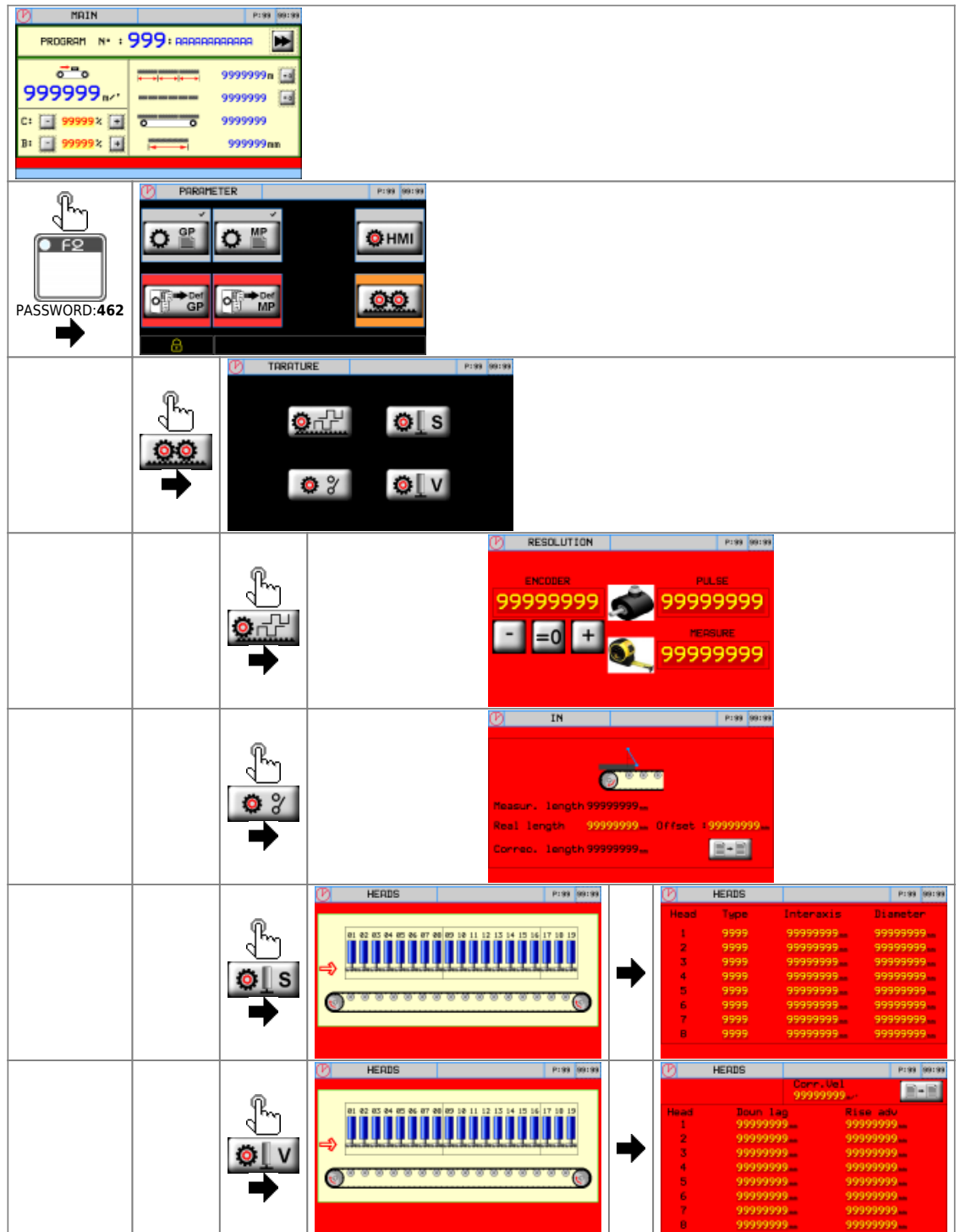
Parameter	U.M.	Default	Range	Description
GP-01	-	4000	P ( Pulse )	<b>Encoder pulse</b> reading x 4, corresponding to length in <b>Measure</b> .
GP-02	-	400.0	M ( Measure )	<b>Length</b> corresponding to encoder pulses ( <b>Pulse</b> ) - P/M is the resolution. It must be 0.000935 ~ 1.000000. - Pulse and Measure are set by the procedure <a href="#">Axis Resolution</a> .
GP-03	-	1	0 ~ 3	<b>Decimal point</b> for Belt <b>speed</b> 0=xxxx, 1=xxx.x, 2=xx.xx, 3=x.xxx
GP-04	-	0	0 ~ 1	<b>Decimal point</b> for Belt <b>misura</b> 0: xxxx, 1: xxx.x
GP-05	-	1	0 ~ 1	<b>Heads Position</b> at belt speed below the minimum (GP-06 ) 0 = heads <b>remain DOWN</b> . 1 = heads <b>go to UP</b> .
GP-06	-	0.1	0 ~ 999999	<b>Minimum Belt speed</b>
GP-07	-	0.5	0 ~ 999999	<b>Speed Delta</b> , when above the filter is applied ( GP-08 ).
GP-08	msec	50	0 ~ 9999	<b>Filter</b> on Belt speed
GP-09	-	0	0 ~ 5	<b>Sampling Time</b> of the frequency meter (used to determine the belt speed) 0 = 240 ms, 1 = 480 ms, 2 = 24 ms, 3 = 120 ms, 4 = 960 ms, 5 = 1920 ms.
GP-10	-	0	0 ~ 1	0 = <b>Save</b> slabs when machine OFF 1 = <b>Do not save</b> slabs when machine OFF
GP-11	-	0	0 ~ 1	<b>Slab IN</b> (input I09) below <b>minimum speed</b> . 0 = YES 1 = NO
GP-12	mm	10.0	0 ~ 9999	<b>Distance</b> , if below two adjacent slabs are <b>worked in continuous</b> The slab counter still counts 2 slabs
GP-13	msec	1000	0 ~ 9999	<b>t1 time</b> for motor start output
GP-14	msec	1000	0 ~ 9999	<b>t2 time</b> between one motor start and another
GP-15	msec	1000	0 ~ 9999	<b>t3 time</b> between the last motor start and Q24 output for end of motor start sequence
GP-16	-	0	0 ~ 1	<b>Abrasive Change Position</b> 0 = on backward LS 1 = on forward LS
GP-17	-	0	0 ~ 1	<b>Enclosures</b> contact logic 0 = NC 1 = NO

