P1DAE

Manual code No.:
D296AE00GF

MARPOSS

MANUFACTURER	Marposs SpA
ADDRESS	Via Saliceto, 13 - Bentivoglio (BO) Italy www.marposs.com
TYPE OF EQUIPMENT - MODEL	P1dAE (Firmware version 1.3)
FUNCTION	System for checking working on grinding machines
MANUAL CODE	D296AE00GF
MANUAL TYPE	**INSTALLATION AND USER MANUAL**
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	Original Language: Italian

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

CE

This product conforms to the following directives:

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

UKCA

Questo prodotto è conforme a questi regolamenti UK:

- 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 63000:2018 (RoHS)

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

IK06

INFORMATION FOR USERS

Pursuant to the Standard IEC 62202 (corresponding to the Italian Standard CEI EN 62262-classification CEI 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 wheelie bin symbol with a cross through it on the equipment or its packaging indicates that the product must be disposed of separately from other waste materials at the end of its working life.

If the user wishes to dispose of this equipment, he/she must do so in accordance with the applicable National regulations governing the separation of the unit into its waste materials at the end of its working life.

Separating waste materials correctly before submitting the equipment for recycling, treatment and environmentally compatible disposal can help to prevent potentially negative effects on health and the environment, as well as making it easier to reuse and/or recycle its constituent materials.

Failure to dispose of this product in accordance with these indications is punishable in accordance with the applicable laws.

CONTENTS

1 GENERAL INFORMATION

1.1 Introduction

This manual has been drawn up to provide the information necessary for safe use of the P1dAE.

1.2 General Description of the System

The P1dAE is an electronic gauging unit for grinding machines. It uses the signal picked up by an AE sensor (piezoelectric transducer) to perform the following functions.

GAP Check
Air gap detection: the definition of a noise threshold allows detection of contact between the grinding wheel and the part for passing from the approach speed to the stock removal speed.
Grinding wheel position check: defining a noise threshold makes it possible to detect the position of the grinding wheel relative to a known reference point.
Dressing continuity check: detection of ultrasound emissions allows dressing cycle optimisation.

CRASH Check
Collision detection. Definition of a correct noise threshold allows detection of accidental grinding wheel collisions.

The P1dAE performs the following functions:
detection of a significant event (GAP or CRASH) generates a corresponding output logic signal available on the I/O connector. The GAP and CRASH signals are available with opto-isolated output for sending to the machine tool control logic.
The Gap or Crash processing analogue signal can be made available on a connector (analogue output) for connection to an analogue input of a CNC which allows parallel processing on the signal arriving from the AE Sensor.
The P1dAE has functions for checking the integrity of the AE sensor cable. If enabled, detection generates the ALARM signal available on the I/O connector (as well as setting the related outputs to the safety condition).
The unit is available with one or two channels, each performing both the Gap and Crash functions. Simultaneous Gap and Crash cycles are supported on all available channels. Two cycle/part sets are also available.
The tables below show the names used to identify the functions and the sets for each channel.

CHANNELS	FUNCTIONS	
CH1	GAP 1	CRASH 1
CH2	GAP 2	CRASH 2

SET #1	**CH1**		**CH2**	
	GAP 1	CRASH 1	GAP 2	CRASH 2
SET #2	**CH1**		**CH2**	
	GAP 1	CRASH 1	GAP 2	CRASH 2

Main features of the P1dAE:

- Input for 1 or 2 AE sensors (1 or 2 channels)
- Simultaneous GAP check and CRASH check on both channels
- Manual or auto-acquired adjustment of hardware channel gain 0-40 dB in 10 dB steps
- Manual or auto-acquired adjustment of hardware channel filtering stage: FB (>4 kHz), HP (>80 kHz), HF (>400kHz)
- Manual or auto-acquired adjustment of minimum and maximum gauging frequencies.
- Auto-acquired adjustment of hardware channel gain, individual channel GAP and CRASH gain, minimum and maximum gauging frequencies by means of a two-step guided procedure with automatic analysis of the working noise and background noise.
- Gap check processing modes (absolute, incremental, incremental with automatic zeroing of the cycle request)

- Programming of conditions for generating output signals (GAP and CRASH) and the level (high/low) of the signal generated
- GAP or CRASH signal analogue output of only one of the two channels
- Opto-isolated inputs and outputs (24V/10mA) for connecting to a CNC
- Opto-isolated output (24V/10mA) for signalling the alarm condition due to cable or AE sensor breaking (if enabled via SW)

The 24V/10mA opto-isolated outputs, protected against short-circuit, allow direct connection to a 24V machine input of a CNC/PLC (type 1 input according to IEC 1131-2). The SOURCE or SINK compatibility of these outputs is obtained by setting up the appropriate connection.

2 GENERAL INFORMATION

2.1 Warnings for users

The P1dAE must be installed and used in accordance with the instructions provided in this manual. Only then will it comply with the European standards and directives listed on pages 2 and 3.
Any modification that alters the P1dAE construction specifications, whether mechanical or electrical, can only be performed by Marposs, which will certify compliance with the safety standards. Any modification or maintenance not indicated in this document shall be considered unauthorised.
Marposs declines all liability in the event of any non-compliance with the above.

The descriptions and illustrations supplied with this documentation are not definitive. Marposs reserves the right to modify the product as and when necessary, in order to improve performance, or for any other reason, and without the obligation to update this document.

This instruction manual provides all the specific information necessary for knowledge and correct use of the Marposs equipment in your possession.

THE BUYER MUST ENSURE THAT ALL PERSONNEL ASSIGNED TO INSTALL, OPERATE AND SERVICE THE EQUIPMENT READ THIS MANUAL

The manual is an integral part of the equipment, therefore the user must ensure that it is always available and in kept good condition throughout the working life of the device.
Marposs liability is limited to correct use of the **P1dAE**, as defined in this manual and its attachments.
Marposs shall provide the customer with a copy of this manual and its attachments.

2.2 Testing and guarantee

Materials are guaranteed against defects, with the following limitations:

- DURATION OF GUARANTEE: the guarantee covers the product and all repairs carried out on it during the standard guarantee period.
- SUBJECT OF THE GUARANTEE: the guarantee applies to the product or its parts marked with the serial number or other identification systems used by Marposs.

The above guarantee applies unless other agreements are reached between Marposs and the Customer.

2.3 Requesting technical assistance and maintenance

In the event of faults that require the intervention of Marposs personnel contact your closest technical support centre (listed at: http://www.marposs.com/worldwide_addresses.php/eng).

2.4 Ordering spare parts

To order spare parts please contact your closest Marposs centre (listed at: http://www.marposs.com/worldwide_addresses.php/eng)

2.5 Original version

This document was originally written in Italian.
In case of any dispute arising from translation errors and inaccuracies, even where carried out by Marposs, the definitive version shall be in Italian.

2.6 Authorised and unauthorised use

2.6.1 Intended use

The P1dAE is designed and built to be installed on automated machinery such as grinding machines, for managing Marposs acoustic sensors which allow monitoring of various stages of working by the grinding wheel and any collisions between the part and the grinding wheel.

The P1dAE must be used:

- by competent trained personnel only
- only if it is in perfect working order. (notify your local service centre and, if necessary, contact the specialized customer service technicians in the event of faults or malfunctions during operation, or if you are in any doubt about the correct operating procedures).

2.6.2 Unauthorised uses

Under no circumstance may the P1dAE be used for any purpose other than that for which it was designed. Any use that differs from the use described in this manual shall be considered unauthorised. Using the P1dAE in any way other than that described in this manual may result in unexpected damage.

The following are also prohibited:

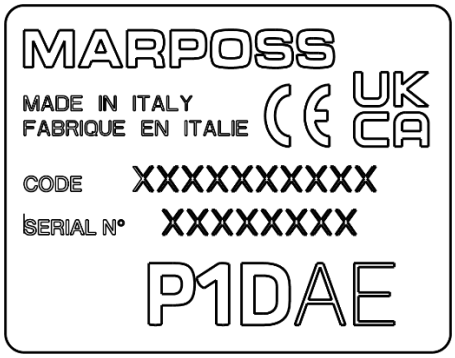
1. modification of the original **P1dAE** configuration;
2. connection of the **P1dAE** to power supplies other than those described in this manual;
3. use of components for purposes not envisaged by Marposs.
4. Allowing unauthorised personnel to carry out maintenance work on the equipment.
5. Removal of safety indications and warnings displayed on the equipment.

Modifications or maintenance operations not covered by this technical document shall be considered unauthorised. Marposs declines all liability in the event of any non-compliance with the above.

2.7 Identification Labels and Pictograms

Various different text formats were used when preparing this manual. Various safety warnings have been defined.

The back of the equipment bears the P1dAE identification label



The following information appears on the plate:

- The SERIAL No of the individual P1dAE
- CE and UKCA marking
- The Marposs product identification CODE.

N.B.
All the data listed on the plate must always be legible.
If a data plate is damaged or even partially illegible due to wear, ask MARPOSS for another one, quoting the data in these instructions or on the original data plate.

2.7.1 Symbols used in the instruction manual

ATTENTION/WARNING
This symbol indicates the risk of damage to the electronic unit or other devices connected to it, or risk conditions for the operator.

N.B.
Important information that may help the operator to use and understand the system is contained in boxes indicated by the letters "N.B." in bold type.

ENVIRONMENTAL HAZARD
Recycle and/or dispose of in accordance with the applicable regulations in the destination Country.

The following is a list of the pictograms that are displayed on the components of the system and called up in the instruction manual:

OBLIGATION TO READ THE INSTRUCTION MANUAL
This pictogram indicates that it is necessary to read the instruction manual before using a piece of machinery or a specific component in order to avoid accidents caused by handling or manipulating the material incorrectly.
The exact description of the label displayed on the machine is provided in the manual.

ELECTRIC SHOCK HAZARD
Electric shock hazards may be present when carrying out fault finding routines on live components

CRUSHING HAZARD
It is usually used to indicate a hand crushing hazard due to moving parts.

GENERIC HAZARD

2.8 Training

PERSONNEL MUST READ THE DOCUMENTATION SUPPLIED WITH THE MACHINE

Personnel included in the following categories are obliged to read the instruction manual supplied with the equipment.
Installation technicians assigned to transport, store and install the **P1dAE**, in order to:
Ensure they are aware of the correct storage procedures for the parts of the **P1dAE** in order to avoid damaging important parts, not only in terms of safety but also from an operational point of view;
Ensure they are aware of the correct **P1dAE** installation procedures, such as wiring the electrical parts, in order to prevent assembly errors that could lead to dangerous situations for the health and safety of the operators.

Operators assigned to supervise normal operation of the equipment, in order to:
ensure they adhere to the applicable regulations governing use of the equipment, and that they read and following the instructions and other information provided in the attached documentation.
P1dAE maintenance technicians, in order to:
ensure they are aware of the correct procedures for carrying out routine and extraordinary maintenance on the equipment.

2.9 Residual Risks

Electrical wiring

Moreover, it is important to remember that:
incorrect actions by the operator can generate residual risks.
The risks and dangers generated by:

- operator distraction,
- failure to comply with the information and instructions contained in these operating instructions,
- deliberate tampering with the **P1dAE** and/or its safety devices.

3 TRANSPORTATION. STORAGE

3.1 Training

The operators assigned for transportation, storage and installation of the **P1dAE** must be trained and informed as required by the applicable directives in the respective countries.

3.2 State of tools and equipment

The operators must use the equipment listed in the corresponding paragraphs when carrying out transportation, storage and installation operations.
It is important to ensure that the equipment and tools are in good condition and that they are not worn, excessively aged or fatigued in any way.
The tools must be selected in accordance with the applicable laws and regulations governing working tools and must be used in accordance with the manufacturers' instructions.

3.3 Taking delivery of the material

During packing all the **P1dAE** technical material is thoroughly checked in order to ensure that no damaged material is shipped.
When unpacking the material check that the **P1dAE** is perfectly intact and not damaged in any way. If it is damaged, notify Marposs immediately.

3.4 Packaging, handling, transport

3.4.1 Packaging

The constituent parts of the **P1dAE** are packed in a made-to-measure cardboard box, which is closed and protected against the weather. The weight of the contents and the shipping instructions are indicated on the outside.

3.4.2 Handling the package

The package can be lifted manually, as set out by the general health and safety standards in the work place for manually moving loads, especially when lifting a load from the ground.

3.4.3 Transporting the package

The package containing the **P1dAE** must be transported with covered transport equipment to avoid exposing the package to the weather.

3.4.4 Disposing of packaging materials

The packaging used for the **P1dAE** consists of materials that can be disposed of without exposing people, animals or property to any significant hazards.

Operators or personnel responsible for disposing of the packaging should be aware that it consists of:

- Cardboard: external container and internal insert
- Polyurethane film: internal insert.

ENVIRONMENTAL HAZARD
The polyurethane film is NOT biodegradable. It must NOT be disposed of in the surrounding environment: recycle and/or dispose of materials in accordance with local regulations.

3.5 Storage

3.5.1 General information

The mechanical and electronic components installed in the **P1dAE** have been selected based on their reliability and resistance. The components satisfy the manufacturing safety requirements and have been designed to withstand temperatures between **–20 °C** and**+70 °C (-4° F** and **158° F)** during transportation and storage.

3.5.2 Storing the P1dAE

The P1dAE must be stored in a covered area where dust and humidity levels are kept to a minimum.
The warehouse storage shelf must be level and smooth.
Do not rest other materials, even light items, on top of the **P1dAE** package or the P1dAE itself, as this may damage it.

4 INSTALLATION

4.1 General information

Before starting the **P1dAE** installation procedure, the operator must ensure that all the normal mechanical workshop equipment is available.

4.2 Environmental conditions

When installing the unit, the operator must check that the final machine has been designed and built to operate in the environmental conditions set out below.

✓ **Type of environment:**

The **P1dAE** and the relative electrical components have been designed and built to be installed in an industrial plant and to be used only in closed environments where they are protected from the weather.
Unless indicated otherwise in the contract the **P1dAE** can operate regularly only in the environmental conditions set out below. Environmental conditions other than those described may damage the machine or cause it to malfunction, giving rise to potential hazardous situations for the operator and exposed personnel.

✓ **Ambient air temperature**

The mechanical and electronic components of the P1dAE have been selected based on their reliability and resistance. The components satisfy the manufacturing safety requirements and have been designed to withstand temperatures between -25°C and +70 °C (-4 °F and +158 °F) during transportation and storage.

✓ **Altitude**

The electrical components are designed to operate correctly up to **2000 m** above sea level.

✓ **Pollutants**

The electrical components have been suitably protected against infiltration by solid bodies and liquids for the intended use of the **P1dAE** and the environment that it is used in.

✓ **“Normal" environmental lighting**

The installation procedure must be carried out under "normal" lighting conditions, i.e. without dazzling the operators with too much light or causing them to strain their eyes in insufficient lighting.
The personnel responsible for installing the **P1dAE** must comply with the minimum requirements set out by the applicable laws in the respective countries in terms of natural and artificial lighting of the premises.
If there is poor lighting in the workplace the operator must use portable lighting equipment.

4.2.1 Removing the P1dAE from the packaging

Marposs has not indicated special devices for removing the P1dAE from the packaging.

ATTENTION
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.

5 GENERAL DESCRIPTION OF THE SYSTEM

The **P1dAE** system is designed to solve the following types of problem on grinding machines:

- **GAP Check:**
  a. *Grinding wheel-part contact check:*
     Defining a noise threshold make it possible to detect the contact between the grinding wheel and the part for the transition from the approach speed to the feed speed.
  b. *Grinding wheel position check*
     Defining a noise threshold makes it possible to detect the position of the grinding wheel with respect to a known reference point, as defined by CNC processing.
  c. *Dressing continuity check (grinder dressing)*
     By monitoring the acoustic emissions during the grinder dressing process it is possible optimize the dressing cycle. The dressing cycle may be considered complete when the sound emission is continuous and uninterrupted.

- **CRASH Check**
  Definition of a correct noise threshold allows detection of accidental grinding wheel collisions.

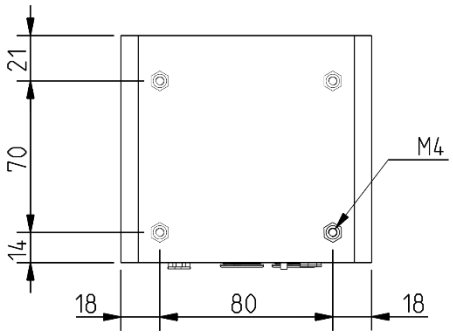
5.1 P1dAE versions

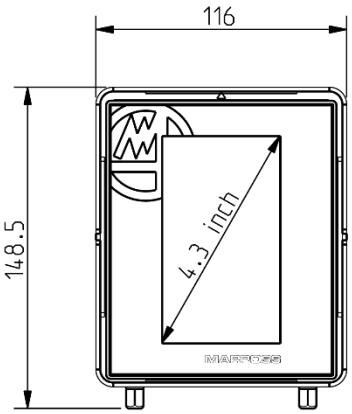
The device is available in 6 different models, which may be identified as follows:

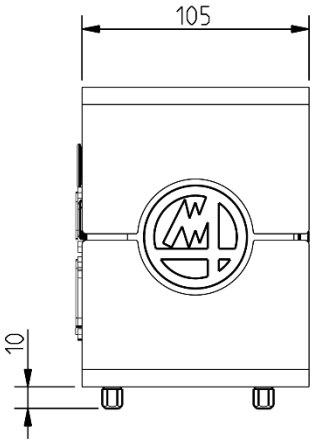
RACK VERSION		
	**Code Number**	**Description**
	830AE11000 **830AE21000**	P1d AE Rack version – 1 Channel P1d AE Rack version – 2 Channels
VERSION WITH CASE		
	**Code Number**	**Description**
	830AE10000 **830AE20000**	P1d AE Version with case – 1 Channel P1d AE Version with case – 2 Channels
VERSION WITH REMOTE PANEL		
	**Code Number**	**Description**
	830AE12000 830AE22000 7708010002	P1d AE Version with Remote panel – 1 Channel P1d AE Version with Remote panel – 2 Channels P1d AE Remote Panel

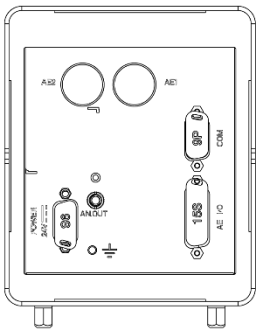
5.2 Overall Dimensions

P1dAE dimensions and volumes: case versions

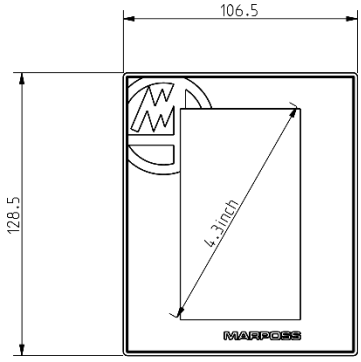


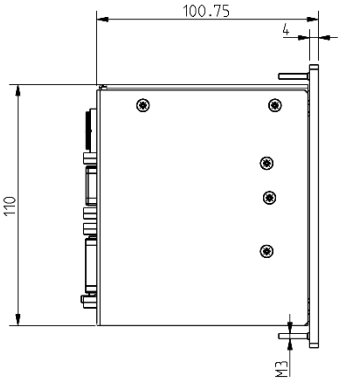


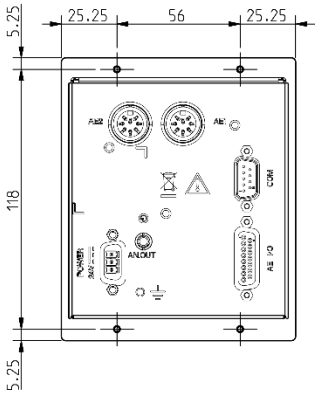


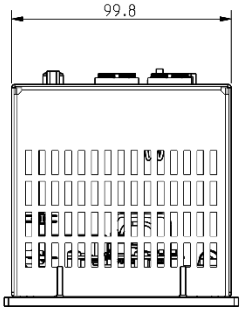


P1dAE dimensions and volumes: Rack version



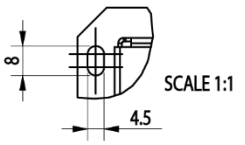


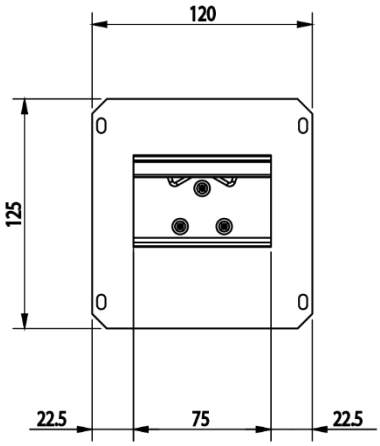


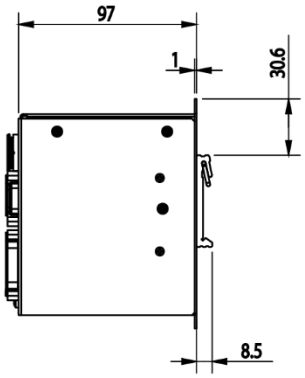


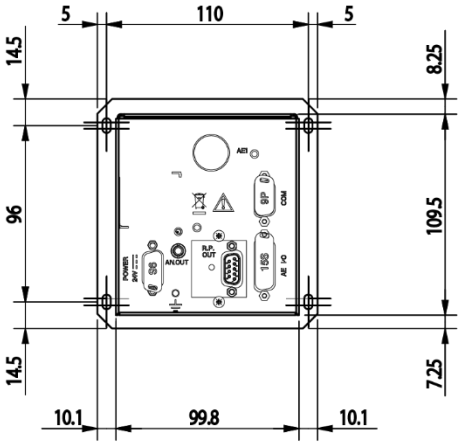
ATTENTION
The rack version requires a fire-resistant covering irrespective of whether it is fitted with the front or remote panel.

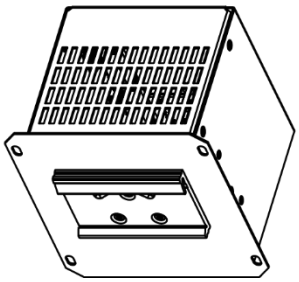
P1dAE dimensions and volumes: remote panel version

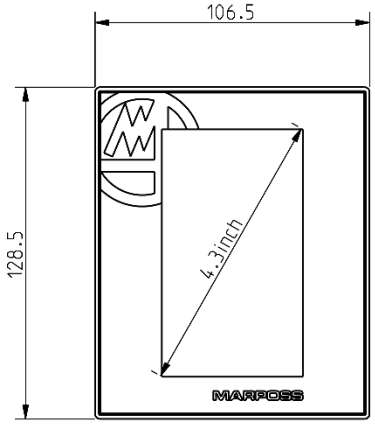


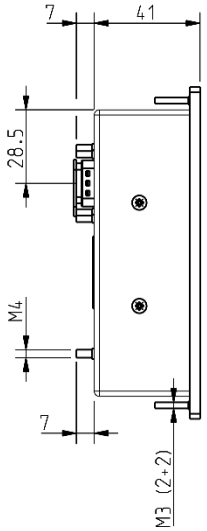


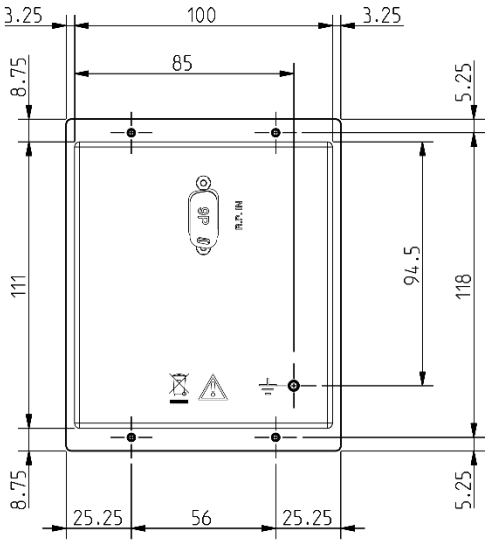












5.3 Technical Specifications

Structure	Rack, Case or Remote panel
Version	**1 CHANNEL** **2 CHANNELS**
No. of Sensors	1 or 2 independent channels
Checks	Gap & Crash
Programmable Thresholds	Programmable
Power supply	SELV type 24V dc ± 20 %
Current drawn	0.5 A
Operating temperature	Between +5° and +45° C
Storage temperature	Between -20° and +70° C
Humidity	Storage <90% Shipping <90% In use <85% ≤ RH<90% max 2 months
Weight	Rack 900 g – Case 2000 g
Protection rating **(IEC 60529)**	IP54 - Front panel IP 40 - Product
I/O signal connection	D-SUB male 15 pin connector.
I/O signals	Sink & Source
Output signal rate	1 ms
Serial Interface	RS232 RX and TX only
Display	LCD Touchscreen display. Resolution 272x480 pixel – Size 4.3”
Electrical Safety Standard	EN 61010-1
EMC Immunity Standard	EN 61326-1

6 INSTALLING THE HARDWARE

	Description
POWER 24V DC	Electrical power supply collector. [Ref.Connecting the power supply]
⏚	Functional earth terminal (M4) [Ref.Connecting the functional earth]
RP OUT	Output for remote panel connection (D-SUB female 9 pin connector) [Ref. Connecting the remote panel]
COM	Serial RS232 interface for connection to an external PC (D-SUB male 9 pin connector) [Ref. Connecting a PC]
AE1	Connection to AE Sensor 1 - Amphenol 8 pin connector
AE2	Connection to AE Sensor 2 - Amphenol 8 pin connector
I/O	D-SUB male 15 pin connector for I/O connection to the machine PLC: [Ref.I/O Interface]
AN. OUT	Connector for analogue output connection. [Ref.Analogue Output]

