

P1DME

Programming Manual

Manual code:

D296ME00GC



MARPOSS

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USER MANUAL CONTENTS

1. OPERATING AND USING THE P1DME	7
1.1 Navigation Menu	8
1.1.1 Modifying the data and navigating	9
2. MAIN MENU	10
3. SETTINGS MENU	11
3.1 Options Menu	12
3.2 HW PROG (Measurement Heads) Menu	15
3.2.1 Measurement Head parameters	15
3.2.4 Programming the Arm Ratio	16
3.2.3 Programming the Acquisition Range	16
3.2.2 Programming the Retraction	16
3.2.5 Retraction Type	17
3.3 User Menu	17
3.4 System Menu	18
3.5 I/O Menu	18
4. IN-PROCESS PROGRAMMING MENU	19
4.1 Measurement	20
4.2 Machine controls	20
4.3 Type of surface processing (interrupted surfaces)	21
4.3.1 Smooth parts	22
4.3.2 Grooved parts	23
4.3.3 Keys and Internal Diameters in Reciprocating Mode	24
4.4 Integral measurement.....	25
4.5 Pulse Feedback (measurement correction) (option)	27
4.6 IN-PROCESS PROGRAMMING WITH ACTIVE OR PASSIVE POSITIONING.....	28
4.7 Programming Active Positioning	28
4.8 Programming Passive Positioning	30
5. IN-PROCESS VIEW MENU	32
5.1 View Menu (Automatic Mode).....	32
5.1.1 View measurement	33
5.1.2 Modifying the control trigger	35
5.2 View Menu (Manual Mode)	36
5.2.1 Measurement Display	36
5.3 Sensitivity Adjustment (Arms Ratio Acquisition).....	39
6. POST-PROCESS PROGRAMMING MENU	40
6.1 SET Selection Page (Option)	40
6.2 SET Programming Page	40
6.2.1 Measures Programming	41
6.3 Machine controls	42
7. POST-PROCESS VIEWS MENU -	43
7.1 View Menu (Manual Mode)	43
7.1.1 Measurement Display	43
7.2 Sensitivity Adjustment (Arms Ratio Acquisition).....	45
7.2.1 Retraction Threshold Acquisition	46
7.3 View Menu (Automatic Mode).....	47
7.3.1 View measurement	48
7.4 Machine controls	49
8. DIAGNOSTICS AND MAINTENANCE	50
8.1 Alarms and Warnings.....	50
8.2 Routine maintenance	51
8.2.1 Cleaning the machine	51
8.2.2 Cleaning the heads	51
8.3 Extraordinary maintenance.....	51
9. FLOW CHART	52
9.1 General Programming Flow Chart.....	52
9.2 Flow Chart - In-Process.....	53
9.3 Flow Chart - Post Process	54

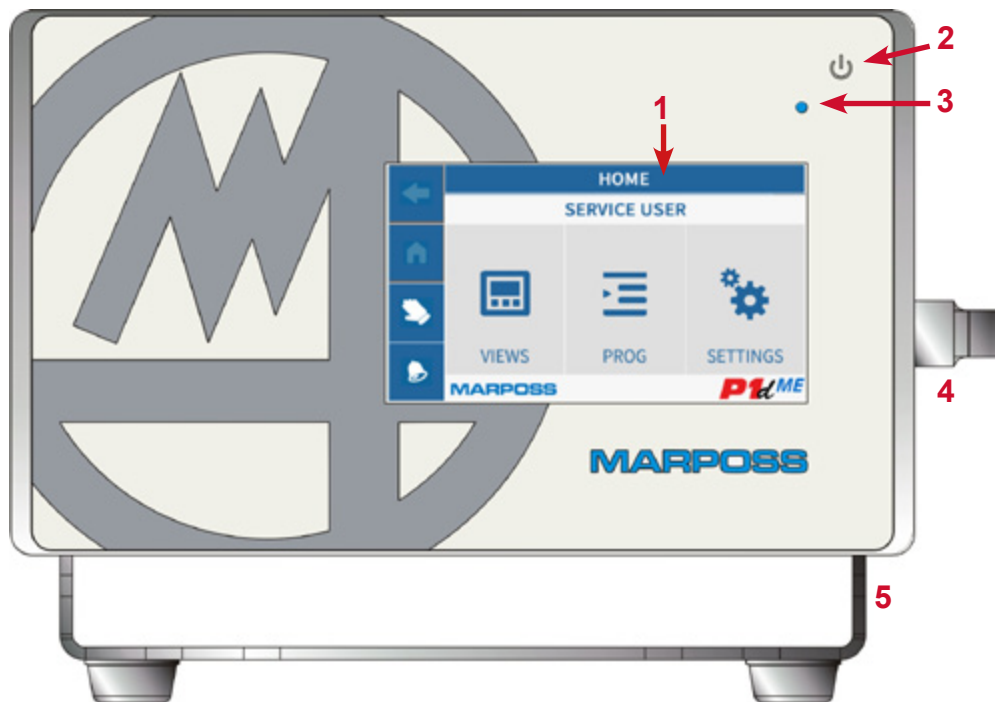







1. OPERATING AND USING THE P1DME

The P1dME is equipped with a panel display, which is used for programming the data and displaying the measurements; this display is divided into:

- Three main sections: VIEW, PROG and SET-UP
- Two operating modes: MANUAL and AUTOMATIC



CAUTION
Handle with care: static sensitive components
Before accessing the front panel, operators must make sure they have eliminated any accumulated electrostatic charges by touching a metallic surface that is connected to the building earth system.

Description of the P1dME panel		
Reference	Description	
1	Capacitive, 4.3" (480 x 272 pixels) LCD display	
2		On/Off button. Press for at least 3 seconds to switch the unit on or off.
3	LED:	
		Blue fixed = device on and operating
		Red flashing = boot loader updating
4	Screen tilt angle adjustment lever (+/-30°) (Optional)	
5	Panel support (Optional)	

When it is switched on, the P1dME is in automatic mode and displays the value measured by the In-Process or Post-Process head. In addition to the measurement value, it is also possible to display the values of the individual transducers housed inside the measurement head.



Operating mode:



MANUAL MODE: in this mode, only the START CYCLE, HEAD RETRACTION and PULSE FEED-BACK machine logic inputs are active, while the outputs to the machine logic are not active (*only the HEAD RETRACTED and ALARM outputs are updated, if present*).



AUTOMATIC MODE: all the inputs and the outputs to the machine logic are active.

It is always possible to access the programming menu, irrespective of the current operating mode.



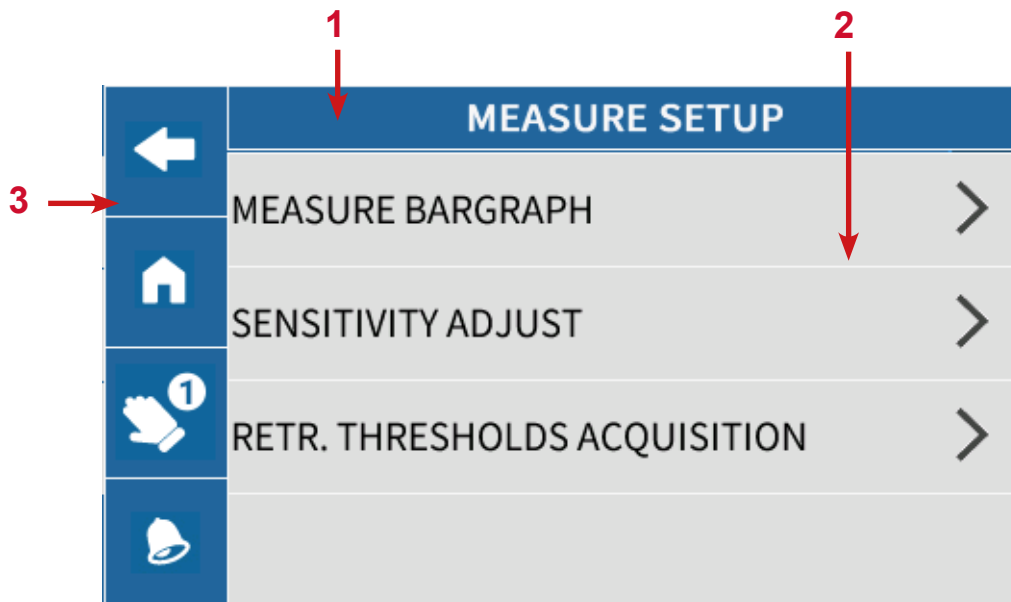
NOTE

If the programming parameters are modified but the P1dME is switched off without saving the data, the changes will be lost.

1.1 Navigation Menu







The navigation menu pages are divided into two sections.

1. User information bar
2. Display window
3. Control bar













The user bar displays the page or menu name, while the control bar contains the following functions:

-  **ARROW**
Press this key to return to the previous page
-  **HOME**
Press this key to return to the main menu
-   **BELL - Alarm Status Indicator**
Blue = Ok Red = Alarm
-   **MAN / AUTO**
Operating mode and Set selection









For In-Process applications with active and passive positioning or Post-Process applications, pressing the Man/ Auto key can be used to select the current SET in addition to the operating mode.

- Press  
- Select MANUAL or AUTOMATIC and press SAVE.
- Press again  
- Press the keyboard to change the SET value, then SAVE to make the changes take effect.

MODE SELECTION			
	AUTOMATIC		<input type="radio"/>
	MANUAL		<input checked="" type="radio"/>
	SET SELECTION	1	<input type="text"/>
	CANCEL		SAVE

1.1.1 Modifying the data and navigating

In the menu pages, use the following buttons to navigate or edit parameters:

-  The right arrow indicates that pressing it accesses the relative menu sub-page
-  Press to open the virtual keypad to change the parameter value
-  Indicates that it opens a multiple-choice page.
-  Press to change the parameter by scrolling though the available choices.
-   Parameter selector in multiple-choice pages.
-   Enable/Disable function.

2. MAIN MENU



It is possible to access the following navigation sub-environments from the main menu:



VIEWS

The Dashboard pages may be used to display the measure in a variety of ways and carry out a series of adjustments, which may be useful during the grinding and measurement system set-up processes.



PROG

The Programming menu pages may be used to program the measurement cycle data.



SETTINGS

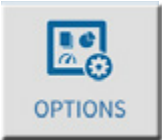
Access the Set-up menu pages to set-up all the data for the electronic unit and the hardware connected to it.

3. SETTINGS MENU

Use this page to access the information associated with the P1dME product.



	SETTINGS		
	OPTIONS	HW PROG	USER
	SYSTEM	I/O	



Options Menu



Measurement Head Programming Menu



User Menu



System Programming Menu



I/O Programming Menu

3.1 Options Menu

Use the Options menu page to select the panel display language.



	OPTIONS		
	LANGUAGE	English	
	MEAS.UNIT	μm	
	START PAGE	BARGR.	

	OPTIONS		
	MEASURE ZERO ADJ...	ENABLE	
	I/O MODULE	C	
	SERIAL PROTOCOL	NONE	

SELECT LANGUAGE

←	LANGUAGE	
⌂	LANGUAGE	English +
👤		
🔔		

Use this button to scroll through the available languages. Once you have selected the desired language, press SAVE to set-up the new panel display language.



UNIT OF MEASUREMENT

←	MEAS.UNIT	
⌂	μm	<input checked="" type="radio"/>
🔄	"	<input type="radio"/>
👤		

Use this page to select the unit of measurement used to display the measurements.