## 1. 4.3 Machine Parameters - MP



Parameter	U.M.	Default	Range	Description
<b>MP-01</b>	-	1	1 ~ 19	Number of heads
<b>MP-02</b>	mm	0	0 ~ 999999	Machine length Distance between the slab IN limit switch and end of the machine
<b>MP-03</b>	-	0	0 ~ 4	<b>Belt Command/Control</b> <b>0</b> - External Command/Control - speed reading <b>1</b> - <b>Command</b> - speed reading - analog out <b>2</b> - <b>Command</b> - speed reading - analog out (set by potentiometer). <b>3:</b> - <b>Command &amp; Control</b> by encoder feedback - speed reading - analog out - Start/Stop from controller <b>4:</b> - <b>Command &amp; Control</b> by encoder feedback - speed reading - analog out (set by potentiometer) - Start/Stop from controller
<b>MP-04</b>	-	0	0 ~ 1	<b>Beam Command</b> <b>0 = External Control.</b> <b>1 = Beam Control</b> with min & max limit switches and slowdown (Il movimento avviene con almeno un pezzo in macchina).
<b>MP-05</b>	-	0	0 ~ 1	<b>Motor Start Sequence</b> . <b>0 = NO</b> <b>1 = yes</b>
<b>MP-06</b>	-	-	-	-
<b>MP-07</b>	-	-	-	-
<b>MP-08</b>	m/min	5.0	0 ~ 5.0	<b>Maximum Belt speed</b> ( AO1 = 10 Volt ) (MP-03 > 0)
<b>MP-09</b>	m/min	3.0	0 ~ 5.0	<b>Max Belt Speed in automatic</b> (MP-03 > 0 )
<b>MP-10</b>	m/min	1.0	0 ~ 5.0	<b>Belt Jog speed</b> ( MP-03 > 0)
<b>MP-11</b>	-	0	0 ~ 1	<b>Beam start mode in automatic</b> ( MP-04 = 1). <b>0 = Start with belt</b> <b>1 = Start when slab IN</b>
<b>MP-12</b>	s	1.000	0 ~ 999.0	<b>Tempo di ritardo</b> tra la Belt start and Beam start (MP-05 = 1)
<b>MP-13</b>	%	5.0	0 ~ 100.0	<b>% maximum speed</b> of Beam in automatic
<b>MP-14</b>	%	5.0	0 ~ 100.0	<b>Slow speed</b> of Beam in automatic (MP-04 = 1)
<b>MP-15</b>	%	50.0	0 ~ 100.0	<b>Jog speed</b> of Beam (MP-04 = 1)
<b>MP-16</b>	s	2.000	0 ~ 999.0	<b>Beam stop time</b> at max & min limit switches ( MP-04 = 1)
<b>MP-17</b>	-	0	0 ~ 1	<b>Slab IN Direction</b> <b>0 = right</b> <b>1 = left</b>

