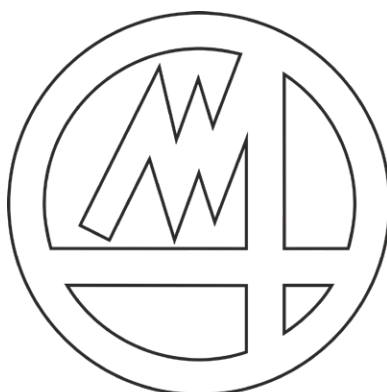


P1DAE

Programming and User Manual

Manual code N:

D296AE00GC



MARPOSS

MANUFACTURER	MARPOSS S.p.A.
ADDRESS	Via Saliceto, 13 - Bentivoglio (BO) Italy - www.marposs.com
TYPE OF EQUIPMENT - MODEL	P1dAE Firmware V 2.2
FUNCTION	Process control system for grinding machines
MANUAL CODE	D296AE00GC
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ORIGINAL LANGUAGE	Italian

MARPOSS S.p.A. is not obliged to notify customers of any subsequent changes to the product.
The descriptions in this manual in no way authorise tampering by unauthorised personnel.
The guarantee covering the equipment shall be void if any evidence of tampering is found.


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About the directive “**ROHS**” regulating the presence of certain hazardous substances in electrical and electronic equipment: http://www.marposs.com/compliance_detail.php/eng/rohs




For information about possible use in Marposs products of materials coming from conflict areas, refer to: http://www.marposs.com/compliance_detail.php/eng/conflict_minerals





This product conforms to the following directives:

- 2014/30/EU EMC directive
- 2011/65/EU RoHS & 2015/863/EU RoHS III




This product conforms to the following UK regulations:

- SI 2016/1091 The Electromagnetic Compatibility Regulations 2016
- SI 2012/3032 The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

The applicable standards are:


- EN 61326-1 (EMC)
- EN 61010 - 1 (SAFETY)
- EN IEC 63000: RoHS



INFORMATION FOR USERS

Pursuant to the Standard IEC 62202 (corresponding to the Italian Standard IEC EN 62262-classification IEC 70-4) “Degree of protection against mechanical impacts”.

The equipment has an energy protection level equivalent to 1 J, corresponding to a rating of IK06 (ref. IEC 62262). The energy level was verified in accordance with the test defined in the Standard EN 61010-1: 2010 paragraph 8.2.2 (impact test). If the glass is broken, use the appropriate safety gloves when handling the object and contact customer service in order to replace the equipment.



INFORMATION FOR USERS

concerning the terms of the National Legislation enforcing the Directive UK SI 2013/3113 and 2012/19/EU on waste electrical and electronic equipment (WEEE).

The crossed out wheelie bin symbol that appears on the product or its packaging indicates that the product must be disposed of separately from other waste materials at the end of its working life.

The manufacture shall be responsible for organizing and handling separate collection of the equipment described in this manual at the end of its working life. Users who wish to dispose of the equipment must contact the manufacture and follow the procedures implemented by the latter for the separate collection of the equipment at the end of its working life.

Sorting the equipment to be disposed of into its component materials before recycling, treatment and environmentally compatible disposal helps to prevent potentially harmful effects on health and the environment and favours re-use and/or recycling of these materials.

Illegal disposal of the product by the user is punishable by the application of fines or other penalties as defined by the applicable regulation.

CONTENTS

1. GENERAL DESCRIPTION OF THE DEVICE

7

1.1 Panel general icons

8

1.2 Alarms and Warnings Menu

9

1.3 Operating mode selection page

10

1.4 Panel menu flow chart

11

2. SETTINGS MENU

12

2.1 Options Menu

13

2.1.1 Select language

13

2.1.2 Autotest time

14

2.1.3 I/O programming page

14

2.1.4 Lock screen

16

2.1.5 Views Menu

17

2.1.6 Ethernet Adapter

18

2.2 HW Prog Menu

19

2.3 User Menu

20

2.4 I/O Test menu

21

2.5 System Menu

22

2.5.1 Equipment Information

22

2.5.2 Panel

23

2.5.3 Save Screen Shots

24

2.5.4 Restore Factory Data

25

3. PROG MENU

26

3.1 Programming and Creating SETS

26

3.2 Hardware Programming

29

3.2.1 Hardware Programming - Hardware Gains

29

3.2.2 Hardware Programming - Hardware Filter

30

3.2.3 Hardware Programming - Threshold

30

3.2.4 Hardware Programming - Measurement Enabled

31

3.3 GAP Menu

32

3.3.1 GAP Programming - Software Gain

32

3.3.2 GAP Programming - Minimum Frequency

33

3.3.3 GAP Programming - Maximum Frequency

33

3.3.4 GAP Programming - Filter Value

34

3.3.5 GAP Programming - Output Bit

35

3.3.6 GAP Programming - Zeroing

38

3.4 CRASH Menu

40

3.4.1 CRASH Programming - Software Gains

40

3.4.2 CRASH Programming - Minimum Frequency

41

3.4.3 CRASH Programming - Maximum Frequency

41

3.4.4 CRASH Programming - Filter Value

42

3.4.5 CRASH Programming - Output Bit

43

3.5 Analogue Outputs

46

4. VIEWS MENU

47

4.1 Acoustic Emission

48

4.2 Acoustic Emission Graph

49

4.3 Acoustic Emission Spectrum

50

4.4 Manual Set-up Menu

53

4.5 Automatic Set-up Menu

56

4.5.1 Set-up Page

57

4.5.2 Hardware Gain and Filter Programming

59

4.5.3 Minimum HW Filter programming

59

4.5.4 HW GAIN

60

4.5.5 GAP Programming and CRASH Programming

60

4.6 Zeroing

61

5. LIST OF ALARMS AND WARNINGS

5.1 List of Alarms.....

5.2 List of Warnings.....

5.3 List of errors

6. P1DAE PARAMETER PROGRAMMING SUMMARY TABLE

62

62

63

64


66

1. GENERAL DESCRIPTION OF THE DEVICE

The P1dAE operator panel includes an LCD touchscreen display (resolution 272x480 pixels - dimensions 4.3") that can be used to programme and view the measurements.




HOME MENU DESCRIPTION




Alarm condition. This icon indicates whether there are any active alarms or warnings.

ALARMS AND WARNINGS MENU




This icon indicates the operating mode and the number of the set that is currently in use.

FUNCTION SELECTOR MENU



Press this soft key to return to the Home Page



Press this soft key to return to the previous page.


HOME

This bar displays the page title.

SERVICE USER

This bar displays the name of the current user.


USER MENU



VIEWS

Press this soft key to access the Views Menu


VIEWS MENU



PROG

Press this soft key to access the Prog Menu

PROG MENU



SETTINGS

Press this soft key to access the Settings Menu

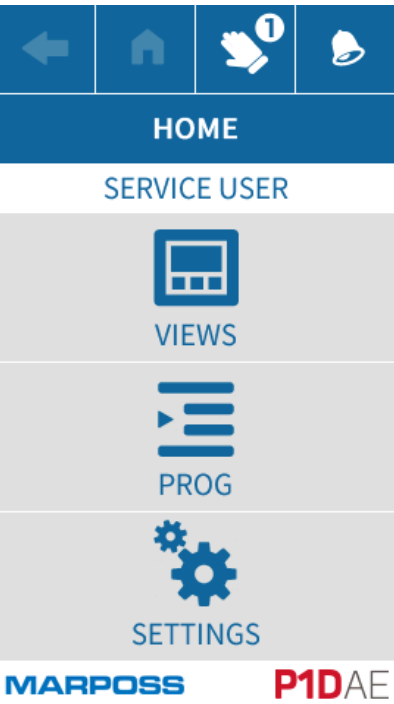
SETTINGS MENU

1.1 Panel general icons

The menu pages include the following icons:

	If a page contains more data than it is possible to display on a single page, it will also include arrow icons that can be used scroll up and down in order view all the available data.
	This icon, which appears at the end of a parameter string, indicates that a multiple choice window will be opened.
	This icon, which appears at the end of a parameter string, indicates that an additional programming page will be opened.
	This icon, which appears at the end of a parameter string, indicates whether it is enabled or disabled.
	<p>This icon, which appears at the end of a parameter string, indicates that it is possible to open a virtual numerical keypad in order to modify the value.</p> <p>For example:</p>
	These check boxes may be used to select a parameter from two or more different data items.
<div><div>CANCEL</div><div>CONFIRM</div><div>SAVE</div></div>	After modifying data, the page may also display some of the following soft keys, which are used to save/confirm the modifications, or exit without saving.

1.2 Alarms and Warnings Menu



This icon indicates whether there are any active alarms or warnings.

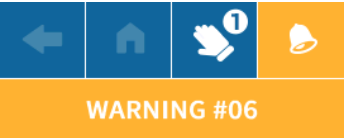
- Blue = no alarms
- Yellow = Warning
- Red = Alarm

Consult the Alarms and Warnings chapter for a complete list of warnings and alarms.

ALARMS AND WARNINGS

If any warnings and/or alarms are active, press the soft key to view them and carry out the clearing procedure.

SAMPLE WARNING:



Primary signal saturation

This message is shown when acoustic primary signal saturates. The signal is too big : HW Gain must be reduced or HW Filter must be increased. To reset the warning condition press the CLEAR button.



SAMPLE ALARM:



AE Sensor Not Connected

This message is shown when
1) the AE sensor is not connected to the respective connector
2) there is an issue on the supply circuit of the sensor
3) there is an issue on the AE sensor. Check the correct connection of the AE



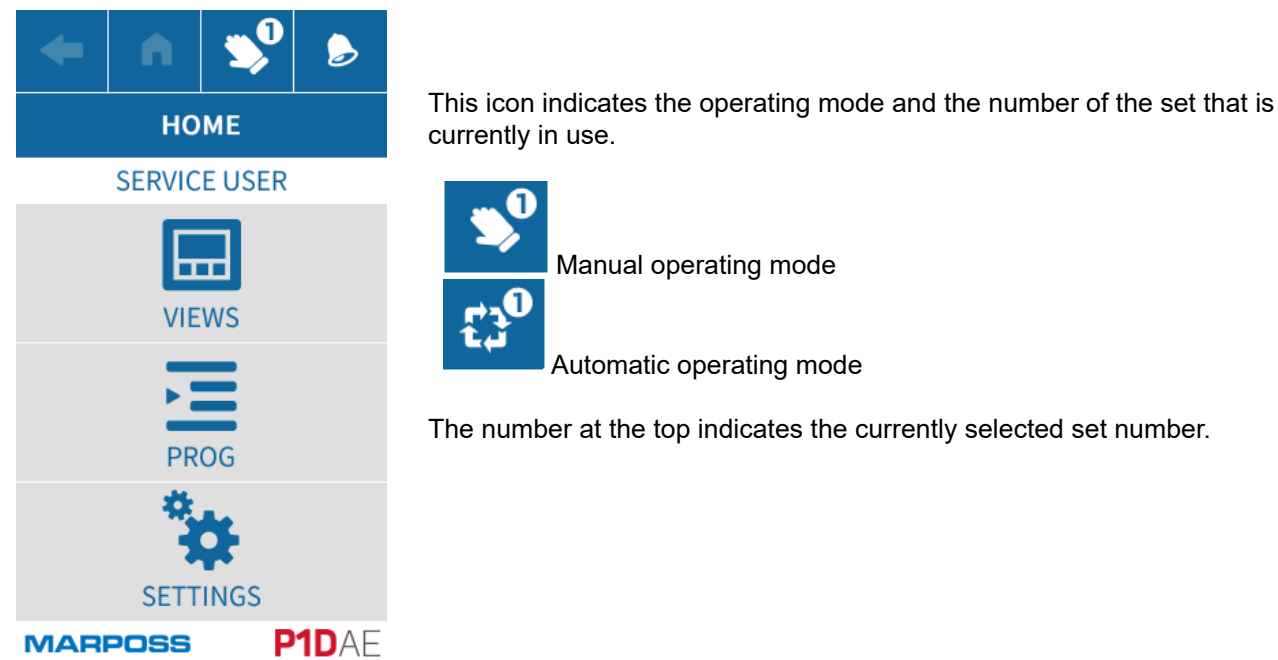
The page indicates the alarm or warning number, the title and message indicating the reason for the alarm, and how to correct it.



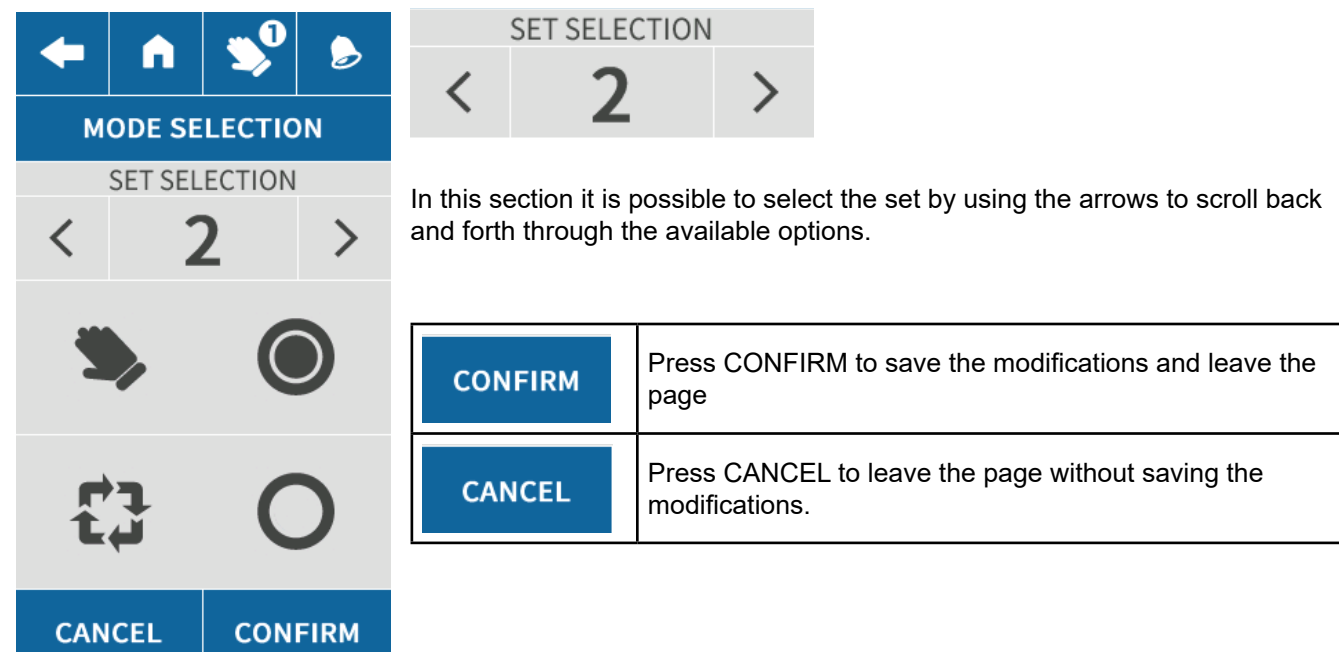
If necessary, use the arrows to scroll through the entire message.

Use the CLEAR button to reset the alarm or warning.

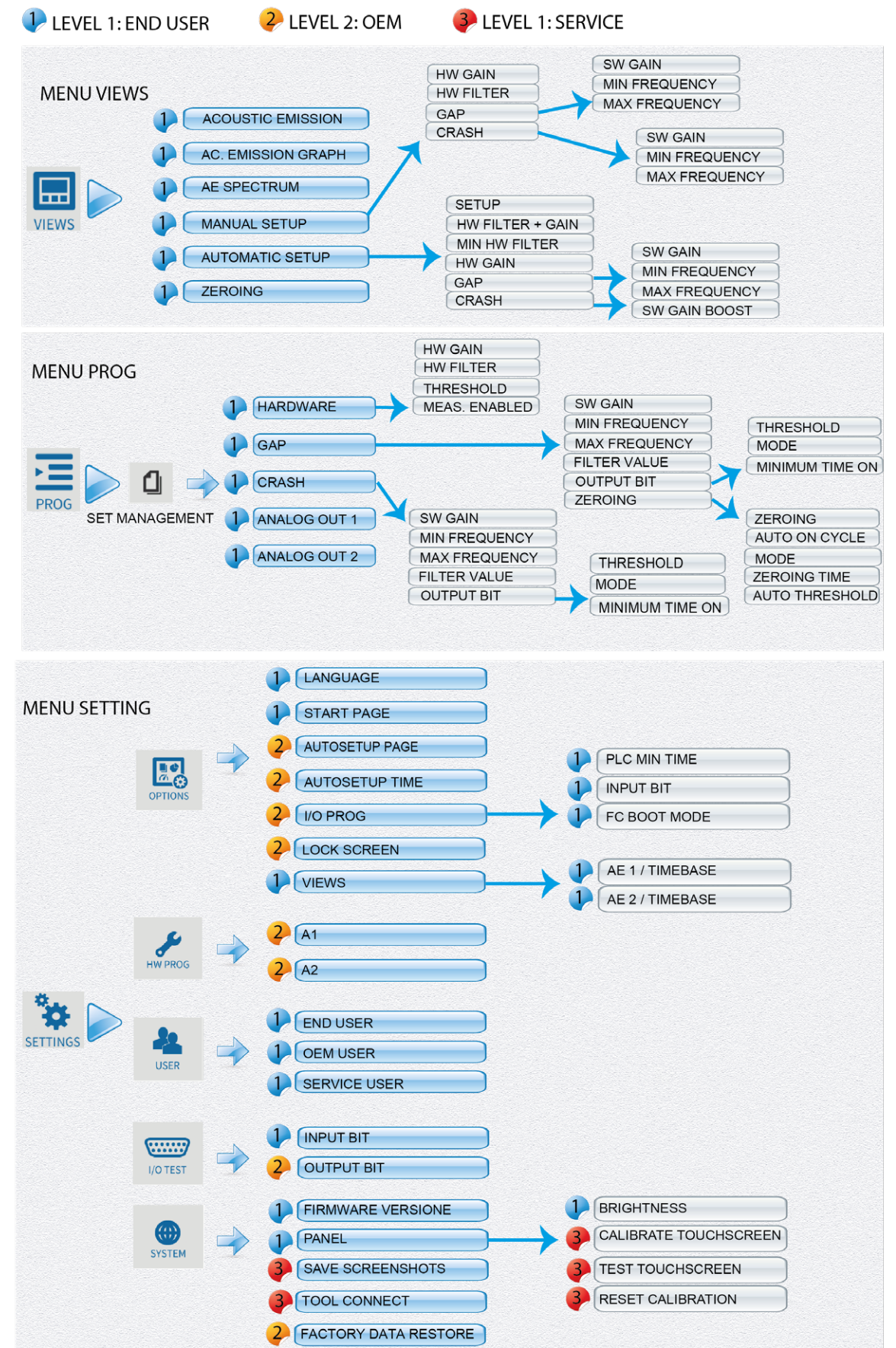
1.3 Operating mode selection page



Press the operating mode soft key to access the set selection page.