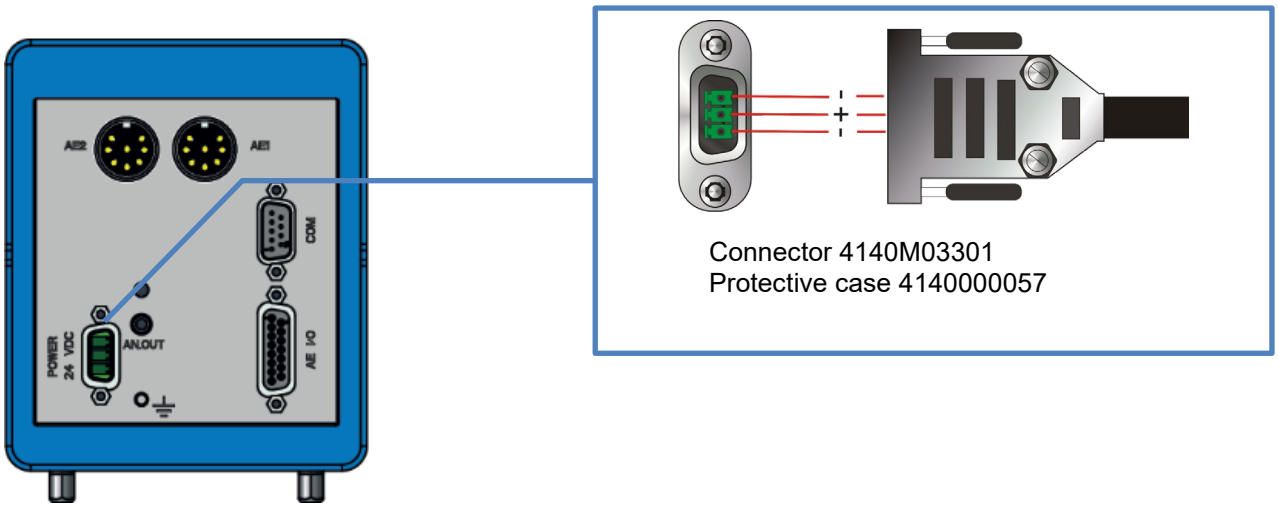
6.1 Connecting the power supply

POWER specifications:

Voltage:	24VDC (±20%) SELV type as defined by EN 60950-1
Current:	drawn: 0.5 A

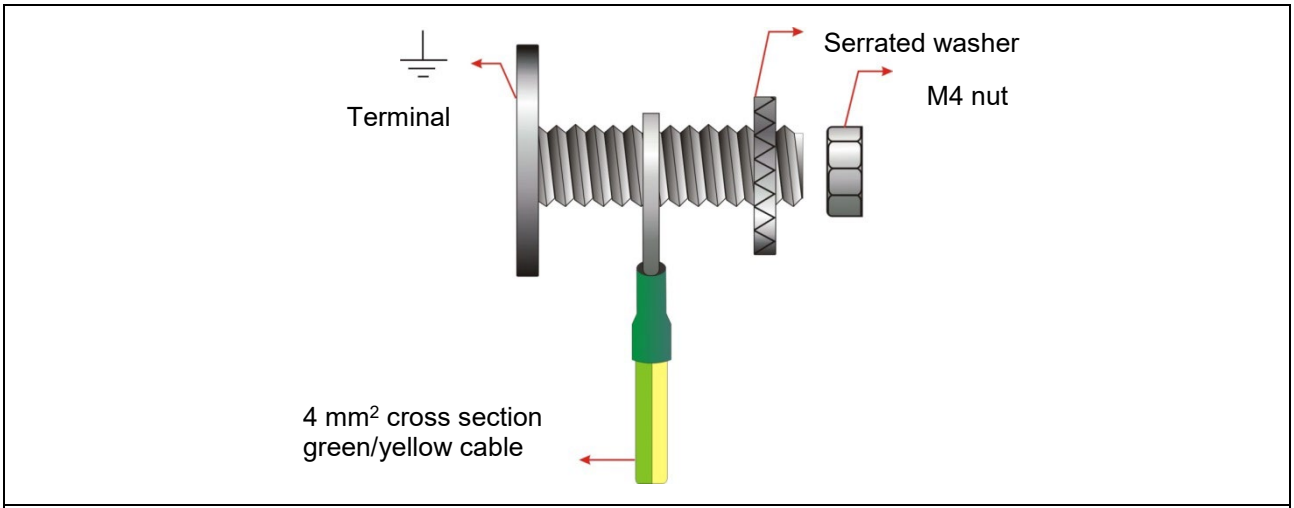
The Phoenix connector is supplied with the equipment and has screws with knobs for manual tightening. We recommend fitting a breaker switch upstream of the machine during installation and operation.

N.B.
The maximum power cable cross section that is compatible with this connector is 1.5 mm².



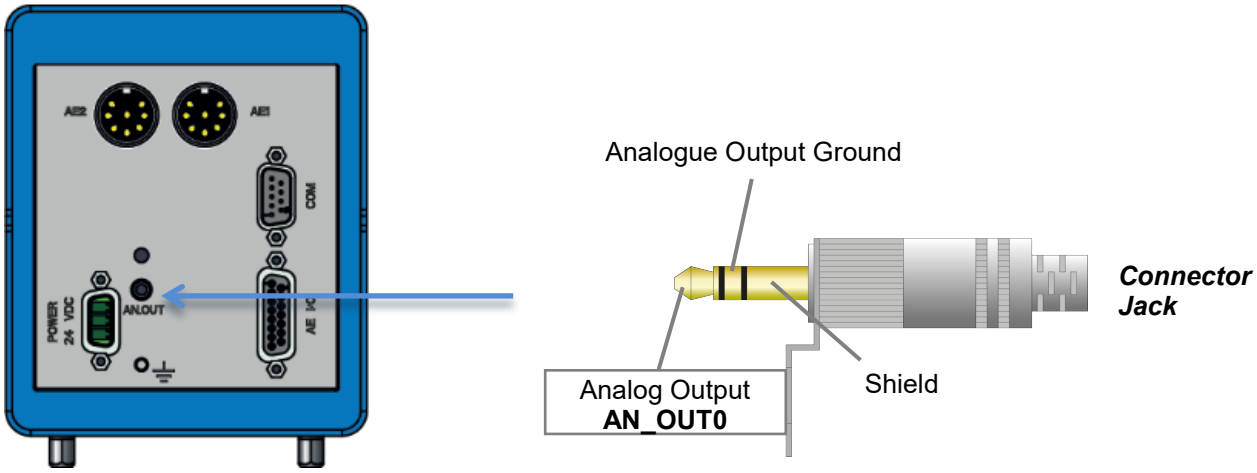
6.2 Functional Earth Connection

Connect the unit to earth with the dedicated terminal (labelled ⏚).
The earth connection is made by connecting the terminal to the centre of mass of the machine the drawer is installed on. Use the shortest possible connection.
Use yellow/green cable with a cross section of at least 4 mm² for the earth connection.



Functional Earth Connection

6.3 Analogue Output Connection



6.3.1 Analogue output connector connection diagram

The Gap&Crash acoustic signal analogue output is available on the connector jack.
Output signal characteristics:

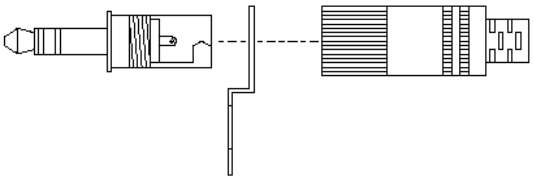
- Output with voltage range **0 to 10V** $_{DC}$
- output resistance = 200 Ohm.

SECURING THE CONNECTOR JACK

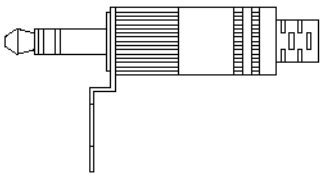
To prevent the male connector jack from accidentally coming out of the socket, secure it using the stop hook (1502040900) supplied (male connector jack kit, Marposs code 6134653900).
Proceed as follows:

- tighten the stop hook on the male connector jack until it is past the thread (figure A);
- make the connections and assemble the connector jack (figure B);

(**A**)



(**B**)



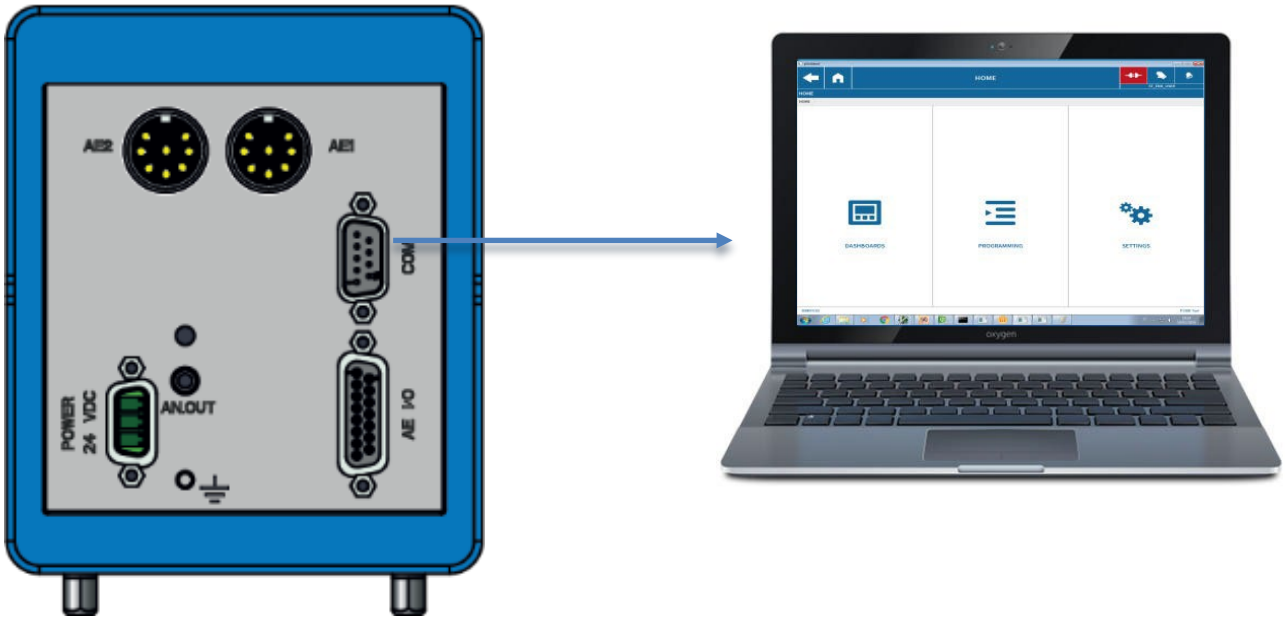
- Plug the male connector jack into the socket and secure the stop hook to the board using the screw on the board.

6.4 Connecting the remote panel

6.4.1 Extension for remote panel

Extension for remote panel	
Length (m)	**Code Number**
1	6737959031
6	6737959030
10	6737959032
15	6737959034
20	6737959036

6.5 Connecting to a PC

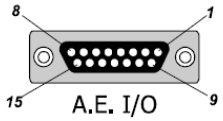


The COM port is used for connecting to an external PC, where the “P1dAE TOOL SW” software supplied with the unit may be installed.

The P1dAE TOOL SW is a service software tool, used by Marposs service, which is connected to the P1dAE unit via a COM port, and can be used to perform the same functions as the unit directly from the PC.

7 I/O CONNECTION

7.1.1 D-SUB I/O connector, signal connection diagram for machine PLC (Only for P1dAE version)



Female D-SUB DB15

PIN No.	Description
1	Not connected
9	Not connected
2	Connect to 0V for SOURCE type outputs Connect to +24V for SINK type outputs
10	GAP#1 input logic signal
3	CRASH#1 input logic signal
11	GAP#2 input logic signal
4	CRASH#2 input logic signal
12	SET input logic signal
5	Connect to +24V for SOURCE type outputs Connect to 0V for SINK type outputs
13	GAP#1 output logic signal
6	CRASH#1 output logic signal
14	GAP#2 output logic signal
7	CRASH#2 output logic signal
15	ALARM/BUSY output logic signal
8	Not connected

N.B.
24V DC (±24V) SELV type power supply as defined by EN 60950-1.
The maximum load of the outputs is 10 mA

N.B.
The maximum power cable cross-section compatible with this connector is 0.5mm^2

7.1.1.1 Recommended Bit activation level.

For **reasons of safety**, we strongly recommend setting up a **low activation level** for the following Bits
- CRASH#1 Output
- CRASH#2 Output

For **safety reasons**, the following Bit is held permanently at the **low activation level**, that is to say, in the active logic state, the system may be in one of the following two conditions:
- BUSY
- ALARM

BUSY identifies a temporary condition envisaged during normal use. ALARM is an abnormal condition which is not envisaged during normal operation of the system.

7.1.1.2 Programmable Flow Control Parameters.

This is a list of Flow Control programmable parameters.
- **IN LPLC** *PLC level for Input bits*
- **OUT TPLC** *PLC time for Output bits*
- **# HWENAB** AE Sensors management enabling
- **#HWTHRS** *AE Sensor HW noise signal Minimum Threshold*
- **#G MODE** Processing mode for *GAP measurement*
- **#G TZER** *GAP Measurement Zeroing Delay Time*
- **#G_OUT** *GAP Measurement Output Bit Mode*
- **#C_OUT** *CRASH Measurement Output Bit Mode*
- **#G_TTRG** *GAP Measurement Output Bit Trigger Time*
- **#C_TTRG** *CRASH Measurement Output Bit Trigger Time.*
- **#G_THRS** *GAP Measurement Output Bit Threshold*
- **#C_THRS** CRASH Measurement Output Bit Threshold

Description	Type	PIN
Alarm, Busy		
Alarm This output is active if a fatal alarm is in progress: • invalid data item saved; • circuits in error state; • Acoustic Sensors disconnected (if the relative physical channel is declared “enabled with alarm also enabled”). An Alarm Condition is terminated only when it is assumed that no fatal errors are present. The Alarm Condition also activates all output commands: • GAP #1 *Activated* • CRASH #1 *Activated* • GAP #2 *Activated* • CRASH #2 *Activated* **Busy** This output is active if a "system already busy" condition is in progress because of an operator request on the panel: • Manual SETUP • Manual working set change; • Zeroing This output is active even if a system already busy condition is in progress due to one of the following PLC Logic requests: • Working set change • Zeroing at start of Gap cycle	OUTPUT BIT	15

In both cases, the P1DAE may not be enabled for processing the measurements required by the flow control: the cycle must not be requested. For safety reasons the Alarm/Busy bit is activated at the low level. The PLC must check its / Alarm| Busy input bit so that it knows when the P1dAE is ready to change set or activate a cycle.		
Sets		
This input bit allows the user to select set A or set B It is always possible to activate set A. Set B could be disabled: selecting it while it is disabled forces an Alarm Condition and activates the /Alarm|Busy output bit This Set selection bit is not processed when a cycle is in progress. This Set selection bit is not processed when the remote SETUP mode or change SET is in progress (via the operator panel): in this case, a “system already busy” condition is forced and the /Alarm|Busy output bit is activated Low level : Set A High level : Set B	INPUT BIT	12
Cycles		
Crash Cycle request on physical channel #1 The requested cycle may not be accepted if an Alarm/Busy condition is present.	INPUT BIT	3
Crash Cycle check on physical channel #1 The check bit is activated during the Crash Cycle #1 if the threshold value <1C THRS> is exceeded for almost < 1C TTRG > [ms], and remains active for at least < OUT TPLC > [ms]. In the event of an alarm condition, the check bit is activated, irrespective of whether a cycle is in progress or not.	OUTPUT BIT	6
Gap Cycle request on physical channel #1 The requested cycle bit may not be accepted if an Alarm/Busy condition is present	INPUT BIT	10
Gap Cycle check on physical channel #1 The check bit is activated during the Gap Cycle #1 if the threshold value <1G THRS> is exceeded for almost < 1G TTRG > [ms], and remains active for at least < OUT TPLC > [ms]. In the event of an alarm condition, the check bit is activated, irrespective of whether a cycle is in progress or not.	OUTPUT BIT	13
Crash Cycle request on physical channel #2 The requested cycle may not be accepted if an Alarm/Busy condition is present.	INPUT BIT	4
Crash Cycle check on physical channel #2 The check bit is activated during the Crash Cycle #2 if the threshold value <2C THRS> is exceeded for almost < 2C TTRG > [ms], and remains active for at least < OUT TPLC > [ms]. In the event of an alarm condition, the check bit is activated, irrespective of whether a cycle is in progress or not.	OUTPUT BIT	7
Gap Cycle request on physical channel #2 The requested cycle bit may not be accepted if an Alarm/Busy condition is present	INPUT BIT	11
Gap Cycle check on physical channel #2 The check bit is activated during the Gap Cycle #2 if the threshold value <2G THRS> is exceeded for almost < 2G TTRG > [ms], and remains active for at least < OUT TPLC > [ms]. In the event of an alarm condition, the check bit is activated, irrespective of whether a cycle is in progress or not.	OUTPUT BIT	14

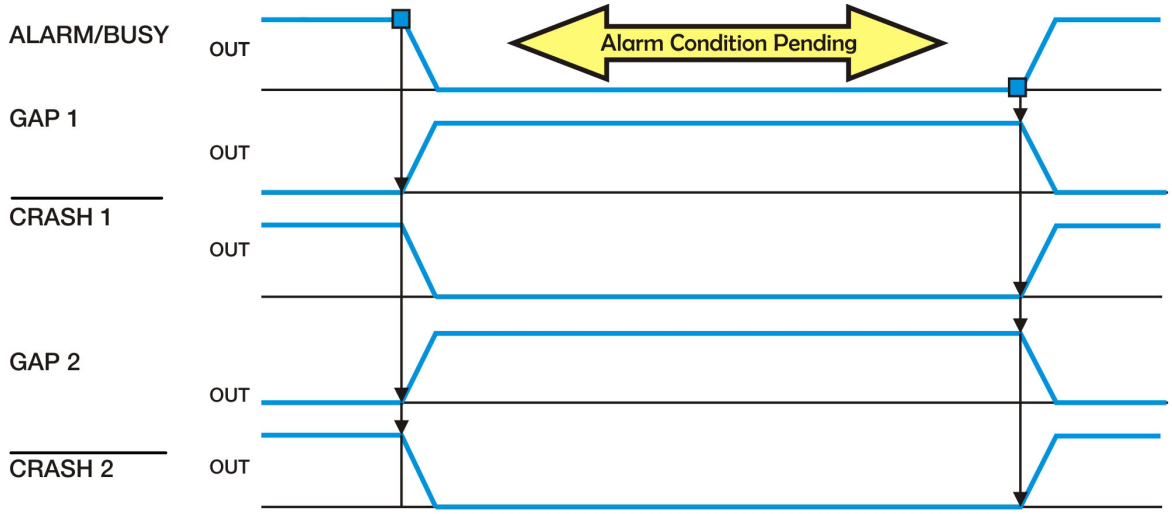
ATTENTION
For safety reasons, we strongly recommend setting up a low activation level for the following signals:
CRASH # 1 OUT BIT
CRASH # 2 OUT BIT

7.2 Alarm/Busy Conditions

7.2.1 Alarm Condition.

In the event of a P1DAE fatal error, the ALARM/BUSY bit is activated with all of the other output checks activated:

- ALARM/BUSY *activated*
- GAP #1 *activated*
- CRASH #1 *activated*
- GAP #2 *activated*
- CRASH #2 *activated*



Gap Output Bit Mode
#G OUT = out active high

Crash Output Bit Mode
#C OUT = out active low

The alarm condition is activated immediately when a fatal error is detected.

The alarm condition is deactivated one second after all fatal errors have been cleared.

7.2.2 Busy Conditions.

If processing is in progress, so the P1DAE does not allow immediate processing of a Set Change or a Cycle Request, the ALARM/BUSY bit is activated, with all of the other output commands inactive.

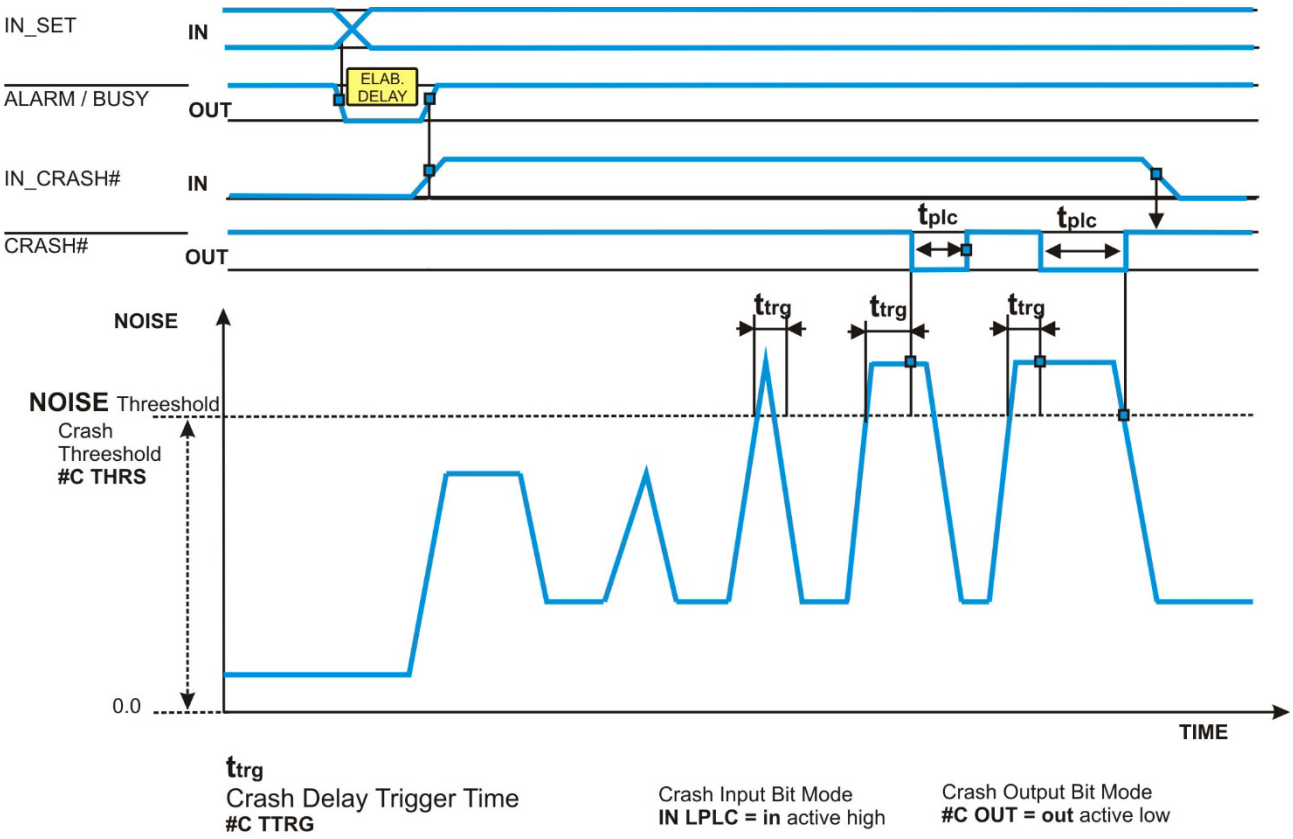
The P1DAE is not ready to perform a Set Change or a Cycle Request (“busy” condition) after the following events:

Set Change from PLC	Time strictly necessary for the electronic unit to finish the operation
Set Change from local panel or remote host interface	Until the set is released again
Zeroing from PLC with cycle “cyc√ inc”	Time strictly necessary for the electronic unit to finish the operation
Zeroing from local panel or remote host interface	Time strictly necessary for the electronic unit to finish the operation
Automatic Setup from local panel or remote host interface	Until the set is released again

7.3 P1dAE Cycles

7.3.1 CRASH check, with non self-locking command

This is an example of CRASH detection on a physical channel: the cycle is run without alarms.



N.B.

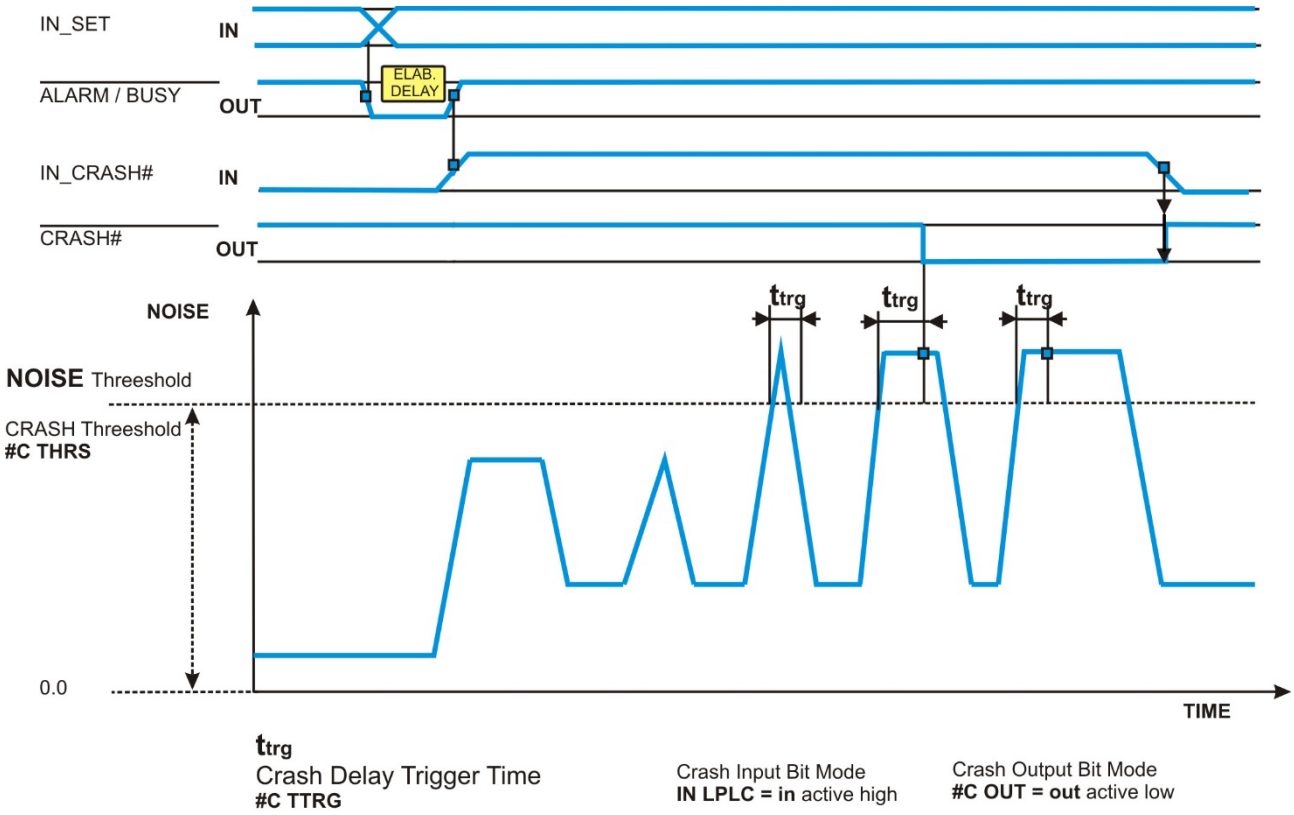
ELAB. DELAY

It is essential to observe the ALARM/BUSY output bit following a Set Change in order to ensure that the system is ready.