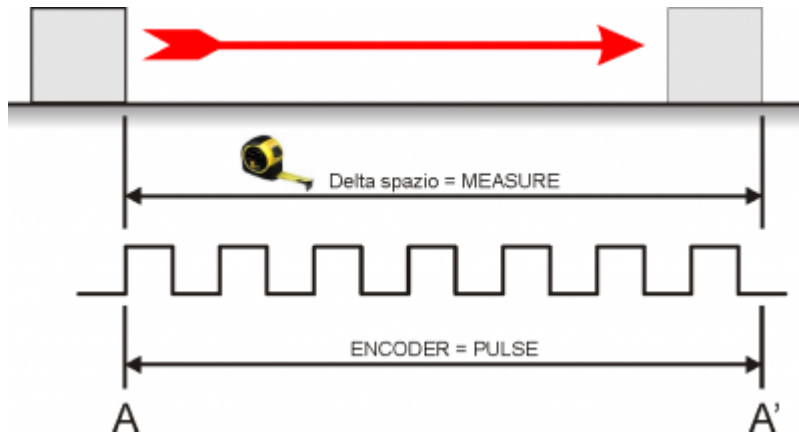
## 1. 4.4 Calibration






## 1. 4.4.1 Belt resolution



## Procedure

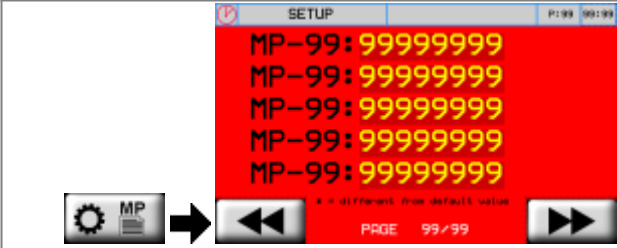


- Press  and check the ENCODER box increases (Analog out +1 Volt)
- Press  and check the ENCODER box decreases (Analog out -1 Volt)
- A - A' = The maximum space
- Take note of the start position (A)
- Zero-set the **ENCODER**: 
- Move the axis from A to A'
- Take note of the reading in **ENCODER** box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

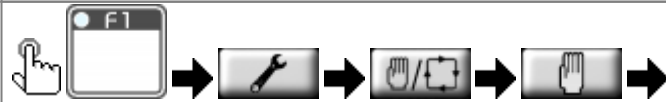
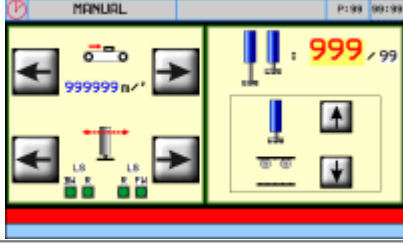

## Important:

- **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

## 1. 4.4.2 Maximum Belt Speed calibration



Set the same speed in MP-08 and MP-10


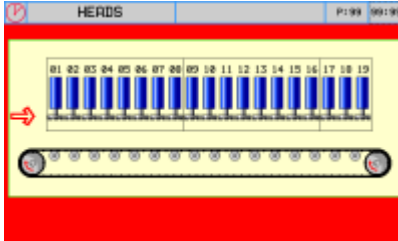
start the belt

Take note of the speed

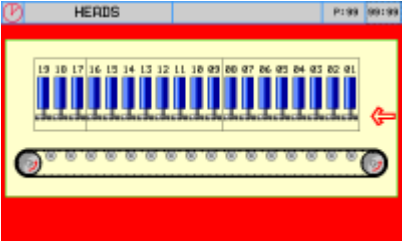

Set the speed in MP-08

Set MP-09 and MP-10 as required


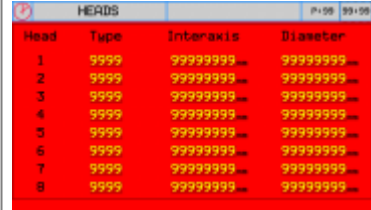
## 4.4.3 Head Calibration


OR

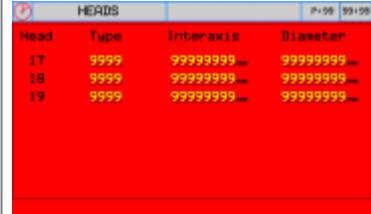
**MP-16 = Slab infeed direction**

Head	Type	Interaxis	Diameter
1	9999	99999999	99999999
2	9999	99999999	99999999
3	9999	99999999	99999999
4	9999	99999999	99999999
5	9999	99999999	99999999
6	9999	99999999	99999999
7	9999	99999999	99999999
8	9999	99999999	99999999



Head	Type	Interaxis	Diameter
9	9999	99999999	99999999
10	9999	99999999	99999999
11	9999	99999999	99999999
12	9999	99999999	99999999
13	9999	99999999	99999999
14	9999	99999999	99999999
15	9999	99999999	99999999
16	9999	99999999	99999999

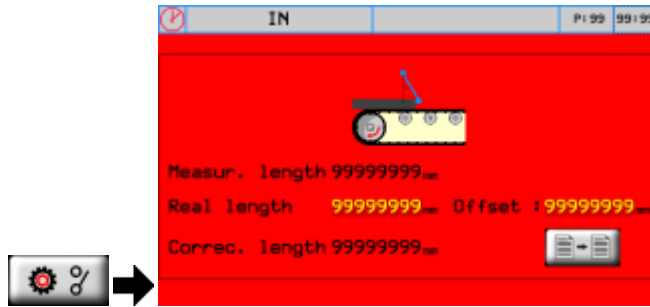




Head	Type	Interaxis	Diameter
17	9999	99999999	99999999
18	9999	99999999	99999999
19	9999	99999999	99999999