1.4 Panel menu flow chart



2. SETTINGS MENU

The SETTINGS Menu includes all the sub-menus used to programme and set-up the device



OPTIONS MENU

- LANGUAGE
- AUTOSETUP TIME
- I/O PROG
- LOCK SCREEN
- VIEWS
 - ▶ START PAGE
 - ▶ AE1 / AE GRAPH / TIMEBASE
 - ▶ AE2 / AE GRAPH / TIMEBASE
- ETHERNET ADAPTER

HARDWARE PROGRAMMING MENU

- AE 1
 - ▶ ENABLED
 - ▶ ALARMS ON
- AE 2
 - ▶ REMOTE
 - ▶ ACTIVE

USER MENU

- END USER
- OEM
- SERVICE USER

I/O TEST MENU

- INPUT BIT
- OUTPUT BIT

SYSTEM MENU

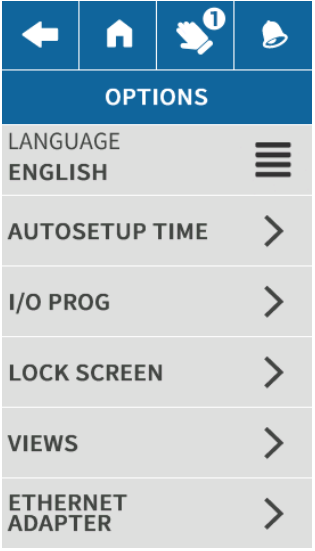
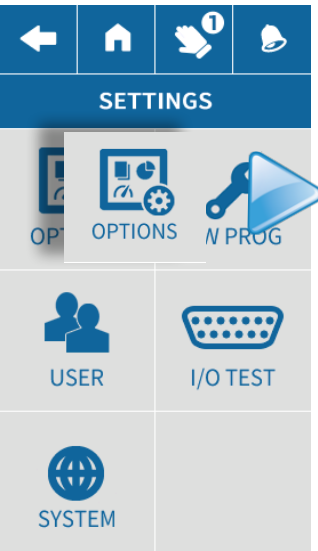
- EQUIPMENT INFORMATION
- PANEL
 - ▶ BRIGHTNESS
 - ▶ CALIBRATE TOUCH SCREEN
 - ▶ TEST TOUCH SCREEN
 - ▶ RESET CALIBRATION
- SAVE SCREEN SHOT
- FACTORY DATA RESTORE

2.1 Options Menu

Programming in manual mode only

View only in automatic mode

Access level 1 (End User)



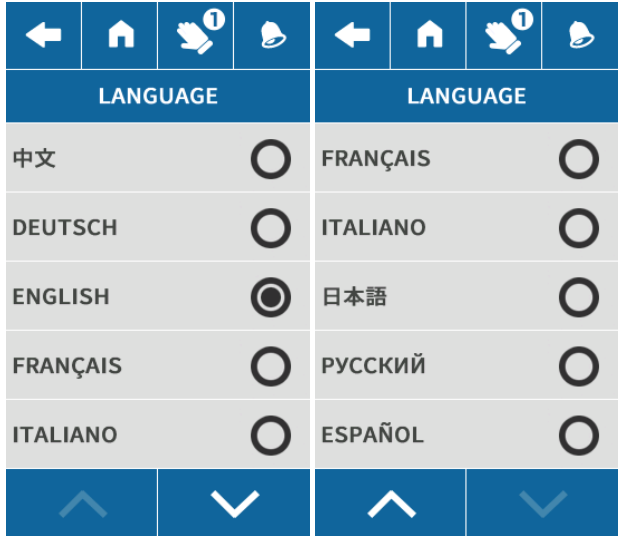
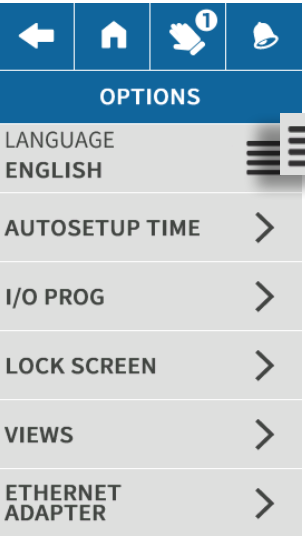
The options menu can be used for the following settings:

- LANGUAGE
- AUTOSETUP TIME
- I/O PROG
- LOCK SCREEN
- VIEWS
- ETHERNET ADAPTER

2.1.1 Select language

Access level 1 (End User)

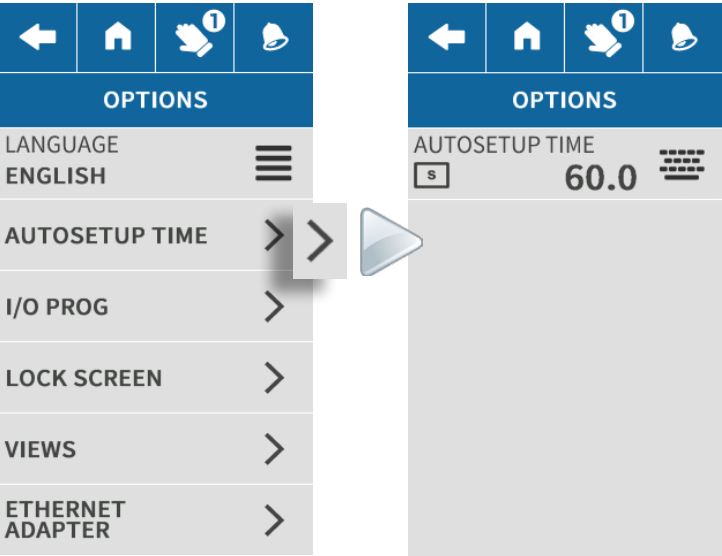
Use this page to select the panel display language from the available options.



2.1.2 Autosetup time

2 Access level 2 (OEM)

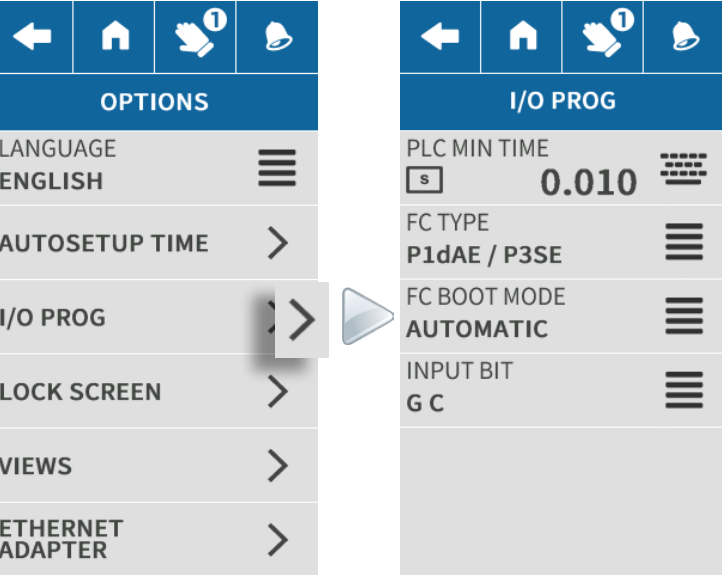
The Autosetup Time is the maximum time taken by the P1dAE to complete an automatic set-up step without operator intervention. Alternatively, the operator may finish it manually.



2.1.3 I/O programming page

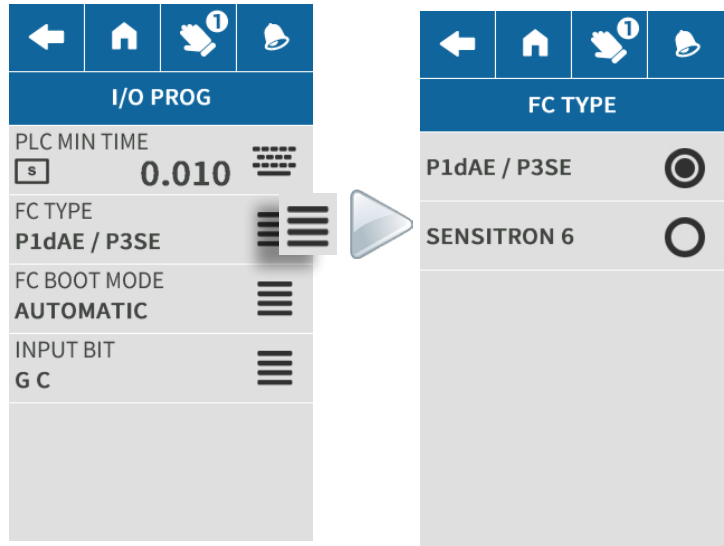
2 Access level 2 (OEM)

Programming the I/O - PLC MINIMUM TIME



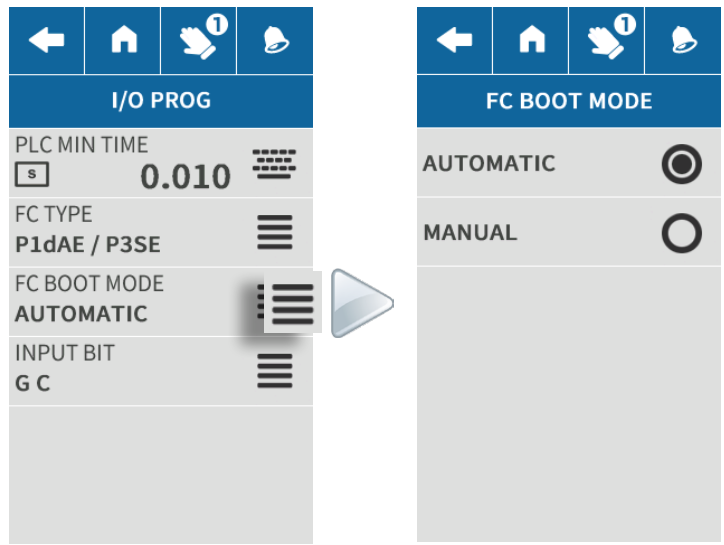
PLC MIN TIME
Defines the minimum activation time for each output bit, with respect to the threshold check, expressed in seconds. (range 0,002 to 0.999s) (default value 0.010 s). Setting a low value will give a fast output bit deactivation time, program only if the type of PLC cycle is equally fast. Setting a high value will give a slow PLC cycle time.

Programming the I/O - FLOW CONTROL TYPE



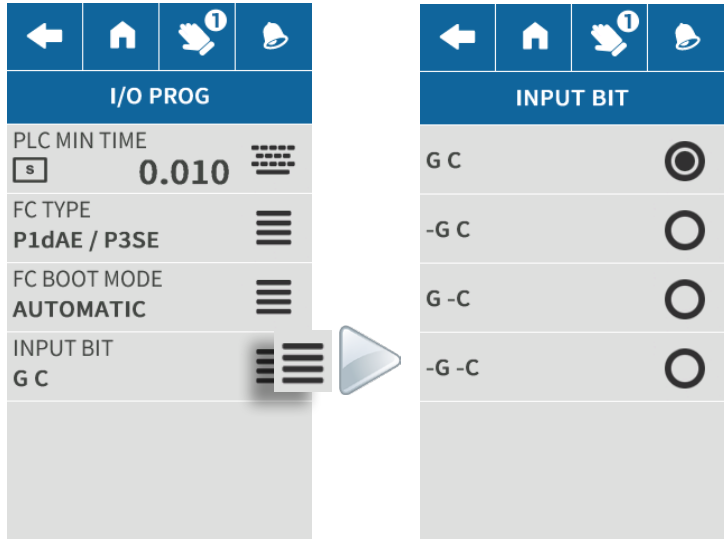
FC TYPE
Defines the type of Flow Control to be used:
• P1DAE/P3SE mode
• SENSITRON mode

Programming the I/O - FC BOOT MODE



FC BOOT MODE
This parameter is for setting the mode in which the P1DAE starts when switched on, i.e.: auto-matic (default) or manual.

Programming the I/O - INPUT BIT



INPUT BIT
Defines the Input Bit activation level for the cycle request (G C default value)
G C GAP active high CRASH active high
-G C GAP active low CRASH active high
G -C GAP active high CRASH active low
-G -C GAP active low CRASH active low

2.1.4 Lock screen

2 Access level 2 (OEM)

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OPTIONS

LANGUAGE

ENGLISH

≡

AUTOSETUP TIME

>

I/O PROG

>

LOCK SCREEN

>

VIEWS

>

ETHERNET ADAPTER

>

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LOCK SCREEN

LOCK

☐

This function can be used to activate or deactivate the lock screen; when active, the operator can view the data and measurement values, but is prevented from modifying any of the parameters.

When the **LOCK** function is active, the **RETENTIVE** parameter also appears. If enabled, the lock screen can be maintained even after restarting the panel.

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LOCK SCREEN

LOCK

☒

RETENTIVE

☐

CANCEL

SAVE

←

🏠

🔄

🔔

SETTINGS

⚙️

OPTIONS

🔧

HW PROG

👤

USER

🔌

I/O TEST

🌐

SYSTEM

When the **LOCK SCREEN** function is active, a padlock symbol will be present in the **HOME** icon.

As can be seen from the adjacent example, it is not possible to modify the parameters

←

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I/O PROG

PLC MIN TIME

S

0.010

FC TYPE

P1dAE / P3SE

≡

FC BOOT MODE

MANUAL

≡

INPUT BIT

G C

≡

2.1.5 Views Menu

1 Access level 1 (End User)

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OPTIONS

LANGUAGE

ENGLISH

≡

AUTOSETUP TIME

>

I/O PROG

>

LOCK SCREEN

>

VIEWS

>

ETHERNET ADAPTER

>

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VIEWS

START PAGE

HOME

≡

ACOUSTIC EMISSION GRAPH

>

←

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🔔

START PAGE

HOME

☒

AUTOMATIC ON CYCLE START

☐

ACOUSTIC EMISSION 1

☐

AE GRAPH 1

☐

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

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VIEWS

START PAGE

HOME

≡

ACOUSTIC EMISSION GRAPH

>

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ACOUSTIC EMISSION GRAPH

TIMEBASE

0.500 s/div

≡

←

🏠

🔄

🔔

TIMEBASE

0.100 s/div

☐

0.200 s/div

☐

0.500 s/div

☒

1.000 s/div

☐

2.000 s/div

☐

TIME BASES
This page may be used to select the time base of the acoustic signal oscilloscope display

2.1.6 Ethernet Adapter

1

Access level 1 (End User)

This page contains the Ethernet programming data for the P1dAE Tool connection.

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OPTIONS

LANGUAGE

ENGLISH

≡

AUTOSETUP TIME

>

I/O PROG

>

LOCK SCREEN

>

VIEWS

>

ETHERNET ADAPTER

>>

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ETHERNET ADAPTER

IP MODE

STATIC IP

≡

IP ADDRESS

192.168.0.200

=====

SUBNET MASK

255.255.255.0

=====

GATEWAY

192.168.0.254

=====

2.2 HW Prog Menu

2

Access level 2 (OEM)

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SETTINGS

⚙️

OPTIONS

🔧

HW PROG

👤

USER

🌐

SYSTEM

🔌

I/O TEST

▶

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HARDWARE

AE1

>

AE2

>

This menu may be used to enabled AE Sensor management and Alarm Control for both channels.