The **ALARM/BUSY** output bit indicates a “Busy” condition.

7.3.2 Crash check, with self-locking command

This is an example of CRASH detection on a physical channel: the cycle is run without alarms.



N.B.

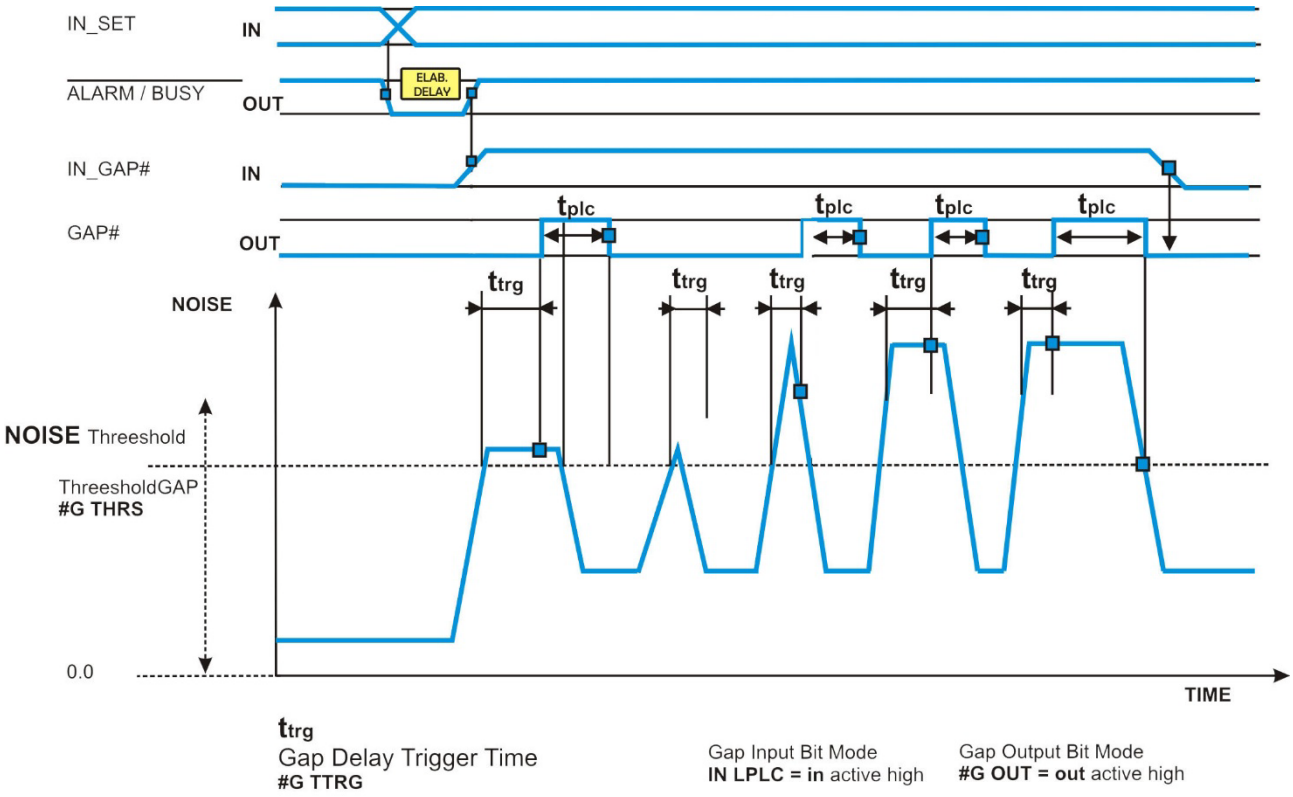
ELAB. DELAY

It is essential to observe the ALARM/BUSY output bit following a Set Change in order to ensure that the system is ready.

The **ALARM/BUSY** output bit indicates a “Busy” condition.

7.3.3 GAP cycle, with non self-locking command, "ABS" or "INC" mode

This is an example of a GAP cycle on a physical channel: the cycle is run without alarms.



N.B.

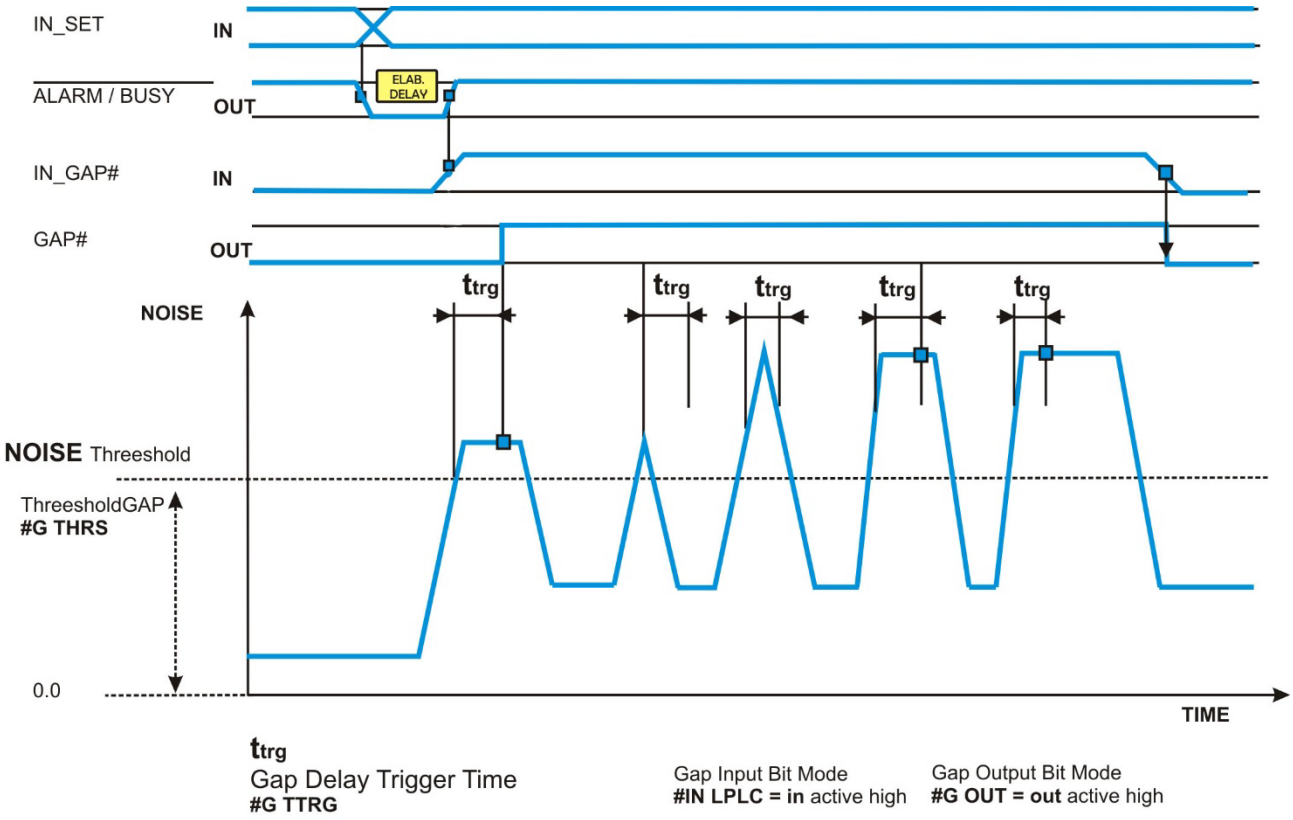
ELAB. DELAY

It is essential to observe the ALARM/BUSY output bit following a Set Change in order to ensure that the system is ready.

The **ALARM/BUSY** output bit indicates a "Busy" condition.

7.3.4 GAP cycle, with self-locking command, "ABS"

The Gap Cycle request on channel number # is explained as example: the cycle is run without alarms.



N.B.

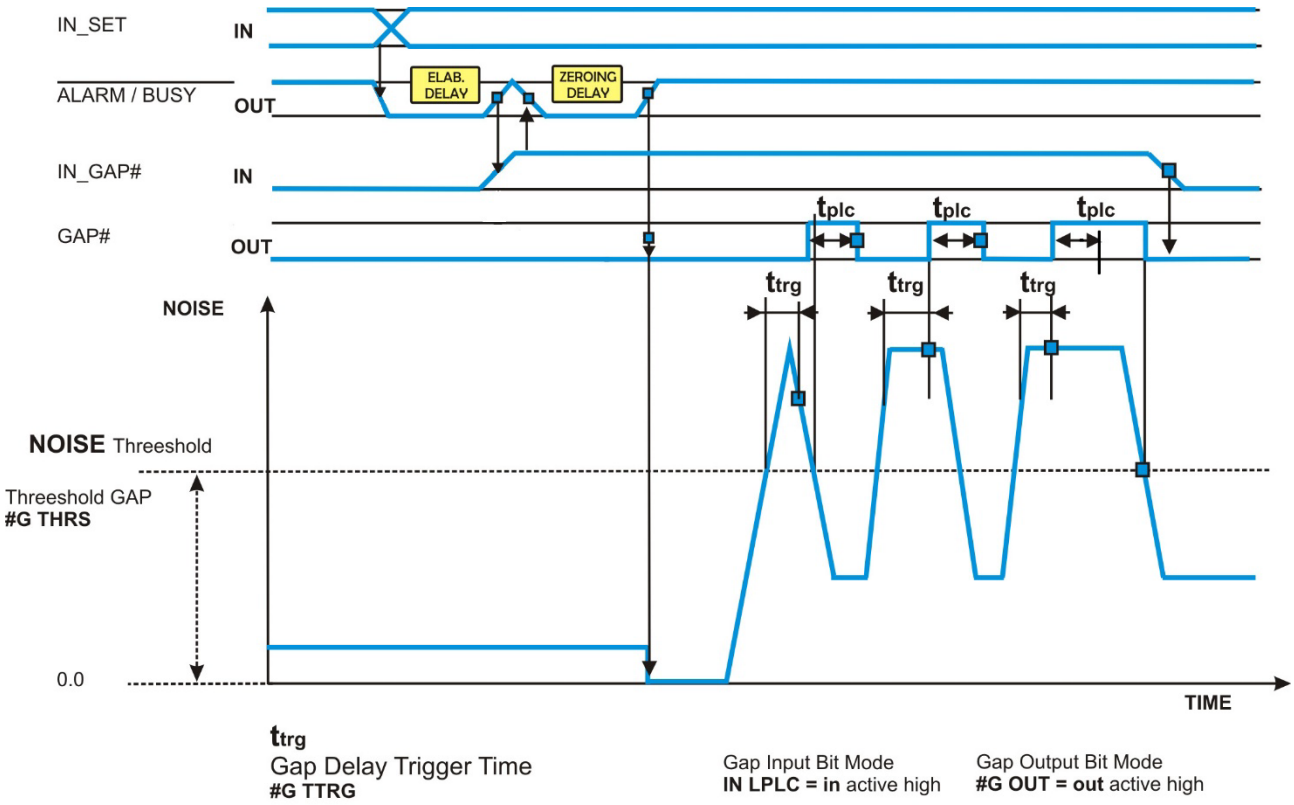
ELAB. DELAY

It is essential to observe the ALARM/BUSY output bit following a Set Change in order to ensure that the system is ready.

The **ALARM/BUSY** output bit indicates a "Busy" condition.

7.3.5 GAP cycle, with non self-locking command, "cyc√ inc" mode

This is an example of a GAP cycle on a physical channel: the cycle is run without alarms.
There is Zeroing of the Gap measurement (without saving the Zeroing data).



N.B.

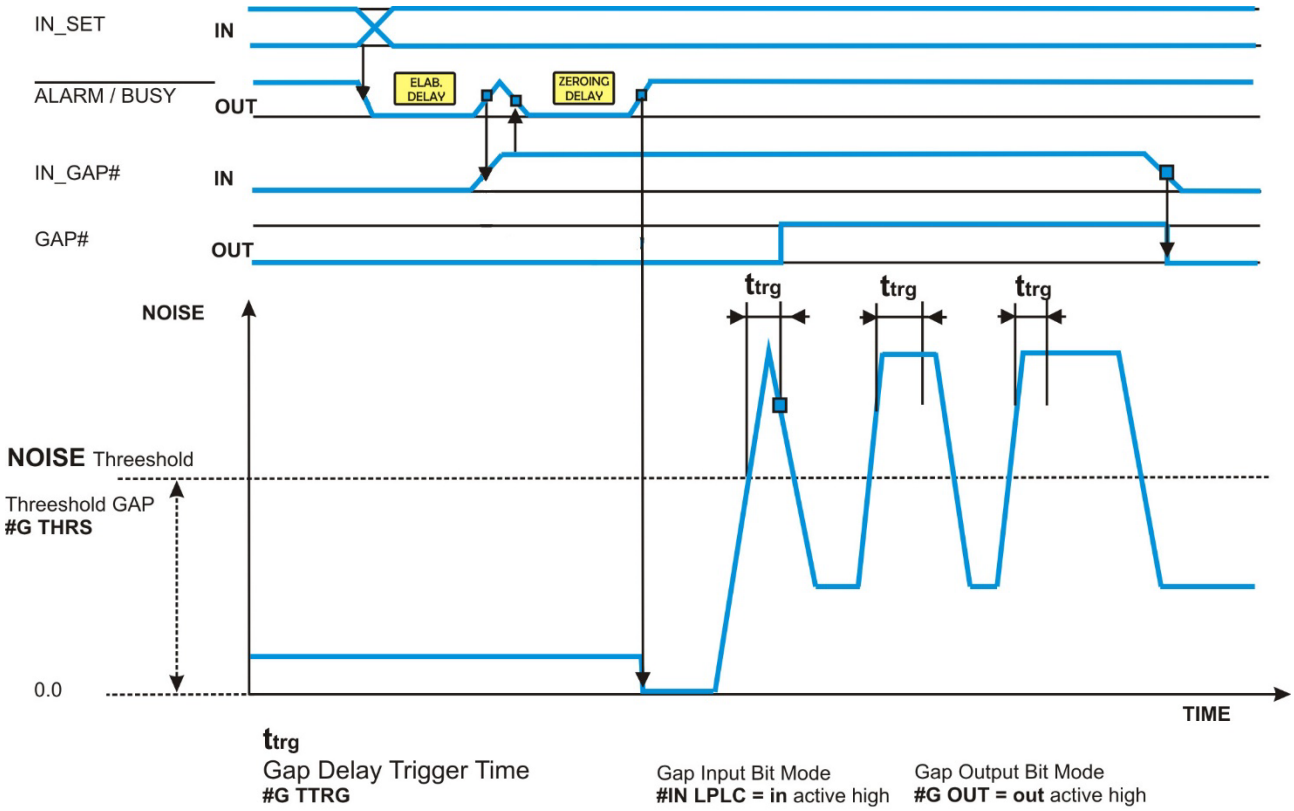
ELAB. DELAY	It is essential to observe the ALARM/BUSY output bit following a Set Change in order to ensure that the system is ready.
ZEROING DELAY	It is essential to observe the ALARM/BUSY output bit following a Gap Cycle with zeroing in order to ensure that the system is ready.

The **ALARM/BUSY** output bit indicates a "Busy" condition.

The Zeroing Delay is as programmed in the **#G TZER** [ms] parameter: whose default value is 250 [ms]. During the Zeroing step, the P1DAE acquires the background noise, therefore no working is allowed which might alter the background noise.

7.3.6 GAP cycle, with self-locking command, "cyc√ inc" mode

The Gap Cycle request on channel number # is explained as example: the cycle is run without alarms.
There is Zeroing of the Gap measurement (without saving the Zeroing data).



N.B.

ELAB. DELAY	It is essential to observe the ALARM/BUSY output bit following a Set Change in order to ensure that the system is ready.
ZEROING DELAY	It is essential to observe the ALARM/BUSY output bit following a Gap Cycle with zeroing in order to ensure that the system is ready.

The **ALARM/BUSY** output bit indicates a "Busy" condition.

The Zeroing Delay is as programmed in the **#G TZER** [ms] parameter: whose default value is 250 [ms].

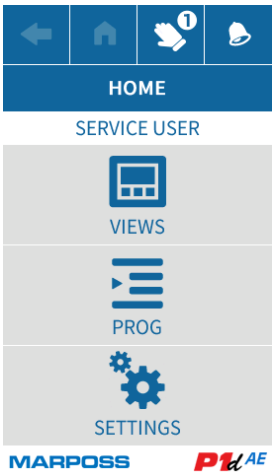
The Background Noise is used to carry out an analysis on the P1DAE during the Zeroing Delay period: no working is allowed during this step.

8 OPERATION AND USE

8.1 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. [Operating mode selection menu]

Press this softkey to return to the Home Page

Press this softkey to return to the previous page.

This bar displays the page title.

This bar displays the name of the current user. [User Menu]

Press this softkey to access the Views Menu [Views Menu]

Press this softkey to access the Prog Menu [Prog Menu]

Press this softkey to access the Settings Menu [SETTINGS MENU]

8.1.1 Panel general icons

The menu pages include the following icons:

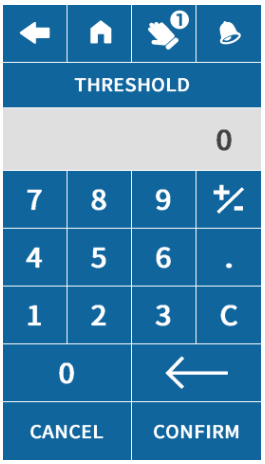
If a page contains more data than it is possible to display on a single page, it will also include arrow icons that can be used scroll up and down in order view all the available data.

This icon, which appears at the end of a parameter string, indicates that a multiple choice window will be opened.

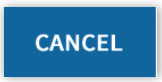
This icon, which appears at the end of a parameter string, indicates that an additional programming page will be opened.

This icon, which appears at the end of a parameter string, indicates whether it is enabled or disabled.

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.
For example:



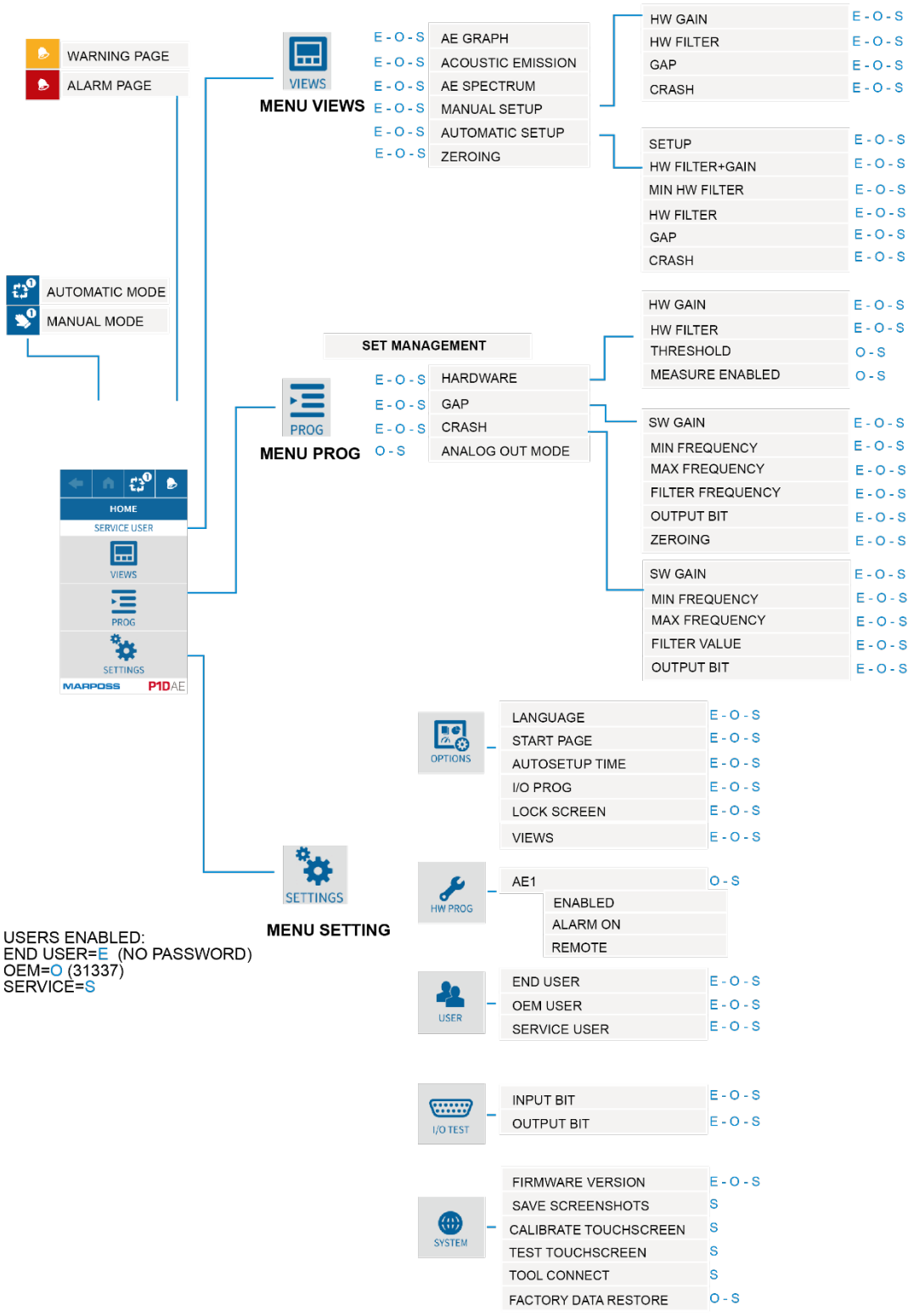
These check boxes may be used to select a parameter from two or more different data items.



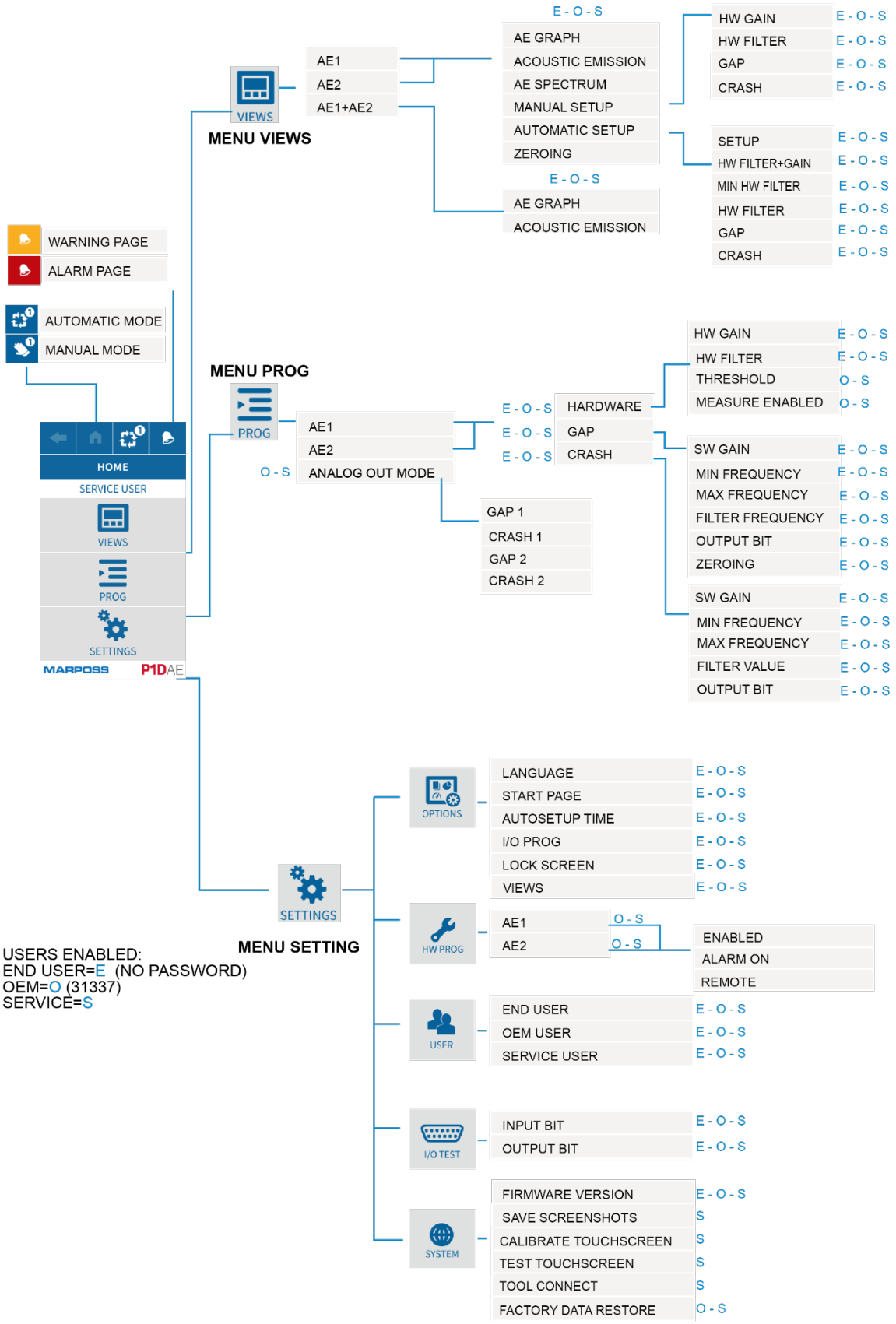
After modifying data, the page may also display some of the following softkeys, which are used to save/confirm the modifications, or exit without saving.