<b>Parameter</b>	<b>U.M.</b>	<b>Default</b>	<b>Range</b>	<b>Description</b>
<b>Type</b>	-	-	0 ~ 5	Head function modes <b>0:</b> OFF <b>1:</b> Polishing <b>2:</b> Milling <b>3:</b> molatrice <b>4:</b> Brush <b>5:</b> Air/water jet
<b>Interaxis</b>	mm	-	0 ~ 99999.0	Distance from <b>slab IN limit switch</b> to the <b>head center</b>
<b>Diameter</b>	mm	-	0 ~ 99999.0	Work diameter









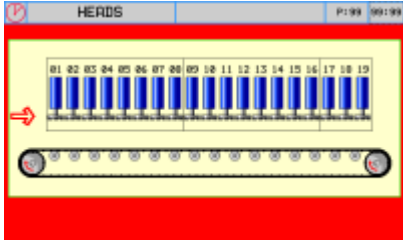
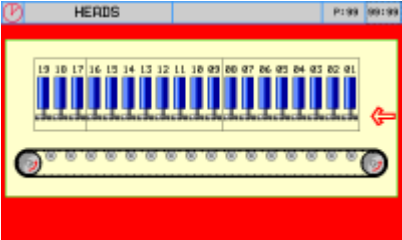



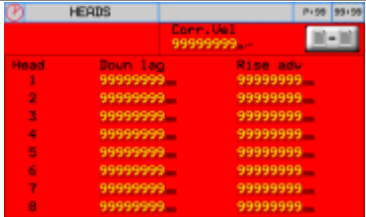
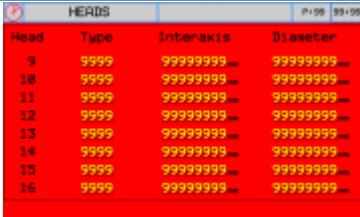
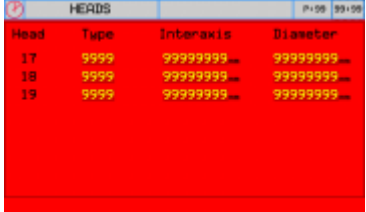
## 1. 4.4.4 Slab IN limit switch offset




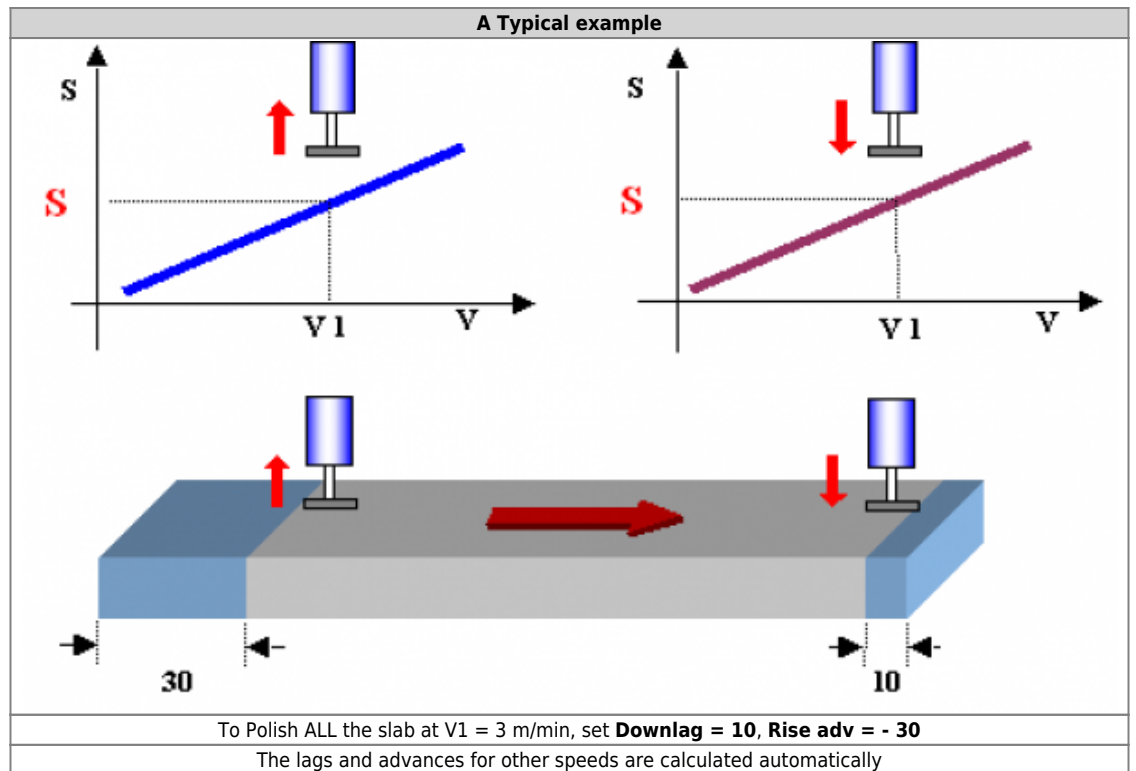
1. Measure the length of a slab and enter in **Real length**
2. **Start** the belt so the controller reads the slab length by the slab In limit switch
3. **Measur. length** gives the length reading
4.   to set the limit switch offset
5. The offset can also be changed manually
6. Correc. Length shows the new corrected length