INITIAL PAGE

←	START PAGE	
⌂	HOME	<input checked="" type="radio"/>
👤	MEASURE BARGRAPH	<input type="radio"/>
🔔	MEASURE WITH ANALOG METER	<input type="radio"/>
🔔		

Use this page to select the page that is displayed when the device is switched on from the list of available options.

ADJUSTING THE MEASUREMENT ZERO-SETTING (OPTION)

←	MEASURE ZERO ADJUST	
⌂	DISABLE	<input type="radio"/>
👤	ENABLE	<input checked="" type="radio"/>
🔔		
🔔		

Use this section to enable or disable the option of varying the zero adjust in 0.5 micron steps directly from the measurement page.

NOTE: Function not available for Post-Process

I/O MODULE (OPTION)



←	I/O MODULE		
⌂	A1/A2/A3/AA		<input type="radio"/>
↺	A5/A6		<input type="radio"/>
↻	B		<input type="radio"/>
🔔	C		<input checked="" type="radio"/>

Selects the I/O module type

NOTE:
function reserved for Marposs personnel

SERIAL PROTOCOL (OPTION)

←	SERIAL PROTOCOL			
⌂	NONE			<input checked="" type="radio"/>
↺	MARPOSS ASCII			<input type="radio"/>
↻	SERIAL PROTOCOL	0		
🔔				

NOTE
This function is only active for configurations that are compatible with the old P1c electronics

The following serial communication protocols are available:
1. Serial Protocol
2. Marposs ASCII Protocol

3.2 HW PROG (Measurement Heads) Menu

Use this page to access the measurement head parameters programming sub-pages

NOTE

It is possible to access the data, but not modify them:




←	HEADS PROGRAMMING	
	HEAD PARAMETERS	>
🏠	ARM RATIO	>
🔄	ACQUIS. RANGES	>
🔔	RETRACTION	>

3.2.1 Measurement Head parameters

←	HEADS PROGRAMMING		
	TOTAL SENSORS	2	☰
🏠	ZERO RANGE ±	μm 50.0	☰
👤	SENSOR TYPE T1	LVDTDIFF	☰
🔔	SENSOR TYPE T2	LVDTDIFF	☰

This page shows the specific parameters of the measuring head (parameters defined at the application configuration level).


ZERO-SETTING RANGE Maximum permissible value of the zero-setting range

Press the  button to enter the value or modify it. (Range min 25 μm – max 500 μm)

NUMBER OF SENSORS


←	TOTAL SENSORS	
1		○
2		●
👤		
🔔		

Number of arm set/contact assemblies in the measurement head.

Use the  button to select 1 or 2 sensors.

SENSOR TYPE (T1 AND/OR T2)

←	SENSOR TYPE T1	
	HBT_DIFF	○
🏠	LVDTDIFF	●
👤	LVDT_SE	○
🔔		

Use the  button to select the type of sensor connected to the measurement module.

3.2.4 Programming the Arm Ratio



ARM RATIO			
←	NOMINAL ARM RATIO	1.000	=====
🏠	ARM RATIO T1	4.003	=====
🧤	ARM RATIO T2	4.000	=====
🔔			

NOMINAL ARMS RATIO

Arms ratio value defined during the system configuration phase, may also be modified manually using the virtual keypad.

T1/T2 ARMS RATIO

Displays the arms ratio modified individually per transducer on the sensitivity setting page.

3.2.3 Programming the Acquisition Range

ACQUIS. RANGES			
←	OVR UPPER LIMIT T1	μm 1000.0	=====
🏠	OVR LOWER LIMIT T1	μm -1016.0	=====
🧤	OVR UPPER LIMIT T2	μm 1016.0	=====
🔔	OVR LOWER LIMIT T2	μm -1016.0	=====

These are the OVR (upper and lower) limits of each transducer within the working range.

3.2.2 Programming the Retraction

RETRACTION			
←	RETRACTION TYPE	24Vdc	=====
🏠	RETRACTION RANGE	μm 3363.0	=====
🧤	FALL SPEED	mm/s 3.0	=====
🔔	VIBRATION TIME	ms 0	=====

RETRACTION TYPE Type of retraction configured: Series (24 Volt), Parallel (12 Volt), 1/3 (8 Volt), Pneumatic. The available retraction type depends on the type of P1dME head in use.

RETRACTION RANGE Maximum retraction range (expressed in microns at the contact)

DROP SPEED The speed at which the finger/contact assembly drops onto the workpiece.

NOTE: Function visible to Service users only

VIBRATION TIME Time by which, once the retraction occurred check is requested from the PLC, the software delays the alarm in case the transducer loses

the retraction condition (e.g. for fast mechanical oscillations during the carriage movement).



NOTE:

Function visible to Service users only



3.2.5 Retraction Type



TYPE OF RETRACTION

Type of configured retraction: Series (24 Volt), Parallel (12 Volt), 1/3 (8 Volt), Pneumatic. The available retraction type depends on the type of P1dME head in use.

RETRACTION RANGE

Maximum retraction range (expressed in microns from the contact)

DROP SPEED

The speed at which the finger/contact assembly drops onto the part.

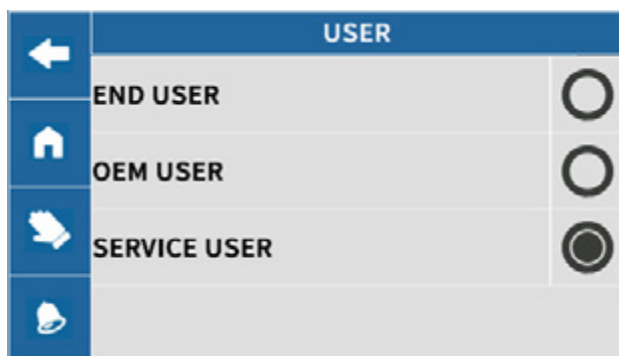
NOTE: Function visible to Service users only

VIBRATION TIME

Time by which, once the retraction occurred check is requested from the PLC, the software delays the alarm in case the transducer loses the retraction condition (e.g. for fast mechanical oscillations during the carriage movement).

NOTE: Function visible to Service users only.

3.3 User Menu



The P1dME unit offers various operative levels, depending on the user who is currently logged in.

Since not all users can, or should, use the same options, there are three different P1dE user levels:

- The **END USER** level user may monitor the measurement process in automatic mode. During measurements the user can also make corrections to the processing cycle. In addition, he/she can view the data programmed for the electronic unit. The END USER can also perform certain Set-up operations.

- **OEM** level users may also program and modify measurement cycles. These users can access the permitted Set-up and Prog operations. For this reason, this user level is intended primarily for the machine manufacturer and its service personnel and it is password protected.

• **SERVICE** level is intended primarily for use by Marposs personnel, and is password protected.

3.4 System Menu

Use this page to view the Firmware version of the system software.



	SYSTEM	
←	FIRMWARE VERSION	>
🏠	HW CODE	>
👤 ¹	SERIAL NUMBER	>
🔔		

	FIRMWARE VERSION	
←	FIRMWARE VERSION	1.4 A
🏠		
👤 ¹		
🔔		

	HW CODE	
←	HW CODE	-----
🏠		
👤 ¹		
🔔		

	SERIAL NUMBER	
←	SERIAL NUMBER	LP000001
🏠		
👤 ¹		
🔔		

The sub-pages display the following:

- ▶ The current firmware version
- ▶ The code of the hardware installed on the device
- ▶ The device serial identification code

3.5 I/O Menu

	I/O		
←	INPUT SIGNAL FILTER	<input type="text" value="S"/>	0.000
🏠			
👤 ¹			
🔔			

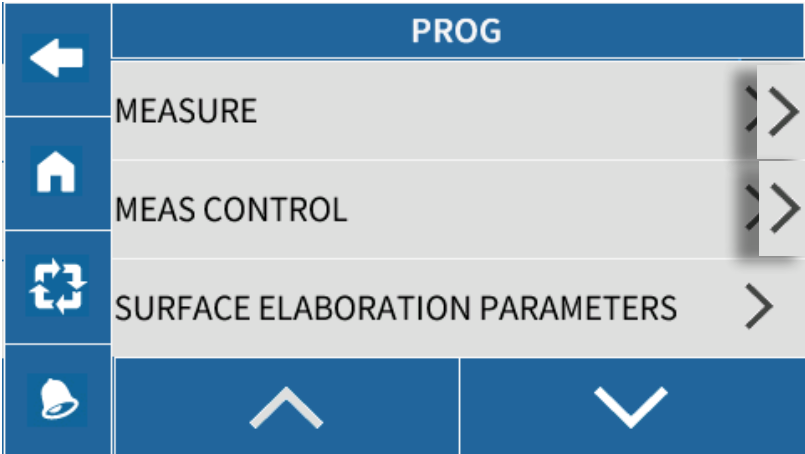
INPUT SIGNALS FILTER
Indicates the filter applied to the input signals specifically for the Start Cycle and Retraction Request. The P1dME views each input signal as stable for the pre-set filtering time before considering the variation in its state. The maximum programmable time is 10 seconds.

IN-PROCESS SECTION

4. IN-PROCESS PROGRAMMING MENU

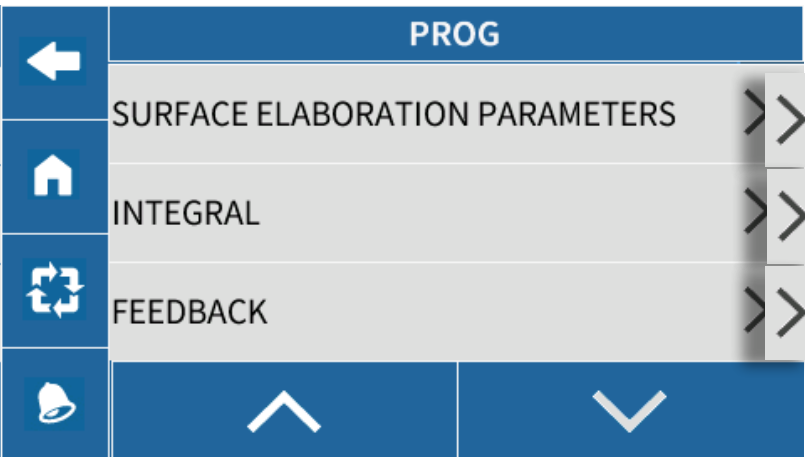


The Programming menu is always active in both Manual or Automatic Mode, the difference being that it is possible to save the data in automatic mode, but it will not be active until the subsequent cycle.



MEASURE
Measurement

MEASURE CONTROL
Measurement Checks



OPTIONAL FUNCTIONS:

SURFACE ELABORATION PARAM.
Type of surface processing (interrupted surfaces)

INTEGRAL
Integral measurement programming

FEEDBACK
Measurement correction programming

NOTE
The functions available in the programming menu may vary according to the software configuration installed on the device. For this reason, some functions may be missing or disabled.

4.1 Measurement

Use this page to set-up the control points:



MEASURE			
←	MEAS TYPE	T1+T2	≡
🏠	DELAY	s 0.000	=====
🧤	MASTER DEVIATION	μm 0.0	=====
🔔			

MEASURE

The user can select the measurement type (equation). The direction and polarity of the contacts T1 and T2 determine the measurement value.

It is possible to select from the following combinations: T1, T2, -T1, -T2, -T1-T2, T1+T2, T1-T2, T2-T1.