It selects the AE Sensor management mode by disabling or enabling it, with or without a connection check.

Enabled ENABLED	If it is not enabled, alarms and measurements are not produced.
Alarm On ALARM ON	If selected, alarm ALA001 or ALA002 is activated in the event of a fault on the corresponding sensor.
Remote REMOTE	Select this parameter in the event of connection to a remote AE sensor, for example with a second MiniCT analogue acoustic cable: the measurement is only validated if a cycle is requested because it is assumed that the remote AE sensor resource can be shared with other electronic units.
ON ACTIVE	Program only when using active acoustic sensors.

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AE 1

ENABLED

☒

ALARMS ON

☒

REMOTE

☐

ACTIVE

☐

←

🏠

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🔔

AE 2

ENABLED

☒

ALARMS ON

☐

REMOTE

☐

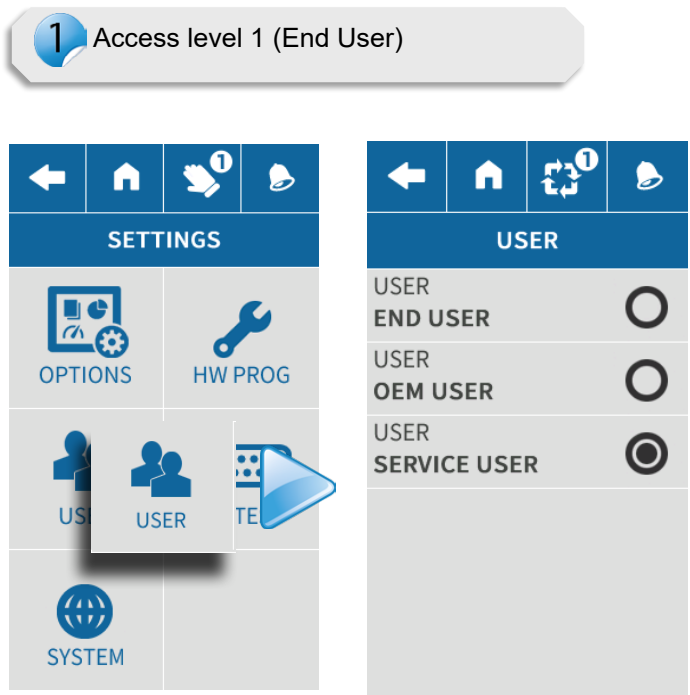
ACTIVE

☐

The options are identical for both channel AE1 and AE2, the only difference being that channel AE1 cannot be disabled.

2.3 User Menu

Use this page to set up the user level.



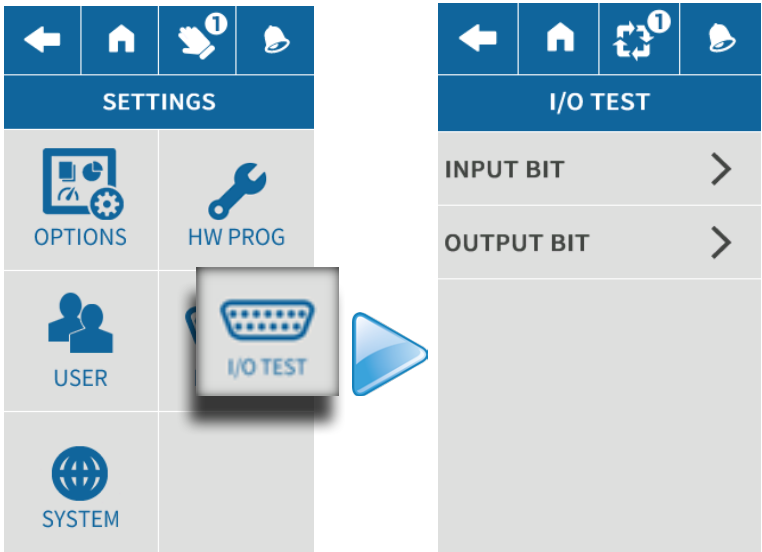
The P1dAE unit offers various operative levels, depending on the user who is currently logged in. These range from simply viewing the data and measurement processes, through programming Sets, to modifying the configuration of the associated electronic unit.
Since not all users can, or should, use the same options, there are three different P1dAE user levels:

- **END USER (E)** level users can view the measurements and sensor monitoring, 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. Default condition.
- **OEM (O)** level users can programme, modify or cancel sets. 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.
- Lastly, **SERVICE (S)** level users can modify configuration data, and programme, modify or delete sets, provided the hardware present permits it. Such users have access to all the Set-up and Prog operations. For this reason this user level is intended primarily for Marposs personnel and is password protected.

The Panel Flow Chart indicates which pages and functions are accessible to the various user levels.

2.4 I/O Test menu

1 Access level 1 (End User)



The I/O tests can be performed in Manual and Automatic mode:

Manual mode:
View the state of the Inputs.
View and/or modify the state of the Outputs

Automatic mode:
Viewing of Inputs and Outputs state

INPUT BIT		
3	CRASH1	<input type="radio"/>
4	CRASH2	<input type="radio"/>
10	GAP1	<input type="radio"/>
11	GAP2	<input type="radio"/>
12	CYCLE BIT	<input type="radio"/>

OUTPUT BIT		
6	CRASH1	<input checked="" type="checkbox"/>
7	CRASH2	<input checked="" type="checkbox"/>
13	GAP1	<input type="checkbox"/>
14	GAP2	<input type="checkbox"/>
15	ALARM/BUSY	<input type="checkbox"/>

[

NOTE
To modify the parameters on the OUTPUT BIT page, access level 2 is required 2

2.5 System Menu

1 Access level 1 (End User)

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SETTINGS

OPTIONS

HW PROG

USER

I/O TEST

SYSTEM

←

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👤1

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SYSTEM

EQUIPMENT INFORMATION

>

PANEL

>

SAVE SCREENSHOTS

✓

FACTORY DATA RESTORE

>

EQUIPMENT INFORMATION

PANEL

SAVE SCREENSHOT

FACTORY DATA RESTORE

2.5.1 Equipment Information

1 Access level 1 (End User)

This page may be used to display the firmware versions of the various components of the application.

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SYSTEM

EQUIPMENT INFORMATION

>

PANEL

>

SAVE SCREENSHOTS

✓

FACTORY DATA RESTORE

>

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EQUIPMENT INFORMATION

PACKAGE CODE

BSM1D340012

PACKAGE VERSION

V2.2B

MAIN UNIT FIRMWARE

V2.2.1

PANEL FIRMWARE

V2.2.1

SERIAL NUMBER

2.5.2 Panel

1 Access level 1 (End User)

It is possible to access the functions used to regulate the P1dAE panel from this menu.

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SYSTEM

EQUIPMENT INFORMATION

>

PANEL

>>

SAVE SCREENSHOTS

✓

FACTORY DATA RESTORE

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PANEL

BRIGHTNESS

%

100

CALIBRATE TOUCHSCREEN

>

TEST TOUCHSCREEN

>

RESET CALIBRATION

>

BRIGHTNESS

Press the keyboard to regulate the panel brightness, entering the desired brightness value manually.

PANEL - TOUCH SCREEN CALIBRATION AND TEST

3 Access level 3 (Service)

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PANEL

BRIGHTNESS

%

100

CALIBRATE TOUCHSCREEN

>>

TEST TOUCHSCREEN

>>

RESET CALIBRATION

>

CALIBRATING THE TOUCH SCREEN

TEST TOUCH SCREEN

Access this function in order to calibrate and test the touch screen. In order to carry out these tests, follow the instructions provided on the test and calibration pages.

PANEL - TOUCH SCREEN CALIBRATION AND TEST

3 Access level 3 (Service)

←

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🔔

PANEL

BRIGHTNESS

%

100

=====

CALIBRATE TOUCHSCREEN>

TEST TOUCHSCREEN>

RESET CALIBRATION>>

←

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🔔

RESET CALIBRATION

This function may be used to reset the panel calibration settings and restore the original factory settings.

Are you sure you want to reset touchscreen calibration?

CANCEL

CONFIRM

2.5.3 Save Screen Shots

3 Access level 3 (Service)

←

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SYSTEM

EQUIPMENT INFORMATION>

PANEL>

SAVE SCREENSHOTS☒

FACTORY DATA RESTORE>

Use this function to save screen shots.

☐Function disabled

☒Function enabled

←

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🔔

SCREENSHOT SAVED

The screenshot has been saved to file
C:\temp\screen05.bmp.

OK

If this function is enabled, it is possible to capture any image by pressing any part of the panel simultaneously with two fingers. When an image has been captured, the adjacent message is displayed.

It is possible to save up to 10 images (if more than 10 images are saved, the previous ones are overwritten).

It is possible to down,load the images from the device using the P1dAETool. This function may only be accessed by Marposs technicians.

2.5.4 Restore Factory Data

2 Access level 2 (OEM)

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SYSTEM

EQUIPMENT INFORMATION>

PANEL>

SAVE SCREENSHOTS☒

FACTORY DATA RESTORE>>

←

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🔔

FACTORY DATA RESTORE

Are you sure you want to restore device to its factory settings?


CANCEL


CONFIRM

This function may be used to reset the device and restore the original factory settings.

3. PROG MENU

3.1 Programming and Creating SETS

 Programming in manual mode only

 View only in automatic mode

1

 Access level 1 (End User)

The operating data are associated with a Set number; it is possible to create a maximum of 2 sets

► Example of programming with one Set:

HOME

SERVICE USER

VIEWS

PROG

SETTINGS

SET MANAGEMENT

1

SET 1 PROGRAMMING, AE1

HARDWARE

GAP

CRASH

ANALOG OUT 1
GAP1

ANALOG OUT 2
CRASH1

Set Programming Menu:

HARDWARE

GAP

CRASH

ANALOGUE OUT 1

ANALOGUE OUT 2

► Example of programming with two Sets:

SET MANAGEMENT

1

2

SET 1 PROGRAMMING

AE1

AE2

ANALOG OUT 1
GAP 1

ANALOG OUT 2
CRASH 1

SET 1 PROGRAMMING

HARDWARE

GAP

CRASH

SET PROGRAMMING - CREATING A NEW SET

The start page lists all the sets that have already been set-up and saved; to create a new one, press:

←

+

🔊

SET MANAGEMENT

🗑️

📄

1

>

Press this button to create SET 2

SET PROGRAMMING - ACCESSING PROGRAMMING

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SET MANAGEMENT

🗑️

📄

1

1

>

🗑️

📄

2

>

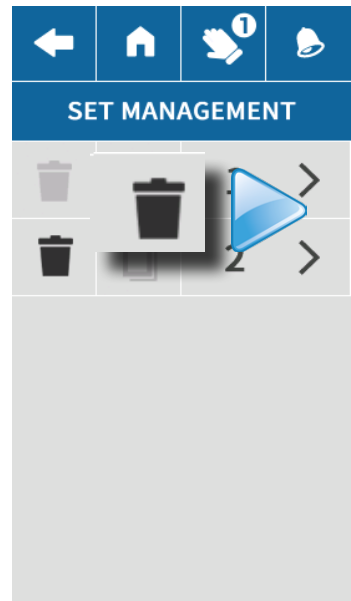
Once they have been created, the sets must be programmed.
To program a new set, or modify an existing one, press the arrow corresponding to the desired set.

SET PROGRAMMING - COPYING A SET



Use this softkey to duplicate the existing set

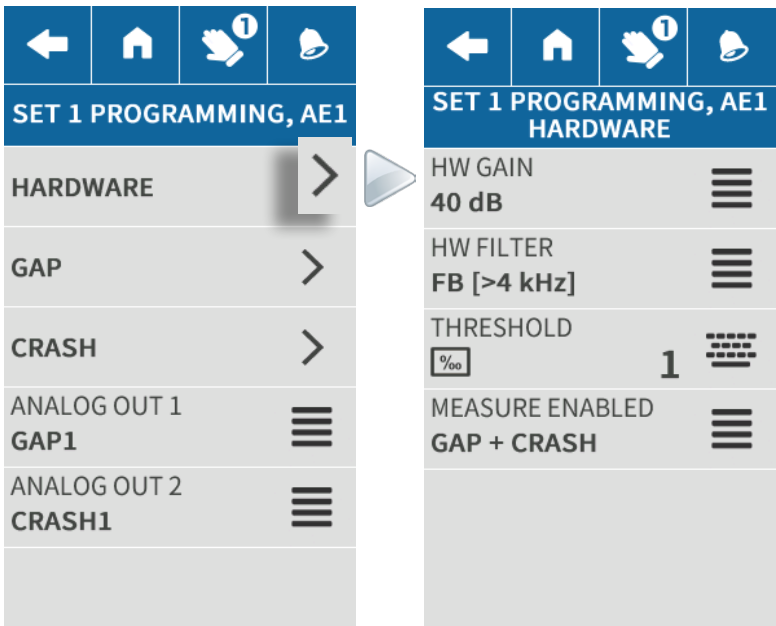
SET PROGRAMMING - DELETING A SET



- Use this softkey to delete a set
- Press the “Delete” key
 - A message appears requesting the operator to confirm the action
 - Press “Confirm” to confirm, or “Cancel” to cancel the action

3.2 Hardware Programming

1 Access level 1 (End User)

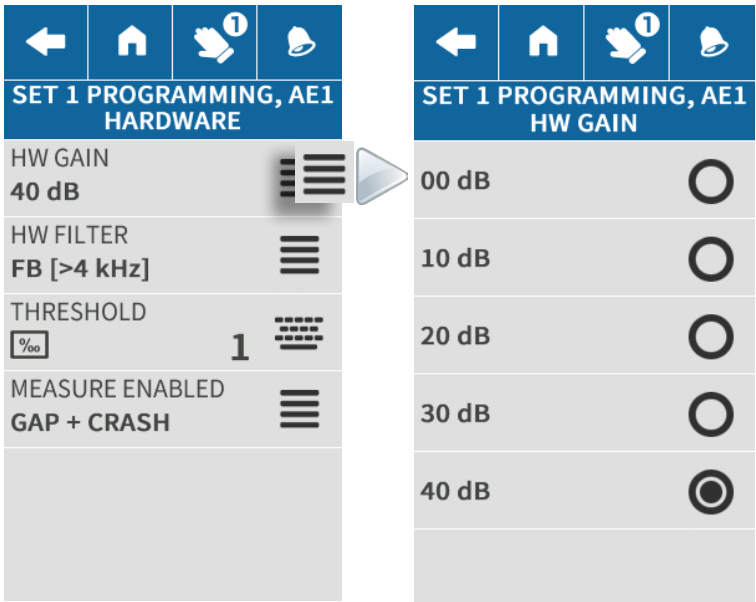


You can set the following parameters in the SET Hardware programming menu:

- HW GAIN
- HW FILTER
- THRESHOLD
- MEASURE ENABLED

3.2.1 Hardware Programming - Hardware Gains

1 Access level 1 (End User)



HW stage gain (list of 10 dB step values)
Sets the HW stage gain: to be programmed for a signal that is high but far from saturation in the least favourable machine operating conditions.

HW GAIN should be programmed so that it never exceeds half of the trend available in the worst working conditions (maximum noise).

HW GAIN must be programmed in combination with HW FILTER. Set a value that is high, but does not saturate the signal.

3.2.2 Hardware Programming - Hardware Filter

1 Access level 1 (End User)

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SET 1 PROGRAMMING, AE1
HARDWARE

HW GAIN
40 dB

HW FILTER
FB [>4 kHz]

THRESHOLD
1

MEASURE ENABLED
GAP + CRASH

▶

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SET 1 PROGRAMMING, AE1
HW FILTER

FB [>4 kHz]

HP [>80 kHz]

HF [>400 kHz]

HW stage filtering band (3 value list).

Sets the HW HP (High-Pass) stage filtering capacity if the machine has background noise components that are large/variable in the low frequency spectrum: this prevents saturation of the acquisition noise circuits, allowing a higher HW gain.

HW FILTER must be programmed in combination with HW GAIN, if possible favouring the FB (Full Band) value.

3.2.3 Hardware Programming - Threshold

2 Access level 2 (OEM)

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SET 1 PROGRAMMING, AE1
HARDWARE

HW GAIN
40 dB

HW FILTER
FB [>4 kHz]

THRESHOLD
1

MEASURE ENABLED
GAP + CRASH

▶ Minimum threshold of the AE Sensor HW noise signal. Check the value of the signal from the AE Sensor.