## 1. 4.4.5 Dynamic head Up/Down correction

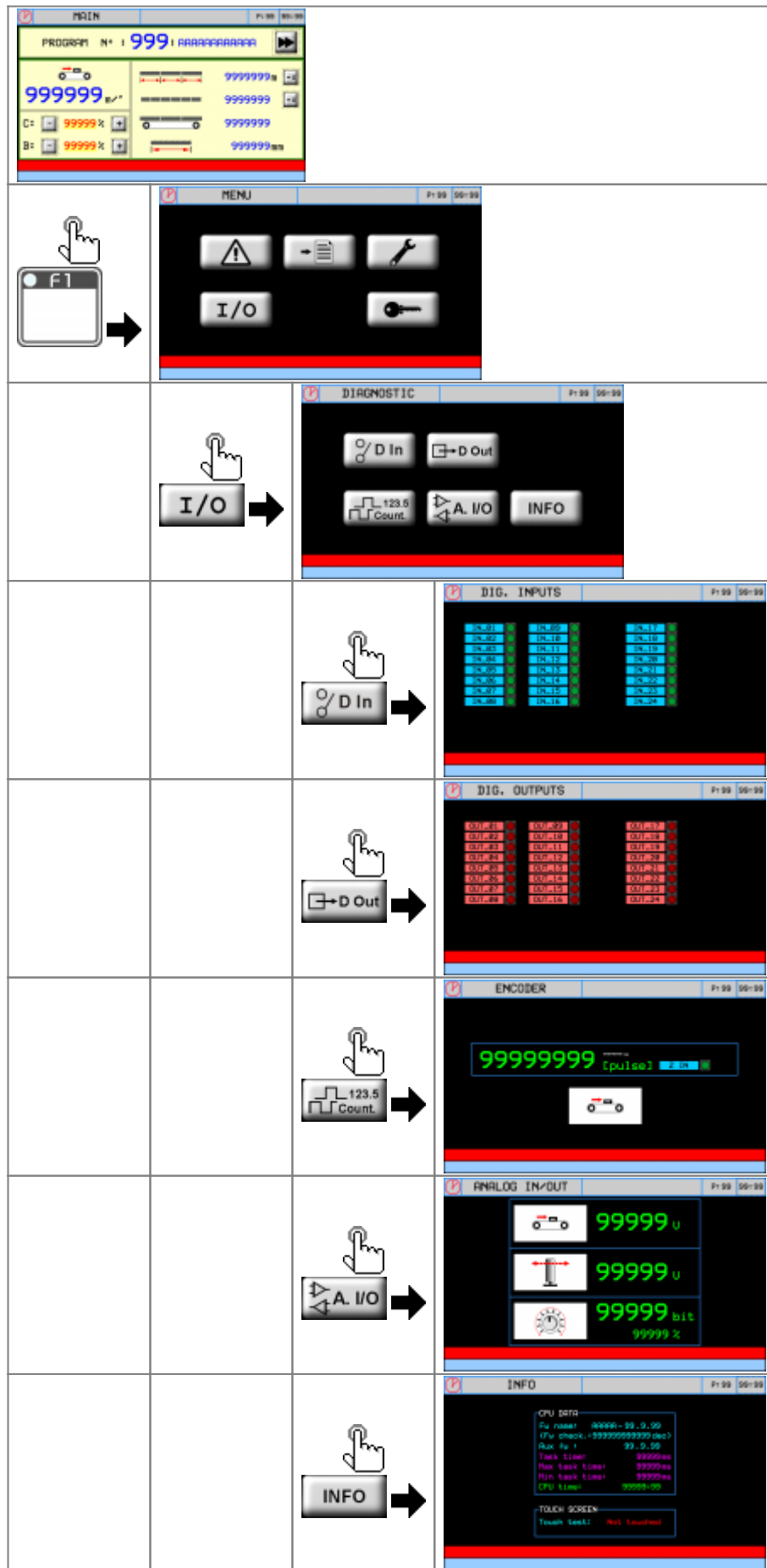
	set all motors to OFF	
 	 	

		OR	
	MP-16 = Slab infeed direction		
 head group 			
			
			

Parameter	U.M.	Default	Range	Description
<b>SPEED CORR.</b>	m/min	3.0	0 ~ 5.0	<b>Reference speed</b> for Dynamic calibration
<b>Down lag</b>	mm	-	-999.0 ~ 999.0	( + ) <b>Delay distance</b> for head DOWN on <b>slab front</b> .
<b>Rise adv</b>	mm	-	-999.0 ~ 999.0	( + ) <b>Advance distance</b> for head UP before <b>slab end</b> .
 <b>Copy settings</b> to all heads				