DELAY

This parameter can be used to define the delay from when the P1dME receives the START CYCLE signal from the machine logic to when it actually starts measuring and updating the checks.

MASTER DEVIATION

Difference between the real value and the nominal value of the master.

This value is normally left as 0, since it is assumed that each part has its own master, however, if the two diameters do not coincide, this parameter must be set to the value equivalent to the difference between the two diameters.

4.2 Machine controls

Programming			
←	Meas Control 1	μm 150.0	=====
🏠	Meas Control 2	μm 300.0	=====
🔄	Meas Control 3	μm 450.0	=====
🔔			


Press to modify the value



Enter the desired value and press CONFIRM to save and return to the controls page.

4.3 Type of surface processing (interrupted surfaces)

Use this page to set-up the control points:



SURFACE TYPE			
←	SURFACE TYPE	EV.TEETH	☰
🏠	SETTLING TIME	ms 500	▢▢▢▢
↻	ESTIM REMOVAL		□
🔔	SURF.PARAMETERS		>

SURFACE PROCESSING TYPE

SURFACE TYPE	
←	SMOOTH <input type="radio"/>
🏠	EV.TEETH <input checked="" type="radio"/>
↻	ODD TEETH <input type="radio"/>
🔔	^

SURFACE TYPE	
←	EV.TEETH <input checked="" type="radio"/>
🏠	ODD TEETH <input type="radio"/>
↻	KEY <input type="radio"/>
🔔	^
	∇

Use this field to select the part type to be processed, depending on its surface characteristics (presence of interruptions).

The processing types may be divided into three different groups, which require different settings:

1. SMOOTH

- Smooth part

2. GROOVED

- Workpiece grooved with even teeth. The measuring contacts are on the surface area simultaneously.
- Workpiece grooved with odd teeth. The measuring contacts are NEVER on the surface area simultaneously.

3. KEYS AND INTERNAL DIAMETERS IN RECIPROCATING MODE

- Part with key
- Typical application for internal measurements (even in reciprocating mode).

4.3.1 Smooth parts



No special programming is required when processing smooth parts.

←

HOME

↺

🔔

SURFACE TYPE

SURFACE TYPE

SETTLING TIME

ESTIM REMOVAL

SURF.PARAMETERS

SMOOTH

ms500

>>

←

HOME

↺

🔔

SURFACE TYPE

SMOOTH

EV.TEETH

ODD TEETH

⤴ ⤵

🔔

SURFACE PARAMETERS

Programming surface parameters

MAX. SETTling TIME

The maximum delay between the start cycle signal and the moment when the software starts processing the damped measurement.

ESTIMATED REMOVAL

This function estimates the metal removal trend (measurement trend) up to the end of the cycle. The maximum estimated removal slope is the same as the slew rate value.

PROGRAMMING SURFACE PARAMETERS

←

HOME

↺

🔔

SURFACE TYPE

FILTER FREQ

FILTER ADJUST

300

FILTERING PARAMETERS

Frequency filters (in tenths of Hz) that serve to correct errors associated with the measured value throughout the machining cycle. Apply the filter to correct both mechanical or electrical “abnormal behaviour” or in specific machine conditions. (Parameters defined during the configuration phase, reserved for qualified technicians or Marposs personnel).

4.3.2 Grooved parts

The measurement of grooved surfaces is electrically damped (filtered) and this damping must be linked to both the workpiece type and rotation speed. Damping keeps the measurement stable in case of interruptions on the part surfaces.

	SURFACE TYPE		
←	SURFACE TYPE	EV.TEETH	≡
🏠	SETTLING TIME	ms	500
↺	ESTIM REMOVAL		□
🔔	SURF.PARAMETERS		>>

SURFACE TYPE		
←	SMOOTH	○
🏠	EV.TEETH	●
↺	ODD TEETH	○
🔔		

SURFACE PARAMETERS

Programming surface parameters

MAX. SETTling TIME

The maximum delay between the start cycle signal and the moment when the software starts processing the damped measurement.

ESTIMATED REMOVAL

This function estimates the metal removal trend (measurement trend) up to the end of the cycle. The maximum estimated removal slope is the same as the slew rate value.

PROGRAMMING SURFACE PARAMETERS

	SURFACE TYPE		
←	FILTER FREQ	300	=====
🏠	FILTER ADJUST		□
↺	INT.SURF.PARAMS		>
🔔			>

FILTERING PARAMETERS

Frequency filters (in tenths of Hz) that serve to correct errors associated with the measured value throughout the machining cycle.

Apply the filter to correct both mechanical or electrical "abnormal behaviour" or in specific machine conditions. (Parameters defined during the configuration phase, reserved for qualified technicians or Marposs personnel).

INT. SURFACE PARAMETERS

Programming surface parameters

PROGRAMMING INTERNAL SURFACE PARAMETERS

SLEW RATE

This filter limits the rate at which the signal falls during the transducer downstroke phase. Values expressed in $\mu\text{m/s}$.

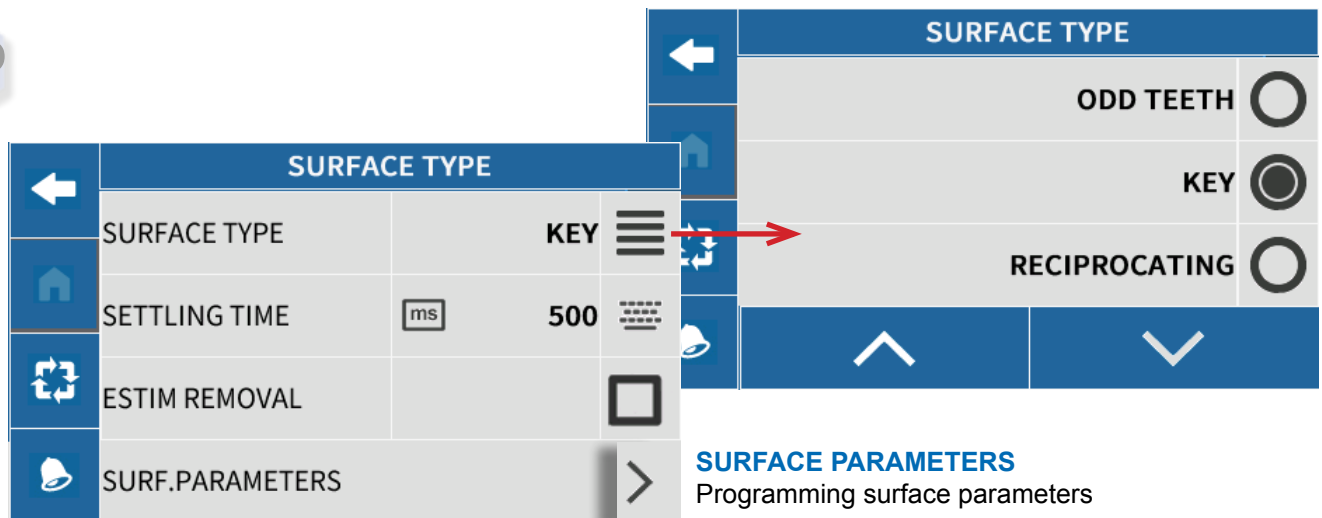
GROW RATE

This filter limits the rate at which the signal rises in order to prevent peaks and ringing during the transducer upstroke phase. The value is expressed in tenths of Hz.

	SURFACE TYPE		
←	GROW RATE	300	=====
🏠	SLEW RATE	15	=====
↺			
🔔			

4.3.3 Keys and Internal Diameters in Reciprocating Mode

The purpose of the measurement settings for keys and diameters in reciprocating mode is to recognise the parts of the workpiece to be measured.



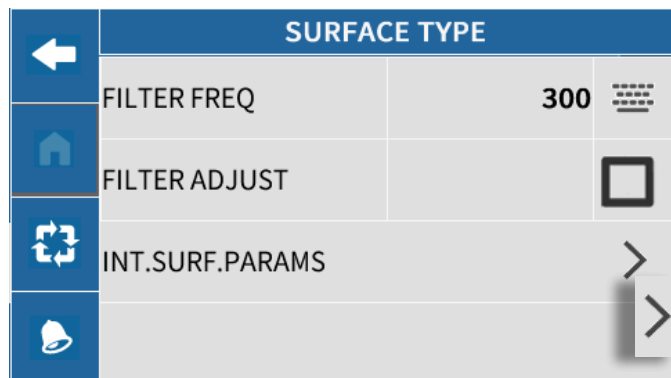
MAX. SETTling TIME

The maximum delay between the start cycle signal and the moment when the software starts processing the damped measurement.

ESTIMATED REMOVAL

This function estimates the metal removal trend (measurement trend) up to the end of the cycle. The maximum estimated removal slope is the same as the slow rate value.

PROGRAMMING SURFACE PARAMETERS



FILTERING PARAMETERS

Frequency filters (in tenths of Hz) that serve to correct errors associated with the measured value throughout the machining cycle.

Apply the filter to correct both mechanical or electrical "abnormal behaviour" or in specific machine conditions. (Parameters defined during the configuration phase, reserved for qualified technicians or Marposs personnel).

INT. SURFACE PARAMETERS

Programming internal surface parameters

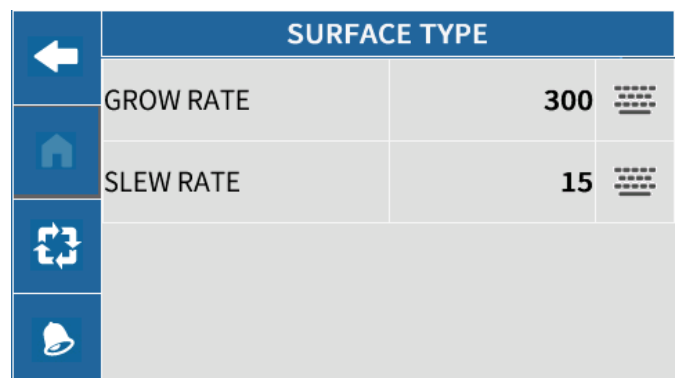
PROGRAMMING INTERNAL SURFACE PARAMETERS

SLEW RATE

This filter limits the rate at which the signal falls during the transducer downstroke phase. Values expressed in $\mu\text{m/s}$.

GROW RATE

This filter limits the rate at which the signal rises in order to prevent peaks and ringing during the transducer upstroke phase. The value is expressed in tenths of Hz.



4.4 Integral measurement

←

HOME

↺

🔔

INTEGRAL MEASURE TYPE

INTEG.MEAS.TYPE	FREE RUN	☰
MEAS RPM	10	=====
REV.PERCENTAGE	100	=====
ESTIM REMOVAL		□

INTEG. MEAS TYPE
Selects the integral measurement type

INTEGRAL MEASUREMENT TYPE

←

HOME

↺

🔔

INTEGRAL MEASURE TYPE

	FREE RUN	⦿
	MAXIMUM	◯

←

HOME

↺

🔔

INTEGRAL MEASURE TYPE

	MINIMUM	◯
	AVERAGE	◯
	ROLL.AV.	◯
	⤴	⤵

Type of integral measurement. The following modes are available:

- ▶ Instantaneous measurement value
- ▶ Maximum value processing
- ▶ Minimum value processing
- ▶ Average value processing
- ▶ Rolling average processing (if configured)
- ▶ Processing for smooth parts in eccentric rotation (if configured). This mode may be selected only in sets with measurement equation with two contacts (T1+T2, T1-T2, -T1-T2, T2-T1).