3.2.4 Hardware Programming - Measurement Enabled

2 Access level 2 (OEM)

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SET 1 PROGRAMMING, AE1
HARDWARE

HW GAIN
40 dB

HW FILTER
FB [>4 kHz]

THRESHOLD
1

MEASURE ENABLED
GAP + CRASH

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SET 1 PROGRAMMING, AE1
MEASURE ENABLED

GAP + CRASH

GAP

CRASH

Selecting Gap and/or Crash mode. Use this function to activate or deactivate the Gap/Crash modes

- **GAP+CRASH:** Gap Active – Crash Active
- **GAP:** Gap Active – Crash Disabled
- **CRASH:** Gap Disabled – Crash Active

3.3 GAP Menu

1 Access level 1 (End User)

←	🏠	👤	🔔
SET 1 PROGRAMMING, AE1			
HARDWARE	>		
GAP	>		
CRASH	>		
ANALOG OUT 1 GAP1	≡		
ANALOG OUT 2 CRASH1	≡		

←	🏠	👤	🔔
SET 1 PROGRAMMING, AE1 GAP			
SW GAIN	dB	0	=====
MIN FREQUENCY	kHz	4	=====
MAX FREQUENCY	kHz	1000	=====
FILTER VALUE	ms	1.0	=====
OUTPUT BIT		>	
ZEROING		>	

GAP Programming Menu:

- SW GAIN
- MIN FREQUENCY
- MAX FREQUENCY
- FILTER VALUE
- OUTPUT BIT
- ZEROING

3.3.1 GAP Programming - Software Gain

1 Access level 1 (End User)

←	🏠	👤	🔔
SET 1 PROGRAMMING, AE1 GAP			
SW GAIN	dB	0	=====
MIN FREQUENCY	kHz	4	=====
MAX FREQUENCY	kHz	1000	=====
FILTER VALUE	ms	1.0	=====
OUTPUT BIT		>	
ZEROING		>	

SW GAIN
Sets the GAP measurement processing gain.
Program after setting up the HW GAIN and HW FILTER parameters,
so that the Gap signal exceeds above the threshold (GAP THRESHOLD)
when the Gap event occurs.
Setting range : from 0 dB to 99 dB.

NOTE
The SW GAIN parameter is calculated automatically by the Automatic
Set-up guided procedure (See Views Menu/Automatic Set-up), and
may be modified together with other parameters in Manual Set-up, or
modified manually on this page.

3.3.2 GAP Programming - Minimum Frequency

1 Access level 1 (End User)

←	🏠	👤	🔔
SET 1 PROGRAMMING, AE1 GAP			
SW GAIN	dB	0	=====
MIN FREQUENCY	kHz	4	=====
MAX FREQUENCY	kHz	1000	=====
FILTER VALUE	ms	1.0	=====
OUTPUT BIT		>	
ZEROING		>	

MINIMUM FREQUENCY
Measurement minimum frequency [kHz]
The parameter is automatically calculated by the Automatic Set-up guided
procedure (AUTOMATIC SET-UP page in VIEWS).
The parameter may also be modified manually.

3.3.3 GAP Programming - Maximum Frequency

1 Access level 1 (End User)

←	🏠	👤	🔔
SET 1 PROGRAMMING, AE1 GAP			
SW GAIN	dB	0	=====
MIN FREQUENCY	kHz	4	=====
MAX FREQUENCY	kHz	1000	=====
FILTER VALUE	ms	1.0	=====
OUTPUT BIT		>	
ZEROING		>	

MAX FREQUENCY
Measurement maximum frequency [kHz]
The parameter is automatically calculated by the Automatic Set-up guided
procedure (AUTOMATIC SET-UP page in VIEWS).
The parameter may also be modified manually.

3.3.4 GAP Programming - Filter Value

1 Access level 1 (End User)

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SET 1 PROGRAMMING, AE1
GAP

SW GAIN
[dB] 0

MIN FREQUENCY
[kHz] 4

MAX FREQUENCY
[kHz] 1000

FILTER VALUE
[ms] 1.0

OUTPUT BIT >

ZEROING >

FILTER VALUE
Sets the GAP Measurement processing filters, stabilising it in excessive noise but with a consequent increase in the total reaction time. Increasing the “FILTER VALUE” time prevents excessive signal noise from causing false triggering of the GAP Measurement output bit, but penalises system response times

3.3.5 GAP Programming - Output Bit

1 Access level 1 (End User)

GAP output Bit programming parameters.

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SET 1 PROGRAMMING, AE1
GAP

SW GAIN
[dB] 0

MIN FREQUENCY
[kHz] 4

MAX FREQUENCY
[kHz] 1000

FILTER VALUE
[ms] 1.0

OUTPUT BIT >>

ZEROING >

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SET 1 PROGRAMMING, AE1
GAP PARAMETERS

THRESHOLD
[‰] 600 1

MODE
▲ 🔒 > 2

MINIMUM TIME ON
[ms] 0 3

1) GAP PARAMETERS - THRESHOLD

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SET 1 PROGRAMMING, AE1
GAP PARAMETERS

THRESHOLD
[‰] 600

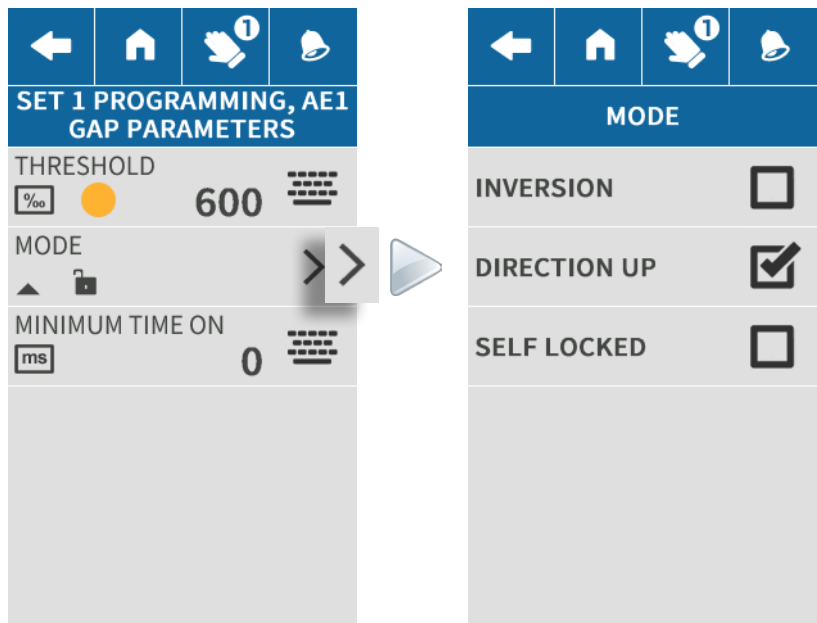
MODE
▲ 🔒 >

MINIMUM TIME ON
[ms] 0

THRESHOLD
GAP measurement output bit trigger threshold [relative to the Range from 0 to 900]
Use this parameter to set the trigger threshold for the GAP command used to determine contact between the grinding wheel and part, or grinding wheel and dressing wheel.

2) GAP PARAMETERS - MODE

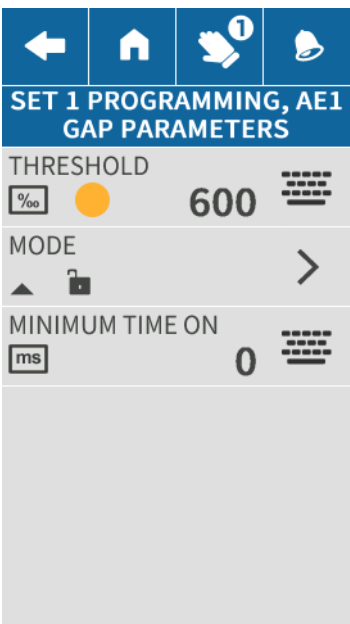
2 Access level 2 (OEM)



Use this section to define some behaviour for the GAP function

	INVERSION If activated, this function inverts the state of the output signal with respect to the control logic condition.
	DIRECTION UP If this function is activated, the Gap output command is triggered when the noise level exceeds the threshold S1.
	If the function is disabled, the Gap output command is triggered when the noise level drops below the threshold S1.
	SELF LOCKED
	GAP signal self locked: as soon as the machine control starts the cycle, the GAP signal is reset. When contact between the grinding wheel and the part or the abrasive dressing wheel is detected, the machine is supplied with the signal, which remains set until the next cycle start. This mode is recommended for the end of air gap check.
	GAP signal not self locked: as soon as the machine control starts the cycle, the GAP signal is reset. The signal supplied to the machine remains while there is contact detected between the grinding wheel and the part or the abrasive dressing wheel. As soon as contact ends, the GAP signal is switched off again. This mode is recommended for the dressing control.

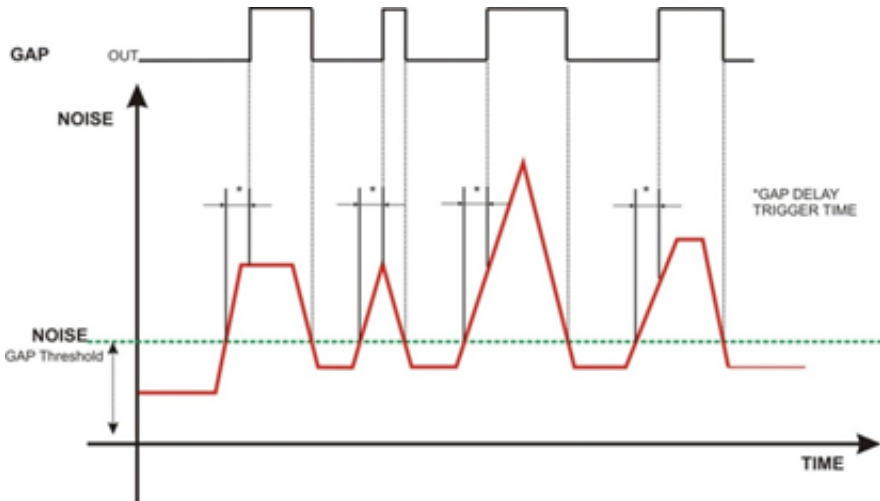
3) GAP PARAMETERS - MINIMUM TIME ON



MINIMUM TIME ON

This parameter may be used to define the minimum length of time that the GAP condition must be present before the corresponding command (activate GAP output) is triggered; this means that the Gap command will not be triggered until the noise level has exceeded the pre-set threshold value for a period greater than that set-up during this phase. In this way it is possible to filter out any impulse noise that might generate false GAP events, although this function will also delay the point at which the command is triggered.

Example of non self-locking GAP, active high:



Setting range between 0 and 9.999 seconds (resolution 0.001 seconds).

3.3.6 GAP Programming - Zeroing

1 Access level 1 (End User)

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SET 1 PROGRAMMING, AE1
GAP

SW GAIN
[dB] 0

MIN FREQUENCY
[kHz] 4

MAX FREQUENCY
[kHz] 1000

FILTER VALUE
[ms] 1.0

OUTPUT BIT >

ZEROING >>

←

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SET 1 PROGRAMMING, AE1
ZEROING

ZEROING ☒

AUTO ON CYCLE ☒

MODE
MEAN VALUE

ZEROING TIME
[ms] 250

AUTO THRESHOLD >

12345

1) ZEROING ENABLED

The GAP channel may be processed in Absolute or Incremental mode. It is necessary to enable the “Zeroing” function when working in Incremental mode.

2) AUTO ON CYCLE

If selected, the P1dAE performs instantaneous zeroing at the moment when a Gap cycle command is issued: the cycle chart on the PLC will have to consider a delay due to that zeroing equal to the value programmed in ZEROING TIME [ms].

3) MODE

This parameter may be used to select either the maximum or minimum value.

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SET 1 PROGRAMMING, AE1
ZEROING

ZEROING ☒

AUTO ON CYCLE ☒

MODE
MEAN VALUE

ZEROING TIME
[ms] 250

AUTO THRESHOLD >

←

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SET 1 PROGRAMMING, AE1
MODE

MAX VALUE ○

MEAN VALUE ●

4) ZEROING TIME

This parameter corresponds to the length of time during which the P1dAE determines the value of the background noise that must be subtracted to zero set the acoustic signal.

5) AUTO THRESHOLD

The system monitors the acoustic signal during the zeroing period and calculates the best value for the threshold, based on the noisiness of the acoustic signal and the “sensitivity” parameter, which may increase the value of the threshold to a safer level.

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SET 1 PROGRAMMING, AE1
ZEROING

ZEROING ☒

AUTO ON CYCLE ☒

MODE
MEAN VALUE

ZEROING TIME
[ms] 250

AUTO THRESHOLD >

←

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SET 1 PROGRAMMING, AE1
AUTO THRESHOLDENABLED ☒MODE
AFTER ZEROINGSENSITIVITY
1.2MAX THRESHOLD
[‰] 600☒ **ENABLED**
Enables/Disables the “automatic threshold” function**SENSITIVITY**
The Sensitivity value ranges from 1.1 to 100.0 and the default value is 1.2.
This parameter defines the sensitivity factor used to increase the value of the automatic threshold calculated during zeroing.

←

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SET 1 PROGRAMMING, AE1
AUTO THRESHOLD

ENABLED ☒

MODE
AFTER ZEROING

SENSITIVITY
1.2

MAX THRESHOLD
[‰] 600

←

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SET 1 PROGRAMMING, AE1
MODE

AFTER ZEROING ●

WHILE ZEROING ○

MODE
it is possible to select either AFTER ZEROING or WHILE ZEROING mode.

AFTER ZEROING calculates the background noise zeroing value after the zeroing process is complete, whereas WHILE ZEROING estimates the background noise value during the zeroing process.
(Default setting: after zeroing).

MAX. THRESHOLD

The calculated auto threshold value may not exceed the value set-up in this parameter.

3.4 CRASH Menu

1 Access level 1 (End User)

←	🏠	👤	🔔
SET 1 PROGRAMMING, AE1			
HARDWARE	>		
GAP	>		
CRASH	>>		
ANALOG OUT 1	≡		
GAP1	≡		
ANALOG OUT 2	≡		
CRASH1	≡		

←	🏠	👤	🔔
SET 1 PROGRAMMING, AE1 CRASH			
SW GAIN	dB	4	▬▬▬▬
MIN FREQUENCY	kHz	4	▬▬▬▬
MAX FREQUENCY	kHz	1000	▬▬▬▬
FILTER VALUE	ms	200.0	▬▬▬▬
OUTPUT BIT	>		

CRASH Programming Menu:

- SW GAIN
- MIN FREQUENCY
- MAX FREQUENCY
- FILTER VALUE
- OUTPUT BIT

3.4.1 CRASH Programming - Software Gains

1 Access level 1 (End User)

←	🏠	👤	🔔
SET 1 PROGRAMMING, AE1 CRASH			
SW GAIN	dB	4	▬▬▬▬
MIN FREQUENCY	kHz	4	▬▬▬▬
MAX FREQUENCY	kHz	1000	▬▬▬▬
FILTER VALUE	ms	200.0	▬▬▬▬
OUTPUT BIT	>		

SW GAIN

The SW GAIN parameter is calculated automatically by the Automatic Set-up guided procedure (See VIEWS/AUTOMATIC SET-UP), and may be modified together with other parameters in Manual Set-up (VIEWS/MANUAL SET-UP) or modified manually on this page. Sets the CRASH measurement processing gain. Program after setting up the HW GAIN and HW FILTER parameters, for having the Crash signal below the threshold (CRASH THRESHOLD) in any machine normal operating condition. Setting range : from 0 dB to 99dB.

3.4.2 CRASH Programming - Minimum Frequency

1 Access level 1 (End User)

←	🏠	👤	🔔
SET 1 PROGRAMMING, AE1 CRASH			
SW GAIN	dB	4	▬▬▬▬
MIN FREQUENCY	kHz	4	▬▬▬▬
MAX FREQUENCY	kHz	1000	▬▬▬▬
FILTER VALUE	ms	200.0	▬▬▬▬
OUTPUT BIT	>		

MIN FREQUENCY

Measurement minimum frequency [kHz]
The parameter is automatically calculated by the Automatic Set-up guided procedure (AUTOMATIC SET-UP page in VIEWS). It is not advisable to modify this parameter.

3.4.3 CRASH Programming - Maximum Frequency

1 Access level 1 (End User)

←	🏠	👤	🔔
SET 1 PROGRAMMING, AE1 CRASH			
SW GAIN	dB	4	▬▬▬▬
MIN FREQUENCY	kHz	4	▬▬▬▬
MAX FREQUENCY	kHz	1000	▬▬▬▬
FILTER VALUE	ms	200.0	▬▬▬▬
OUTPUT BIT	>		

MAX FREQUENCY

Measurement maximum frequency [kHz]
The parameter is automatically calculated by the Automatic Set-up guided procedure (AUTOMATIC SET-UP page in VIEWS). It is not advisable to modify this parameter.

3.4.4 CRASH Programming - Filter Value

1 Access level 1 (End User)

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SET 1 PROGRAMMING, AE1
CRASH

SW GAIN

dB

4

=====

MIN FREQUENCY

kHz

4

=====

MAX FREQUENCY

kHz

1000

=====

FILTER VALUE

ms

200.0

=====

OUTPUT BIT

>

FILTER VALUE
Sets the CRASH Measurement processing filters, stabilising it in excessive noise but with a consequent increase in the total reaction time. Increasing the “FILTER VALUE” prevents excessive signal noise from causing false triggering of the CRASH Measurement output bit, but penalises system response times.