8.1.2 Panel flow chart

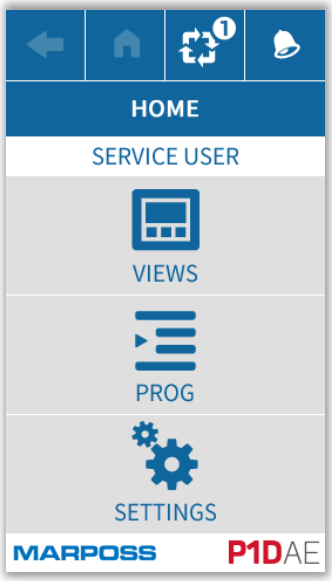
1 CHANNEL P1D AE



2 CHANNEL P1D AE



8.1.3 Alarms and Warnings Menu



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

Blue = no alarms

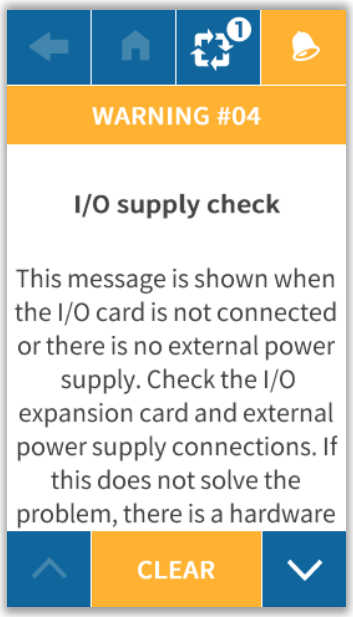
Yellow = Warning

Red = Alarm

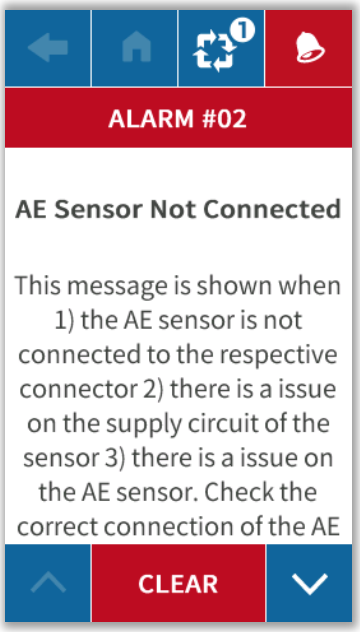
Consult the Alarms and Warnings chapter for a complete list of warnings and alarms.

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

SAMPLE WARNING:



SAMPLE ALARM:

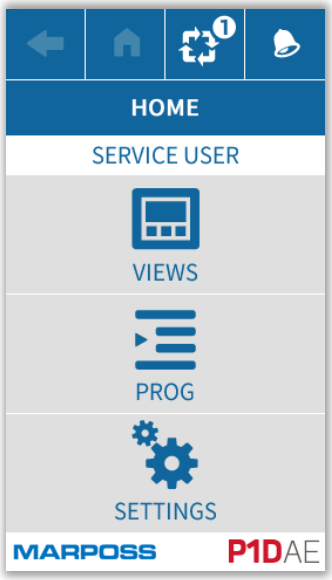


The page indicates the alarm or warning number, the title and message indicating the reason for the alarm, and how to correct it.

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

Use the CLEAR button to reset the alarm or warning.

8.1.4 Operating mode selection page



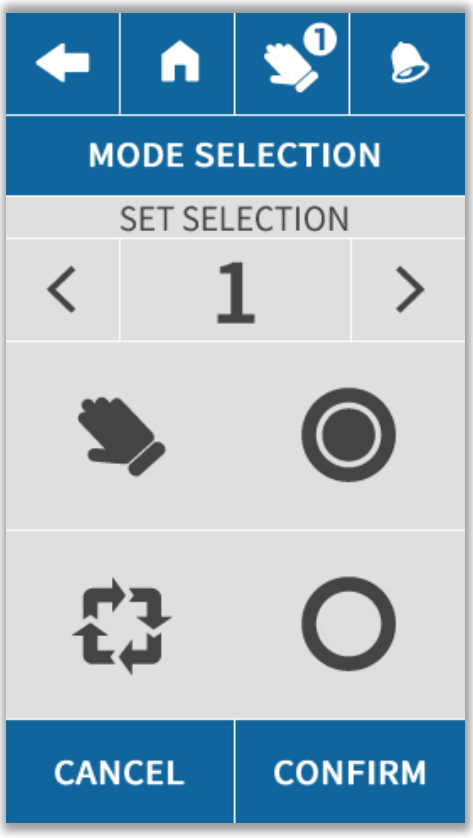
This icon indicates the operating mode and the number of the set that is currently in use.


Manual operating mode

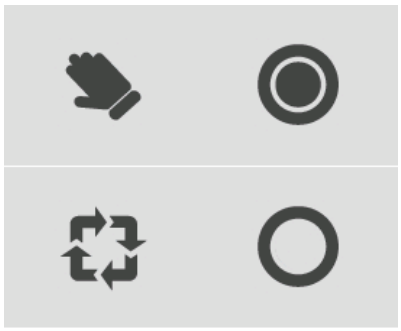

Automatic operating mode

The number at the top indicates the currently selected set number.

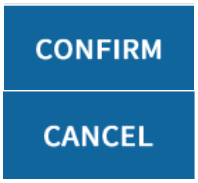
Press the softkey to access the selection page.



In this section it is possible to select the set by using the arrows to scroll back and forth through the available options.



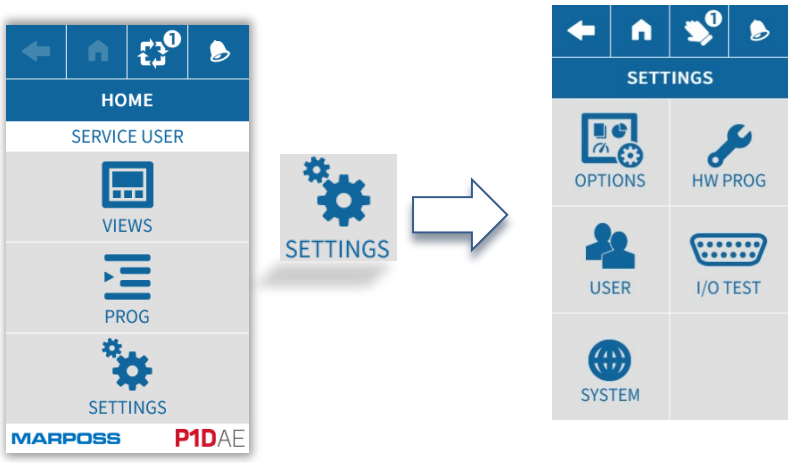
Whereas in this section it is possible to select Manual or Automatic operating mode.



Press CONFIRM to save the modifications and leave the page

Press CANCEL to leave the page without saving the modifications.

8.2 SETTINGS MENU



OPTIONS

- LANGUAGE
- START PAGE
- AUTOSETUP TIME
- I/O PROG
- LOCK SCREEN
- VIEWS

HW PROG

- AE1
- AE2
  - ENABLED
  - ALARMS ON
  - REMOTE

USER

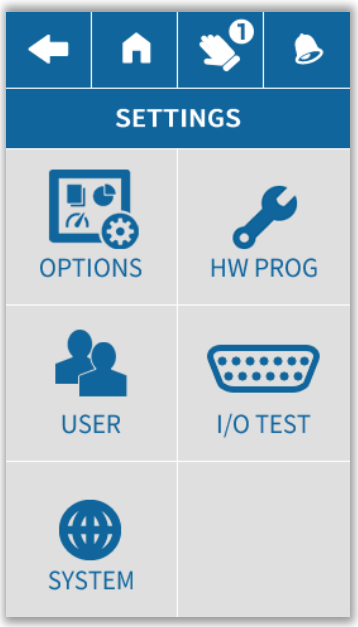
- END USER
- OEM USER
- SERVICE USER

I/O TEST

- INPUT BIT
- OUTPUT BIT

SYSTEM

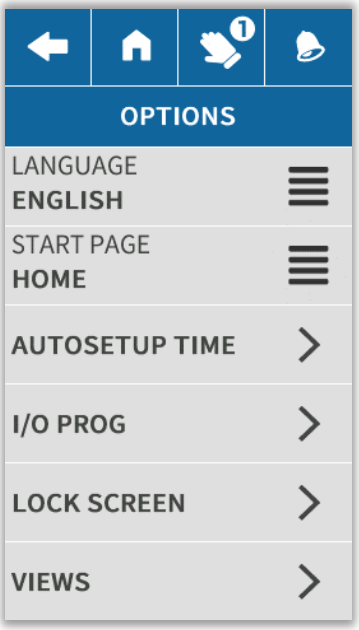
- FIRMWARE VERSION
- SAVE SCREENSHOT
- CALIBRATE TOUCHSCREEN
- TEST TOUCHSCREEN
- TOOL CONNECT
- FACTORY DATA RESTORE



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

OPTIONS	OPTIONS MENU
HW PROG	HARDWARE PROGRAMMING MENU
USER	USER MENU
I/O TEST	I/O TEST MENU
SYSTEM	SYSTEM MENU

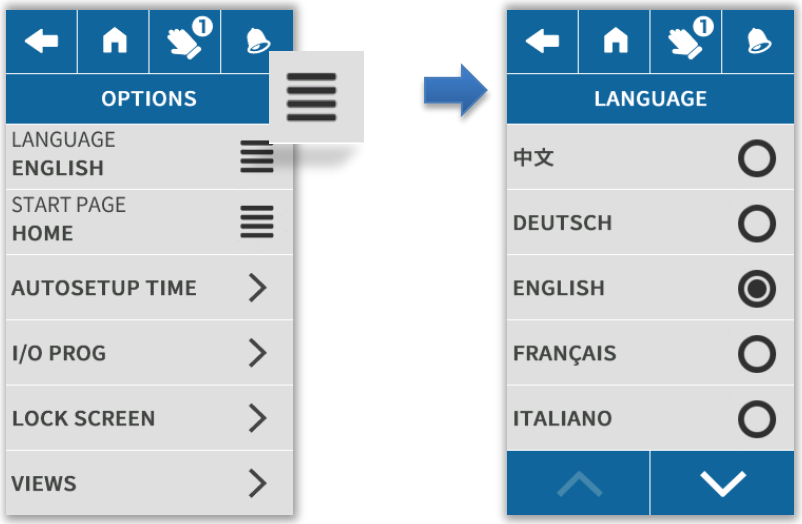
8.2.1 Options Menu



The options menu can be used for the following settings:

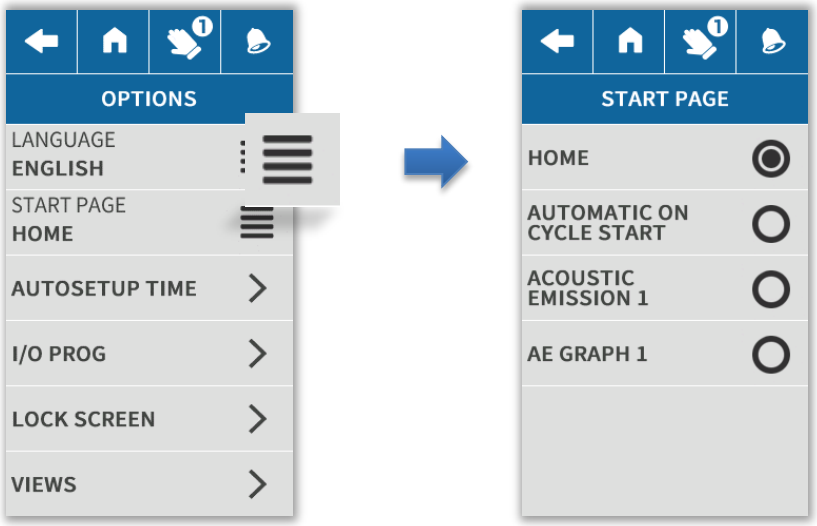
1. Language
2. Start page
3. Autosetup Time
4. I/O programming
5. Lock screen
6. Views

1. SELECT LANGUAGE



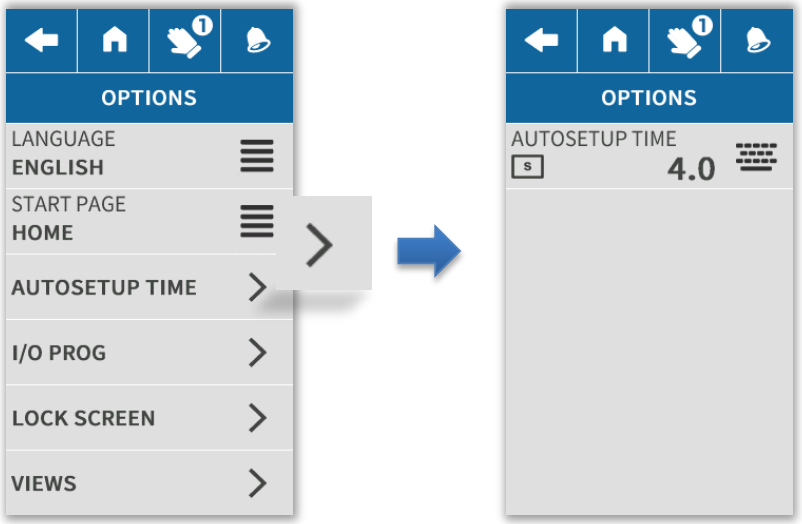
Use this page to select the panel display language from the available options.

2. 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.

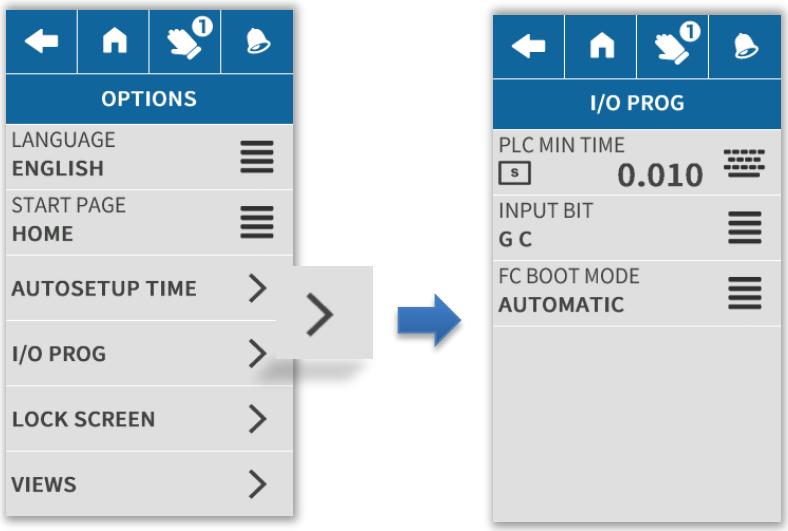
3. AUTOSETUP TIME



ONLY IN MANUAL MODE (OEM – SERVICE)

The Autosetup Time is the maximum time in which the P1dAE finishes an automatic setup step without operator intervention. Alternatively, the operator may finish it manually.

4. I/O PROGRAMMING PAGE



ONLY IN MANUAL MODE (OEM – SERVICE)

► 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, which is certain only if the type of PLC cycle is equally fast.
Setting a high value will give a slow PLC cycle time.

► INPUT BIT

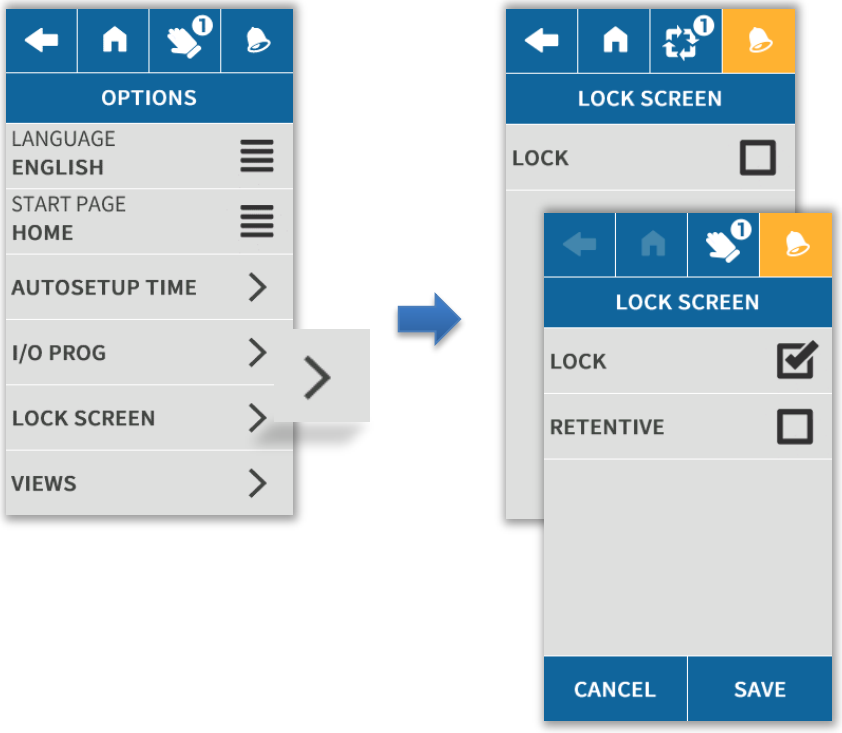
Level for input bit: set the activation level for the cycle request input bit (default value G C)

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

► FC BOOT MODE

This parameter is for setting the mode in which the machine starts when switched on, i.e.: automatic (default) or manual.

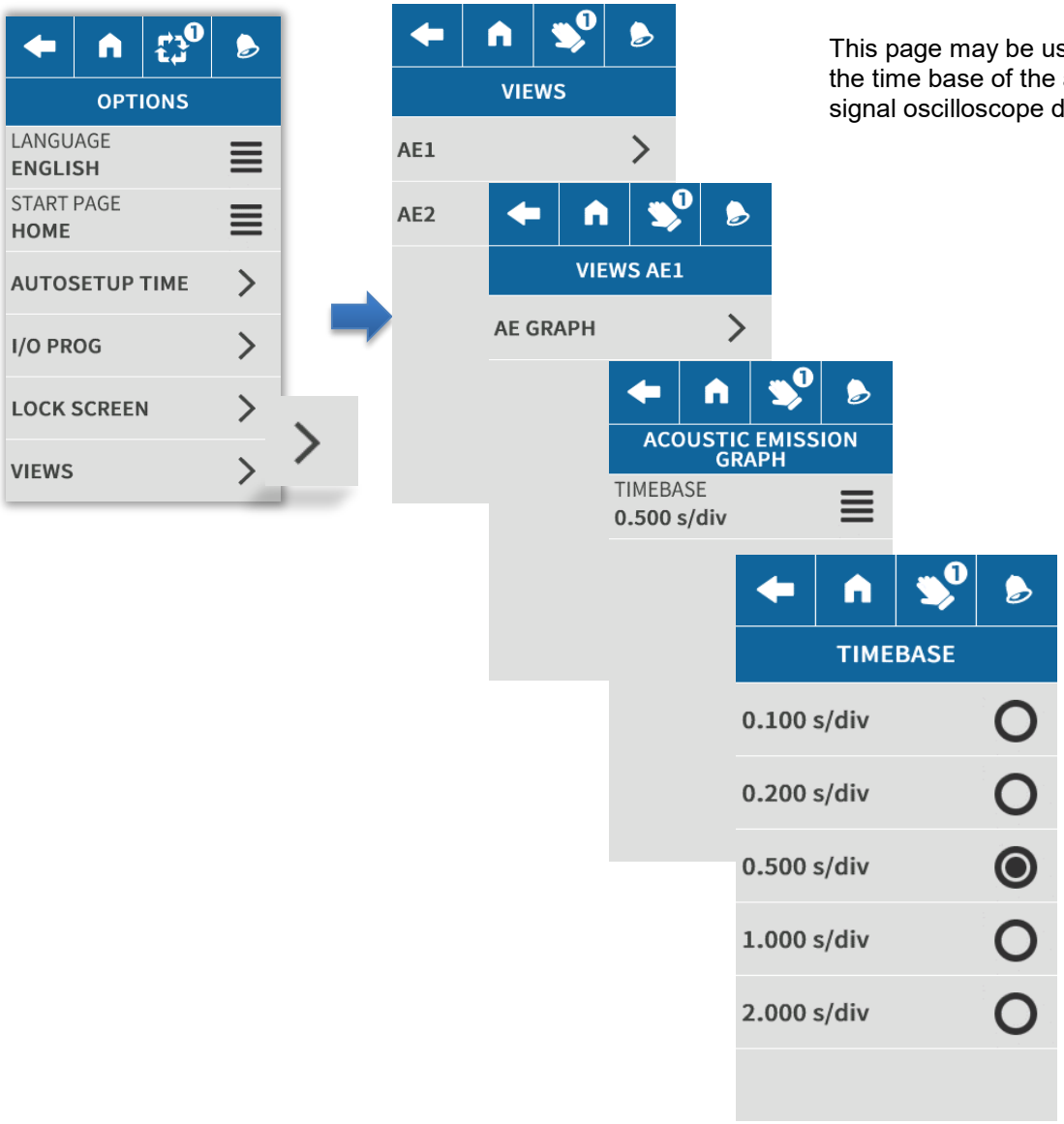
5. LOCK SCREEN



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.

6. VIEWS



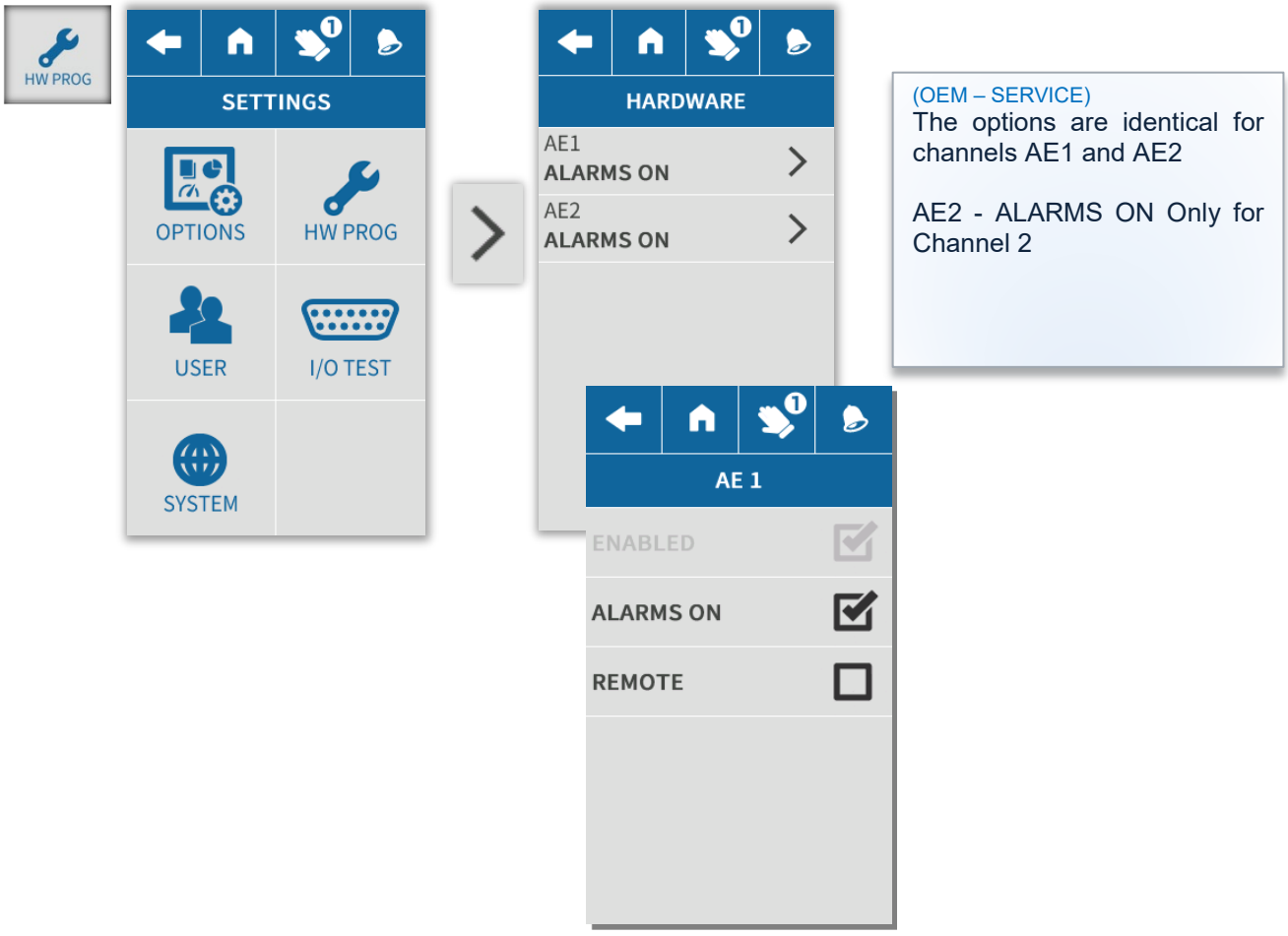
This page may be used to select the time base of the acoustic signal oscilloscope display

8.2.2 HW Prog Menu

AE Sensor management enabling and Alarm Check Enabling

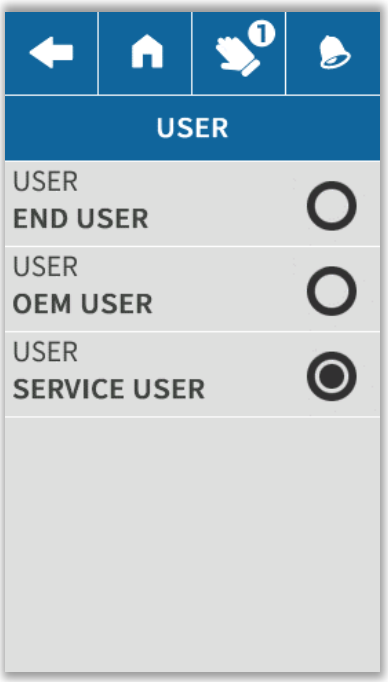
Set the AE Sensor management mode by disabling or enabling it with or without a connection check.