NOTE
The integral measurement type selection depends on the selected “Surface processing type”.

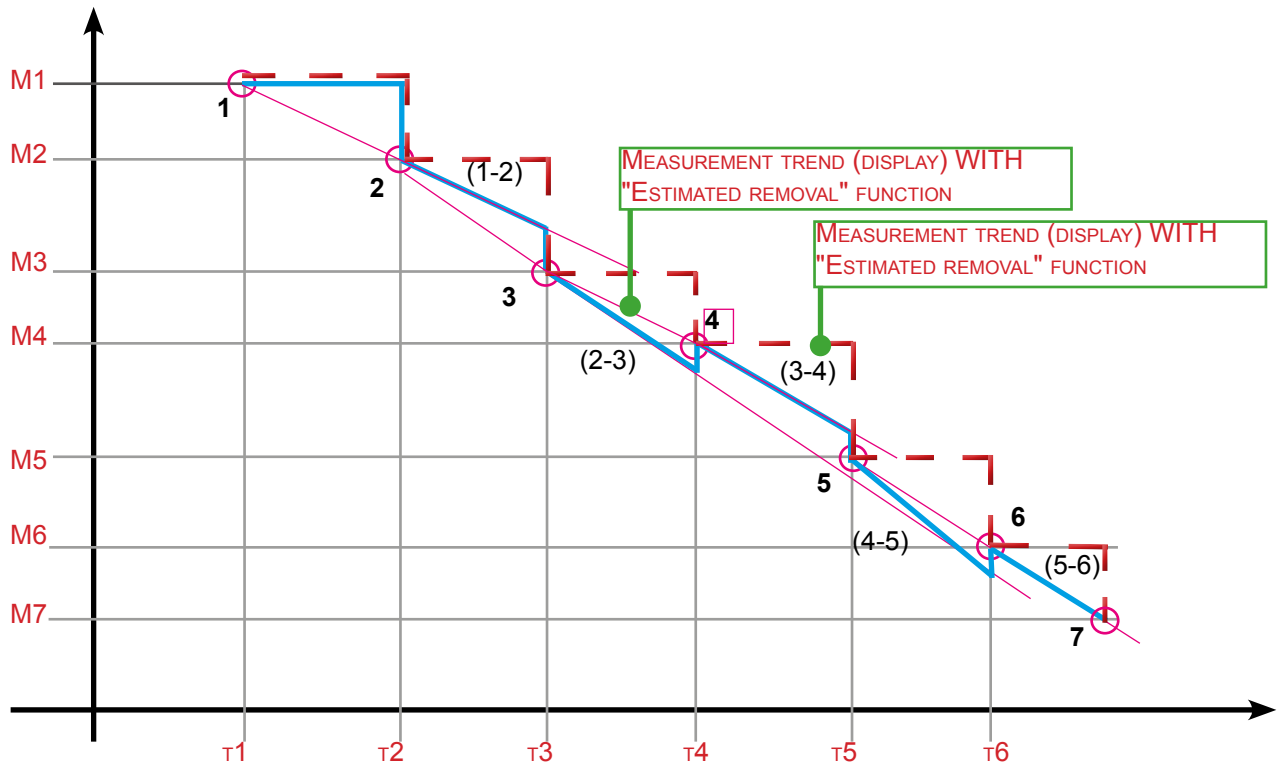
RPM MEAS.
RPM for integral measurement processing.

PERCENTAGE REVOLUTION
(1 to 1000%) percentage of the revolution of the workpiece on which the integral measurement is made.
Default 100% = 1 part revolution.

ESTIMATED REMOVAL

This function estimates the metal removal trend (measurement trend) up to the end of the cycle (continuous curve processing).

If the check box is selected, the software samples a series of consecutive measurements and processes them in order to provide a continuous measurement trend display. This method produces a measurement display that is much more faithful to the actual process, and means that process commands, and in particular the zero command, can be activated with much greater precision.



1, 2, 3, 4, -- measurement sampling points
(1-2), (2-3), -- corresponding measurement point interpolation lines

The measurement is updated continuously, rather than at each part rotation: two consecutive measurement samples are interpolated in order to define the measurement trend until the subsequent sample point; this is repeated using the next sample measurement, interpolating to define the measurement trend until the subsequent sample point, and so on until "zero" is reached.



4.5 Pulse Feedback (measurement correction) (option)

Pulse Feedback is defined as the measurement correction by shifting the “zero” determined by pulses supplied through external logic.
This shift may be both positive and negative depending on the type of pulse.
It is possible to enable/disable the "Pulse Feedback" option and define its characteristics during Programming .

[NOTE
Select the correct Set (Part/Cycle) before programming.

	FEEDBACK		
	FEEDBACK		
	PULSE WEIGHT	4.0	

- Pulse feedback active
- Pulse feedback inactive

Pulse weight Minimum correction value applied for each pulse (from 0 to 50 µm)

4.6 IN-PROCESS PROGRAMMING WITH ACTIVE OR PASSIVE POSITIONING



The Programming Menu will be slightly different in applications with active or passive positioning, as described below.

←

SET MANAGEMENT

SET 1

SET 2

↺

🔔

➡

SET 1

Diameter Measurement Programming Menu

➡

SET 2

Active or Passive Measurement Programming Menu

Press SET 1 to access Measurement Programming as described in “4. IN-PROCESS PROGRAMMING MENU” on page 19, or press SET 2 to access the Positioning SET Programming menu.

4.7 Programming Active Positioning

←

SET MANAGEMENT

SET 1

SET 2

↺

🔔

←

PROG SET 2

MEASURE

↺

🔔

←

MEASURE

SENSOR CHOICE

SENS 2

≡

DELAY

S

0.000

≡

MASTER DEVIATION

μm

0.0

≡

POSITIONING MODE

Press

≡

► SENSOR SELECTION

←	MEASURE	
SENS 1		<input type="radio"/>
SENS 2		<input checked="" type="radio"/>
↺ ¹		
🔔		

Sensor choice (with two-sensor measurement head). Selecting the sensor to be used for the positioning cycle.



► DELAY

The time between the "start cycle" signal from the machine logic and the enable in the gauge for starting the measuring cycle.

► MASTER DEVIATION

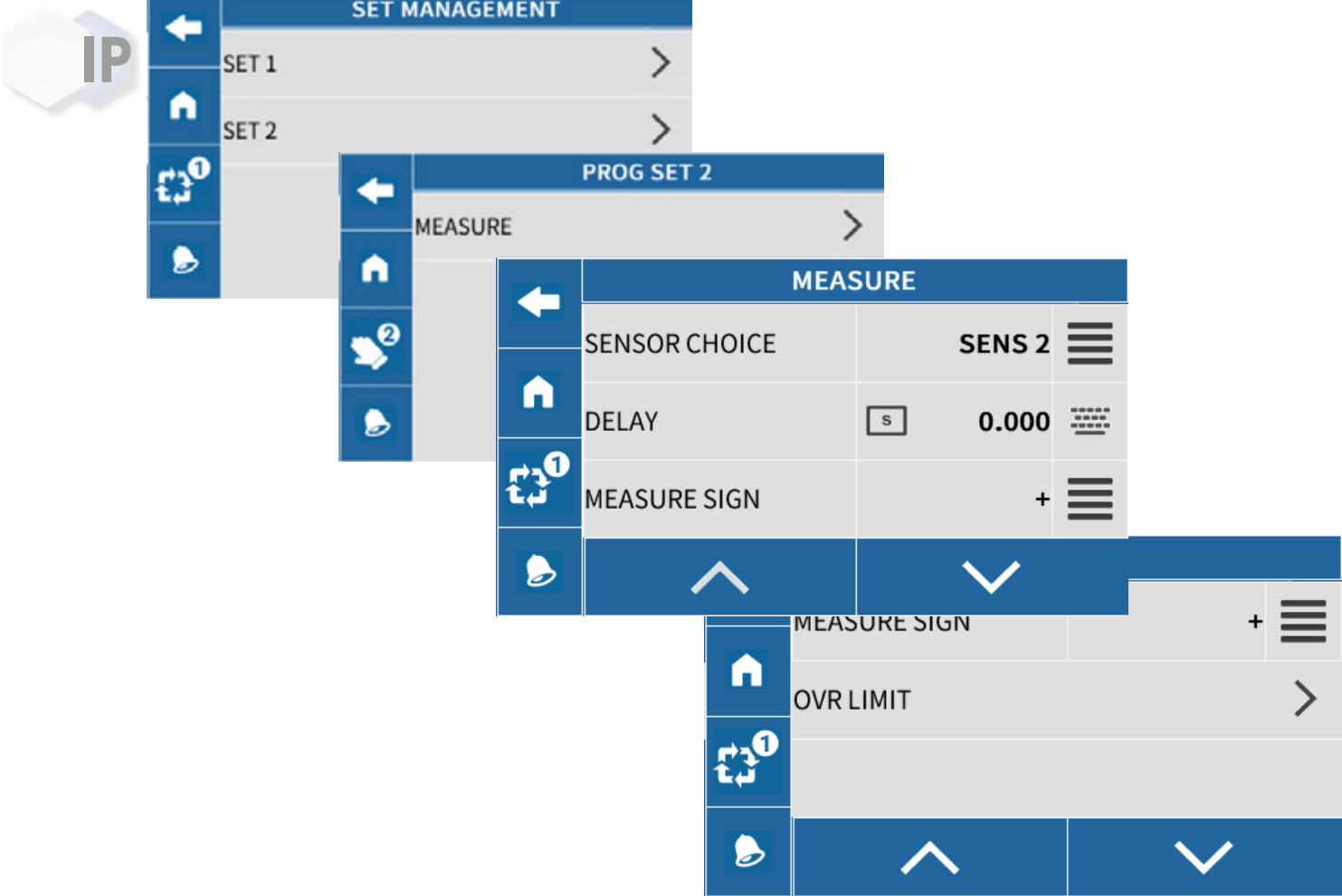
This value is set up in order to indicate the difference between the dimension of the sample part and desired final dimension.

► POSITIONING MODE

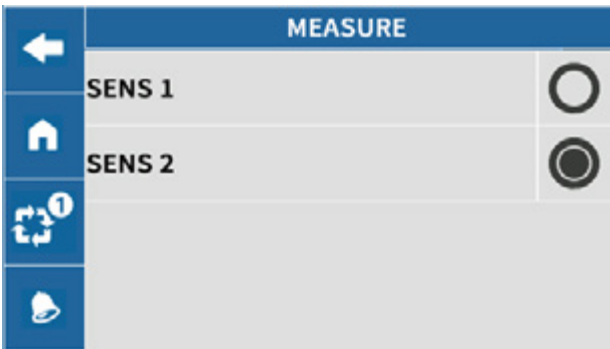
←	MEASURE	
Press		<input checked="" type="radio"/>
Release		<input type="radio"/>
↺ ¹		
🔔		

Contact movement while positioning
Press = the workpiece moves towards contact
Release = the workpiece moves away from contact;

4.8 Programming Passive Positioning



► SENSOR SELECTION



Selecting the sensor to be used for the positioning cycle.

► DELAY

The time between the "start cycle" signal from the machine logic and the enable in the gauge for starting the measuring cycle.

► MEASUREMENT SIGN

	MEASURE		
←			
+			
⌂	-		
↺ ¹			
🔔			

Selects the measurement sign
+ = normal measurement;
- = inverted measurement.