3.4.5 CRASH Programming - Output Bit

1 Access level 1 (End User)

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SET 1 PROGRAMMING, AE1
CRASH

SW GAIN

dB

4

=====

MIN FREQUENCY

kHz

4

=====

MAX FREQUENCY

kHz

1000

=====

FILTER VALUE

ms

200.0

=====

OUTPUT BIT

>>

←

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🔔

SET 1 PROGRAMMING, AE1
CRASH PARAMETERS

THRESHOLD

%

●

800

=====

MODE

— ▲ 🔒

>

MINIMUM TIME ON

ms

0

=====

1) CRASH PARAMETERS - THRESHOLD

←

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SET 1 PROGRAMMING, AE1
CRASH PARAMETERS

THRESHOLD

%

●

800

=====

MODE

— ▲ 🔒

>

MINIMUM TIME ON

ms

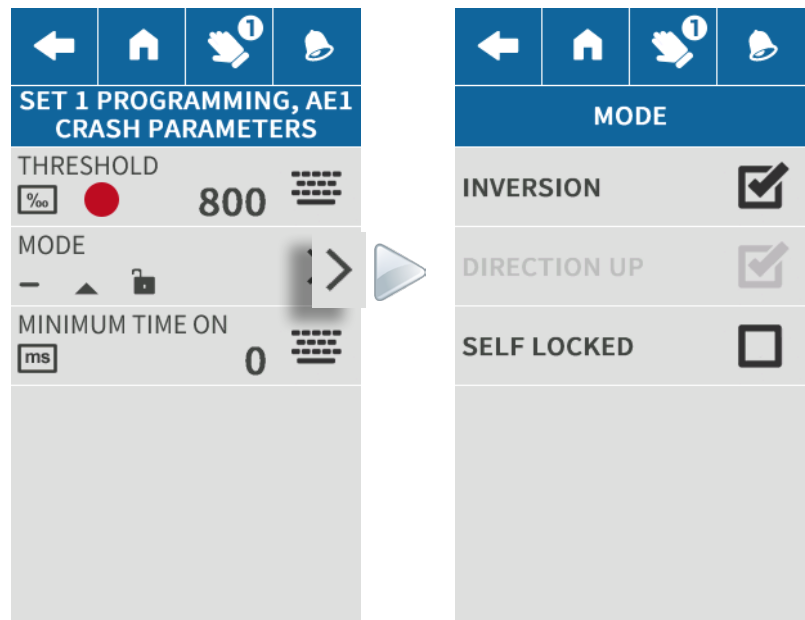
0

=====

CRASH COMMAND THRESHOLD
CRASH command trigger threshold setting, to be programmed for having the Crash signal above the threshold on an estimated Crash event, never in the machine normal operating condition.

2) CRASH PARAMETERS - MODE

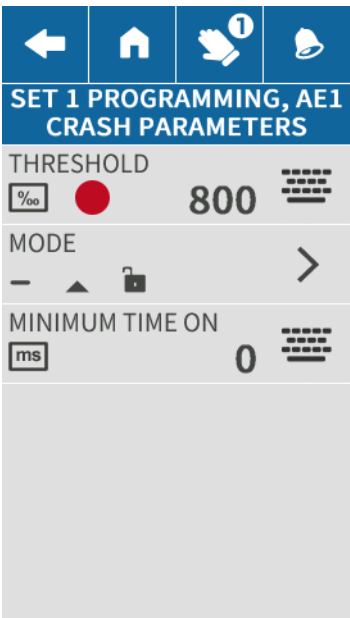
2 Access level 2 (OEM)



Use this section to define some behaviour for the GAP function

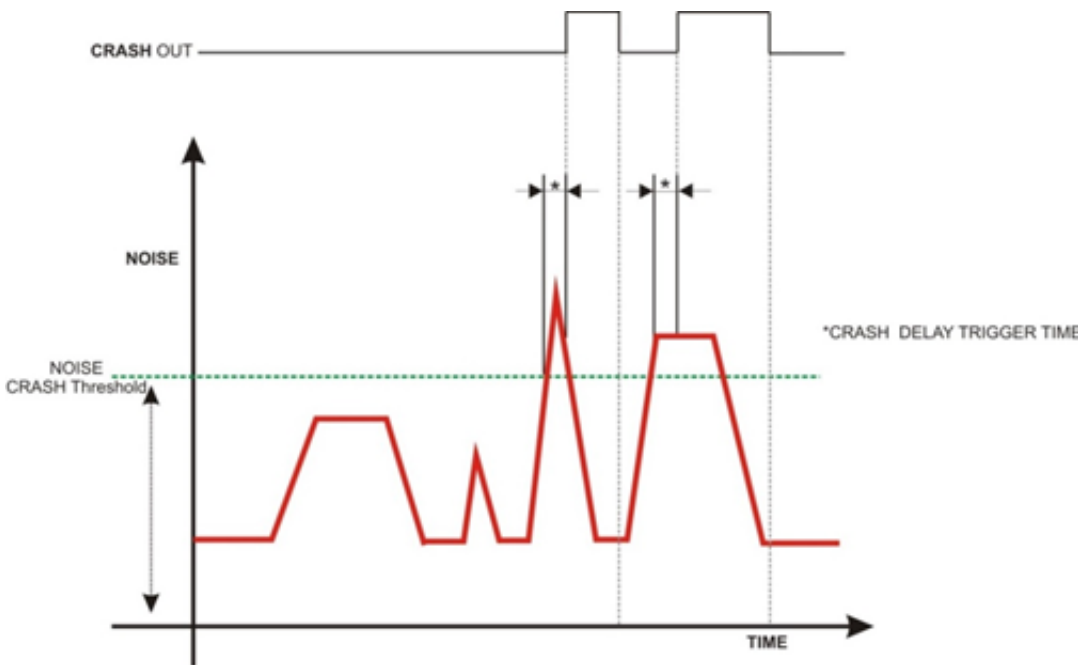
	INVERSION If activated, this function inverts the state of the output signal with respect to the control logic condition.
	SELF LOCKED Self-locked control. Once supplied the Crash output check is reset only at the successive Crash check enabling.
	NON self-locked control. The Crash output control is reset when the noise level drops below the trigger threshold.

3) CRASH PARAMETERS - MINIMUM TIME ON



This parameter may be used to define the minimum length of time that the CRASH condition must be present before the corresponding command (activate CRASH output) is triggered; this means that the Crash command will not be triggered until the noise level has exceeded the pre-set threshold value for a period greater than that set-up during this phase. In this way it is possible to filter out any impulse noise that might generate false Crash events, although this function will also delay the point at which the command is triggered.

Example of non self-locking CRASH, active high:



Setting range between 0 and 9.999 seconds (resolution 0.001 seconds).

3.5 Analogue Outputs

2 Access level 2 (OEM)

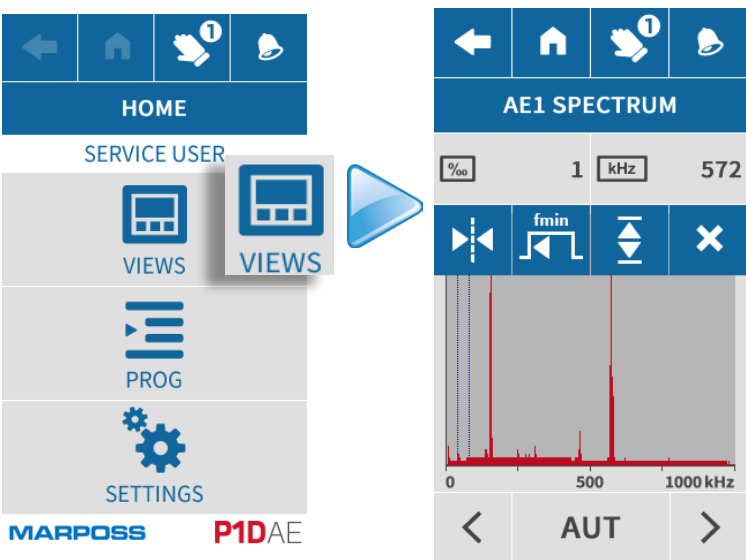
← SET 1 PROGRAMMING, AE1 →	← SET 1 PROGRAMMING, ANALOG OUT 1 →	← SET 1 PROGRAMMING, ANALOG OUT 2 →
HARDWARE >	GAP 1 <input checked="" type="radio"/>	GAP 1 <input type="radio"/>
GAP >	CRASH 1 <input type="radio"/>	CRASH 1 <input checked="" type="radio"/>
CRASH >	GAP 2 <input type="radio"/>	GAP 2 <input type="radio"/>
ANALOG OUT 1 GAP1	CRASH 2 <input type="radio"/>	CRASH 2 <input type="radio"/>
ANALOG OUT 2 CRASH1	AUTO GAP <input type="radio"/>	AUTO GAP <input type="radio"/>
	AUTO CRASH <input type="radio"/>	AUTO CRASH <input type="radio"/>

Analogue output signal Sets the Analogue Output measurement source (0 to 10 [V]).
The choice may be static in the cases of GAP 1 or 2 and CRASH 1° 2, or dynamic by selecting AUTO GAP or AUTO CRASH.
When AUTO GAP is selected, either the GAP 1 signal or the GAP 2 signal is directed to the output, depending on the cycle requested. The principle is the same if AUTO CRASH is selected.

4. VIEWS MENU

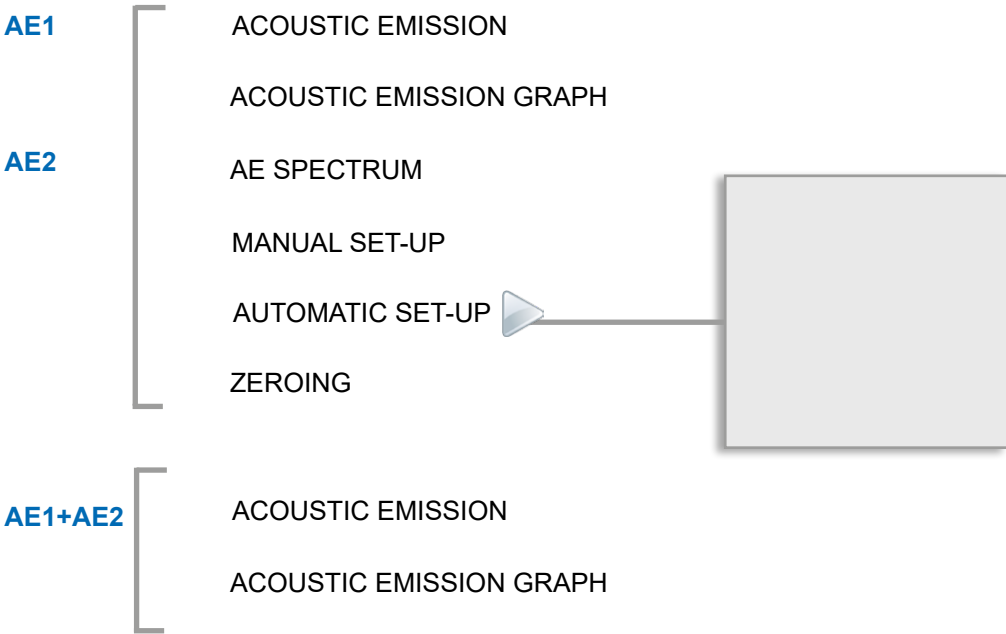
Programming in manual mode only View only in automatic mode

1 Access level 1 (End User)



This menu can be used to access the various acoustic measurement display pages.

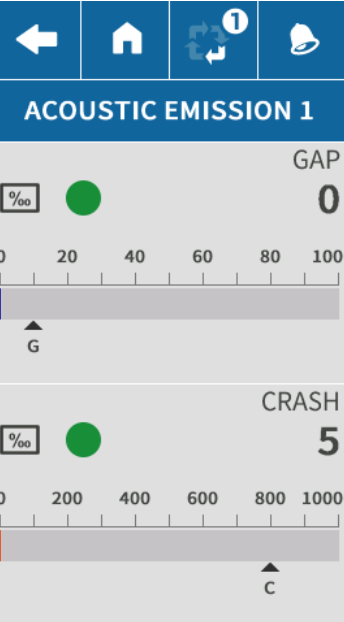
VIEWS MENU



4.1 Acoustic Emission

1 Access level 1 (End User)

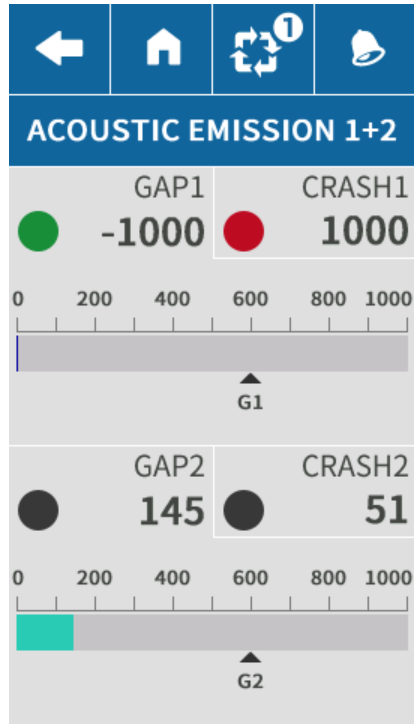
This displays the Gap check and Crash check noise values.
The values are displayed numerically and on a bargraph.



Gap check noise value
G= GAP command trigger threshold

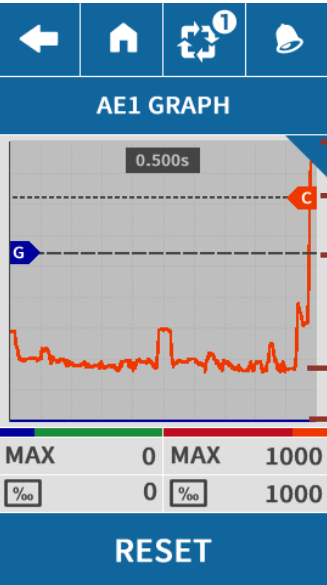
Crash check noise value
C= CRASH command trigger threshold

For a 2-channel equipment unit, you can open the Acoustic Emission display page for the two channels simultaneously:
MENU VIEWS → AE1 + AE2 → ACOUSTIC EMISSION
On this page you can display the graph of the noise value for the Gap check and Crash check for the two channels simultaneously.



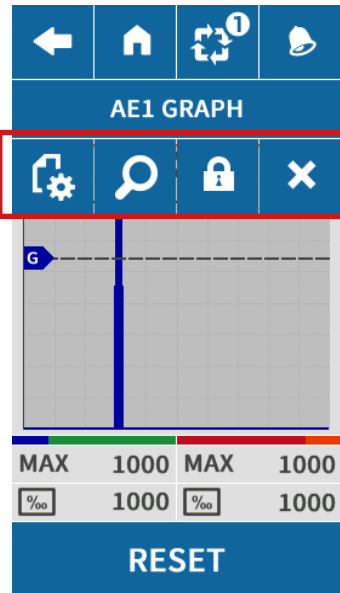
4.2 Acoustic Emission Graph

This page is used to display the Gap and Crash function oscilloscope



Click on this triangle to open the options window.(*)
Crash signal threshold
Gap signal threshold
Noise level measurement - CRASH signal
Noise level measurement - GAP signal

(*) Press the blue triangle to open a window with option keys:



Press this button to open the GAP and CRASH threshold set-up window at the bottom of the screen:



Use the + and – keys to change the threshold value.
And the left/right arrows to move from Gap to Crash.



Press this key and the zoom control bar appears at the bottom of the screen:

Use the magnifying glass icon to zoom in or out on the graph.



Use the arrows to move the area of the graph to be displayed.



Oscilloscope STOP function.



Key for exiting options panel.

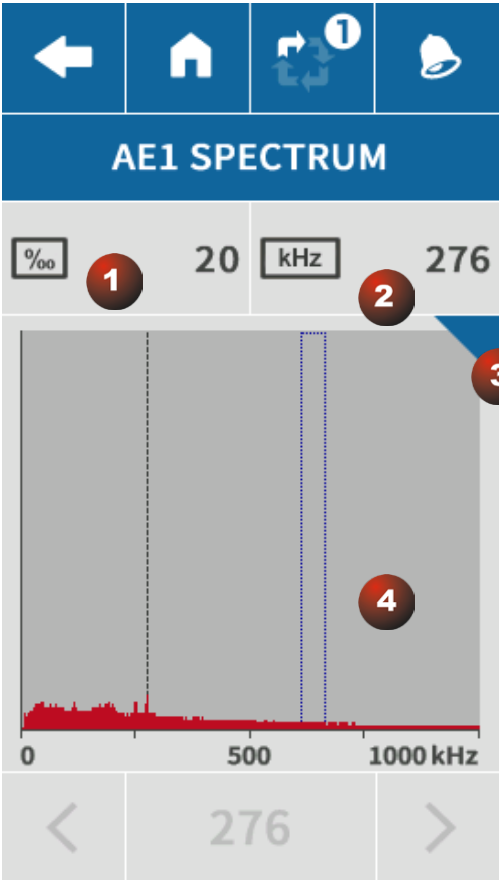
4.3 Acoustic Emission Spectrum

The frequency spectral analysis procedure allows a display of the machine frequency behaviour, with a band between 0 and 1 MHz in 4kHz steps.
The maximum amplitude component is highlighted, showing its peak value and the relative frequency.