## 1. 5. Diagnostic



## 1. 5.1 Digital Input diagnostic



INPUT	NAME	LOGIC	DESCRIPTION	
I01	Emergency	NC - O	<b>Stop</b>	with Alarm message
I02	Not used	-	-	
I03	Start motors	NO - C	<b>Start</b> motor sequence	con MP-05 = 1
I04	Power system enabled	NO - C	Machine ready	-
I05	NE	NC - O	In automatic, stop beam and belt /Reset the "motor rotation startup error" message	-
I06	Overload cutouts	NC - O	Chain of overload cutouts	with Alarm message
I07	Enclosures	NC - O	Chain of enclosures	
I08	Air pressure switch	NC - O	No air	
I09	Slab IN	NO / C	<b>Limit switch</b> for slab <b>length acquisition</b>	
I10	Not Used	-	-	
I11	Not Used	-	-	
I12	Inverter fault	NC - O	Inverter alarm	with Alarm message
I13	Beam Forward LS	NC - O	<b>Beam forward limit switch with fast speed</b>	con MP-04 = 1
I14	Beam Backward LS	NC - O	<b>Beam backward limit switch with fast speed</b>	
I15	Beam Forward Slow LS	NO - CC	<b>Beam forward limit switch with slow speed</b>	
I16	Beam Backward Slow LS	NO - CC	<b>Beam backward limit switch with slow speed</b>	

Note

★ NC - O = **N**ormally **C**losed contact, action when the contact **O**pens

★ NO - C = **N**ormally **O**pen contact, action when the contact **C**loses

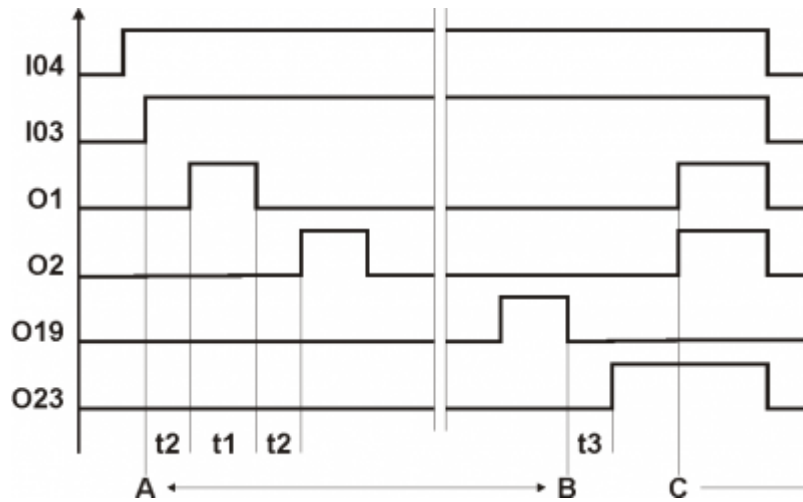
★ NO - CC = **N**ormally **O**pen contact, action when the contact **C**losed in **C**ontinuous

## 5.2 Digital Output diagnostic



N°	DESCRIPTION
O1~O19	Head UP/DOWN and motor start commands
O20	Belt direction - <b>OFF</b> forward - <b>ON</b> backward
O21	Beam direction - <b>OFF</b> forward - <b>ON</b> backward
O22	<b>Water valve</b> output
O23	Trips when <b>slabs &lt; 30</b> in machine (upline machine consensus)
O24	<b>Machine OK</b> output

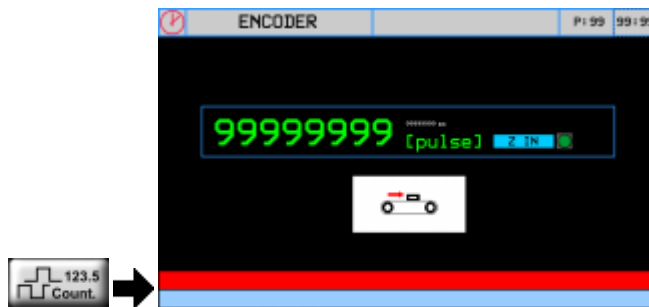
### 1. 5.3 Operating Diagrams



- **t1** one motor start time
- **t2** time between one motor start and another
- **t3** at end of motor starts (O19 = OFF), wait **t3 time** for O23 = ON
- **O23 = ON** end of motor starts and OK to start loading slabs upline
- **A - B** start head motors time
- **C** time before machine is ready for work

### 5.4 Belt encoder count

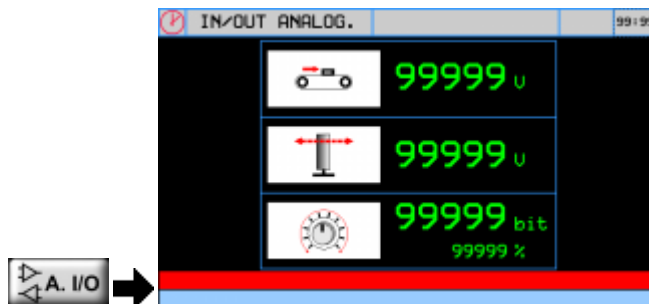
N°	NAME	DESCRIPTION
PHA1/PHB1	Belt encoder signals	- to measure the <b>slab lengths</b> and <b>establish their position</b> on the belt - measure the <b>feed speed of the slabs</b> and calculate the head Up/Down <b>advances - delays</b>