► OVR

	MEASURE			
←				
⌂	OVR LIMIT			
↺ ¹	+OVR		1000.0	
🔔	-OVR		-1000.0	

Group of parameters used to define the valid range of passive positioning measurement values. Above or below the programmed values, "+OVR" or "-OVR" is displayed. The values must be within the measuring head operating range.

Select the "OVR limits" field in order to program the positive and negative limits. If you do not select the "OVR limits" field, the measuring head operating range limits are used as the range limits (maximum).

+OVR Positive threshold above

which the measurement is out of range
-OVR Negative threshold below which the measurement is out of range

5. IN-PROCESS VIEW MENU



5.1 View Menu (Automatic Mode)

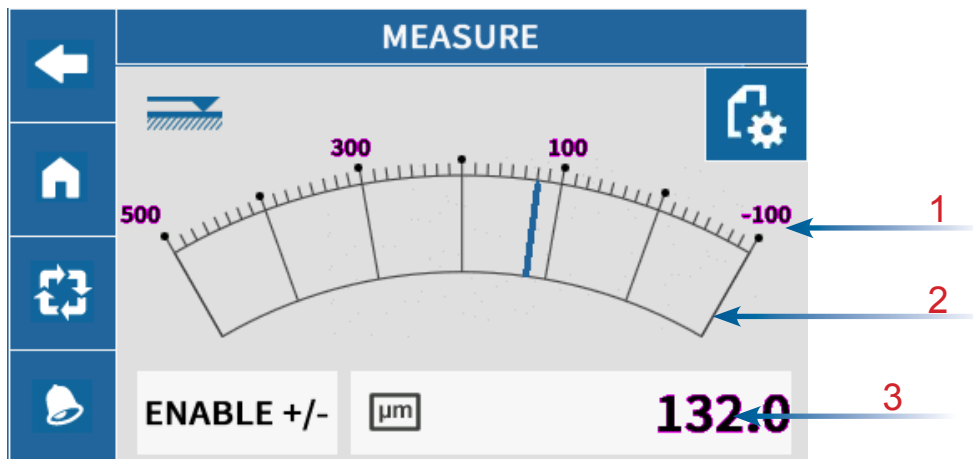
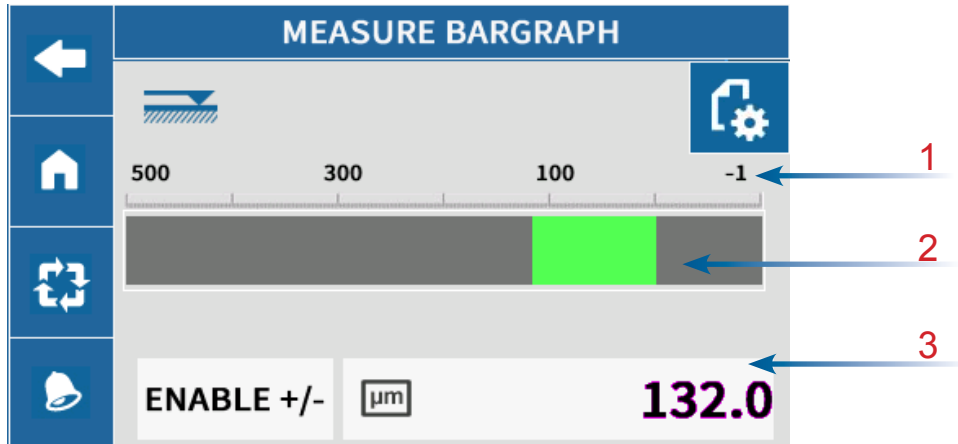
Use this page to access the measurement information, calibrate the measurement head and correct the measurement value.

	VIEWINGS		
	MEASURE BARGRAPH		MEASURE BARGRAPH Measurement bargraph display
	MEASURE WITH ANALOG METER		MEASURE WITH ANALOG METER Measurement with analogue instrument
	CONTROLS MODIFY		CONTROLS MODIFY Modifies the control trigger



5.1.1 View measurement

Two pages with two different display modes have been created: the first displays the measurement on a bar-graph, while on the second it is represented by a dial gauge.



- 1 Measurement graphic display
- 2 When the start measurement cycle control is activated, the "check points" are also displayed
The controls that are not highlighted are those that have not been triggered yet, whereas those highlighted in blue have already been triggered.
- 3 Numerical display of the measurement complete with respective unit of measurement
The following display modes are available:
50-0-10 (x1 / x10) μm
0.0020-0-0.0004 (x 1/ x 10) inches



Measurement head retraction state



Real-time zero adjustment

This key will be available if the function was enabled during configuration (Setting / Option / Measure zero adjust, see "Adjusting the measurement zero-setting (OPTION)" on page 13).



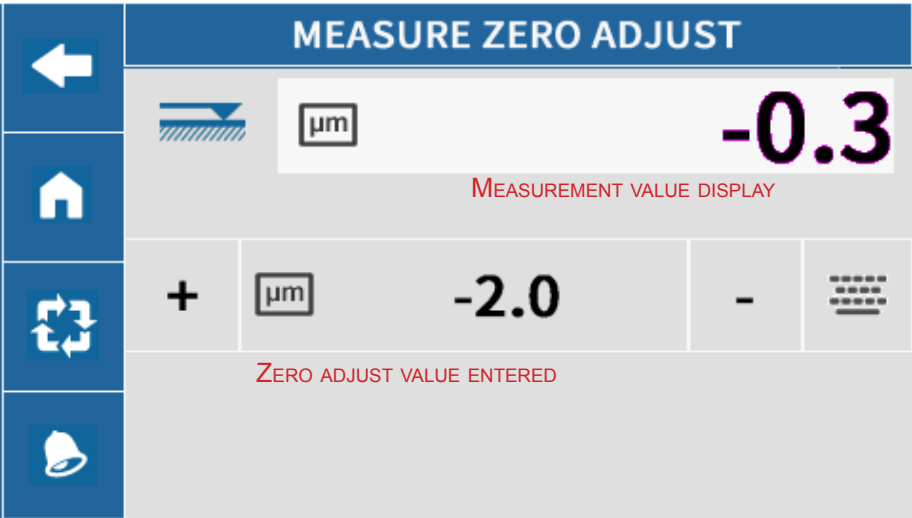
Pressing this key for a few seconds will make the + and - keys appear in order to adjust the measurement zero-setting in real time.



Press this key to access the Zero Adjustment page

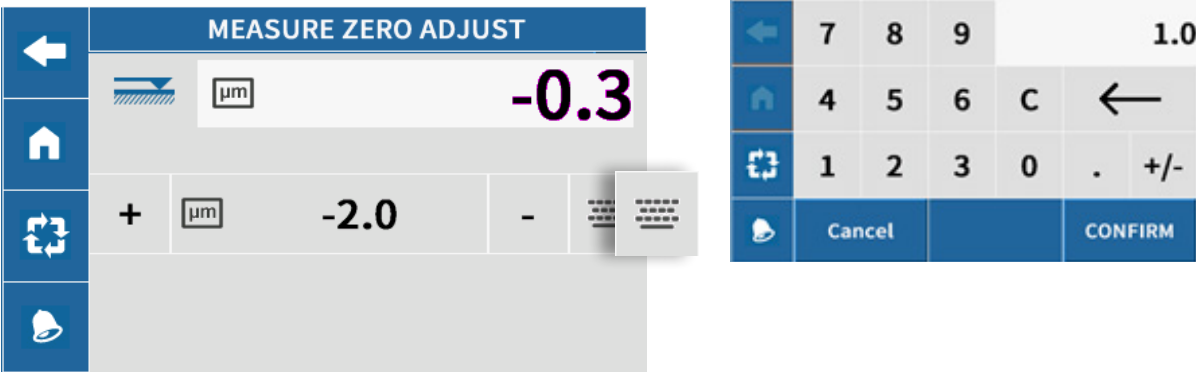


ADJUSTING THE MEASUREMENT ZERO-SETTING

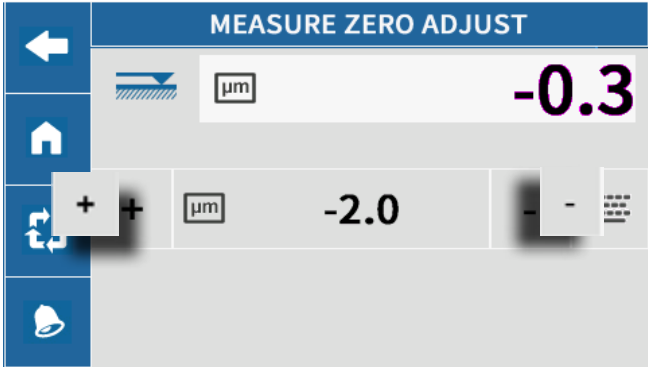


The zero adjustments are used when small measurement deviations are found when checking the piece after machining.
For example, if a part is undersized, you must enter a measurement adjustment with an equal but opposite value.

Changing the Zero Adjustment value



Alternatively, use the + and - buttons to increase or decrease the value by 1µm.
Once the desired value has been entered, press SAVE, or CANCEL.





5.1.2 Modifying the control trigger
Use this page to modify the command trigger control points:

	CONTROLS MODIFY			
	MEAS CONTROL 1		30.0	
	MEAS CONTROL 2		120.0	
	MEAS CONTROL 3		250.0	

Press and use the keypad to modify the value.

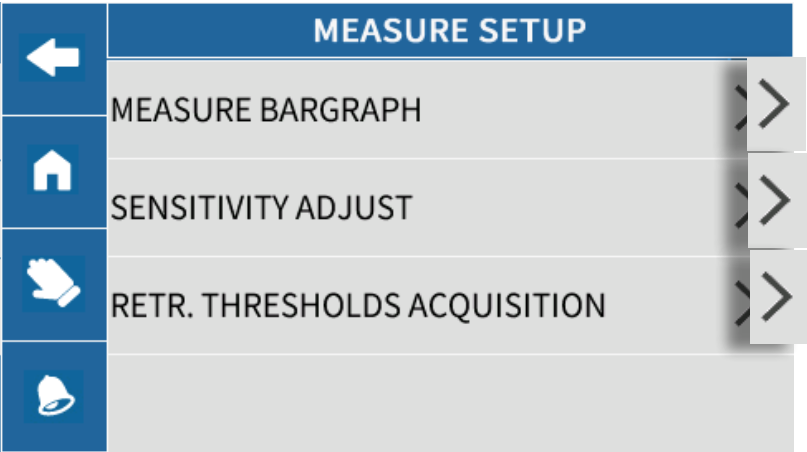
	7	8	9	150		
	4	5	6	C		
	1	2	3	0	.	+/-
	Cancel				CONFIRM	

Enter the desired value and press CONFIRM to save and return to the controls page.