ENABLED	If it is not enabled, alarms and measurements are not produced.
ALARM ON	If selected, the corresponding alarm ALA001 or ALA002 will be enabled.
REMOTE	Select this parameter in the event of connection to a remote AE sensor, for example with a MiniCT analogue acoustic cable: In this case, 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.



8.2.3 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 Setup and Prog operations. For this reason this user level is intended primarily for Marposs personnel and is password protected.

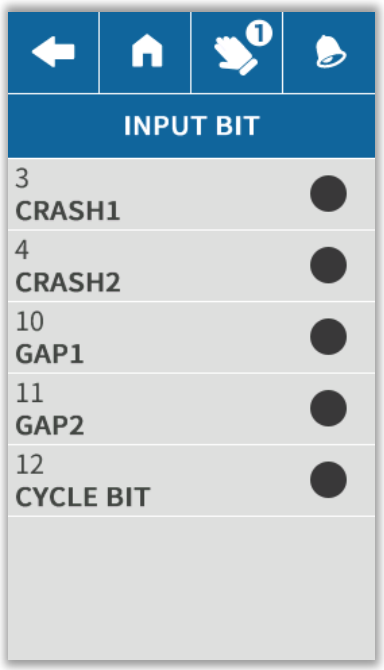
The Panel Flow Chart indicates which pages and functions are accessible to the various user levels.

8.2.4 I/O Test Menu

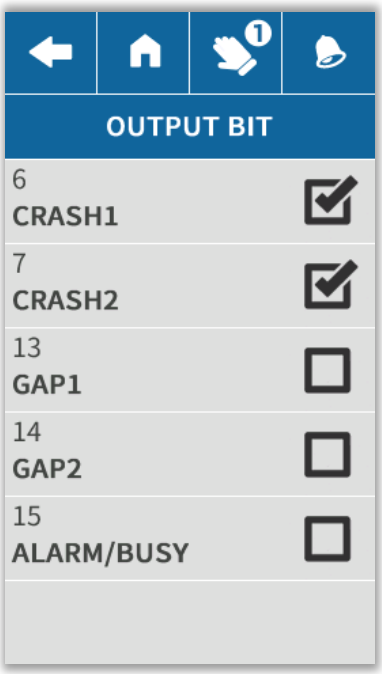
The I/O tests can be performed in Manual and Automatic mode:

- 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

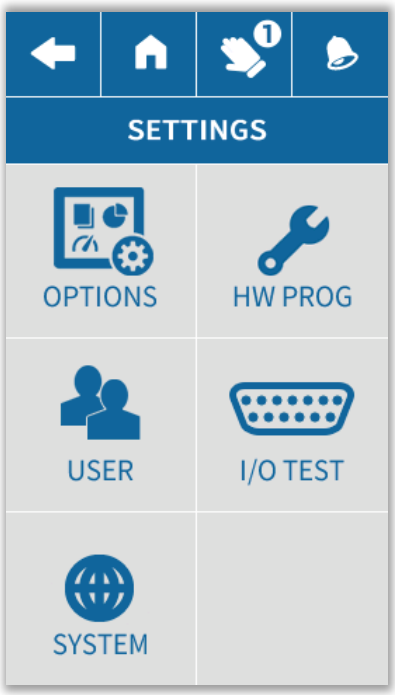


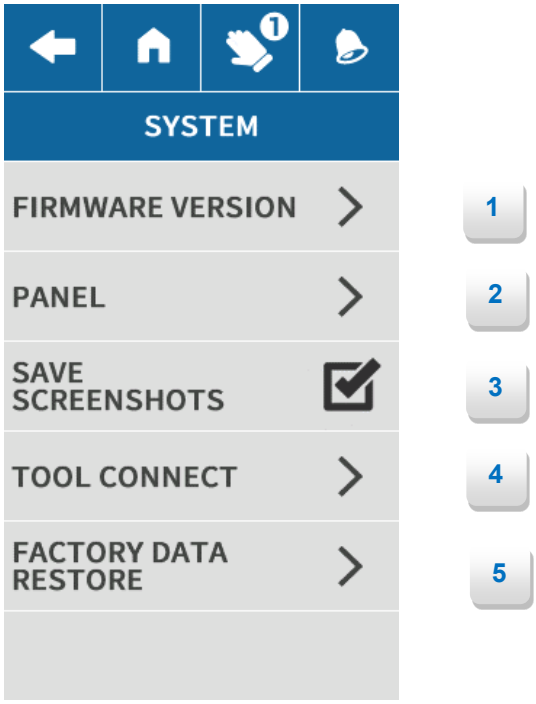
OUTPUT BIT



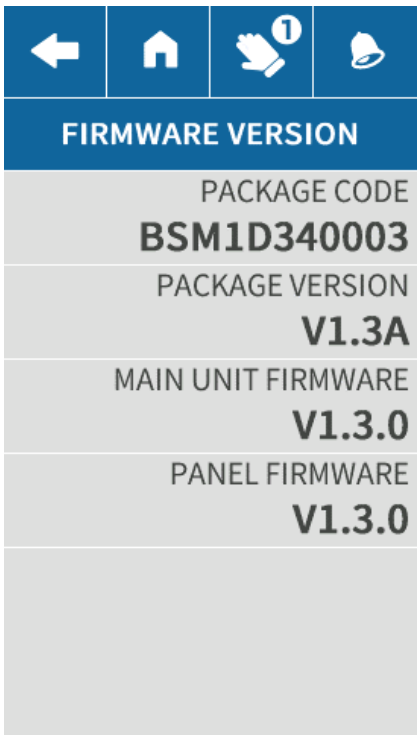
8.2.5 System Menu

Manual and Automatic operating mode





1. FIRMWARE VERSION



FIRMWARE VERSION

[OEM-SERVICE]
This page may be used to display the firmware versions of the various components of the application.

2. SAVE SCREENSHOT

Manual and Automatic. [Service]

Use this function to save screenshots.

☐ function disabled

☑ function enabled

3. CALIBRATE/ TEST TOUCHSCREEN

Manual and Automatic. [Service]

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.

4. TOOL CONNECT

Manual [Service]

Press this softkey to force a connection with the P1dAE_tool in the event of malfunctions.
Notice that in general the connection with the P1dAE_tool occurs remotely in automatic mode.
This will open the window shown on the left, which indicates that service serial link mode is active.

5. FACTORY DATA RESTORE

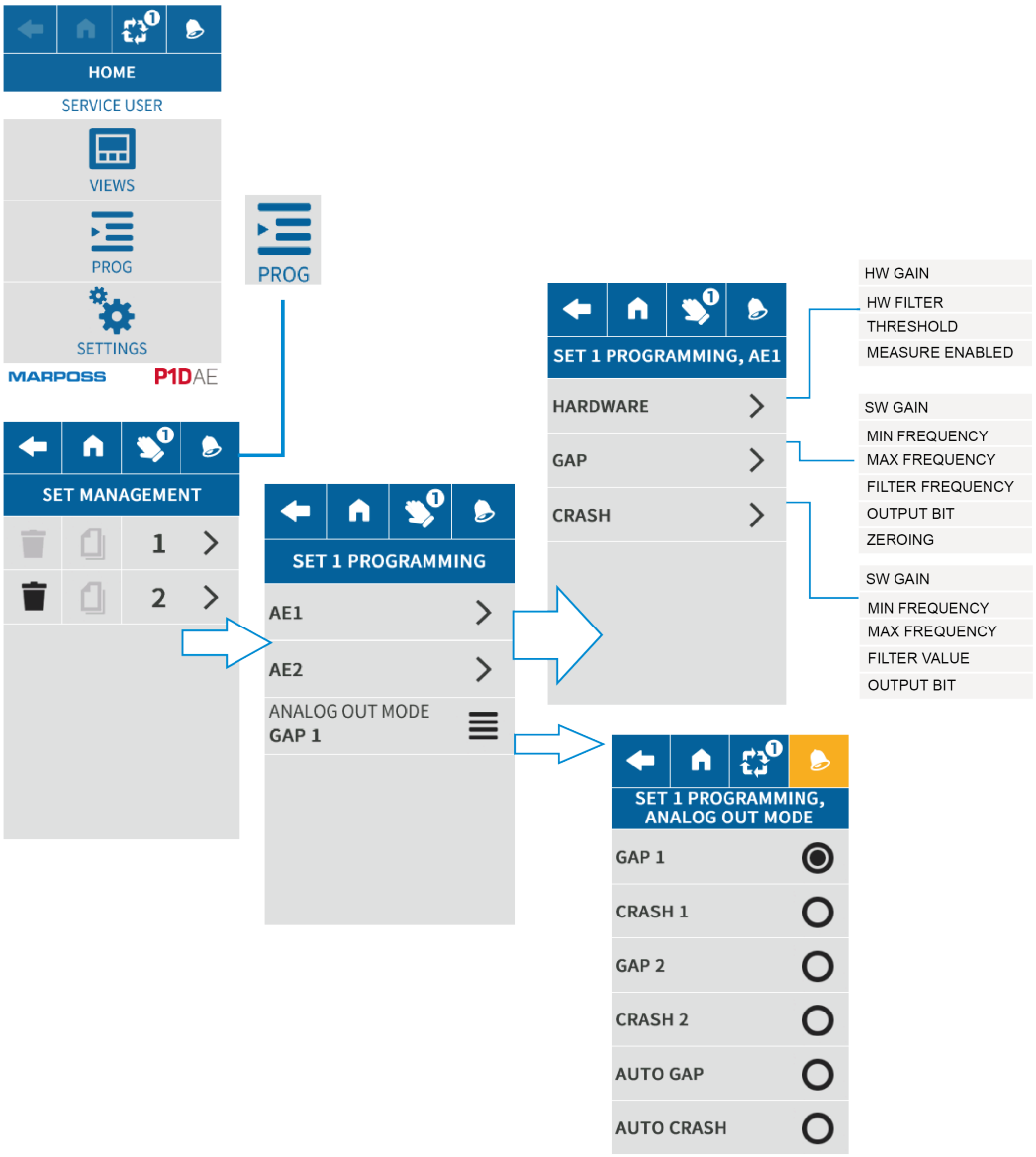
Manual [Service]

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

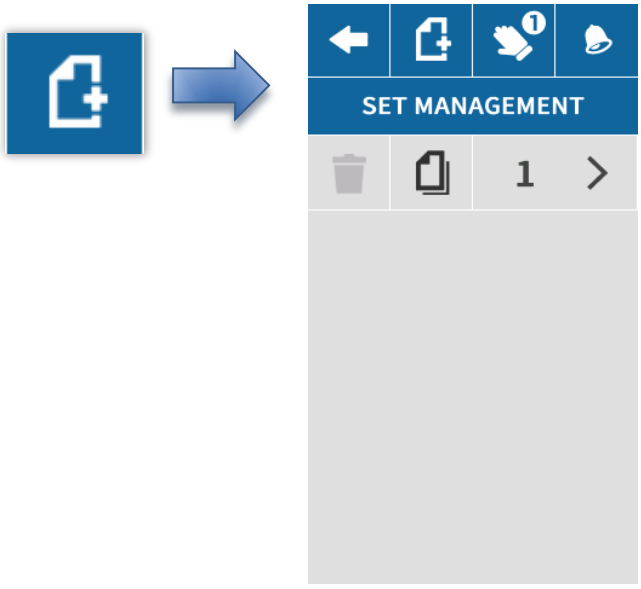
8.3 PROG Menu

Manual and Automatic operating mode

[End User – OEM – Service]



The operating data are associated with a Set number of up to a maximum of 2 sets
The start page lists all the sets that have already been set-up and saved; to create a new one, press



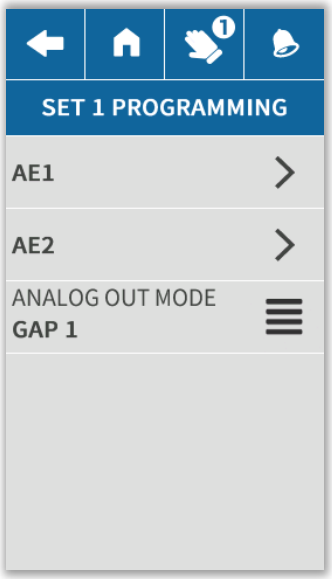
Use this softkey to duplicate the existing set

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

Once they have been created, the sets must be programmed.

8.3.1 Set Management Menu



Set Programming Menu:

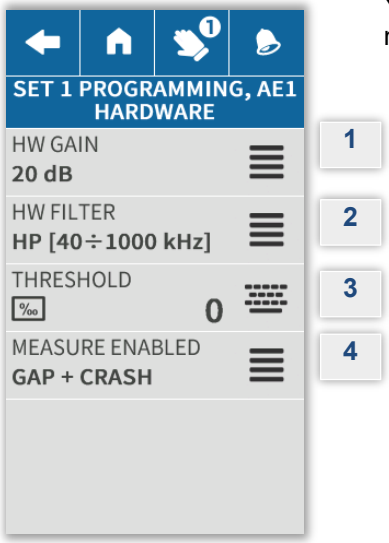
- AE1
- AE2 (Only for 2 Channels)
- ANALOG OUT MODE (Only for 2 channels)

N.B.: The menus for programming the two channels are identical. Below is a description of only the pages of channel 1 as an example.

Programming Menu for the Channel 1 set

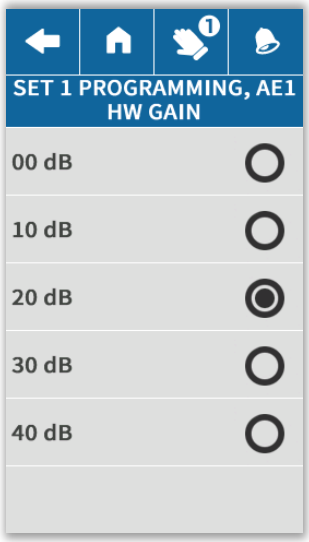
- HARDWARE
- GAP
- CRASH
- ANALOG OUT MODE

8.3.1.1 HARDWARE MENU



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

1. **HW GAIN**
2. **HW FILTER**
3. **THRESHOLD**
4. **MEASURE ENABLED**

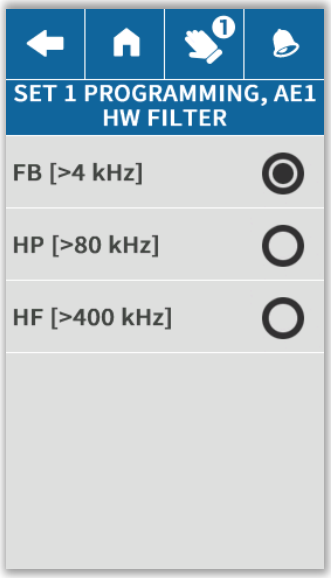


1) HW GAIN Programming

HW stage gain (list of 10 dB step values)
Sets the gain of the HW stage: to be programmed for having 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.

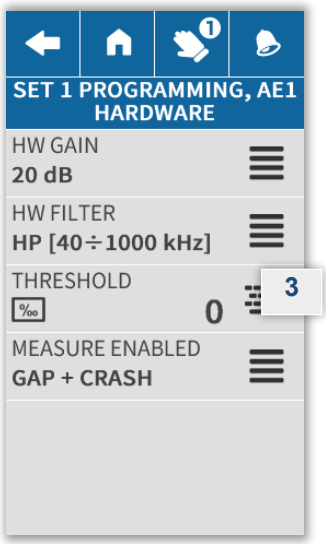


2) HW FILTER Programming

HW stage filtering band (3 value list).

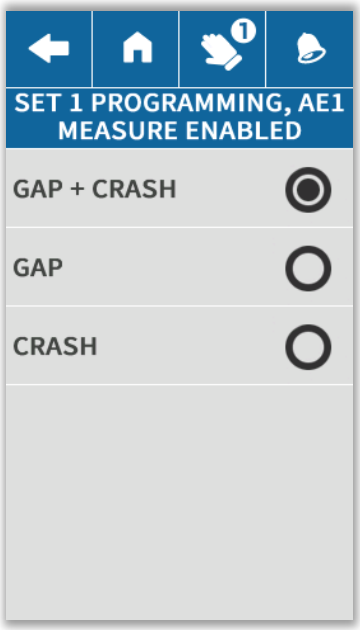
Sets the **HW HP (High-Pass)** stage filtering capacity if the machine has background noise components that are large/variable in the low frequency spectrum: this prevents saturation of the acquisition noise circuits, allowing a higher HW gain.

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



3) THRESHOLD Programming

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

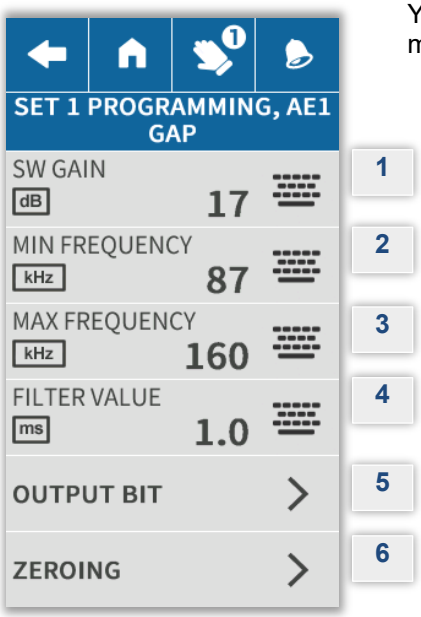


4) MEASURE ENABLED Programming

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

8.3.1.2 GAP MENU



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

1. **SW GAIN**
2. **MIN. FREQUENCY**
3. **MAX. FREQUENCY**
4. **FILTER VALUE**
5. **OUTPUT BIT**
6. **ZEROING**

1. SW GAIN

N.B.
The SW GAIN parameter is automatically calculated by the Automatic Setup guided procedure (AUTOMATIC SETUP page in VIEWS 8.4.5), modifiable together with other parameters in Manual Setup (MANUAL SETUP page in VIEWS 8.4.4), *or manually modifiable in this page.*

Sets the GAP measurement processing gain.
To be programmed after setting the **HW GAIN** parameter (Sec. 8.3.1.1) and **HW FILTER** parameter (Sec. 8.3.1.2)
for having the Gap signal above the threshold (GAP THRESHOLD) on the Gap event.

Setting range : from 0 dB to 99dB.

2. MIN FREQUENCY

Measurement minimum frequency [kHz]
The parameter is automatically calculated by the Automatic Setup guided procedure (AUTOMATIC SETUP page in VIEWS) .
The parameter can be manually modified.

3. MAX FREQUENCY

Measurement maximum frequency [kHz]
The parameter is automatically calculated by the Automatic Setup guided procedure (AUTOMATIC SETUP page in VIEWS) .
The parameter can be manually modified.

4. 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

5. OUTPUT BIT

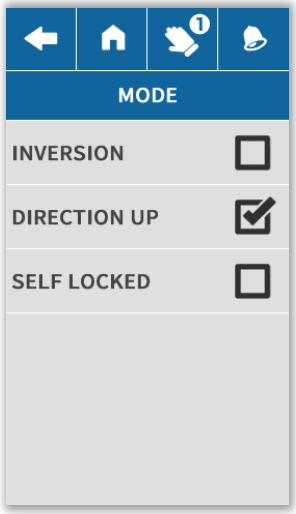
► THRESHOLD

GAP measurement output bit trigger threshold

[relative to the Range from 0 to 1000]

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.

► MODE



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

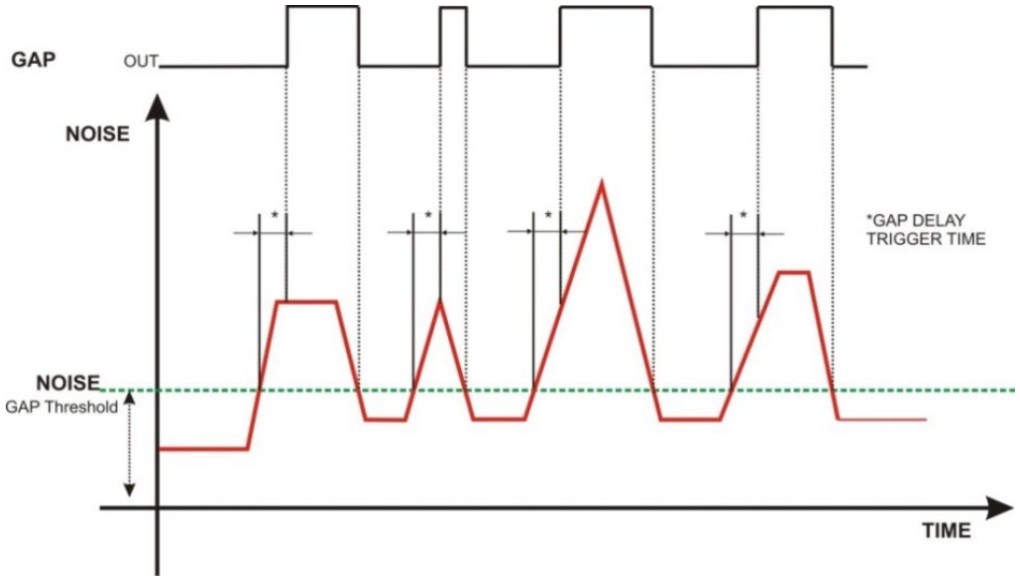
GAP signal self locked: as soon as the machine control starts the cycle, the GAP signal is reset. When contact between the grinding wheel and the part or the abrasive dressing wheel is detected, the machine is supplied with the signal, which remains set until the next cycle start. This mode is recommended 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.

► **MINIMUM TIME ON**

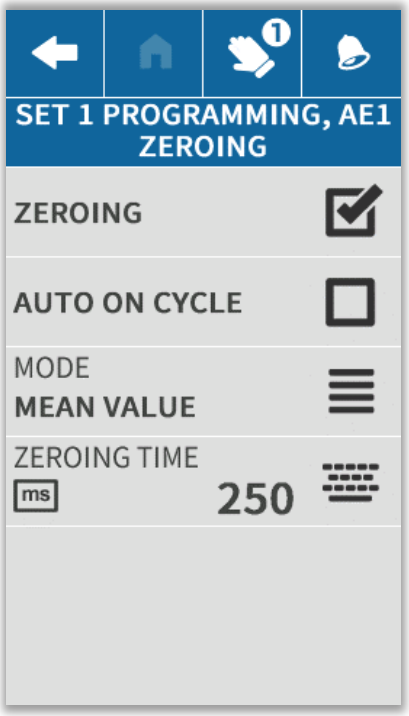
This parameter may be used to define the minimum length of time that the GAP condition must be present before the corresponding command (activate GAP output) is triggered; this means that the Gap command will not be triggered until the noise level has exceeded the pre-set threshold value for a period 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).

6. ZEROING



► ZEROING ENABLED

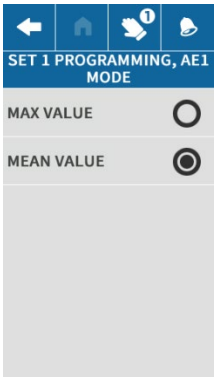
The GAP channel may be processed in Absolute or Differential mode. If the “Zeroing enabled” function is enabled, differential mode is enabled so that zeroing is carried out automatically at the start of the GAP cycle.

► 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]

► MODE

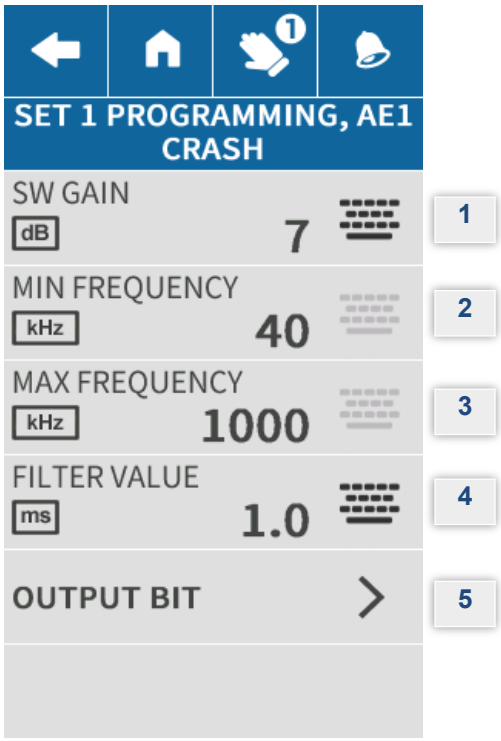
This parameter may be used to select either the maximum or minimum value.