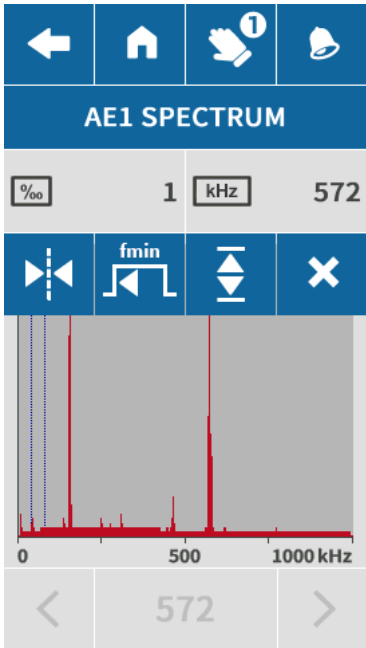
Opening the options window allows:

- management of the displaying of a slider on the maximum amplitude spectral component, in automatic or manual mode, specifying the frequency
- management of minimum and maximum frequency adjustment for the GAP measurement, while displaying the relative barriers
- management of the maximum value in the vertical scale
- Minimum and maximum frequency adjustment for the GAP measurement, accessible using the fmin and fmax toggle option keys, allows programming of the MIN FREQUENCY and MAX FREQUENCY parameters for the GAP measurement in a more intuitive graphical environment: the relative barriers displayed allow graphical identification of the portion of the spectrum that will be used for processing the GAP measurement.

The MIN FREQUENCY and MAX FREQUENCY parameters are the same as those which can be modified in PROG by selecting the current set and the GAP measurement.



- 1) Amplitude [parts per thousand] of the main spectral line
- 2) Frequency [kHz] of the main spectral line
- 3) Key for opening the options window
- 4) Spectrum display area



Vertical slider



MIN FREQUENCY and MAX FREQUENCY parameter values relative to the GAP measurement for the current set.



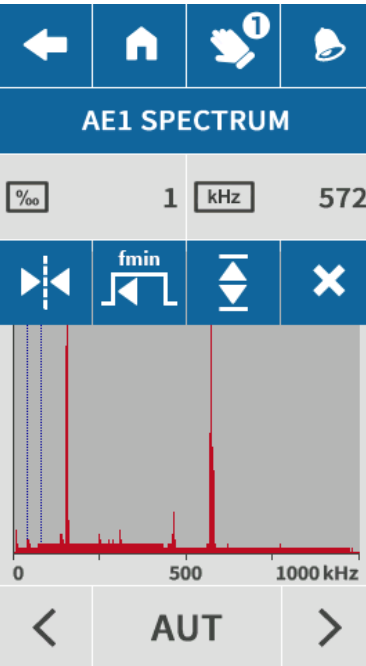
Maximum value in the vertical scale



Close options window



Vertical slider that may be either automatic or manual:



< MAN >

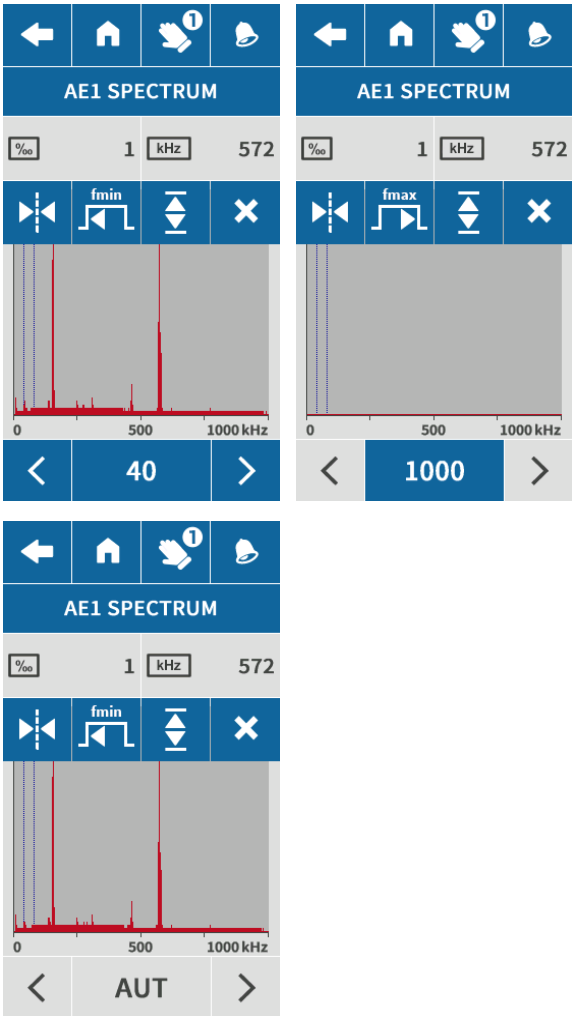
AUTOMATIC indicates the current maximum value on the graph.

< AUT >

MANUAL: the user positions the slider by means of a selector located under the graph, which is enabled only once the options window has been closed.

< 40 >

It is possible to move to a given position by pressing the value itself, opening a numeric keypad.



The fmin and fmax keys act on the values of the MIN FREQUENCY and MAX FREQUENCY parameters relative to the GAP measurement for the current set.

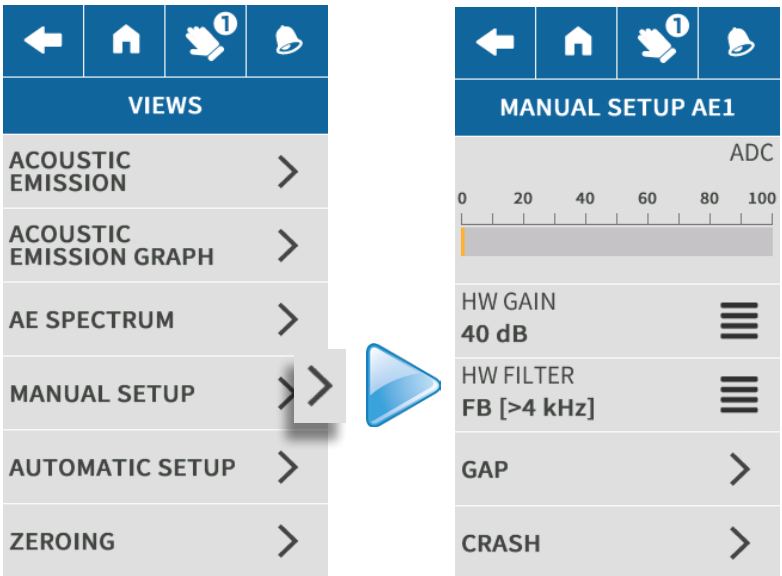
Press the fmin button to switch to fmax.

Select one of the two parameters, then act on the value using the arrows below.

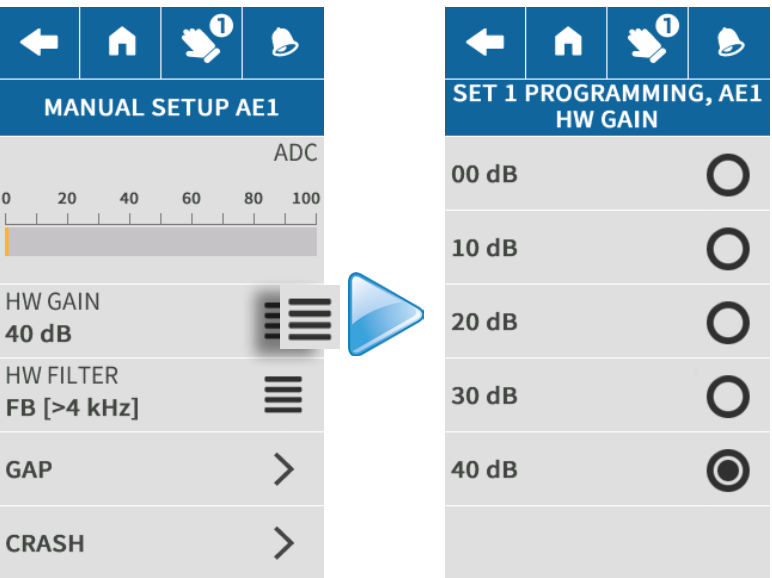
4.4 Manual Set-up Menu

This VIEWS page is a wizard which allows a Manual Set-up of a P1dAE AE channel, programming all of its basic parameters in a graphical environment:

- 1. HW GAIN
- 2. HW FILTER
- 3. GAP (SW GAIN / MIN and MAX FREQUENCY)
- 4. CRASH (SW GAIN / MIN and MAX FREQUENCY)



This page can be used as an alternative to the Automatic Set-up wizard (see next section) or to refine its results. The parameters always relate to the currently selected set.

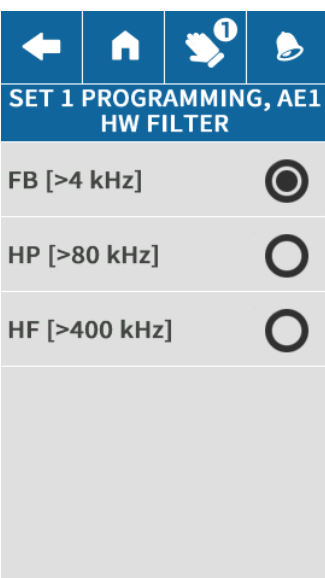
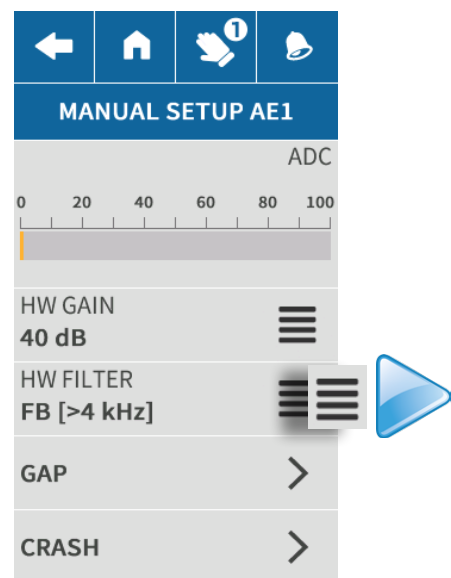


1) HW GAIN PROGRAMMING

Sets the Hardware stage gain: to be programmed for a signal that is high but far from saturation in the least favourable machine operating conditions.

HW GAIN should be programmed so that it never exceeds half of the trend available in the worst working conditions (maximum noise).

HW GAIN must be programmed in combination with HW FILTER. Set a value that is high, but does not saturate the signal.



2) HW FILTER PROGRAMMING
HW stage filtering band (3 value list).

Sets the HW HP (High-Pass) stage filtering capacity if the machine has background noise components that are large/variable in the low frequency spectrum: this prevents saturation of the acquisition noise circuits, allowing a higher HW gain.

HW FILTER must be programmed in combination with HW GAIN, if possible favouring the FB (Full Band) value.

NOTE

The HW GAIN and HW FILTER parameters are the same as those which can be modified in PROG by selecting the current set.

The MIN FREQUENCY and MAX FREQUENCY parameters are the same as those which can be modified in PROG by selecting the current set and the GAP measurement.

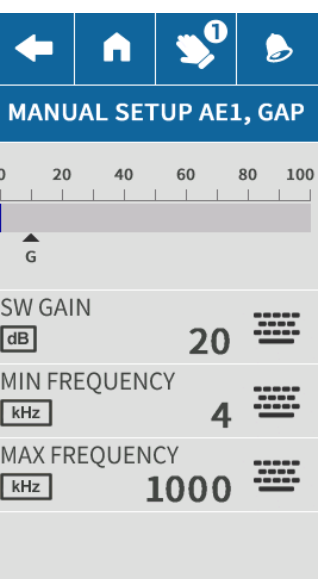
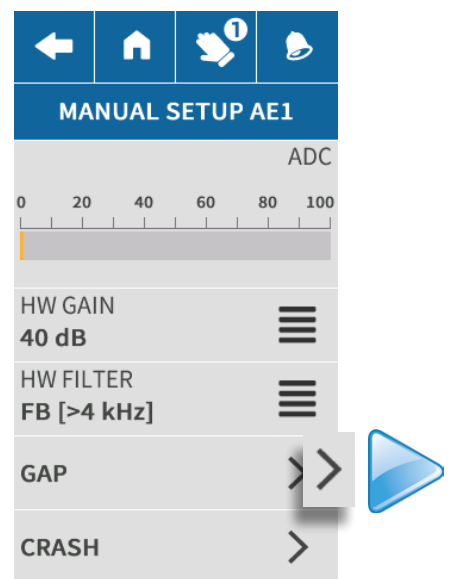
The SW GAIN parameters are the same as those which can be modified in PROG by selecting the current set and the GAP or CRASH measurement.

3) GAP PROGRAMMING

These things are essential for a good P1dAE Manual Set-up:

- Presence of a machine acoustic response similar to the operating one (DO WORK)

Always highlighting the input signal saturation level (with the yellow ADC bargraph at the top of the page), first modifying the HW GAIN parameter and if necessary HW FILTER until you have a fair signal acquired without ever reaching the halfway point of the full-scale value available (to avoid possible saturation)



You can set the following parameters in the SET GAP programming menu:

- SW GAIN
- MIN. FREQUENCY
- MAX. FREQUENCY

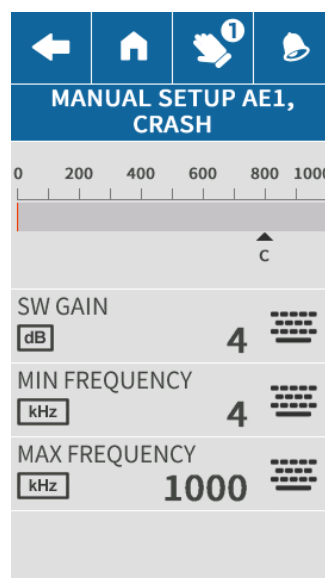
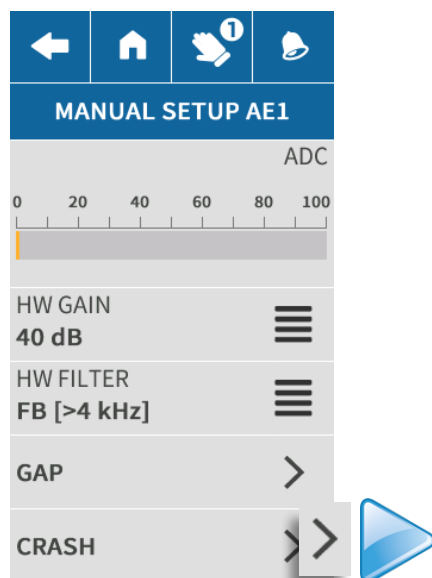
► SW GAIN
GAP measurement gain [dB]
Automatically calculated parameters (Set-up Mode)
During the ADJUST session the parameters may be modified with direct access.
Sets the GAP measurement processing gain.
To be programmed after having set the HW GAIN parameter (Sec. 8.3.1.1)
To be programmed for having the Gap signal above the threshold (GAP THRESHOLD) on the Gap event.

► MIN FREQUENCY
GAP measurement minimum frequency [kHz]
Automatically calculated parameters
Sets the minimum processing frequency [kHz] of the GAP measurement: below which there is no useful Gap event signal contribution, or the machine background noise is excessive.

► MAX FREQUENCY
GAP measurement maximum frequency [kHz]
Automatically calculated parameters.
Sets the maximum processing frequency [kHz] of the GAP measurement: above which there is no useful Gap event signal contribution, or the machine background noise is excessive.

4) CRASH PROGRAMMING
You can set the following parameters in the SET GAP programming menu:

- SW GAIN
- MIN. FREQUENCY
- MAX. FREQUENCY



► SW GAIN
Automatically calculated parameters (Set-up Mode)
During the ADJUST session the parameters may be modified with direct access.
Sets the Crash measurement processing gain.
To be programmed after having set the SW GAIN parameter. To be programmed for having the Crash signal above the threshold on the estimated Crash event, never in the machine normal operating condition.
This parameter is used to set the Crash command trigger threshold. The value set is always an absolute value.

Setting range: from 0 to 99 expressed in decibels.

► MIN FREQUENCY
Measurement minimum frequency [kHz]
The parameter is automatically calculated by the Automatic Set-up guided procedure (AUTOMATIC SET-UP page in VIEWS).
The parameter may also be modified manually.

► MAX FREQUENCY
Measurement maximum frequency [kHz]
The parameter is automatically calculated by the Automatic Set-up guided procedure (AUTOMATIC SET-UP page in VIEWS).
The parameter may also be modified manually.