[

NOTE
The programmed commands must be consistent
Meas Control 1 < Meas Control 2
Meas Control 2 < Meas Control 3

5.2 View Menu (Manual Mode)



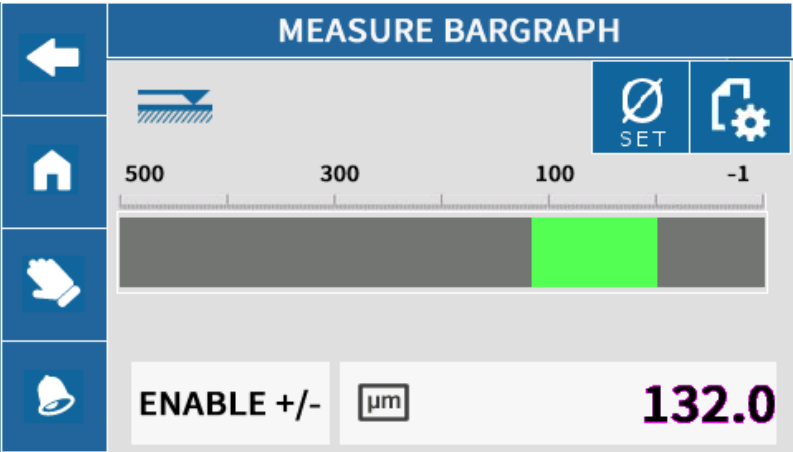
MEASURE BARGRAPH
Measurement bargraph display

SENSITIVITY ADJUST
Sensitivity adjustment

RETR. THRESHOLDS ACQUISITION
Retraction threshold acquisition

5.2.1 Measurement Display

This page is used to display the measured value.



Press this key to access the Electrical Zeroing page



Press this key to access the Zero Adjustment page



ELECTRICAL ZEROING

Electrical zero-setting MUST be performed:

- In static mode on a master work-piece.
- In dynamic mode, i.e. with the master work-piece rotating and bathed in coolant.
- At regular intervals, normally at the start of each shift and/or when the grinder is switched on



	ZEROINGS	
	TRANSDUCER 1	TRANSDUCER 2
	- 3.9	4.4
	ZEROING	RESET
	0.5	



Press ZEROING to reset the measurement.



Press this button to RESET the zero.

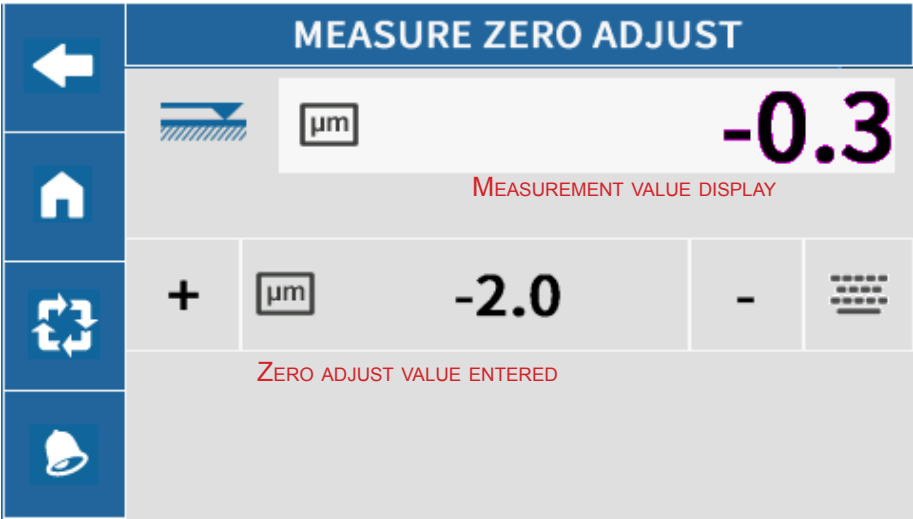
Procedure for Electrical Zeroing:

1. Gauge in manual mode.
2. Position the master work-piece in the machine (master work-piece rotating and bathed in coolant),
3. Move the measurement head(s) to the measuring position.
4. Press “Zeroing” to perform the electrical zeroing

If no error messages are displayed, the electric zero-setting procedure has been completed correctly.

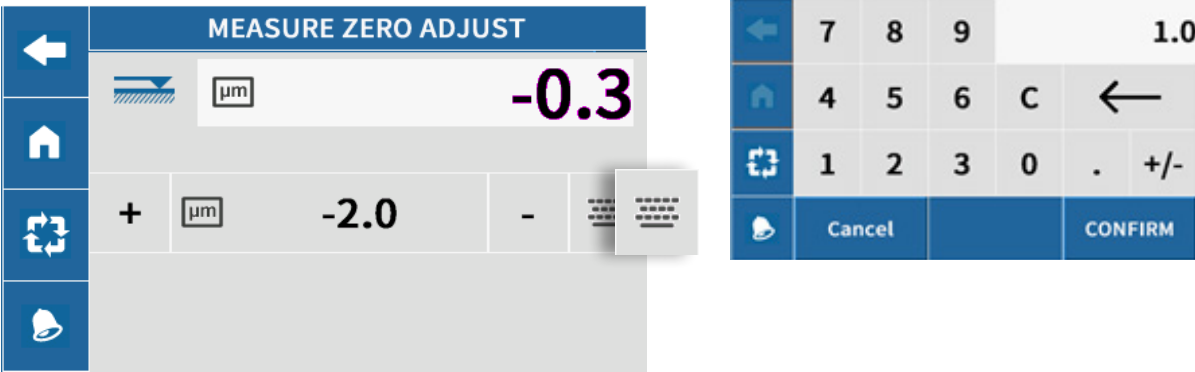


ADJUSTING THE MEASUREMENT ZERO-SETTING

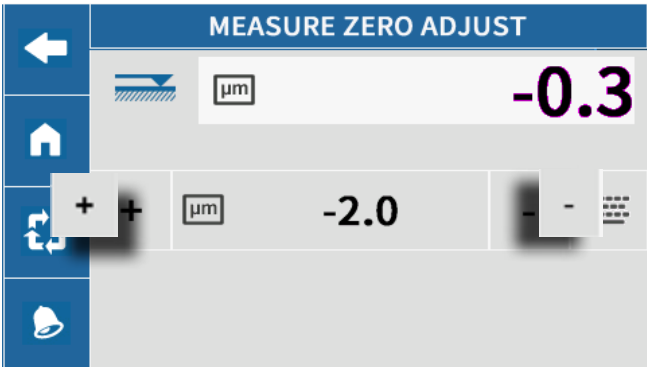


The zero adjustments are used when small measurement deviations are found when checking the piece after machining.
For example, if a part is undersized, you must enter a measurement adjustment with an equal but opposite value.

Changing the Zero Adjustment value



Alternatively, use the + and - buttons to increase or decrease the value by 1μm.
Once the desired value has been entered, press SAVE, or CANCEL.





5.3 Sensitivity Adjustment (Arms Ratio Acquisition)

	SENSITIVITY ADJUST			
	TRANSDUCER		VALUE	
	¹ <	1	>	² 4.4
	+	2.412		³ -
	⁵ CANCEL		ACQUIRE ⁴	

ACQUIRE

Value of retraction threshold referred to transducer

CANCEL

Reset the retraction threshold auto-acquired value

- Selected probe number. Select probe 1 or 2 using the arrow buttons.

[NOTE:
If there is only one contact, the arrow buttons are disabled.

- Value measured by selected transducer.
- Sensitivity value of selected transducer.
- To save the data, press ACQUIRE before leaving the page.
- Press CANCEL to cancel any adjustments.

PROCEDURE:

- Position a shim of known diameter for the transducer selected in the TRANSDUCER field (1).
Check that the value of the shim appears in the VALUE field (2).
- If the reading differs from the expected value, use the and buttons to modify the sensitivity value (3).
 - Press ACQUIRE to save the adjustment.

[NOTE
If two transducers are installed, the same procedure must be carried out for both.

POST-PROCESS SECTION

6. POST-PROCESS PROGRAMMING MENU



The Programming menu is always active in both Manual or Automatic Mode, the difference being that it is possible to save the data in automatic mode, but it will not be active until the subsequent cycle.

6.1 SET Selection Page (Option)

NOTE
This page is only available if the current software was configured for two SETs. There can be no more than two sets.

←

SET MANAGEMENT

SET 1

>>

SET1
SET1 programming

🏠

SET 2

>>

SET2
SET2 programming

🔄¹

🔔

Below describes the programming for SET1 only as the programming pages for the two sets are the same.

6.2 SET Programming Page

←

PROG SET 1

MEASURE

>>

MEASURE
Measurement

🏠

MEAS CONTROL

>>

MEASURE CONTROL
Measurement Checks

🔄¹

🔔

NOTE
For configurations that do not have two sets, pressing the “PROG” key in the main menu will access this page directly.



6.2.1 Measures Programming

	MEASURE		
	MEAS TYPE		T1
	DELAY		0.000
	MASTER DEVIATION		0.0

MEASURE

The user can select the measurement type (equation). The direction and polarity of the contacts T1 and T2 determine the measurement value.

It is possible to select from the following combinations: T1, T2, -T1, -T2, -T1-T2, T1+T2, T1-T2, T2-T1.

DELAY

This parameter can be used to define the delay from when the P1dME receives the START CYCLE signal from the machine logic to when it actually starts measuring and updating the checks.

MASTER DEVIATION

Difference between the real value and the nominal value of the master.

This value is normally left as 0, since it is assumed that each part has its own master, however, if the two diameters do not coincide, this parameter must be set to the value equivalent to the difference between the two diameters.

6.3 Machine controls



POST-PROCESS measurements are measurements performed after the workpiece machining stage, and may be performed in dynamic or static mode.

The result of the measurement allows the selection of parts machined of the following types:

- Workpieces in tolerance: suitable for the subsequent production stages.
- Recoverable workpieces: recoverable through reworking.
- Reject workpieces: rejected for undersize measurements.

Use this page to modify the check points for the measurement trigger controls:

	MEAS CONTROL				
	MEAS CONTROL 1+		25.0		Workpiece in tolerance but > OK
	MEAS CONTROL 1-		-25.0		Workpiece in tolerance but < OK
	MEAS CONTROL 2+		50.0		Recoverable workpiece control (*)
	MEAS CONTROL 2-		-50.0		Recoverable workpiece control (*)

(*) Optional parameters

Press to modify the value



Enter the desired value and press CONFIRM to save and return to the controls page.

7. POST-PROCESS VIEWS MENU -
7.1 View Menu (Manual Mode)



←

MEASURE SETUP

MEASURE BARGRAPH

>>

⌂

SENSITIVITY ADJUST

>>

🧤

RETR. THRESHOLDS ACQUISITION

>>

🔔

Measure Bargraph

Measurement bargraph display

Sensitivity Adjust

Sensitivity set-up

Retraction Thresholds Acquisition

Retraction Threshold Acquisition

7.1.1 Measurement Display
This page is used to display the measured value.

←

MEASURE

500

250

0

-250

-500

1

μm

-528.9

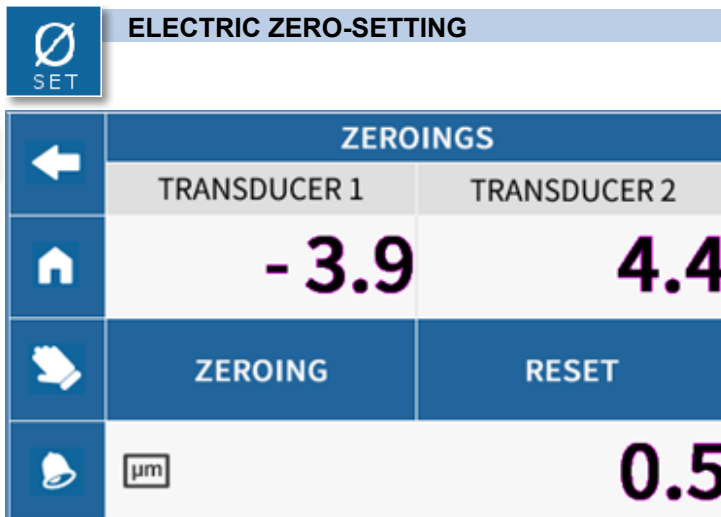
2

- 1 Measurement graphic display
- 2 Numerical display of the measurement complete with respective unit of measurement
The following display modes are available:
50-0-10 (x1 / x10) μm
0.0020-0-0.0004 (x 1/ x 10) inches

Measurement head retraction state

Press this key to access the Electrical Zeroing page

Press this key to access the Zero Adjustment page



Electrical zero-setting MUST be performed:

- In static mode on a master work-piece.
- In dynamic mode, i.e. with the master work-piece rotating and bathed in coolant.
- At regular intervals, normally at the start of each shift and/or when the grinder is switched on.