► 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.

8.3.1.3 CRASH MENU



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

1. **SW GAIN**
2. **MIN. FREQUENCY**
3. **MAX. FREQUENCY**
4. **FILTER VALUE**
5. **OUTPUT BIT**

1. SW GAIN

The SW GAIN parameter is automatically calculated by the Automatic Setup guided procedure (AUTOMATIC SETUP page in VIEWS 8.4.5), modifiable together with other parameters in Manual Setup (MANUAL SETUP page in VIEWS 8.4.4), *or manually modifiable in this page.*
Sets the CRASH measurement processing gain.
To be programmed after setting the **HW GAIN** parameter (Sec. 8.3.1.1) and **HW FILTER** parameter (Sec. 8.3.1.2)
for having the Crash signal below the threshold (CRASH THRESHOLD) in any machine normal operating condition.
Setting range : from 0 dB to 99dB.

2. MIN FREQUENCY

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

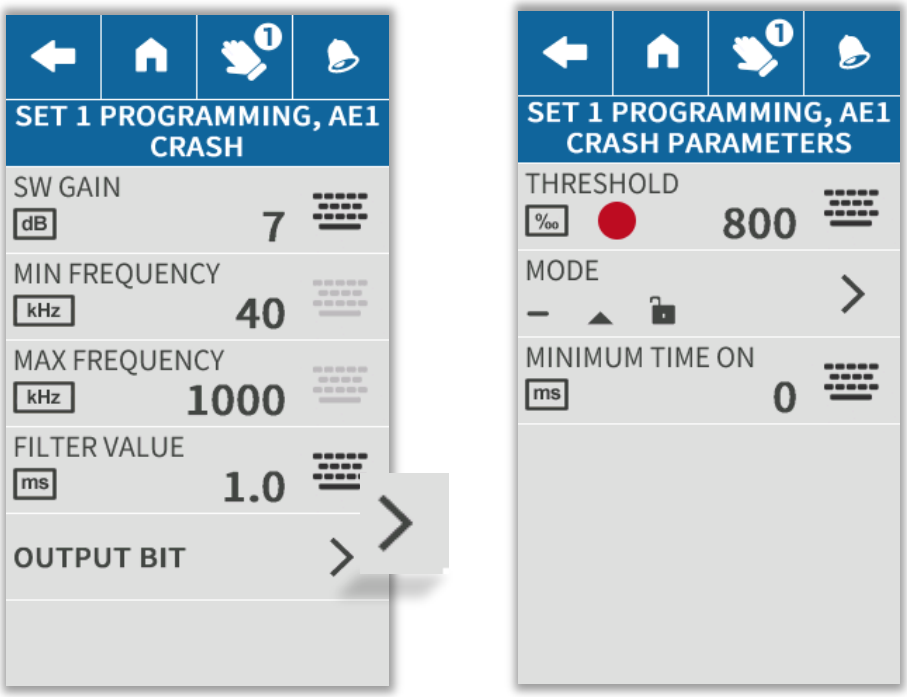
3. MAX FREQUENCY

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

4. 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

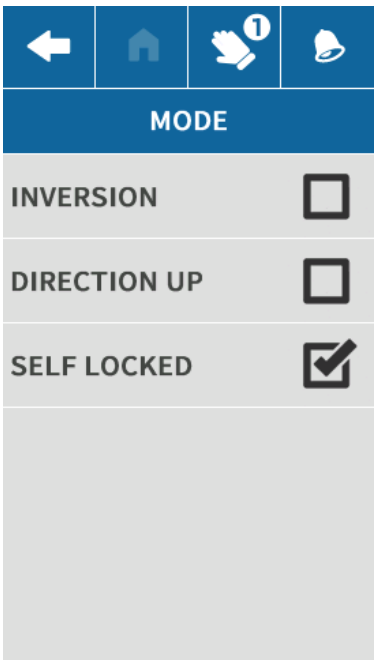
5. OUTPUT BIT



► CRASH COMMAND THRESHOLD

CRASH measurement output bit trigger threshold
[relative to the Range from 0 to 1000]
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.

► MODE



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 Crash output command is triggered when the noise level exceeds the programmed threshold.

If the function is disabled, the Crash output command is triggered when the noise level drops below the programmed threshold.

SELF LOCKED

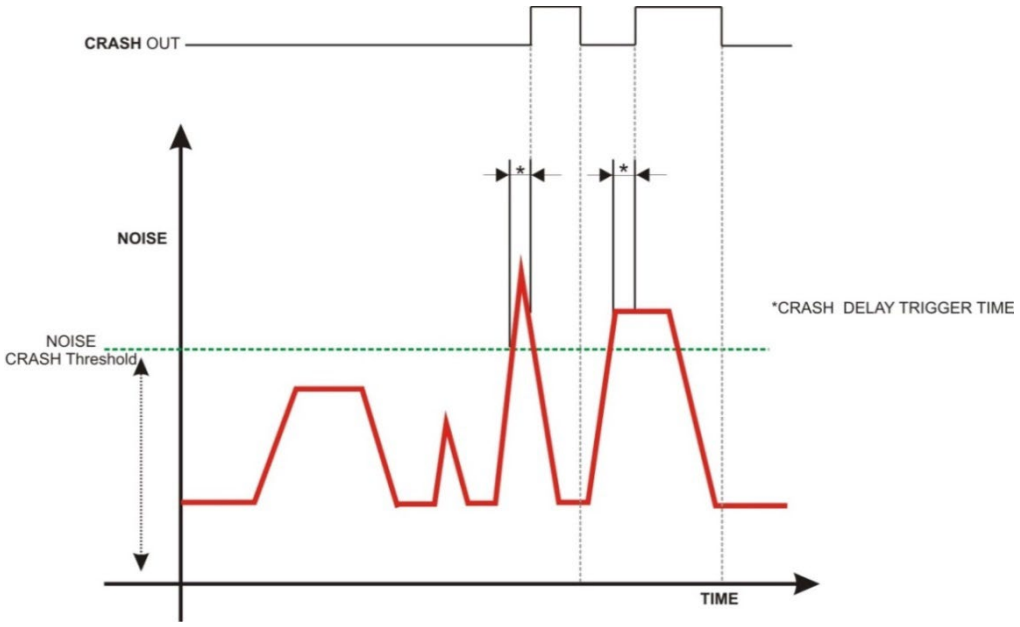
Self-locked control. Once supplied the Crash output check is reset only at the successive Crash check enabling.

NON self-locked control. The Crash output control is reset when the noise level drops below the trigger threshold.

► MINIMUM TIME ON

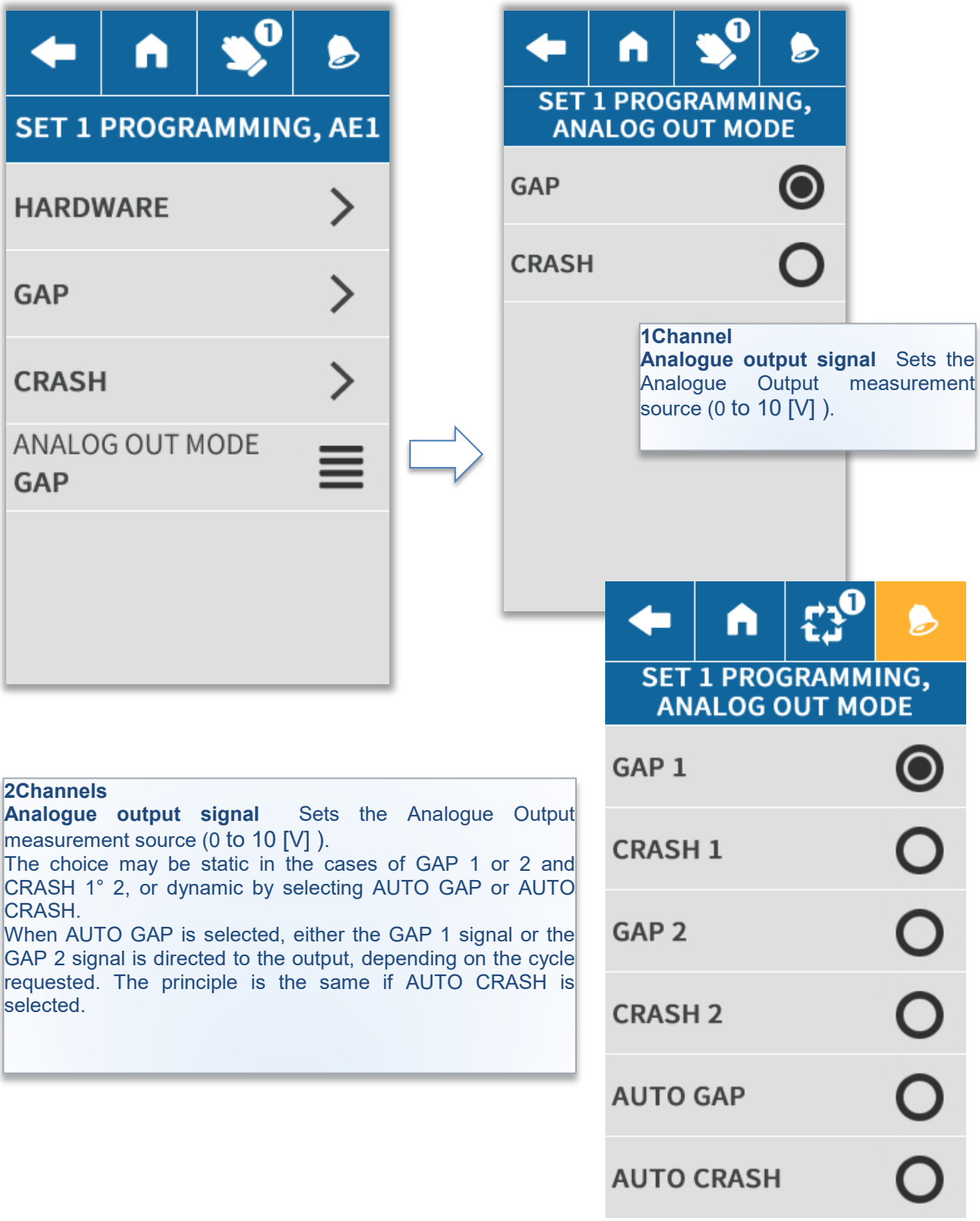
This parameter may be used to define the minimum length of time that the CRASH condition must be present before the corresponding command (activate CRASH output) is triggered; this means that the Crash command will not be triggered until the noise level has exceeded the pre-set threshold value for a 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).

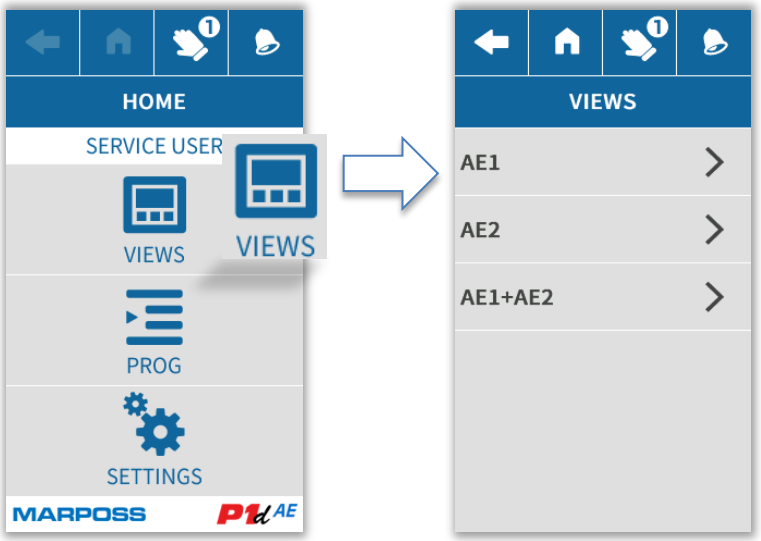
8.3.1.4 ANALOGUE OUT MODE



2Channels
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.

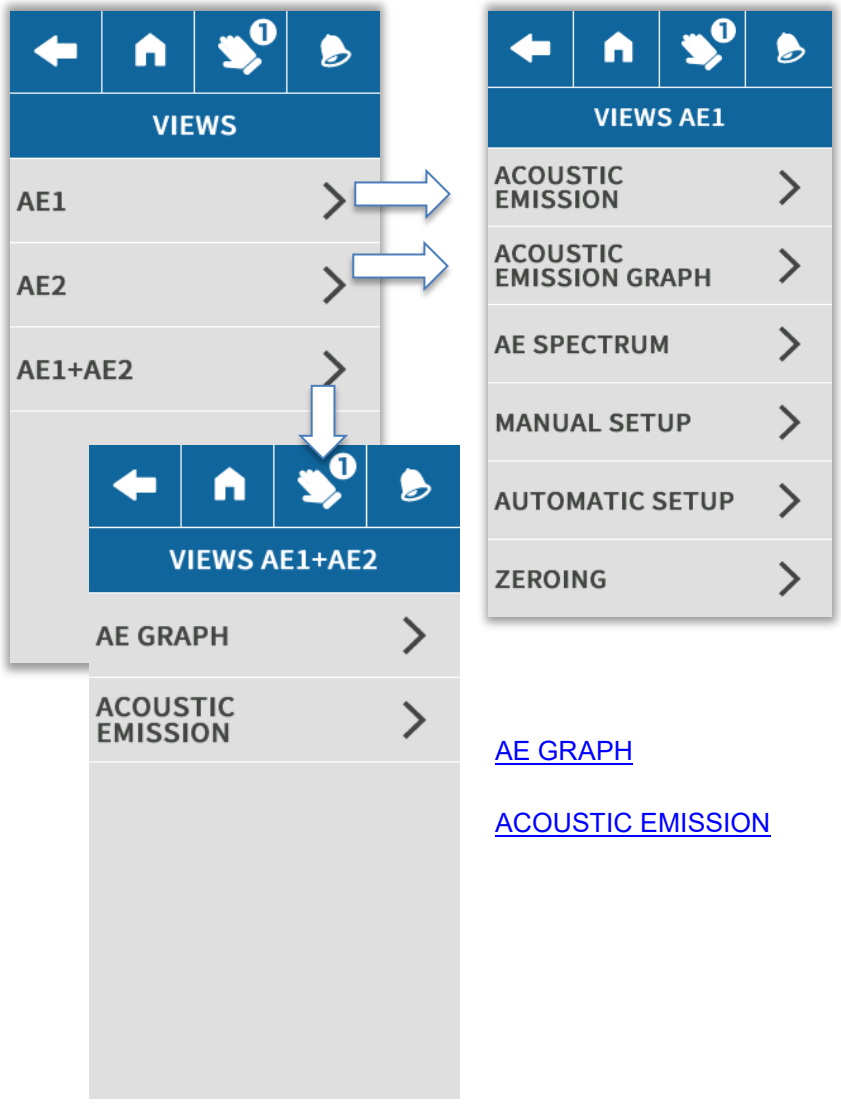
8.4 Menu Views

Manual and Automatic operating mode
[End User – OEM – Service]



Pages AE 2 and AE1 +AE2 are only present on 2-channel equipment units.

Below is a description of the pages in the View menu only for AE1, since they are identical for AE2. They only refer to the two different channels.



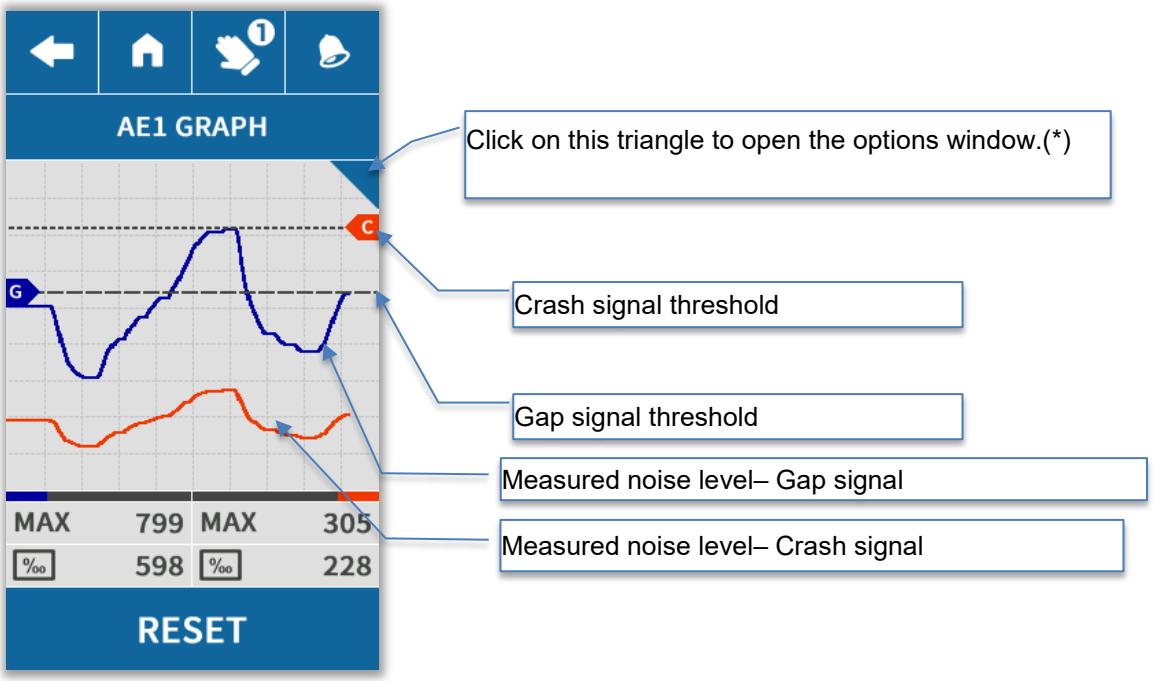
This menu can be used to access the various acoustic measurement display pages.

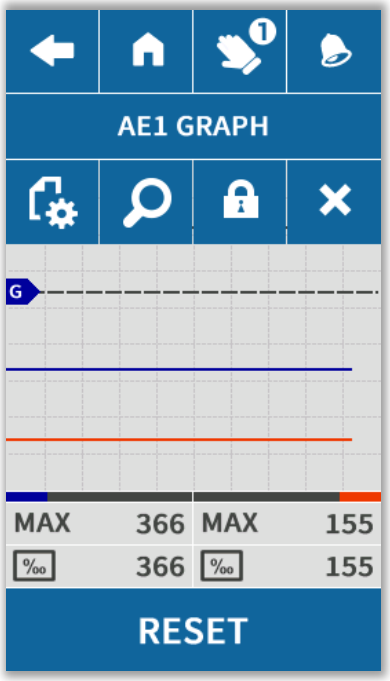
AE GRAPH
ACOUSTIC EMISSION
AE SPECTRUM
MANUAL SETUP
AUTOMATIC SETUP
ZEROING

AE GRAPH
ACOUSTIC EMISSION

8.4.1 Acoustic Emission Graph menu

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





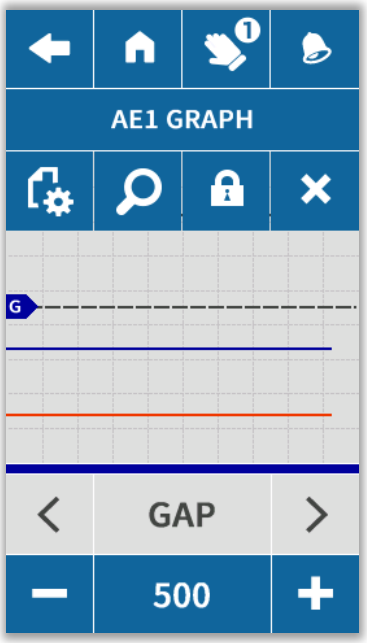
(*) Press the blue triangle to open a window with option keys:

GAP and CRASH threshold setting

Zoom function for enlarging the signal detail.

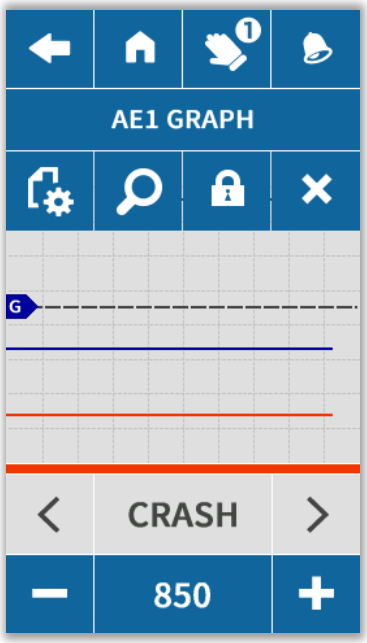
Oscilloscope STOP function.

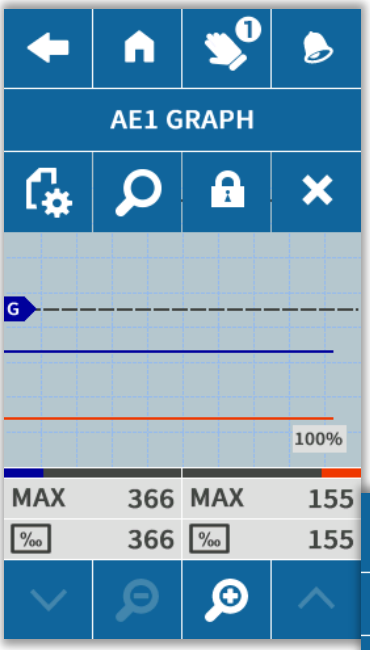
Key for exiting options panel.



Press this key to change the Gap and Crash threshold.

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



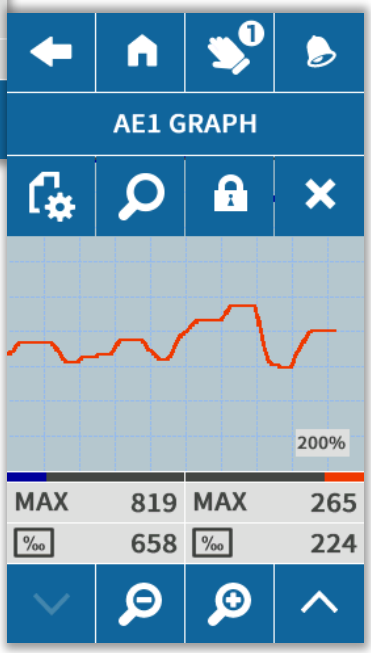


Press this key and the zoom control bar appears at the bottom of the screen:

Zoom in

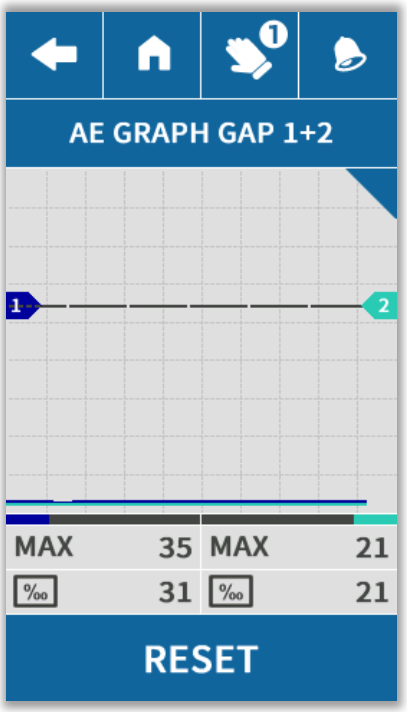
Zoom out

After setting the zoom level on the graph, use the arrows to move the area of the graph to be displayed.



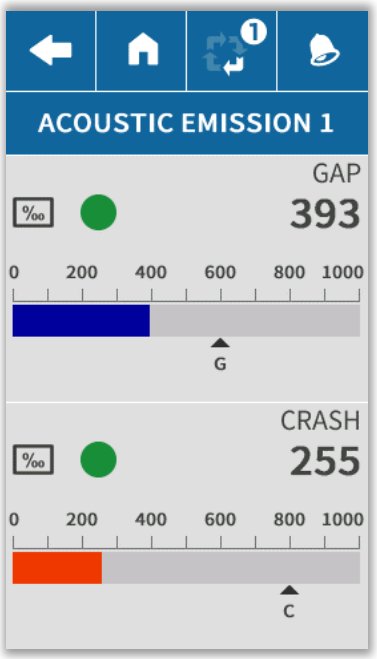
For a 2-channel equipment unit, you can open the AE Graph display page for the two channels simultaneously:
MENU VIEWS ➔ AE1 + AE2 ➔ AE GRAPH

On this page, you can display the GAP oscilloscope for channels 1 and 2 on the same screen page.
The options menu functions are the same as previously described.



8.4.2 Acoustic Emission menu

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



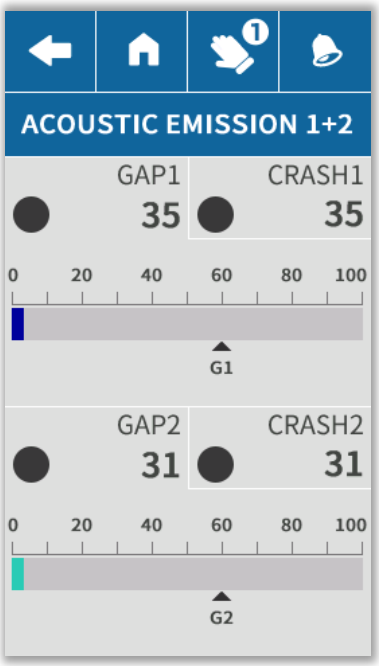
Gap check noise value

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.