4.5 Automatic Set-up Menu

This page may be used to perform an Automatic Set-up of a P1dAE AE channel, automatically configuring all of its basic parameters simultaneously in a graphical environment:

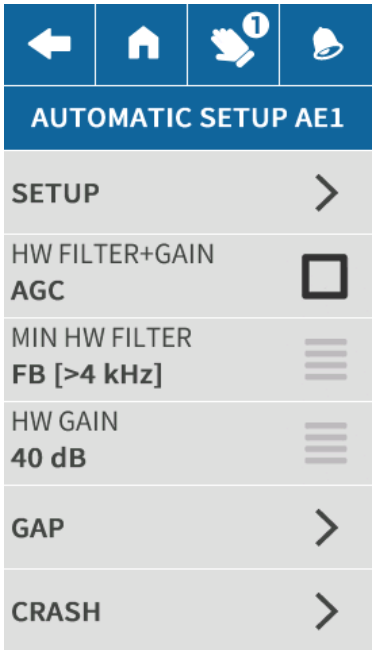
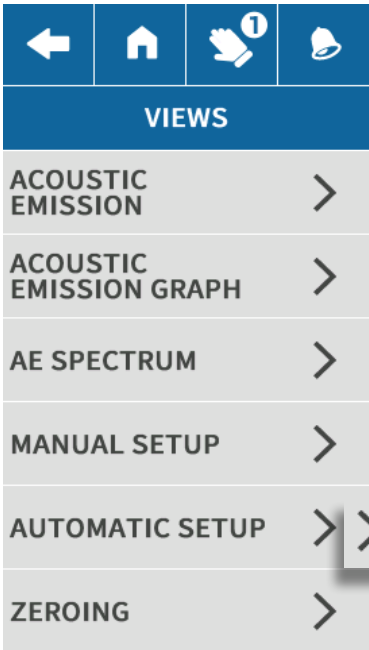
- HW GAIN
- HW FILTER
- GAP MIN FREQUENCY
- GAP MAX FREQUENCY
- CRASH and GAP SW GAIN

This page can be used as an alternative to the Manual Set-up (see previous section).

- The parameters always relate to the currently selected set;
- The HW GAIN and HW FILTER parameters are the same as those which can be modified in PROG by selecting the current set;
- The MIN FREQUENCY and MAX FREQUENCY parameters are the same as those which can be modified in PROG by selecting the current set and the GAP measurement;
- The SW GAIN parameters are the same as those which can be modified in PROG by selecting the current set and the GAP or CRASH measurement.

These things are essential for a good P1dAE Automatic Set-up:

- Acquiring the machine acoustic response in the operating condition (DO WORK), similar to that expected with the GAP event , optionally selecting the AGC item (automatic calculation of optimal HW GAIN and HW FILTER) if unsure whether or not the HW stage setting is good;
- Acquiring the machine acoustic response in the background condition (NO WORK), similar to that expected at the start of a GAP cycle;
- Always highlighting the input signal saturation level (with the yellow ADC bargraph at the top of the page), aborting the procedure if saturation is reached and requesting a new AGC (automatic calculation of optimal HW GAIN and HW FILTER).



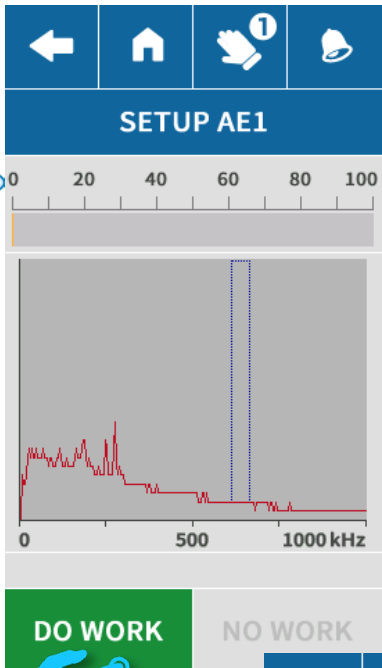
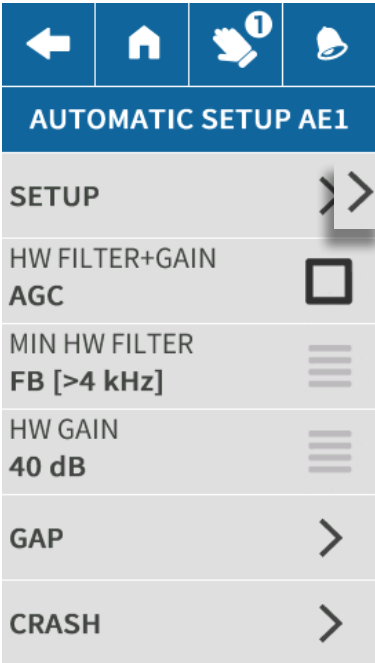
It is possible to set-up following parameters in the AUTOMATIC SET-UP menu:

1. SET-UP
2. HW FILTER+GAIN
3. MIN HW FILTER
4. HW GAIN
5. GAP
6. CRASH

4.5.1 Set-up Page

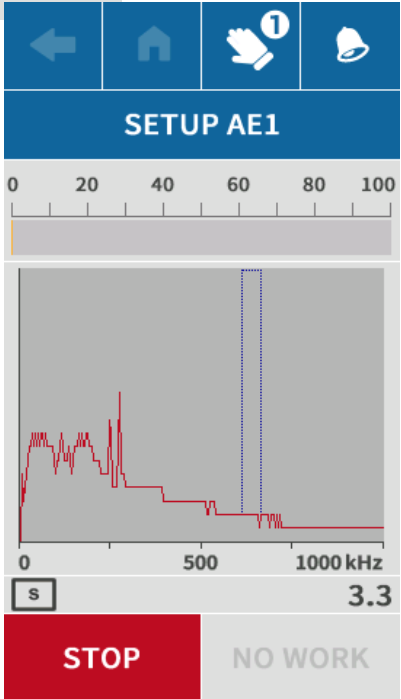
With this menu it is possible to acquire the machine acoustic response in the operating condition (DO WORK) and then in the background condition (NO WORK) .

We recommend first selecting the next checkbox HW FILTER + GAIN AGC (automatic calculation of optimal HW GAIN and HW FILTER) if you are unsure whether or not the HW stage setting is good.
With selection of MIN HW FILTER it is possible to force the P1dAE to use a narrower band amongst those available FB (> 4 kHz) , HP (> 80 kHz) , HF (> 400 kHz) if the presence of low frequency stray signals has already been detected.



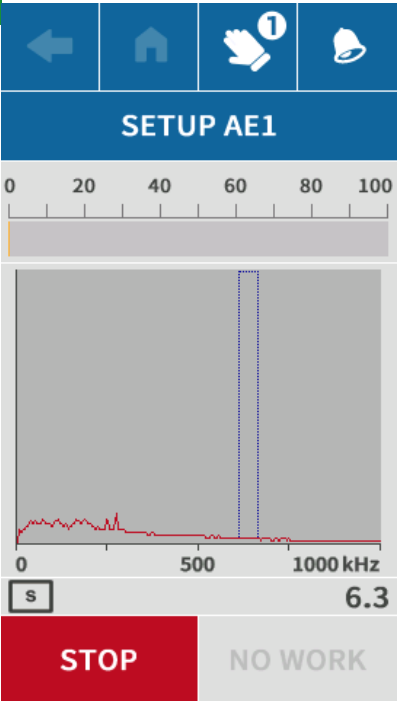
DO WORK
Function for configuring the P1dAE to the ultrasound limit values during operation.

The (yellow) bargraph shows the saturation level. This function allows you to check if the signal for the physical channel selected in SET-UP mode is too strong.



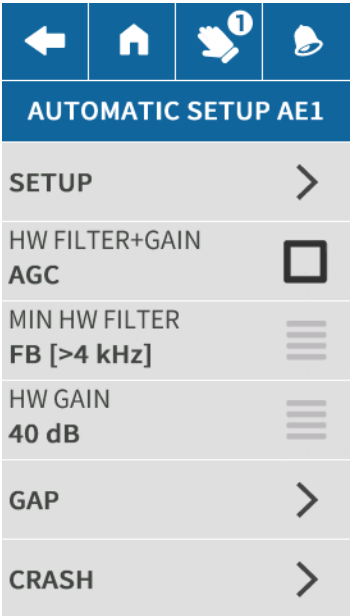


NO WORK
Function only suggested if the previous “DO WORK” acquisition was positive. Function for configuring the P1dAE to the ultrasound limit values of the background noise.
The (yellow) bargraph shows the saturation level. This function allows you to check if the signal for the physical channel selected in SET-UP mode is too strong.



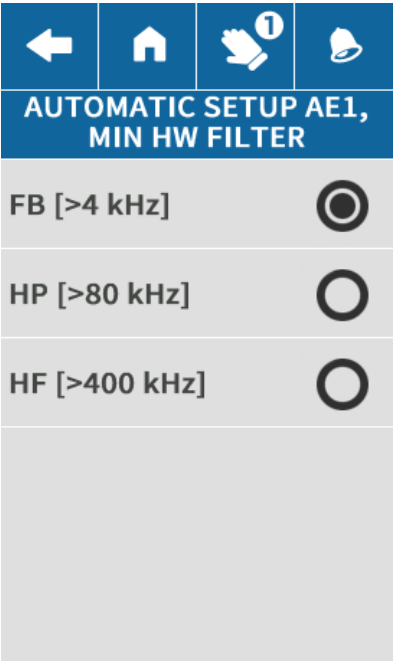
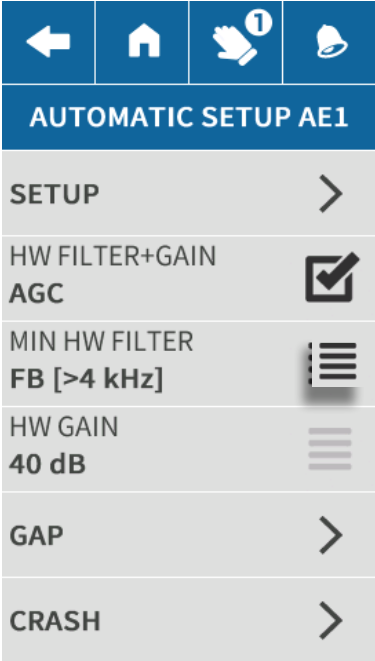
NOTE
The DoWORK and NoWORK functions must be performed in Absolute (abs) mode. If the difference between the contact noise and the background noise is minimal, not allowing simple programming of a check threshold, the functions must be performed in Incremental (inc) mode.

4.5.2 Hardware Gain and Filter Programming



Automatic calculation of optimal HW GAIN and HW FILTER.
To be selected if you are unsure whether or not the HW stage setting is good. When AGC is selected, the first step when analysing the machine acoustic response in the operating condition (DO WORK) is dedicated to automatic calculation of the optimal HW GAIN and HW FILTER: this step lasts just a few seconds and is terminated automatically. The optimised parameters are also saved and implemented automatically.
If HW FILTER + GAIN are selected, selection of MIN HW FILTER is also enabled.

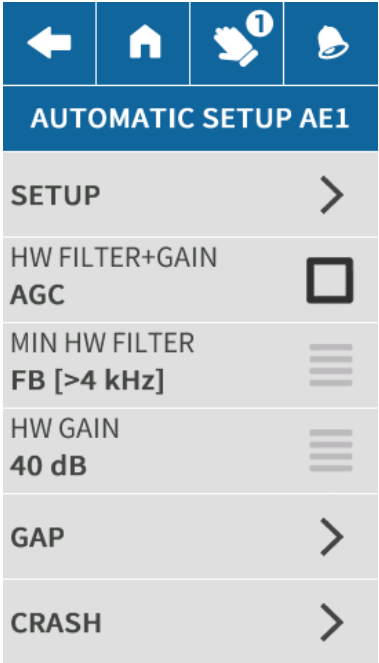
4.5.3 Minimum HW Filter programming



MINIMUM HARDWARE FILTER
If HW FILTER + GAIN are selected, MIN HW FILTER may also be selected.
MIN HW FILTER is selected by default with the HW FILTER parameter, but a different value can be selected to force the P1dAE to use a narrower band amongst those available FB (> 4 kHz), HP (> 80 kHz), HF (> 400 kHz). That is useful if the presence of low frequency stray signals has already be detected, which could cause saturation of the HW stage or in any case are not useful for defining GAP and/or CRASH events.

- If FB is selected (> 4 kHz) (Full Band):
- the Automatic Set-up algorithm will search for the optimum signal between 4 kHz and 1000 kHz
 - the Crash Signal will be processed from 4kHz to 1000kHz
- If HP is selected (> 80 kHz):
- the Automatic Set-up algorithm will search for the optimum signal between 40 kHz and 1000 kHz
 - the Crash Signal will be processed from 40kHz to 1000kHz
- If HF is selected (> 400 kHz):
- the Automatic Set-up algorithm will search for the optimum signal between 200 kHz and 1000 kHz
 - the Crash Signal will be processed from 200kHz to 1000kHz
- The “FB” option is preferred, except for a very strong and variable low frequency electric/acoustic noise.

4.5.4 HW GAIN

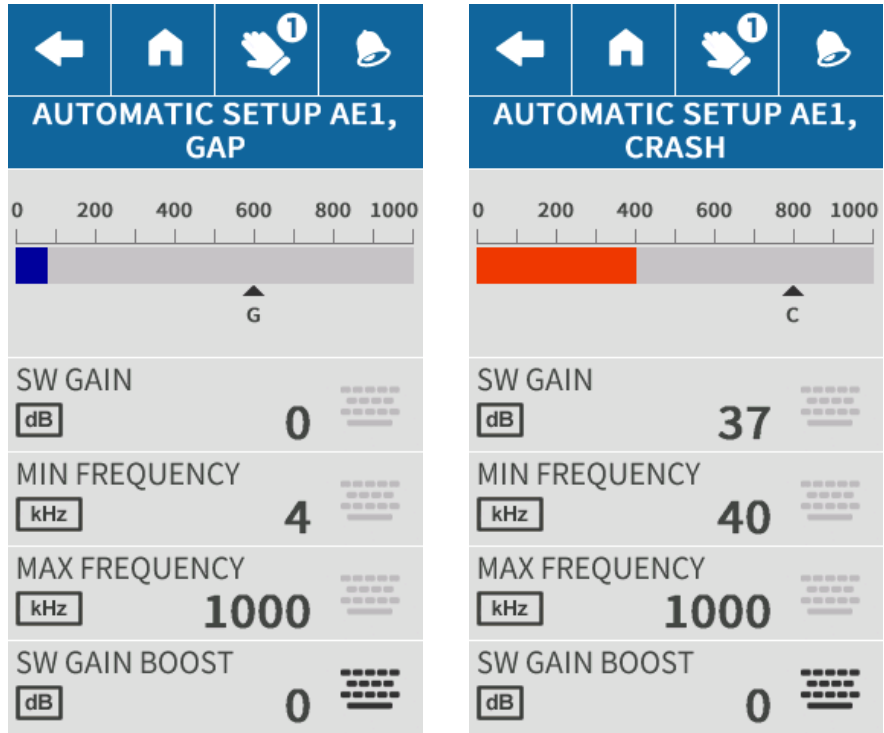


May be used exclusively to view HW GAIN parameter that is currently programmed and implemented. (The parameter may be modified in Programming/Hardware).

4.5.5 GAP Programming and CRASH Programming

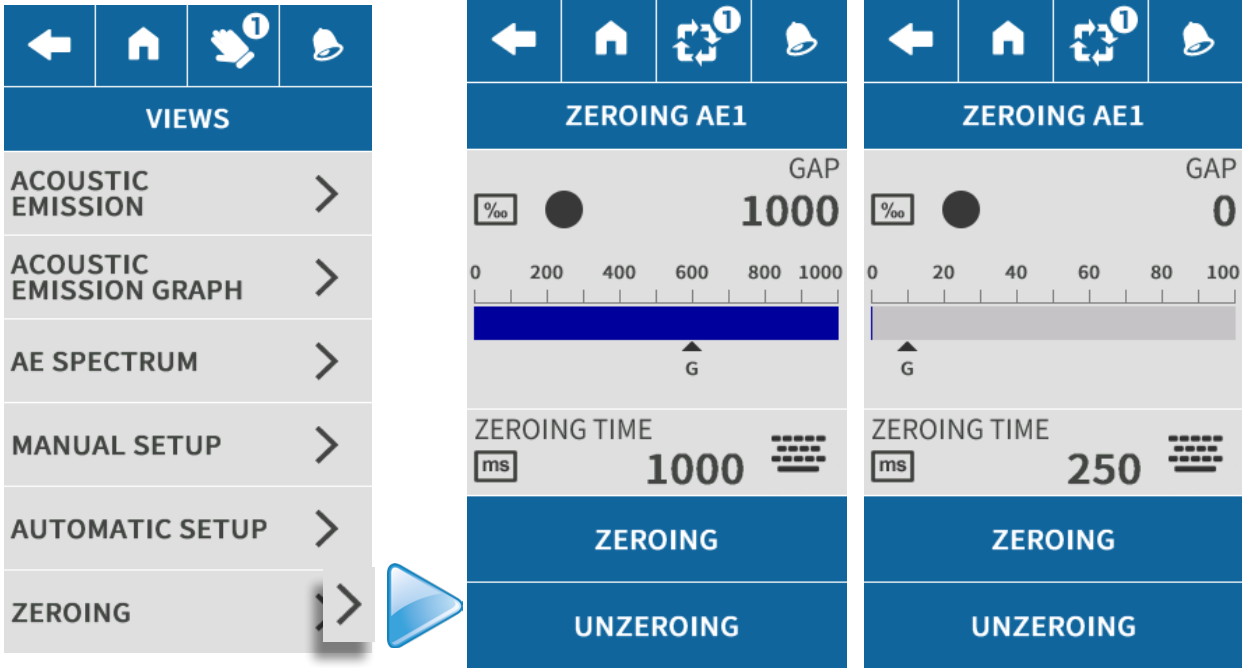
- The GAP and CRASH sub-pages allow:
- Displaying (with the bargraph at the top of the page) of the measurement level obtained with the current programming of the HW GAIN , HW FILTER parameters and the parameters relative to the measurement
 - Displaying and/or modification of the parameters relative to the measurement

For information about the individual parameters, see the descriptions in the PROG section above.