Procedure for Electrical Zeroing:

1. Gauge in manual mode.
2. Position the master work-piece in the machine (master work-piece rotating and bathed in coolant),
3. Move the measurement head(s) to the measuring position.
4. Press "Zeroing" to perform the electrical

zeroing

If no error messages are displayed, the electric zero-setting procedure has been completed correctly.



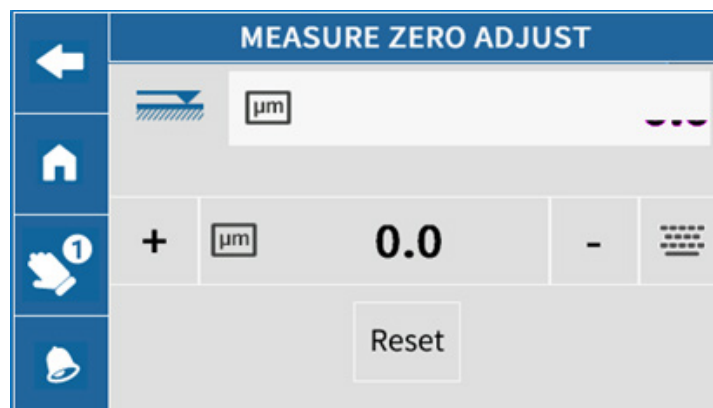
Press ZEROING to reset the measurement.



Press this button to RESET the zero.



ZERO ADJUSTMENT



The zero adjustments are used when small measurement deviations are found when checking the piece after machining.

For example, if a part is undersized, you must enter a measurement adjustment with an equal but opposite value.

- 1) Measurement value display
- 2) Zero correction value entered
- 3) RESET Press this key to reset the last zero adjustment made

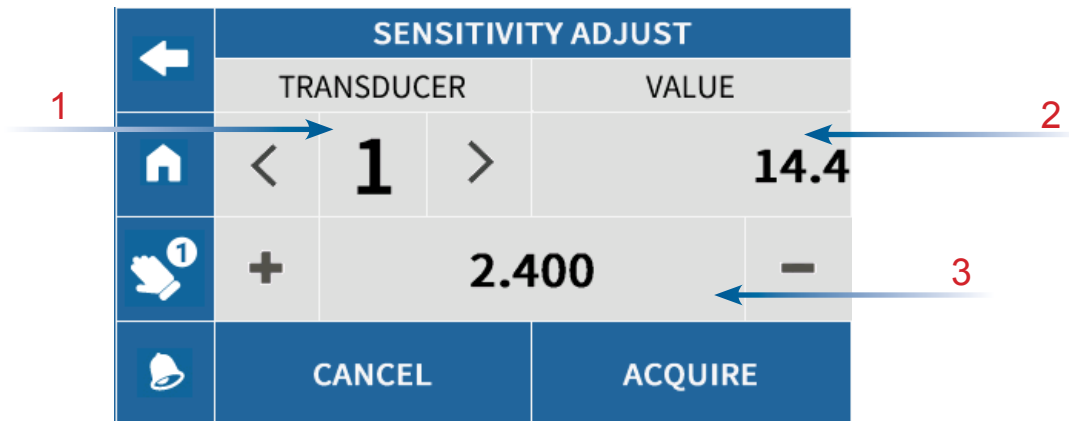
Changing the Zero Adjustment value

The zero adjustment value may be entered manually using the keypad, once the desired value has been entered, press "Confirm".

Alternatively, use the + and - buttons to increase or decrease the value by 1 μm .

Once the desired value has been entered, press SAVE, or CANCEL.

7.2 Sensitivity Adjustment (Arms Ratio Acquisition)



1) Selected contact number. Select probe 1 or 2 using the arrow buttons.

NOTE
the arrow buttons are disabled if there is only one contact.

- 2) Value measured by the selected transducer.
- 3) Sensitivity value of the selected transducer.
- 4) To save the data, press ACQUIRE before leaving the page.
- 5) Press CANCEL to cancel any adjustments.

PROCEDURE:

- Position a shim of known diameter for the transducer selected in the TRANSDUCER field (1).
- Check that the value of the shim appears in the VALUE field (2).
- If the reading differs from the expected value, use the + and - keys to make a fine adjustment to the sensitivity value (3), or press the value to edit it.
- Press ACQUIRE to save the adjustment.

NOTE
If two transducers are installed, the same procedure must be carried out for both.

NOTE
Press the fine adjustment keys to edit the transducer sensitivity immediately. Wait a few seconds each time before pressing the key again.

7.2.1 Retraction Threshold Acquisition

Value of retraction threshold referred to transducer



	RETRACTION THRESHOLDS ACQUISITION	
	T1 THRESHOLD	T2 THRESHOLD
	----	----
	TRANSDUCER 1	TRANSDUCER 2
	14.5	118.0
	ACQUIRE	RESET

ACQUIRE

Resets the auto-acquired value of the retraction threshold

RESET

Value of retraction threshold referred to transducer

Current value of transducers.

	RETRACTION THRESHOLDS ACQUISITION	
	T1 THRESHOLD	T2 THRESHOLD
	472.0	472.0
	TRANSDUCER 1	TRANSDUCER 2
	-349.2	348.4
	ACQUIRE	RESET

Value of retraction threshold, with respect to the transducers

7.3 View Menu (Automatic Mode)

Use this page to access the measurement information, calibrate the measurement head and correct the measurement value.

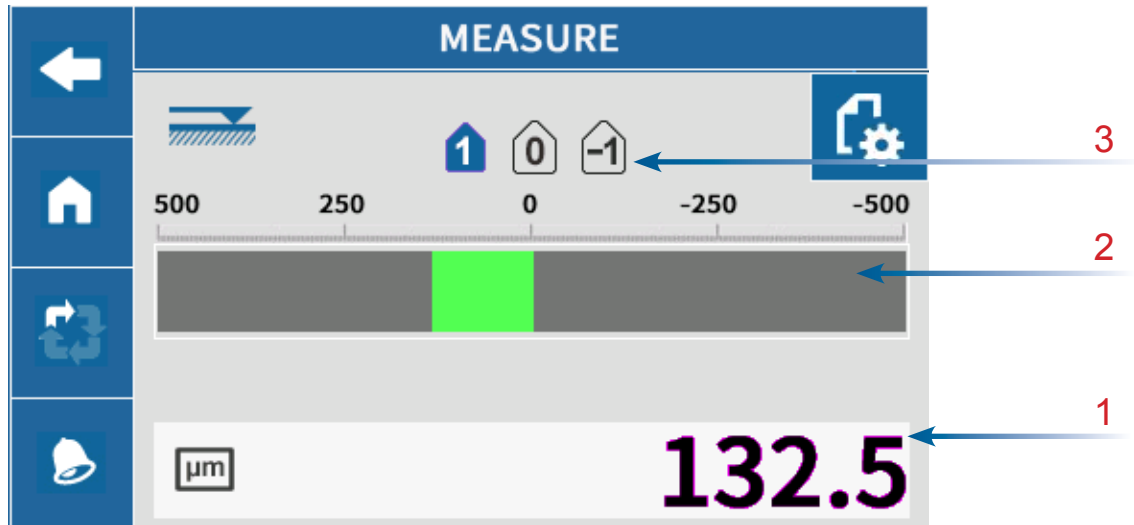


	VIEWINGS
←	MEASURE BARGRAPH >
🏠	CONTROLS MODIFY >
🔄	
🔔	

Measure Bargraph
Measurement bargraph display

Controls Modify
Machine controls

7.3.1 View measurement



- 1 Measurement graphic display
- 2 When the start measurement cycle control is activated, the “check points” are also displayed. The controls that are not highlighted (0 and 1 in the examples) are those that have not been triggered yet, whereas those that are highlighted in blue (3 and 2) have already been triggered.
- 3 Numerical display of the measurement complete with respective unit of measurement. The following display modes are available:
 50-0-10 (x1 / x10) μm
 0.0020-0-0.0004 (x 1/ x 10) inches



Measurement head retraction state



Press this key to access the Zero Adjustment page



ZERO ADJUSTMENT

←

MEASURE ZERO ADJUST

μm

+

μm

0.0

-

Reset

The zero adjustments are used when small measurement deviations are found when checking the piece after machining. For example, if a part is undersized, you must enter a measurement adjustment with an equal but opposite value.



- 1 Measurement value display
- 2 Zero correction value entered
- 3 RESET Press this key to reset the last zero adjustment made

Changing the Zero Adjustment value

The zero adjustment value may be entered manually using the keypad, once the desired value has been entered, press "Confirm".

Alternatively, use the + and - buttons to increase or decrease the value by 1μm. Once the desired value has been entered, press SAVE, or CANCEL.

7.4 Machine controls

POST-PROCESS measurements are measurements performed after the workpiece machining stage, and may be performed in dynamic or static mode.

The result of the measurement allows the selection of parts machined of the following types:

- Workpieces in tolerance: suitable for the subsequent production stages.
- Recoverable workpieces: recoverable through reworking.
- Reject workpieces: rejected for undersize measurements.

Use this page to modify the check points for the measurement trigger controls:

	MEAS CONTROL			
←	MEAS CONTROL 1+	μm	25.0	
Home	MEAS CONTROL 1-	μm	-25.0	
↺ 1	MEAS CONTROL 2+	μm	50.0	
🔔	MEAS CONTROL 2-	μm	-50.0	

Workpiece in tolerance but > OK

Workpiece in tolerance but < OK

Recoverable workpiece control

Workpiece reject control.