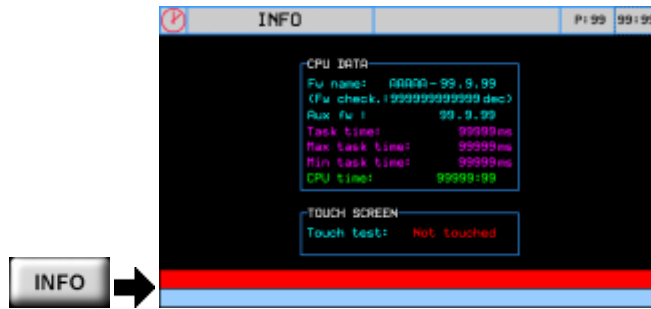
- Note:**
- **Z\_INP** led signals the Z pulse input state (**not used** in this application).
  - Pulse : Encoder pulses x 4

### 5.5 Analog Inputs and Outputs

N°	NAME	DESCRIPTION
AI1	Analog input, belt speed variation (analog out AO1).	Potentiometer input. Reading in bit and percentage
AO1	Out 0~10 Volt	Inverter command
AO2		Belt Beam

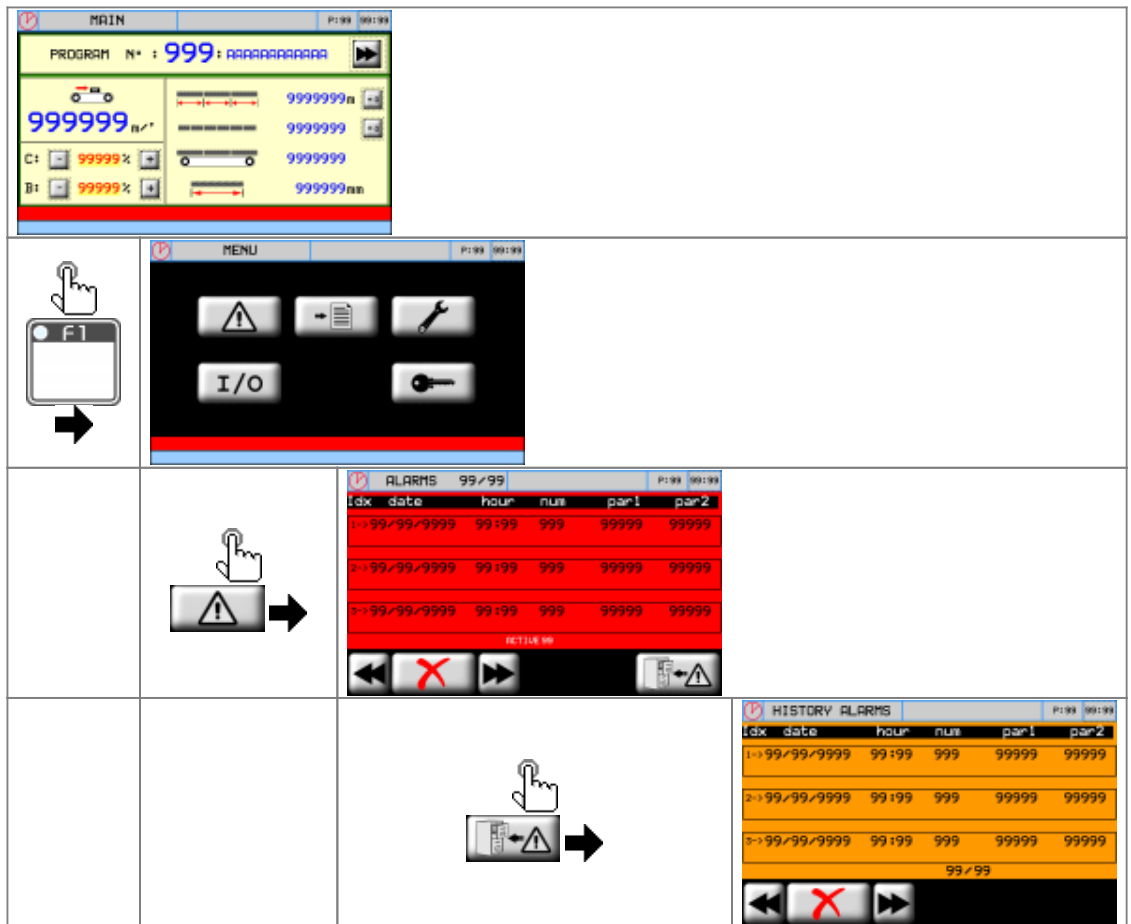


### 5.6 System Info




<b>Fw name</b>	firmware and checksum names
<b>Aux fw</b>	I/O module firmware (not used in this application)
<b>Task time</b>	CPU cycle time: <b>Minimum, Medium, Maximum</b>
<b>CPU time</b>	CPU run time (hh:mm)
<b>Touch screen</b>	Test touch