► **SW GAIN BOOST**
this parameter may be used to increase or decrease the value of the software gain calculated during the autose-up procedure.

4.6 Zeroing



This function is only suggested for the GAP measurement and when inc. type programming is used.

ZEROING This function is used to zero set the background noise.

UNZEROING if the previous zeroing has been carried out successfully, this key can be used to cancel it.

5. LIST OF ALARMS AND WARNINGS

5.1 List of Alarms

ALARM No.		DESCRIPTION
1	CHANNEL 1	AE Sensor not connected This message is displayed when: 1) the AE sensor is not connected to the respective input; 2) there is a fault on the sensor power supply circuits; 3) there is a fault on the AE sensor. Check whether the AE sensor is connected correctly. Check whether the sensor is faulty. If the problem persists, replace the device with a functional one. Check that the sensor input board functions correctly. To reset the error condition press the CANCEL button.
2	CHANNEL 2	
3	CHANNEL 1	AE Sensor not operative This message is displayed when the AE sensor connected to the respective Physical Channel is not operative. The noise signal level of the Physical Channel is verified when a Gap Cycle or Crash Cycle is requested: if the level is below the programmed <THRESHOLD> value (Minimum Noise Signal Threshold), the AE sensor is assumed to be non-operative. The alarm is cancelled when there is no cycle pending in the respective Physical Channel. Check the programmed <THRESHOLD> value with respect to the noise level when a Gap Cycle or a Crash Cycle is requested on the Physical Channel. If the problem persists, replace the device with a functional one. Check that the sensor input board functions correctly. To reset the error condition press the CANCEL button.
4	CHANNEL 2	
5	CHANNEL 1	HW Circuitry This message is displayed when: 1) there is a fault on the HW circuitry (e.g.: A/D converter not functioning), detected by the SW as a time-out on certain operations; 2) the board power supply level is incorrect, compromising the correct operation of the acquisition circuitry, as confirmed by a test provided by the HW itself. If the problem persists, replace the device with a functional one. Check that the sensor input board functions correctly. To reset the error condition press the CANCEL button.
6	CHANNEL 2	
7	CHANNEL 1	Corrupt memory This message is displayed when the saved programming data corresponding to the respective AE channel ate checked and found to be corrupt. In this case, the default data will be loaded. Reprogram the unit, checking that the data are maintained after the system is switched off and on again, without any further alarms. To reset the error condition press the CANCEL button.
8	CHANNEL 2	

5.2 List of Warnings

WARNING No.	DESCRIPTION
1	Automatic set-up critical This message is displayed when some parameters are found to be potentially critical after determining the Automatic Set-up parameters. A slight difference has been detected between working condition and background noise acquisition steps. Check the parameters and that the working condition and background noise acquisition steps are executed correctly. The AE sensor could be move to a better position. To reset the error condition press the CANCEL button.
2	Automatic set-up failed This message is displayed when the Automatic Set-up parameters determination process fails. No difference has been detected between working condition and background noise acquisition steps, or an error condition has been detected. Check that the working condition and background noise acquisition steps are executed correctly. The AE sensor could be move to a better position. To reset the error condition press the CANCEL button.
3	Cycle request pending This message is displayed when the request has not been executed because a cycle request that could affect the processing state is pending. Check whether a cycle request from the I/O logic is pending. To reset the error condition press the CANCEL button.
4	I/O supply check This message appears when the I/O expansion board is not connected or there is no external power supply. Check the I/O expansion card and external power supply connections. If this does not solve the problem, there is a hardware problem in the I/O module (expansion or auxiliary board); call Service.
5	AGC Automatic set-up failed This message is displayed when the AGC automatic set-up calculation has failed. The signal is too high in every HW band, saturating the acquisition even when at the lower HW Gain (00 dB). The AE sensor could be move to a better position. Reduce the amplitude of the acoustic signal if possible. If the problem persists, check that the sensor input board functions correctly. To reset the error condition press the CANCEL button.
6	Primary signal saturated This message is displayed when the primary acoustic signal is saturated. The signal is too high: reduce the HW Gain or increase the HW Filter. To cancel the signal, press the CLEAN button.

5.3 List of errors

ERROR No.	DESCRIPTION
1	Elaboration board error This message indicates that there is a communication problem with the measurement elaboration board. Check the connection between the elaboration board and the panel. If the problem persists, request assistance from authorised personnel. To reset the error condition press the CANCEL button.
2	No hardware channel This message is displayed when there are no hardware channels available on the measurement elaboration board. This is a fatal condition. Replace the device with a functional one. To reset the error condition press the CANCEL button.
3	Ethernet driver fault The Ethernet hardware driver does not function correctly. Switch the system off and on again. If the problem persists, contact Customer Service.
4	Duplicate IP Address Another device having the same Ethernet IP address has been detected on the network. Change the IP address.

6. P1DAE PARAMETER PROGRAMMING SUMMARY TABLE

DISPLAYED PARAMETER	DESCRIPTION	SETTINGS RANGE	DE-FAULT
SETTINGS ▶ OPTIONS MENU			
PLC MIN TIME OEM - SERVICE ONLY MANUAL MODE ONLY	Minimum PLC time [s] for commands output. <ul style="list-style-type: none">This parameter defines the minimum activation time [s] for each Output bit so that the PLC is able to acquire it correctly.Low value: fast P1dAE output bit deactivation time DEL, but only if the type of PLC cycle is equally fast.High value: slow PLC cycle time.	0.002 s - 0.999 s	0.010 s 0.050 s in Legacy Sensi-tron6 mode
FC TYPE OEM - SERVICE ONLY MANUAL MODE ONLY	Flow Control type	<ul style="list-style-type: none">P1dAE / P3SESENSITRON6	P1dAE / P3SE
FC BOOT MODE OEM - SERVICE ONLY MANUAL MODE ONLY	Flow Control Boot Mode	on mode: <ul style="list-style-type: none">AUTOMATICMANUAL	AUTO-MATIC
INPUT BIT OEM - SERVICE ONLY MANUAL MODE ONLY	PLC level for Input bit. This parameter defines the Cycle Request Input Bit activation level.	g c GAP active high CRASH active high	g c
		-g c GAP active low CRASH active high	
		g -c GAP active high CRASH active low	
		-g -c GAP active low CRASH active low	
AUTOSETUP TIME OEM - SERVICE ONLY MANUAL MODE ONLY	AUTOSETUP TIME The Autosetup Time is the maximum time taken by the P1dAE to complete an automatic set-up step without operator intervention. Alternatively, the operator may finish it manually.	1.0 s – 60.0 s	60 s

SETTING ▶ HW PROG MENU			
AE1 OEM - SERVICE ONLY AE2 OEM - SERVICE ONLY	Acoustic Sensors Enable Management This parameter defines the Acoustic Sensor management mode: ENABLED: enables or disables the acoustic sensor ALARMS ON: enables or disables the sensor connection test alarm REMOTE: connection to remote sensor ACTIVE: connection to active acoustic sensors	ENABLED Enabled without control alarms. ENABLED + ALARM ON Enabled with control alarms. ENABLED + REMOTE Remote sensor enabled without control alarms. ENABLED + ALARM ON + REMOTE Remote sensor enabled with control alarms. ENABLED + ALARM ON + REMOTE + ACTIVE Active sensor enabled with control alarms.	ENABLED + ALARM ON ENABLED + ALARM ON
PROG/SET MANAGEMENT ▶ AE1-AE2 MENU			
AE# HW FILTER	AE Hardware Filter Physical Channel. HW FILTER Programming HW stage filtering band (3 value list). <ul style="list-style-type: none">Sets the HW HP (High-Pass) stage filtering capacity if the machine has background noise components that are large/variable in the low frequency spectrum: this prevents saturation of the acquisition noise circuits, allowing a higher HW gain.HW FILTER must be programmed in combination with HW GAIN, if possible favouring the FB (Full Band) value.	<ul style="list-style-type: none">FB >4 kHzHP >80 kHzHF >400 kHz	FB >4 kHz
	AE Hardware Gain Physical Channel.	<ul style="list-style-type: none">00 dB10 dB20 dB30 dB40 dB	00 dB

AE# THRESHOLD OEM - SERVICE ONLY IN P1DAE/ P3SE MODE ONLY	Minimum threshold of the HW noise signal of the AE Sensor relative to the 1000 range. There is also the option of verifying the correct operation of the AE Sensor each time the Gap and/or Crash cycle request is generated. The process uses this value when a Gap or Crash cycle is requested. If the noise signal is below the threshold value when the cycle is requested, an alarm is generated. This alarm is cancelled when there are no cycles in progress.	000‰ - 900‰	0‰ (Disabled)
AE# GAP & CRASH INPUT BIT OEM - SERVICE ONLY IN P1DAE/ P3SE MODE ONLY	Logic Channel Enable mode. • Corrects the microphone management mode, disabling or enabling the Gap or Crash measurement on it. • If "Gap" is selected, the crash measurement and alarm are not generated. • If "Crash" is selected, the gap measurement and alarm are not generated.	• GAP + CRASH • GAP • CRASH	GAP + CRASH
PROG ► SET MANAGEMENT ► AE1-AE2 ► GAP MENU			
AE# GAP SW GAIN	GAP logic channel software gain	00 dB ÷ 99 dB	00 dB
AE# GAP MIN FREQUENCY	GAP logic channel minimum frequency	4kHz - 960kHz	4 kHz
AE# GAP MAX FREQUENCY	GAP logic channel maximum frequency	44kHz - 1000kHz	1000 kHz
AE# GAP FILTER VALUE	Gap logic channel filter	1.0 ms - 250.0 ms	1.0 ms
AE# GAP OUTPUT BIT THRESHOLD OEM - SERVICE ONLY	Gap logic channel output bit threshold	10 ‰ ÷ 990 ‰	600 ‰

AE # GAP OUTPUT BIT MODE OEM – SERVICE ONLY GAP&CRASH or GAP MODE ONLY For P1DAE / P3SE mode	GAP measurement output bit mode. [List of values] Defines the GAP measurement Output Bit (GAP #) management mode. • Level normal or inverted (-) • Free (always active/inactive) or locked (remains active after 1st activation event detected) • Activated when the GAP signal goes above ↑ or falls below ↓ the programmed threshold value.	<div>↑ Activated, if signal ≥ thresh-old Self-retained ↑ Activated, if signal ≥ thresh-old, locked -↑ Activated, if signal ≥ thresh-old, inverted Self-retained ↑ Activated, if signal ≥ thresh-old, locked and inverted ↓ Activated, if signal ≤ thresh-old Self-retained ↓ Activated, if signal ≤ thresh-old, locked -↓ Activated, if signal ≤ thresh-old, inverted Self-retained ↓ Activated, if signal ≤ thresh-old, locked and inverted</div> <div>↑</div>	
For Legacy Sensitron6 mode		<div>↑ Activated, if signal ≥ thresh-old -↑ Activated, if signal ≥ thresh-old, inverted</div> <div>-↑</div>	
AE # GAP OUTPUT BIT MINIMUM TIME OEM – SERVICE ONLY GAP&CRASH or GAP MODE ONLY	Minimum activation time for the gap logic channel output bit [ms]. • This parameter defines the minimum duration of the GAP event [ms] necessary to activate the GAP measurement Output Bit (GAP #). • Increasing this value ensures that the an Output Bit (GAP #) is not generated erroneously by peaks in the machine noise level, although it also increases the reaction time.	0ms - 9999 ms	0 ms

AE # GAP ZEROING ENABLE GAP&CRASH or GAP MODE ONLY	Enable gap logic channel zero setting. This parameter defines the Gap measurement processing mode. <ul style="list-style-type: none">ABSOLUTE, typically used for machines with low background noise levels.INCREMENTAL, with manual background noise zeroing option when required. This mode is normally used for machines with high but stable background noise levels (or when it cannot be clearly distinguished from contact noise).INCREMENTAL, with automatic background noise zeroing option at every cycle. This is normally used when the background noise level varies slowly over time and cannot be clearly distinguished from contact noise.	<ul style="list-style-type: none">NoneZEROING enable zero settingZEROING + AUTO ON CYCLE enable zero setting + automatic zero setting when Gap request generated.	none
AE # GAP ZEROING MODE GAP&CRASH or GAP MODE ONLY AND ONLY WHEN ZERO SETTING IS ENABLED.	Gap logic channel zero setting mode.	<ul style="list-style-type: none">MAX VALUE Maximum GAP signal zero setting with zero setting time.MEAN VALUE Mean GAP signal zero setting with zero setting time.	MEAN VALUE
AE# GAP ZEROING TIME GAP&CRASH or GAP MODE ONLY AND ONLY WHEN ZERO SETTING IS ENABLED.	Gap logic channel zero setting time.	50 ms - 5000 ms	250 ms
AE# GAP AUTOTHRESHOLD ENABLE GAP&CRASH or GAP MODE ONLY AND ONLY WHEN ZERO SETTING IS ENABLED.	Enable GAP logic channel automatic threshold calculation during zeroing function. The system monitors the acoustic signal during the zeroing period and calculates the best value for the threshold, based on the noisiness of the acoustic signal and the “sensitivity” parameter, which may increase the value of the threshold to a safer level.	<ul style="list-style-type: none">AFTER ZEROING the background noise zeroing value is calculated after the zeroing process.WHILE ZEROING the background noise zeroing value is calculated during the zeroing process.	AFTER ZEROING

AE# GAP ZEROING AUTOMATIC THRESHOLD SENSITIVITY GAP&CRASH or GAP MODE ONLY AND ONLY WHEN ZERO SETTING IS ENABLED.	Automatic zeroing threshold sensitivity The sensitivity value regulates the distance between the automatic threshold and the acoustic value that has just been zeroed.	1.1 - 100.0	1.2
AE# GAP MAX AUTO-THRESHOLD GAP&CRASH or GAP MODE ONLY AND ONLY WHEN ZERO SETTING IS ENABLED.	The calculated auto threshold value may not exceed the value set-up in this parameter.	10 - 990	600
PROG ► SET MANAGEMENT/AE1–AE2 ► CRASH MENU			
AE# CRASH SW GAIN	Crash logic channel software gain.	00 dB - 99 dB	00 dB
AE# CRASH MIN FREQUENCY	Crash logic channel minimum frequency.	4kHz - 960kHz	4 kHz
AE# CRASH MAX FREQUENCY	Crash logic channel maximum frequency.	44kHz - 1000kHz	1000 kHz
AE# CRASH FILTER VALUE	Crash logic channel filter.	1.0 ms - 250.0 ms	1.0 ms
AE# CRASH OUTPUT BIT THRESHOLD OEM – SERVICE ONLY GAP&CRASH or GAP MODE ONLY	Crash logic channel output bit threshold with respect to 1000 range. This parameter defines the Crash measurement level necessary to activate the Crash Output Bit.	10 ‰ - 990 ‰	800 ‰

<div>AE# CRASH OUTPUT BIT MODE OEM – SERVICE ONLY GAP&CRASH or GAP MODE ONLY</div> <div>For P1DAE / P3SE mode:</div>	<div>CRASH measurement output bit mode [List of values] This parameter defines the CRASH measurement Output Bit (CRASH #) management mode:<ul style="list-style-type: none">Level normal or inverted (-)Free (always active/inactive) or locked (remains active after 1st activation event detected).</div>	<div>↑ Activated, if signal ≥ threshold Self-retained ↑ Activated, if signal ≥ threshold, locked - ↑ Activated, if signal ≥ threshold, inverted -Self-retained ↑ Activated, if signal ≥ threshold, locked and inverted</div>	- ↑
<div>For Legacy Sensitron6 mode</div>		<div>↑ Activated, if signal ≥ threshold - ↑ Activated, if signal ≥ threshold, inverted</div>	- ↑
<div>AE# CRASH MINIMUM TIME ON OEM – SERVICE ONLY GAP&CRASH or GAP MODE ONLY</div>	<div>CRASH measurement output bit minimum activation time [ms]<ul style="list-style-type: none">This parameter defines the CRASH event measurement level necessary to activate the CRASH Measurement Output Bit (CRASH #). Increasing this value ensures that the an Output Bit (CRASH #) is not generated erroneously by peaks in the machine noise level, although it also increases the reaction time.</div>	000ms - 9999 ms	0 ms
PROG ► SET MANAGEMENT ► AE1–AE2 ► ANALOG OUT MODE			
<div>AE# ANALOG OUT OEM – SERVICE ONLY</div>	<div>Analogue output signal Sets the Analogue Output measurement source (0 to 10 [V]).</div>	<div>• GAP1 • CRASH1 • GAP2 • CRASH2 • AUTO GAP • AUTO CRASH</div>	GAP1

End of Documents