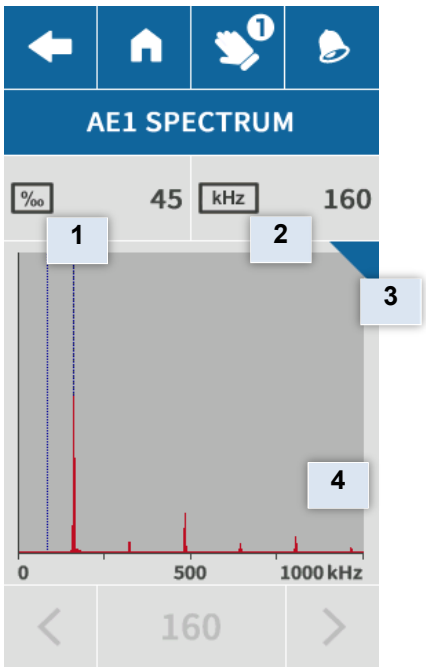


8.4.3 Acoustic Emission Spectrum Menu

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.

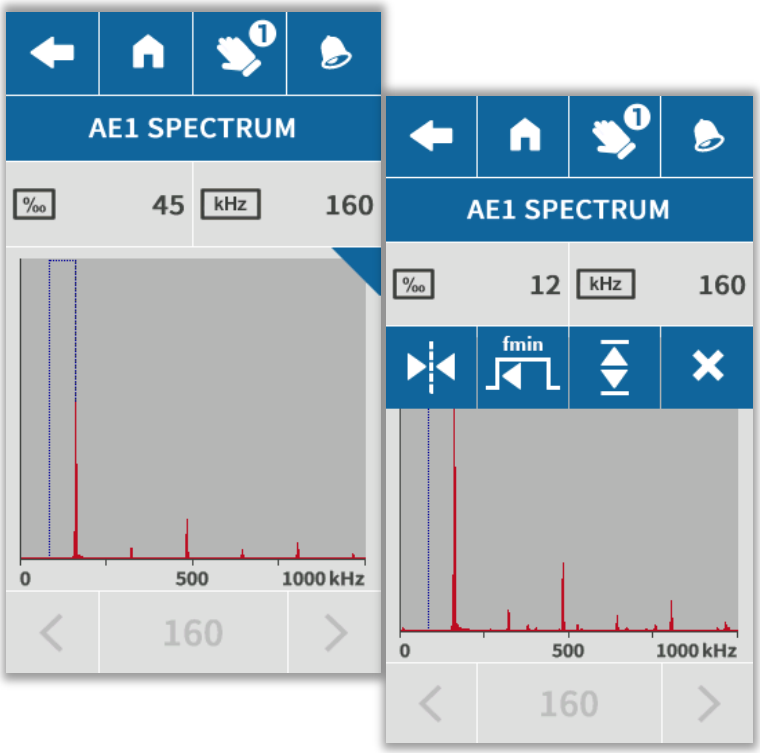


1) Amplitude [parts per thousand] of the main spectral line

2) Frequency [kHz] of the main spectral line

3) Key for opening the options window

4) Spectrum display area

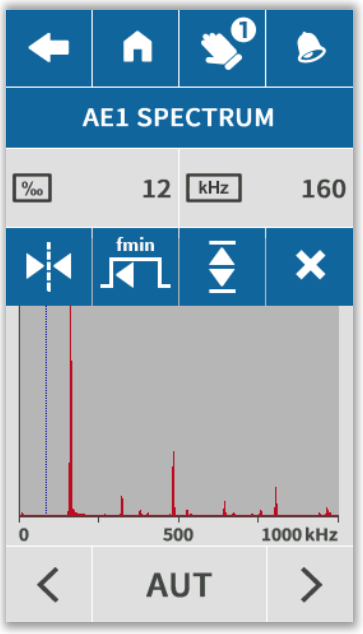


Vertical slider

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

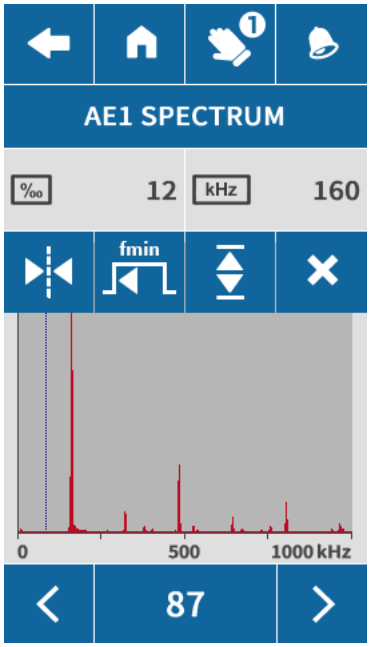


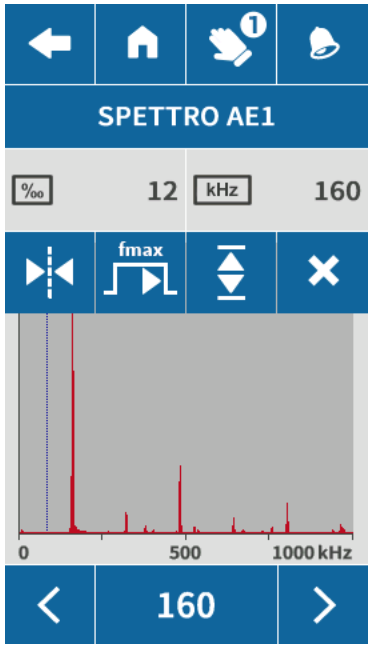
Vertical slider that may be either automatic or manual:

AUTOMATIC indicates the current maximum value on the graph.

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.

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



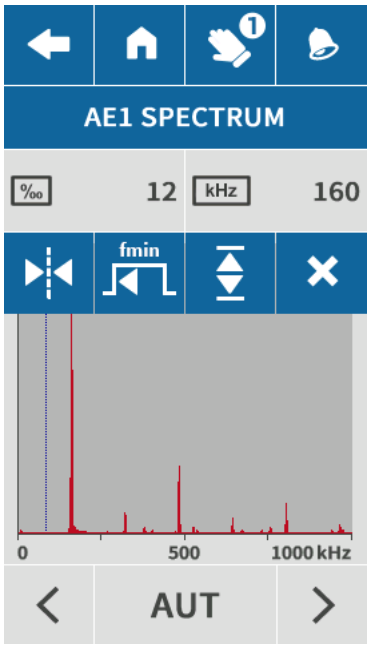


The fmin and fmax keys act on the values of the MIN FREQUENCY and MAX FREQUENCY parameters relative to the GAP measurement for the current set.

Press the fmin key 

to switch 

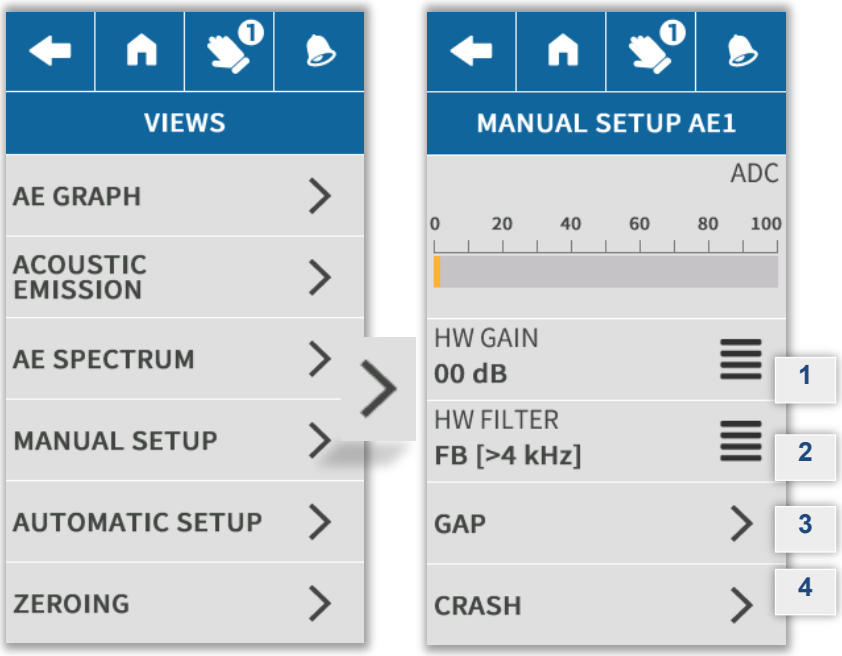
Select one of the two parameters, then act on the value using the arrows below



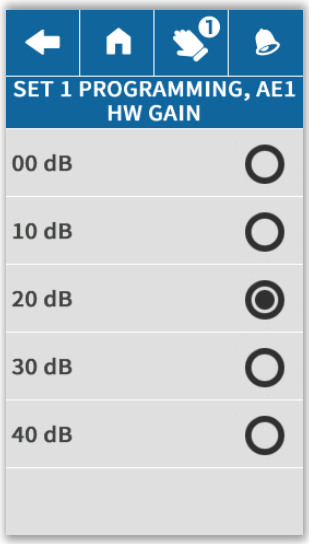
8.4.4 Manual Setup Menu

This VIEWS page is a wizard which allows a Manual Setup 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 Setup wizard (see next section) or to refine its results.
The parameters always relate to the currently selected set.

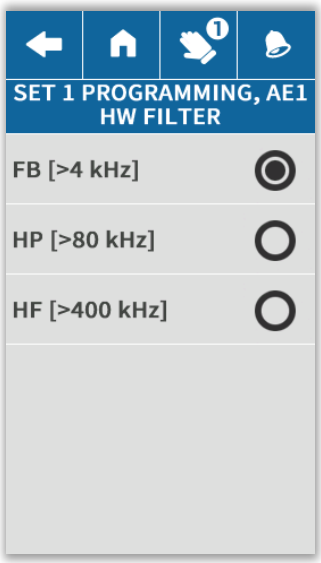


1) HW GAIN Programming

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.



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.

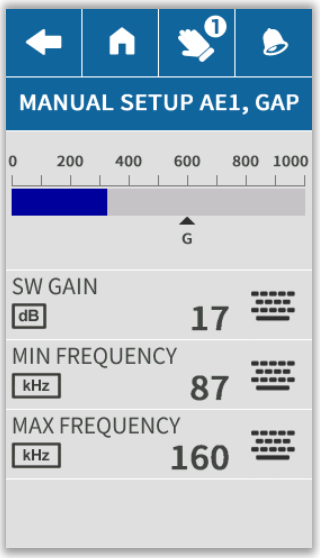
HW FILTER must be programmed in combination with HW GAIN, if possible favouring the **FB (Full Band)** value.

N.B.
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 Setup:

- 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 (Setup 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.

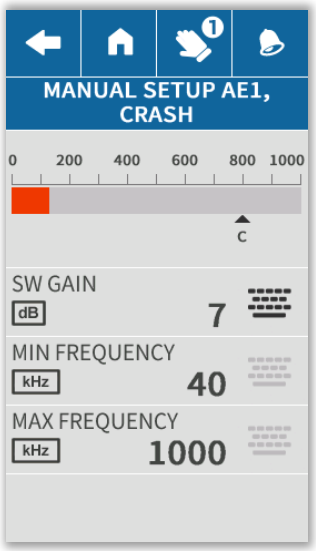
► **MAX FREQUENCY**

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 (Setup 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 99.9 expressed as a linear value (default) or in decibels.

1. MIN FREQUENCY

Measurement minimum frequency [kHz]
The parameter is automatically calculated by the Automatic Setup guided procedure (AUTOMATIC SETUP page in VIEWS) .
The parameter cannot be manually modified.

2. MAX FREQUENCY

Measurement maximum frequency [kHz]
The parameter is automatically calculated by the Automatic Setup guided procedure (AUTOMATIC SETUP page in VIEWS) .
The parameter cannot be manually modified.

8.4.5 Automatic Setup Menu

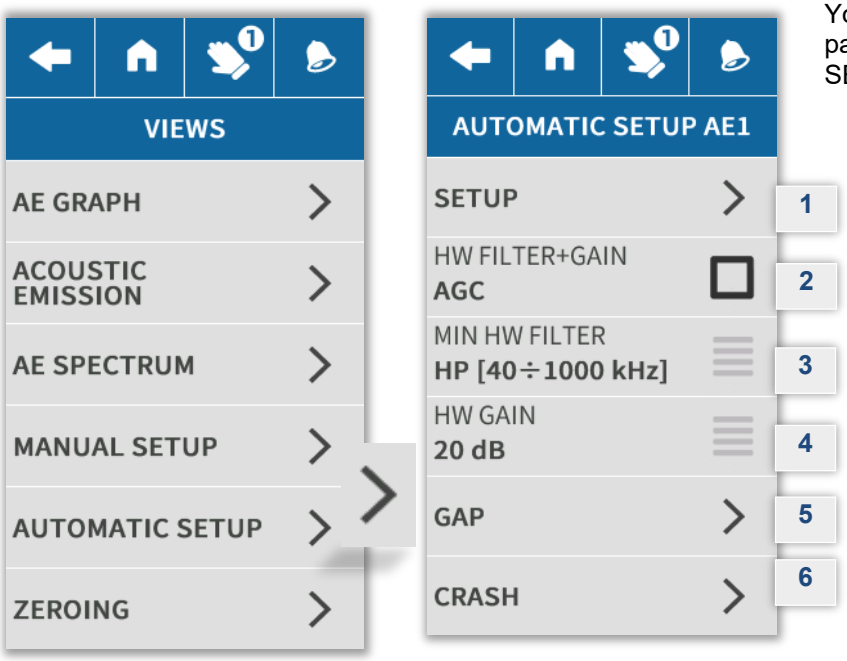
This VIEWS page is a wizard which allows an Automatic Setup of a P1dAE AE channel, automatically configuring all of its basic parameters in a graphical environment:

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

and simultaneously.
This page can be used as an alternative to the Manual Setup wizard (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 Setup:

- 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)



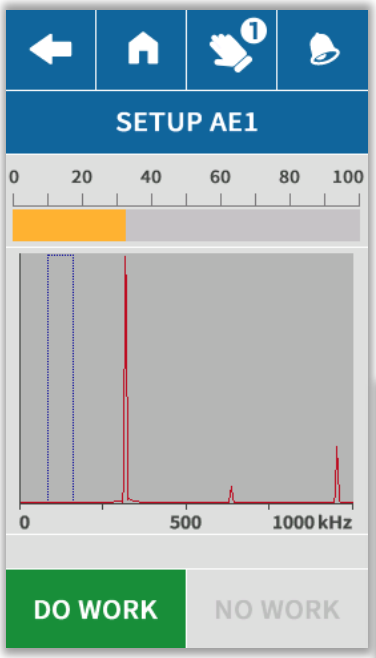
You can set the following parameters in the AUTOMATIC SETUP menu:

1. **SETUP**
2. **HW FILTER+GAIN**
3. **MIN HW FILTER**
4. **HW GAIN**
5. **GAP**
6. **CRASH**

1. Setup Menu

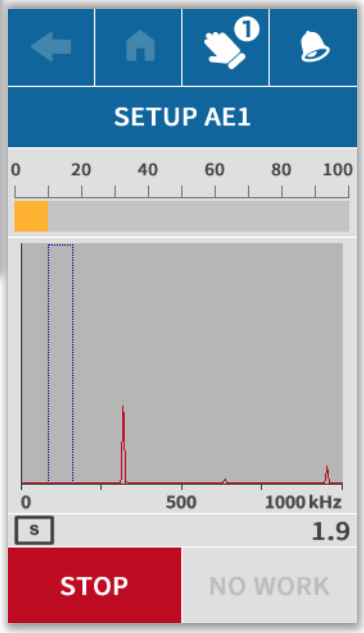
With this menu it is possible to acquire the machine acoustic response in the operating condition (DO WORK) and then in the background condition (NO WORK) .

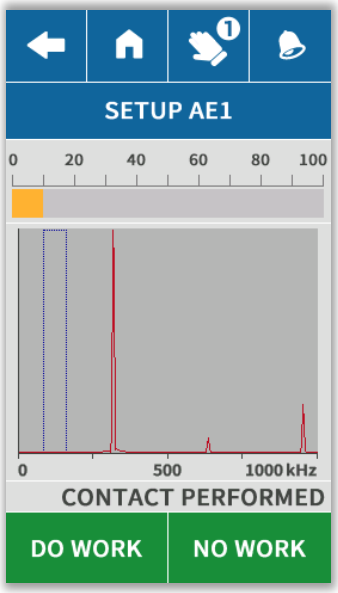
We recommend first selecting the next checkbox HW FILTER + GAIN AGC (automatic calculation of optimal HW GAIN and HW FILTER) if you are unsure whether or not the HW stage setting is good.
With selection of MIN HW FILTER it is possible to force the P1dAE to use a narrower band amongst those available 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 SETUP mode is too strong.

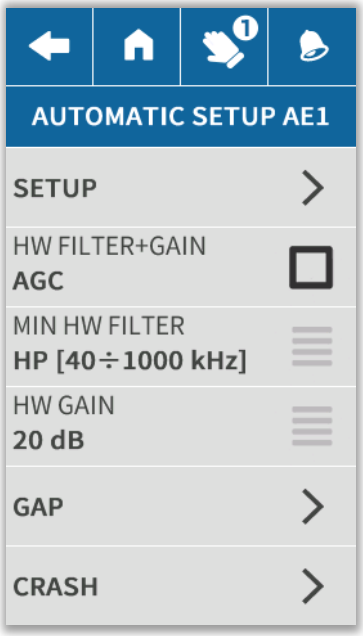




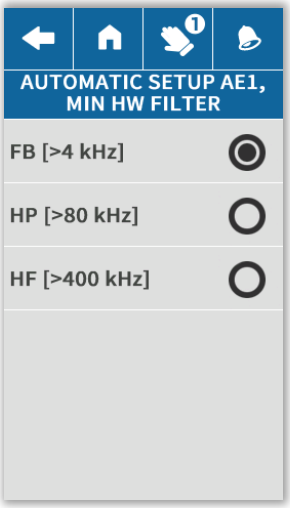
NO WORK
Function only suggested if the previous "DO WORK" acquisition was positive. Function for configuring the P1dAE to the ultrasound limit values of the background noise.
The (yellow) bargraph shows the saturation level. This function allows you to check if the signal for the physical channel selected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

N.B.
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.

2. HW FILTER + GAIN 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 you select AGC, the first step of analysis of the machine acoustic response in the operating condition (DO WORK) is dedicated to automatic calculation of the optimal HW GAIN and HW FILTER: that step lasts just a few seconds and is finished automatically. The optimal parameters are also automatically saved and applied.
If HW FILTER + GAIN are selected, selection of MIN HW FILTER is also enabled.



3. MINIMUM HW FILTER programming

If HW FILTER + GAIN are selected, MIN HW FILTER may also be selected.

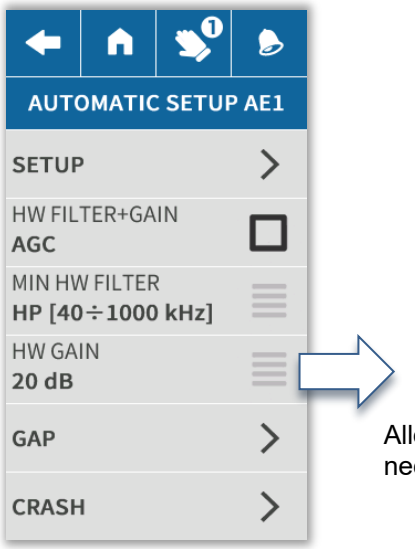
MIN HW FILTER is selected by default with the HW FILTER parameter, but a different value can be selected to force the P1dAE to use a narrower band amongst those available FB (> 4 kHz) , HP (> 80 kHz) , HF (> 400 kHz) .

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 Setup 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 Setup algorithm will search for the optimum signal between **40 kHz** and **1000 kHz**
• the Crash Signal will be processed from **40 kHz** to **1000 kHz**

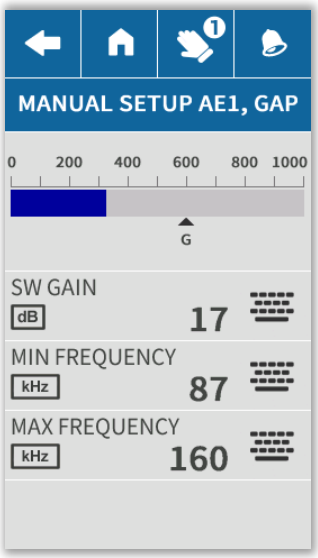
If HF is selected (> 400 kHz):
• the Automatic Setup algorithm will search for the optimum signal between **200 kHz** and **1000 kHz**
• the Crash Signal will be processed from **200 kHz** to **1000 kHz**
The “FB” option is preferred, except for a very strong and variable low frequency electric/acoustic noise.

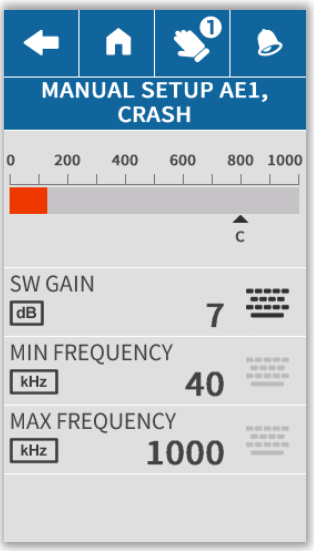


4. Display HW GAIN

Allows displaying of the HW GAIN currently programmed and applied, if necessary as modified by the AGC procedure.

5. GAP Programming and CRASH Programming (6)



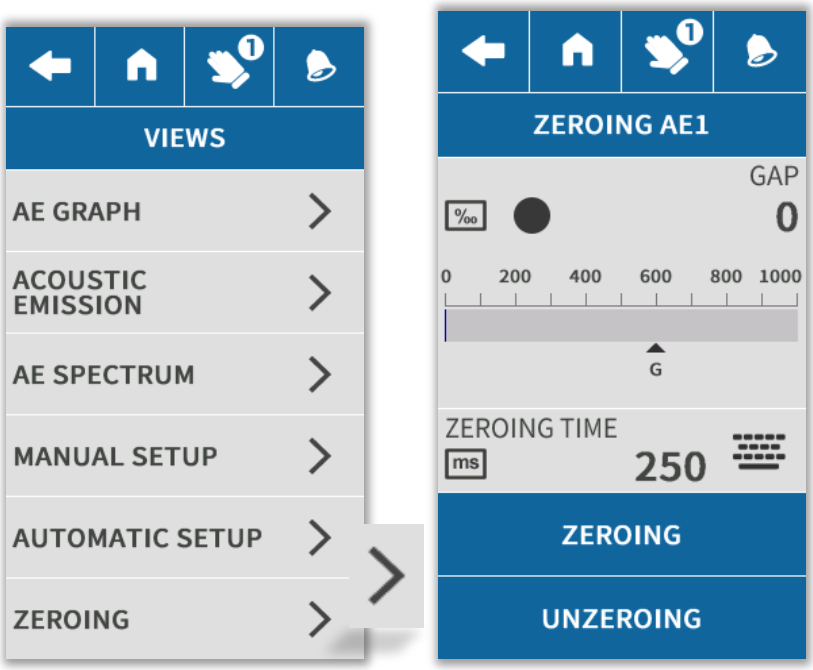


The GAP and CRASH sub-pages allow:

- 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.

8.4.6 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.

9 HARDWARE ACCESSORIES (ACOUSTIC SENSORS)

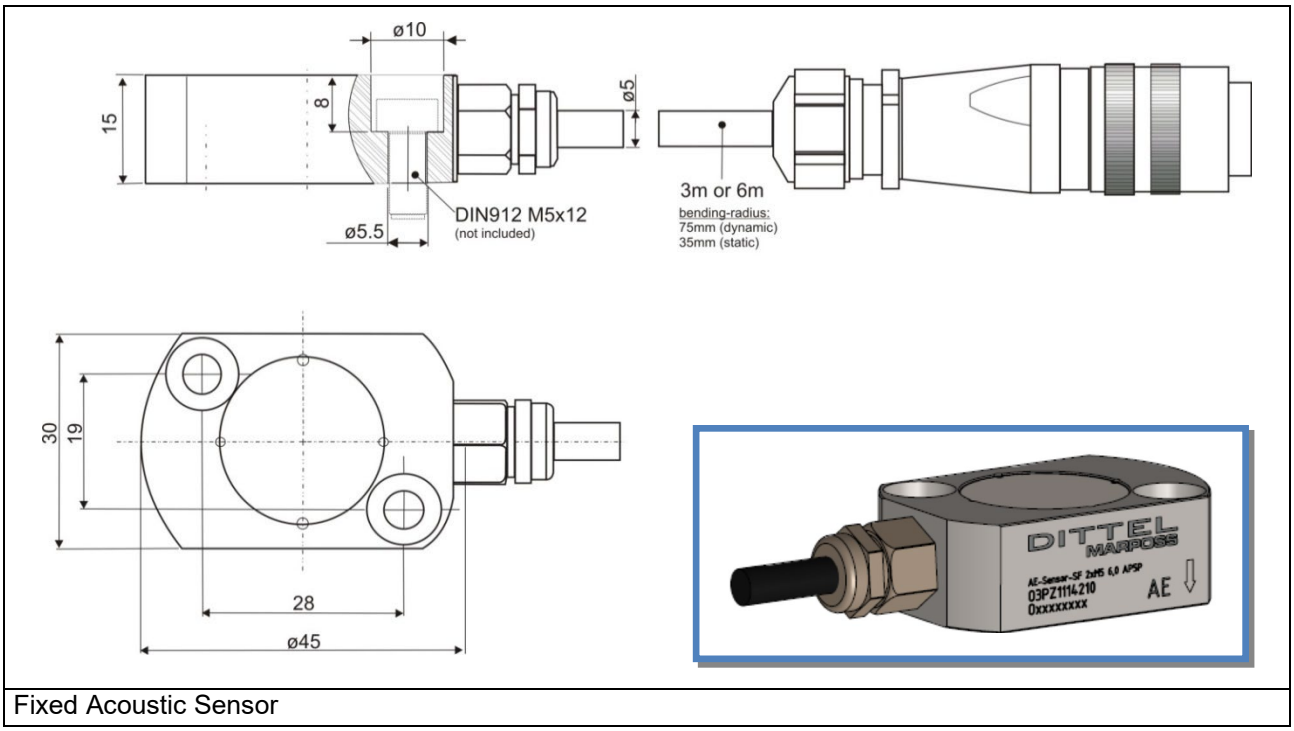
The P1DAE can be fitted with various types of acoustic sensor:
1. Fixed wideband acoustic sensor;
2. Wideband acoustic sensor with contactless transmission.