## 1. 6. Alarms




### 6.1 Alarm list




Message	Cause	Input
<b>Emergency pressed</b>	Check the emergency button and line	I01
<b>Inverter fault</b>	Control the inverter	I12
<b>Belt encoder fault</b>	Control the belt encoder (Active only with MP-03 > 2).	
<b>Overload cutouts</b>	Check the overload cutouts	I06
<b>Enclosures</b>	Check the enclosures	I07
<b>No air</b>	Check the air pressure switch	I08
	the <b>Belt encoder fault</b> alarm trips automatically if the belt moves less 2 u.m. in 5 seconds (less than 60 mm/min)	




## 1. 6.2 Alarm history



STORICO ALLARMI					
idx	date	hour	num	par1	par2
1->	99/99/9999	99:99	999	99999	99999
2->	99/99/9999	99:99	999	99999	99999
3->	99/99/9999	99:99	999	99999	99999
99/99					



**To cancel alarms**  
- eliminate the cause  
- press for 3 seconds

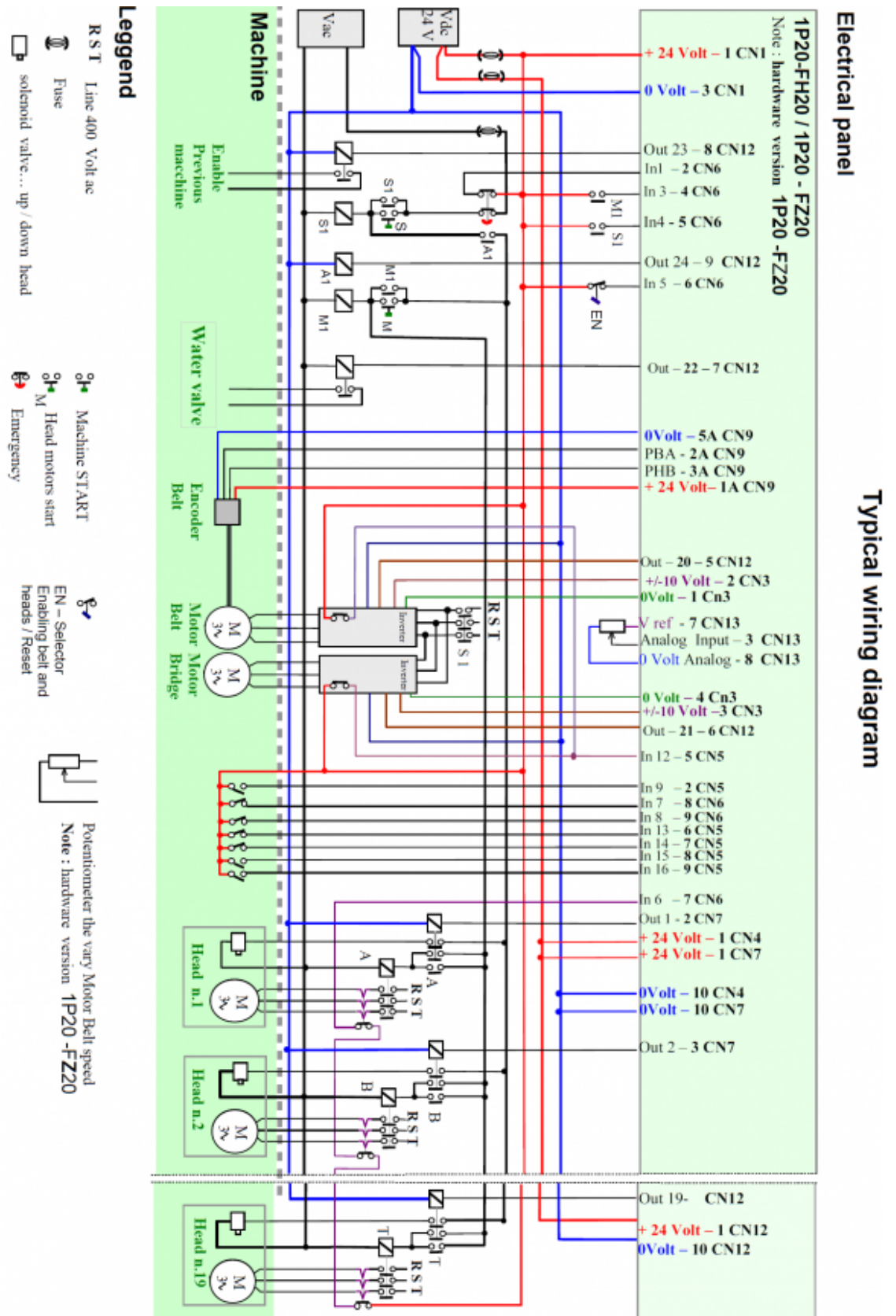


Maximum 60 alarms

## 7. Warnings

Message	Description
<b>Too many slabs in the machine</b>	There are more than 30 slabs in the machine
<b>Waiting for power system...</b>	Waiting for the power system to startup (MP-08 enabled)(I04 = ON )
<b>Going to change abrasive position...</b>	The beam has been commanded to move to change abrasive
<b>Power system disabled</b>	Power system disabled (I04 = OFF).
<b>Caution Motors off</b>	Belt start attempted with motors off

## 1. 8. Typical wiring diagram



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