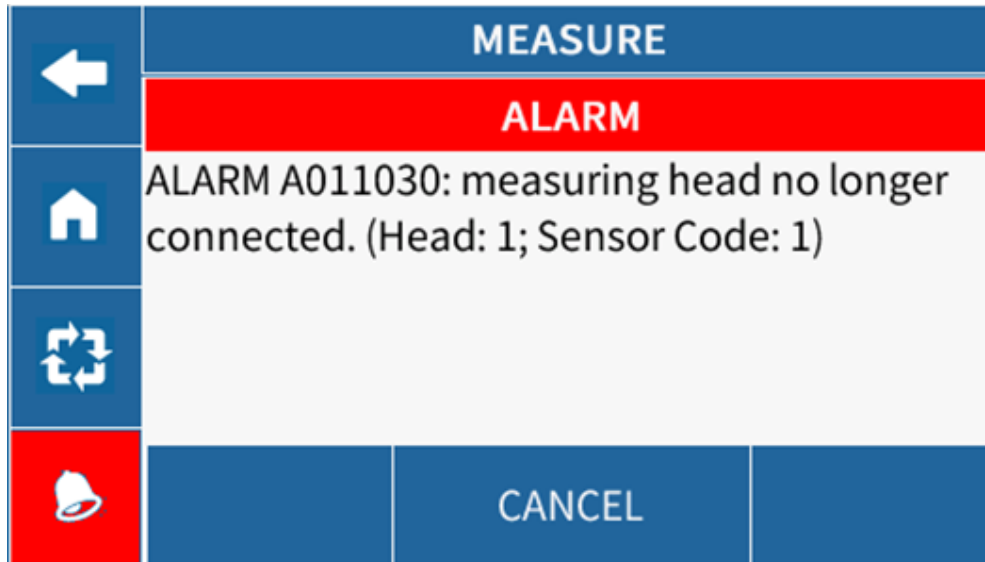
NOTE
The programmed commands must be consistent
Meas Control +1 < Meas Control +2
Meas Control -1 < Meas Control -2

8. DIAGNOSTICS AND MAINTENANCE

8.1 Alarms and Warnings

DM

Each alarm is shown on the display



- on the panel: the alarm icon turns red
- on the I/O: the ALARM pin is active



ALARMS	DESCRIPTION	SOLUTION
ALARM 03	Electrical zeroing failed	Check that the transducer measurements are within the head zero-setting range, then repeat the electric zero-setting.
ALARM 28	Head no longer retracted	Check that the head is retracted when the dedicated command is activated.
ALARM 29	Head retraction failure	Check that the head is retracted when the dedicated command is activated.
ALARM 30	Head not connected	Check that the head connector has been inserted in the unit correctly.

8.2 Routine maintenance

8.2.1 Cleaning the machine

To clean the external part of the electronic unit and the front panel, use a damp, static-free cloth.

**ATTENTION**

DO NOT USE SOLVENTS OR ABRASIVE PRODUCTS.

8.2.2 Cleaning the heads

Clean the heads using a soft cloth at regular intervals, depending on the operating conditions, taking care to avoid damaging any rubber seals and output cables.

ATTENTION

DO NOT USE SOLVENTS OR ABRASIVE PRODUCTS.

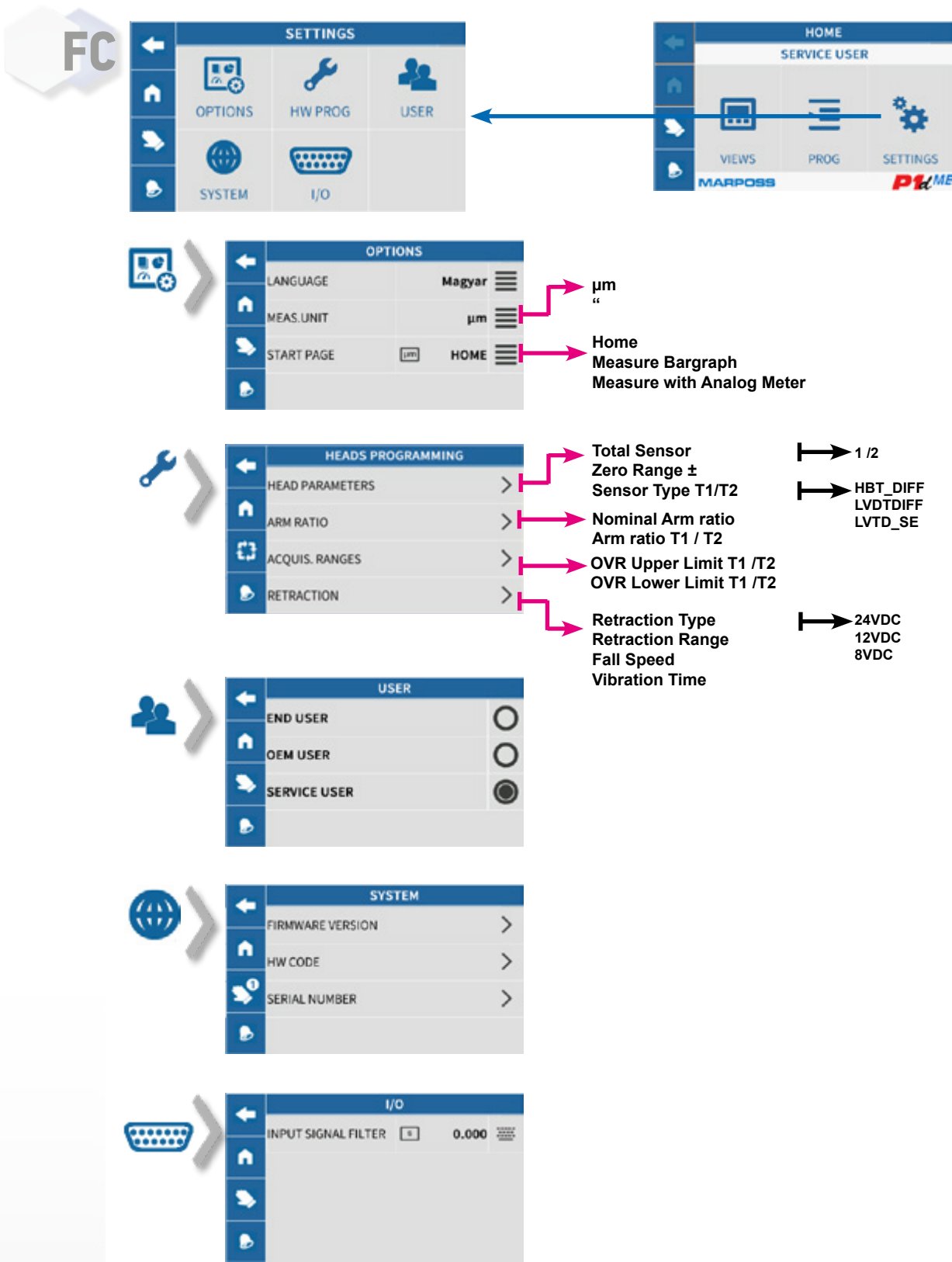
8.3 Extraordinary maintenance

ATTENTION

The extraordinary maintenance operations may only be carried out by authorised personnel.

9. FLOW CHART

9.1 General Programming Flow Chart



9.2 Flow Chart - In-Process



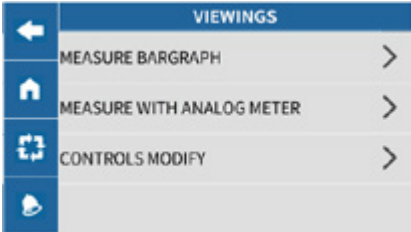
PROGRAMMING
(4 on page 19)



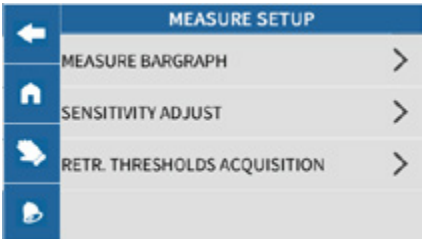
VIEWS



Automatic Mode Viewing
(5.1 on page 32)



Manual Mode Viewing
(5.2 on page 36)



MEASURE

Meas. Type
Delay
Master Deviation

MEASURE CONTROL

Meas. Control 1
Meas. Control 2
Meas. Control 3

SURFACE ELABORATION
PARAMETERS *

Surface Type
Settling Time
Removal Estimate
Surface Parameters
Filter Freq.
Filter Adjust
Int. Surface Parameters
Grow rate
Slew Rate

INTEGRAL *

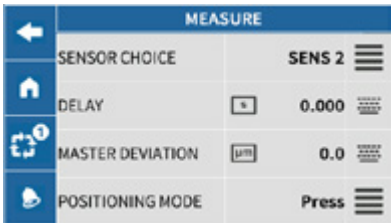
Integral Meas. Type
Meas. Rpm
Rev. Percentage
Removal Estimate

FEEDBACK *

Feedback
Pulse weight

PROGRAMMING WITH ACTIVE/PASSIVE POSITIONING (4.6 on page 28)

ACTIVE POSITIONING



Sensor Choice → Sens 1
Delay → Sens 2
Master Deviation → Press
Positioning Mode → Release

PASSIVE POSITIONING



Sensor Choice → Sens 1
Delay → Sens 2
Measure Sign → +
OVR Limit → -

9.3 Flow Chart - Post Process

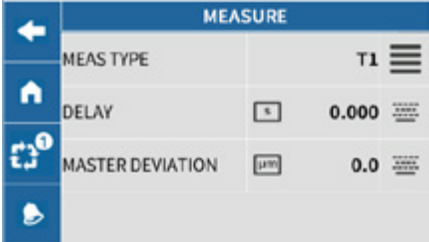
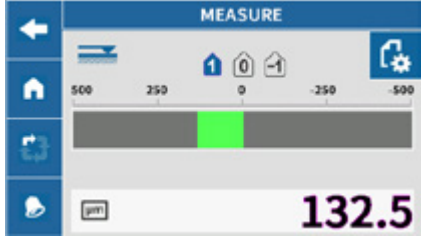
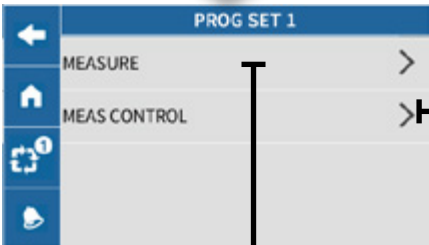
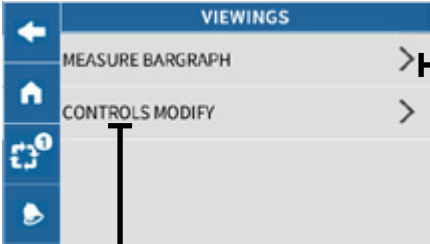


PROGRAMMING
(6 on page 40)

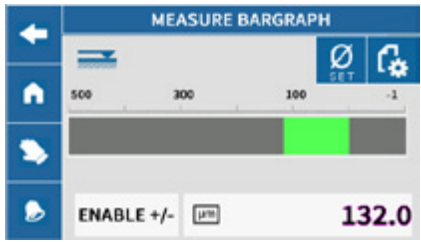
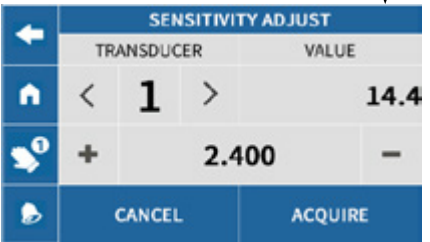
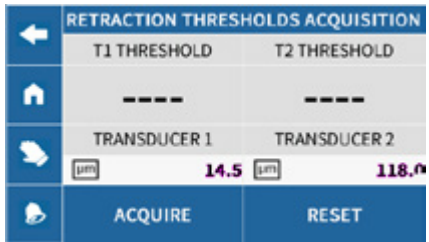
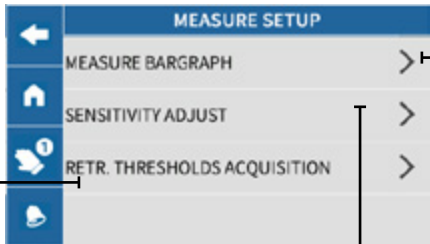


VIEWS

Automatic Mode Viewing
(7.3 on page 47)



Manual Mode Viewing
(7 on page 43)



End of Documents

P1DME