9.1 Fixed acoustic sensors

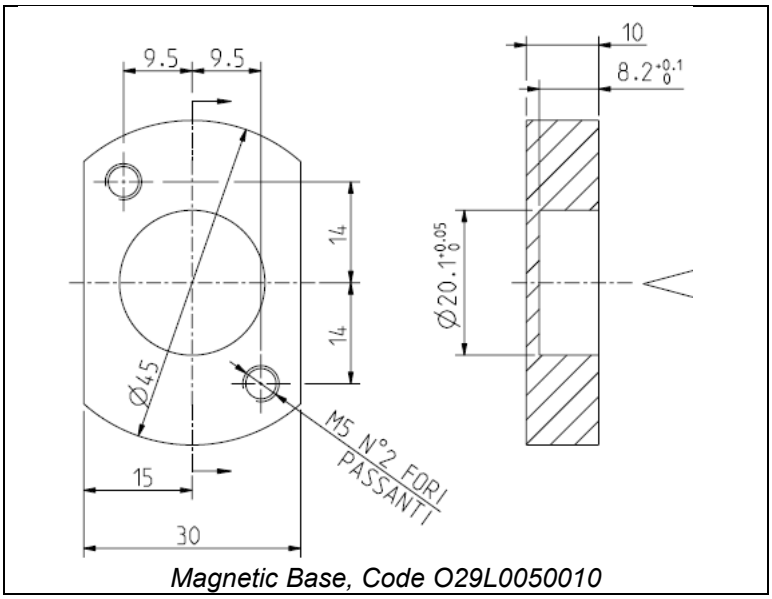
Fixed Acoustic Sensor SF

Fixed wideband acoustic sensor:

Version	Code Number
with 3 metre cable	O3PZ1114209
with 6 metre cable	O3PZ1114210



Fixed Acoustic Sensor

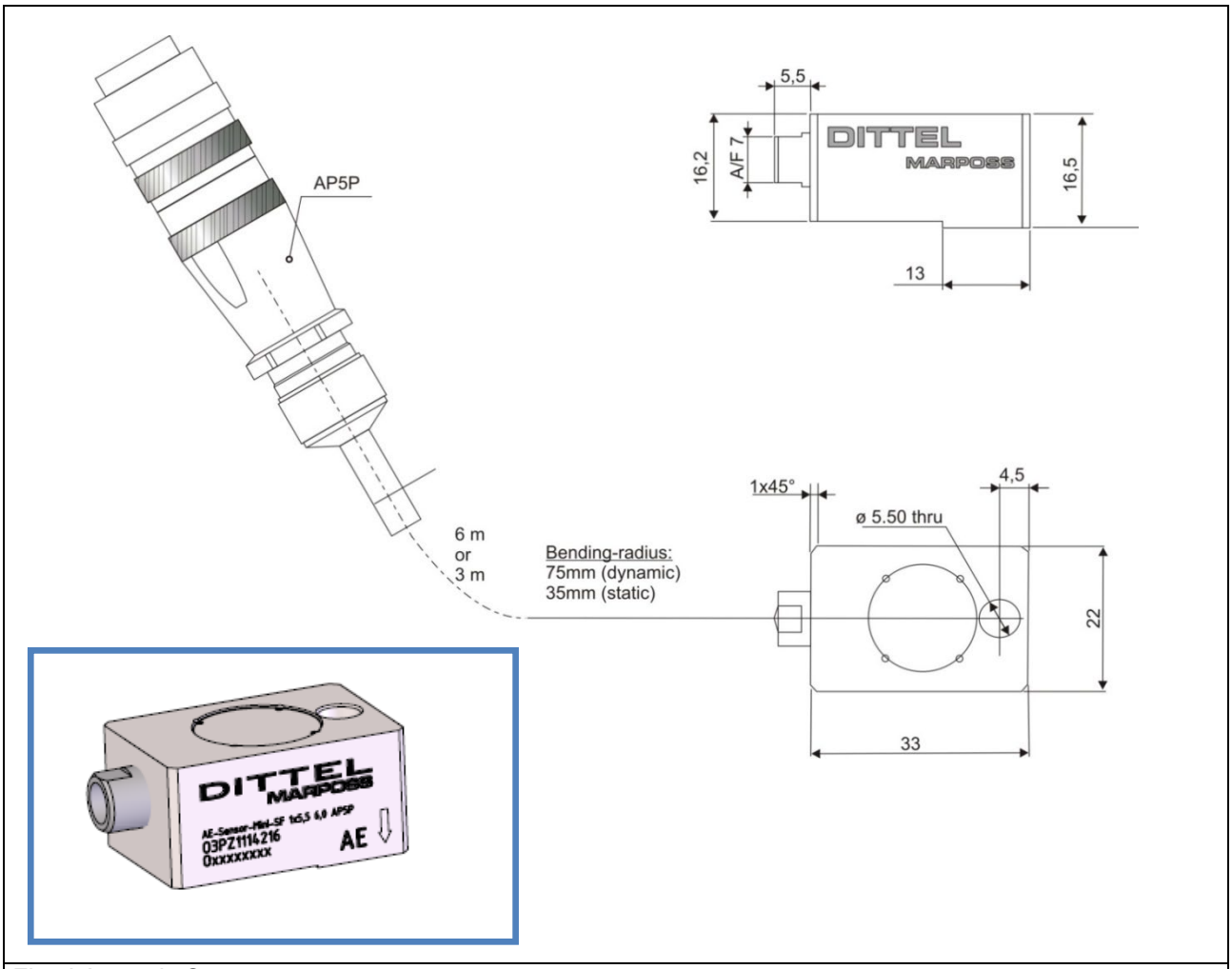


Magnetic Base, Code O29L0050010

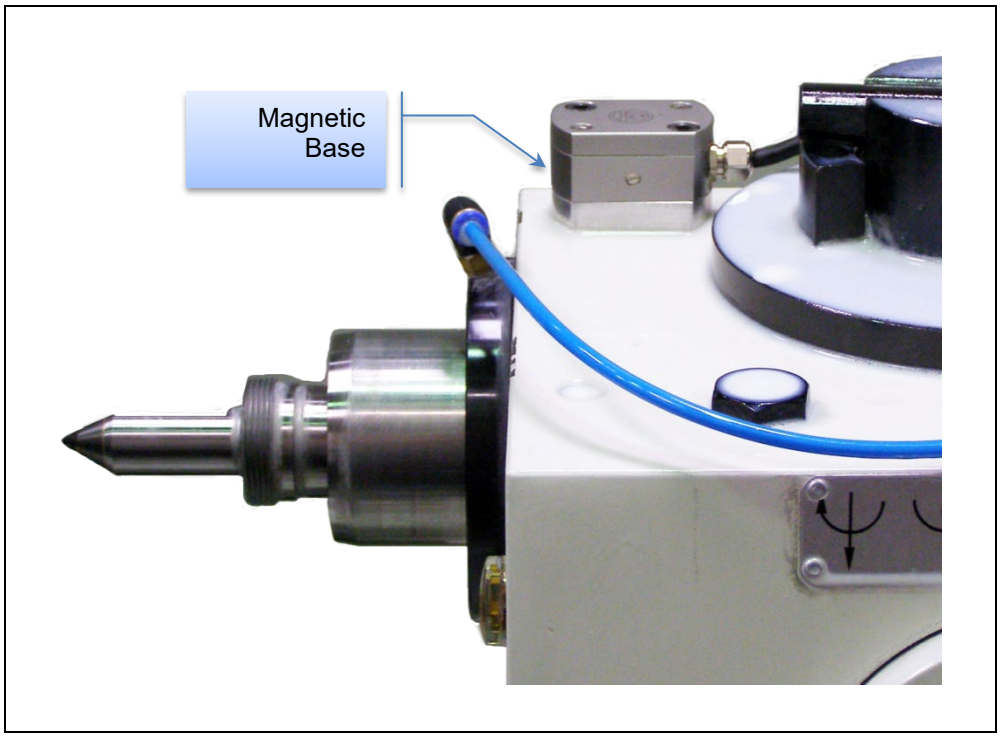
For fixing in the machine there are two holes in the cover for M5x25 screws. Alternatively, you can use the magnetic base, code O29L0050010.

Fixed Mini Acoustic Sensor SF

Version	Code Number
with 3 metre cable	O3PZ1114218
with 6 metre cable	O3PZ1114216



Fixed Acoustic Sensor



Recommended positions for installing the FS or Mini FS acoustic sensor in the machine:

- on the tailstock: near the part axis of rotation;
- on the part holder head: near the spindle;
- on the grinding wheel carriage: as close as possible to the grinding wheel.

The best position must always be found, since it may vary considerably from one machine to another. In any case the acoustic sensor should never be fixed on the grinding machine bed.

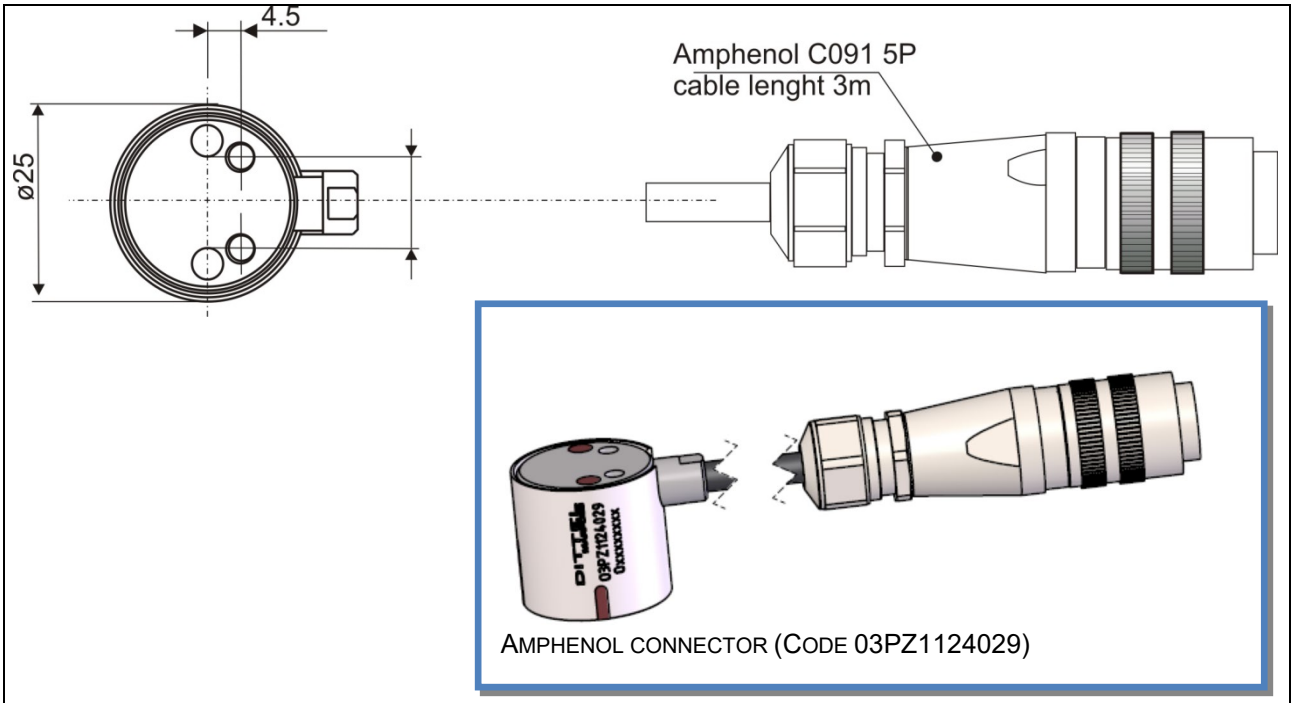
N.B.
Before installing the acoustic sensor, remove the paint from the fixing surface and apply silicone grease between the acoustic sensor and the supporting surface to improve sound transmission to the acoustic sensor.

The FS sensor body has two machine mounting holes designed to accept M5 x 12 screws, while the Mini FS sensor body has a single M5 x 12 screw mounting hole.

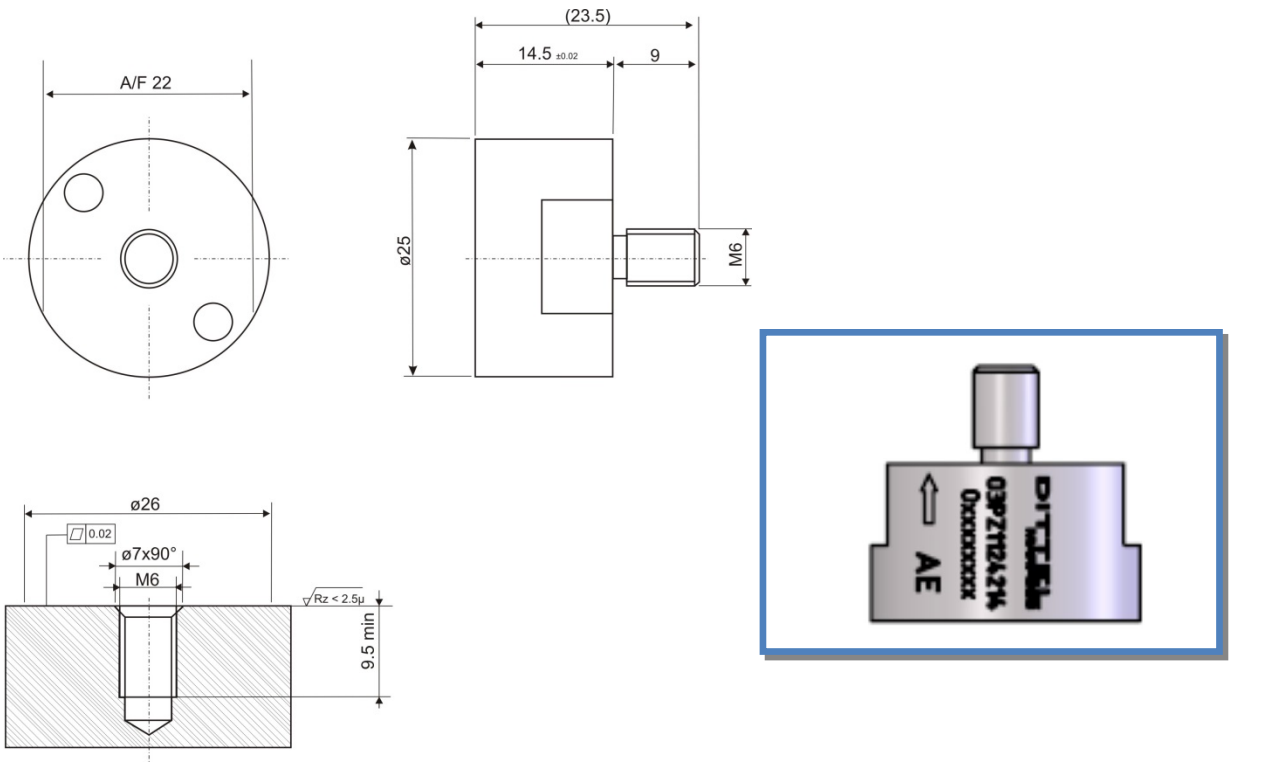
9.2 Acoustic sensor with contactless transmission

The acoustic sensor consists of two parts:

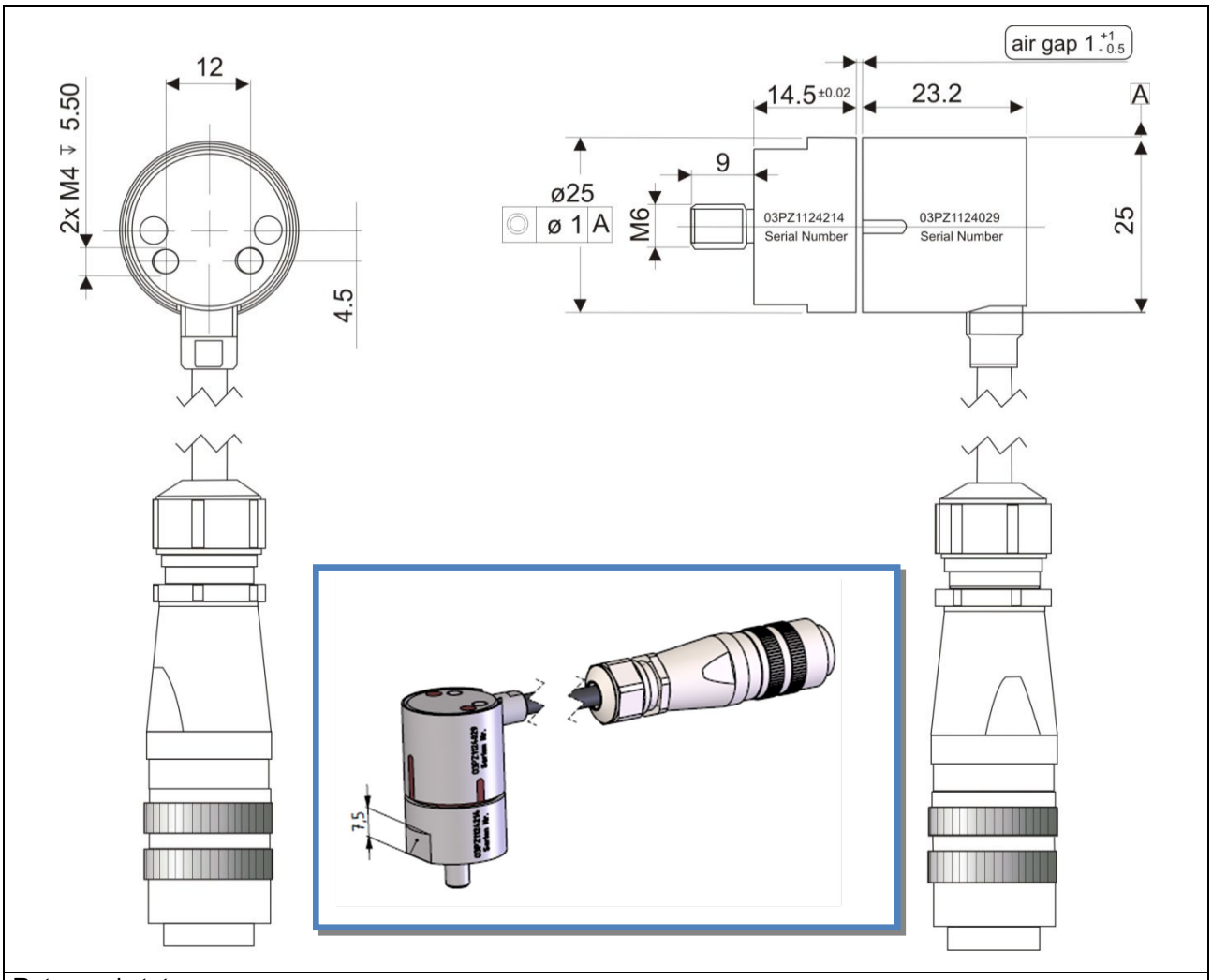
- Rotating part (03PZ1124214) to be mounted directly in the grinding wheel - spindle unit;
- Fixed part with 3 metre cable (03PZ1124029) to be connected to the electronic unit.



Acoustic sensor with contactless transmission



Rotor (code 03PZ1124214)

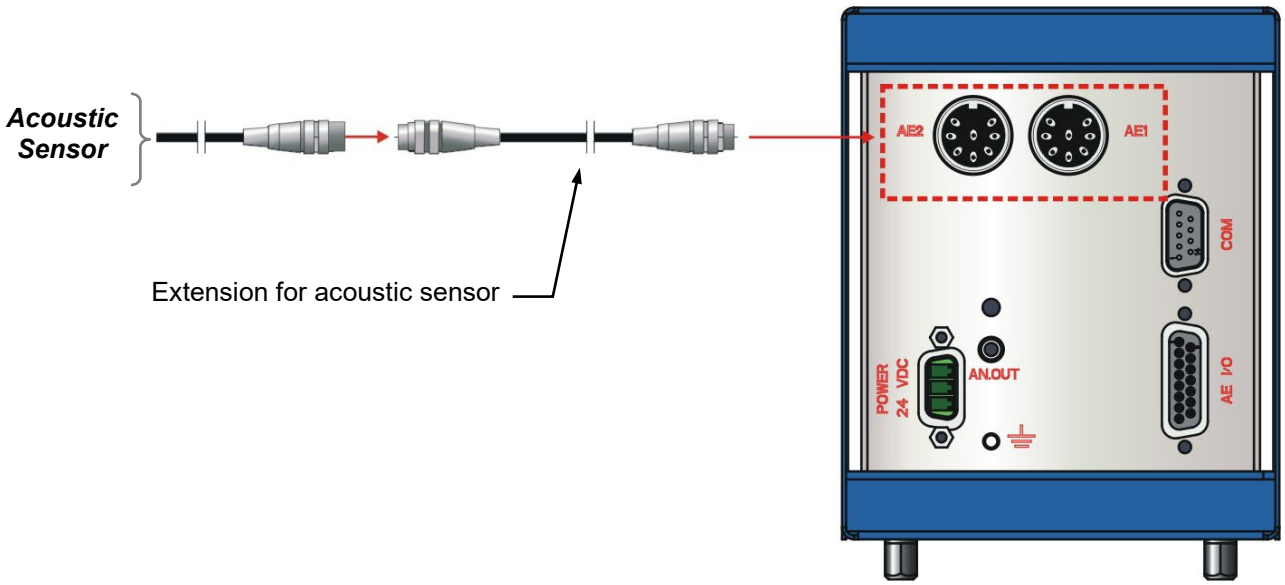


Rotor and stator

In order ensure that the acoustic sensor is installed correctly, the following conditions must be satisfied:

- distance (GAP) between the two transmission surfaces: **1.0 + 1.0/ -0.5 mm;**
- alignment error in all directions (OFFSET) between the fixed part and the rotating part: **± 0.5 mm;**
- remove the paint from the surface on which you want to secure the fixed part of the acoustic sensor. This operation is essential to guarantee the stability of the measurement displayed on the electronic unit and for immunity from interference;
- apply silicone grease between the rotating part of the acoustic sensor and the supporting surface.

9.3 Extensions for acoustic sensor



Extensions for acoustic sensor	
Length (m)	**Code Number**
3	6739696332
6	6739696233
10	6739696194
15	6739696148
20	6739696222

Appendix A
Table
Program instructions
Parameters P1DAE

DISPLAYED PARAMETER	DESCRIPTION	SETTINGS RANGE	DEFAULT
SETTINGS ► OPTIONS MENU			
PLC MIN TIME OEM - SERVICE ONLY MANUAL MODE ONLY	**Minimum PLC time [s] for commands output.** • 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**
FC BOOT MODE OEM - SERVICE ONLY MANUAL MODE ONLY	**Flow Control Boot Mode**	on mode: • AUTOMATIC • MANUAL	**AUTOMATIC**
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** GAP active low CRASH active high **g -c** GAP active high CRASH active low **-g -c** GAP active low CRASH active low	**g c**
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 2 CHANNEL VERSIONS 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	**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** **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). • 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.	• **FB >4 kHz** • **HP >80 kHz** • **HF >400 kHz**	**FB >4 kHz**
AE# HW GAIN	**AE Hardware Gain Physical Channel.**	• **00 dB** • **10 dB** • **20 dB** • **30 dB** • **40 dB**	**00 dB**

AE# THRESHOLD OEM - SERVICE 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	**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 - 25.0 ms**	**1.0 ms**
AE# GAP OUTPUT BIT THRESHOLD OEM - SERVICE ONLY	**Gap logic channel output bit threshold**	**10 ‰ ÷ 990 ‰**	**600 ‰**

#G OUT OEM – SERVICE ONLY GAP&CRASH or GAP MODE ONLY	**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.	↑ 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 ↓ 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	↑
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.	**0 ms - 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. • **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.	• **None** • **ZEROING** enable zero setting • **ZEROING + 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.**	• **MAX VALUE** Maximum GAP signal zero setting with zero setting time. • **MEA**N 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**
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 FRQUENCY	**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 ‰**

AE# CRASH OUTPUT BIT MODE OEM – SERVICE ONLY GAP&CRASH or GAP MODE ONLY	**CRASH measurement output bit mode.** [List of values] This parameter defines the CRASH measurement Output Bit (CRASH #) management mode: • Level normal or inverted (-) • Free (always active/inactive) or locked (remains active after 1st activation event detected).	↑ 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	**-** ↑
AE# CRASH MINIMUM TIME ON OEM – SERVICE ONLY GAP&CRASH or GAP MODE ONLY	**CRASH measurement output bit minimum activation time** [ms] • 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.	**000ms - 9999 ms**	**0 ms**
PROG ► SET MANAGEMENT ► AE1–AE2 ► ANALOG OUT MODE			
AE# ANALOG OUT MODE OEM – SERVICE ONLY	Analogue output signal Sets the Analogue Output measurement source (0 to 10 [V]).	• **GAP1** • **CRASH1** • **GAP2** • **CRASH2** • **AUTO GAP** • **AUTO CRASH**	**GAP1**

End of document