Acoustic Emission Measuring Instrument

Zplus A
USER MANUAL

Sanmenxia ZhongyuanJingmi Co.,Ltd

To ensure your safe use of this instrument, please observe the following items.

[Hazardous matter]

1. There is electricity inside the instrument. Touching it may cause death and personal injury!

2. Do not remove the housing except for maintenance and inspection by professional maintenance personnel!

3. Before removing the housing, you must cut off the power supply and unplug the power plug!

[Matters needing attention]

1. The vibration sensor is a vibration sensitive component that should be handled with care to avoid damage to the sensor due to severe vibration caused by external causes such as bumps! When installing a sensor, first allow a small portion of the magnetic base to contact the mounting surface, and then slowly straighten the magnetic base to a vertical position. It is prohibited to install the parallel contact surface of the magnetic base on the installation surface as a whole! Shock can damage the sensor.

2. The balancing head is a sealed component to prevent debris such as coolant from entering. Non professional personnel are not allowed to open or disassemble the balancing head at will!

3. The balancing head is a heavy component, and care should be taken during installation and disassembly to prevent it from falling and damaging!

4. The operating temperature of the balancing head must not exceed 55 ℃ (130

℉)!

5. It is prohibited to store heavy objects on the housing of the electric box, and it is prohibited to sit or step on the electric box!

6. The power supply and grounding wires of all components must be grounded for safety reasons!

[About Carrying Abroad]

Please inform our company in advance when taking this instrument out of the country due to various local regulations.

We are not responsible for any accidents that occur in the event of being carried abroad without declaration.

[Warranty Description]

1. This product warranty service is only valid under normal use.

2. Non product quality issues and malfunctions caused by abnormal use are not covered by warranty.

For example, malfunctions caused by the following circumstances, including but not limited to, are not covered by warranty:

(1) The display panel was shattered due to external impact.

(2) The user opened this product without authorization, which caused moisture and liquid ingress.

(3) The user's wiring error or abnormal power connection caused this product to malfunction.

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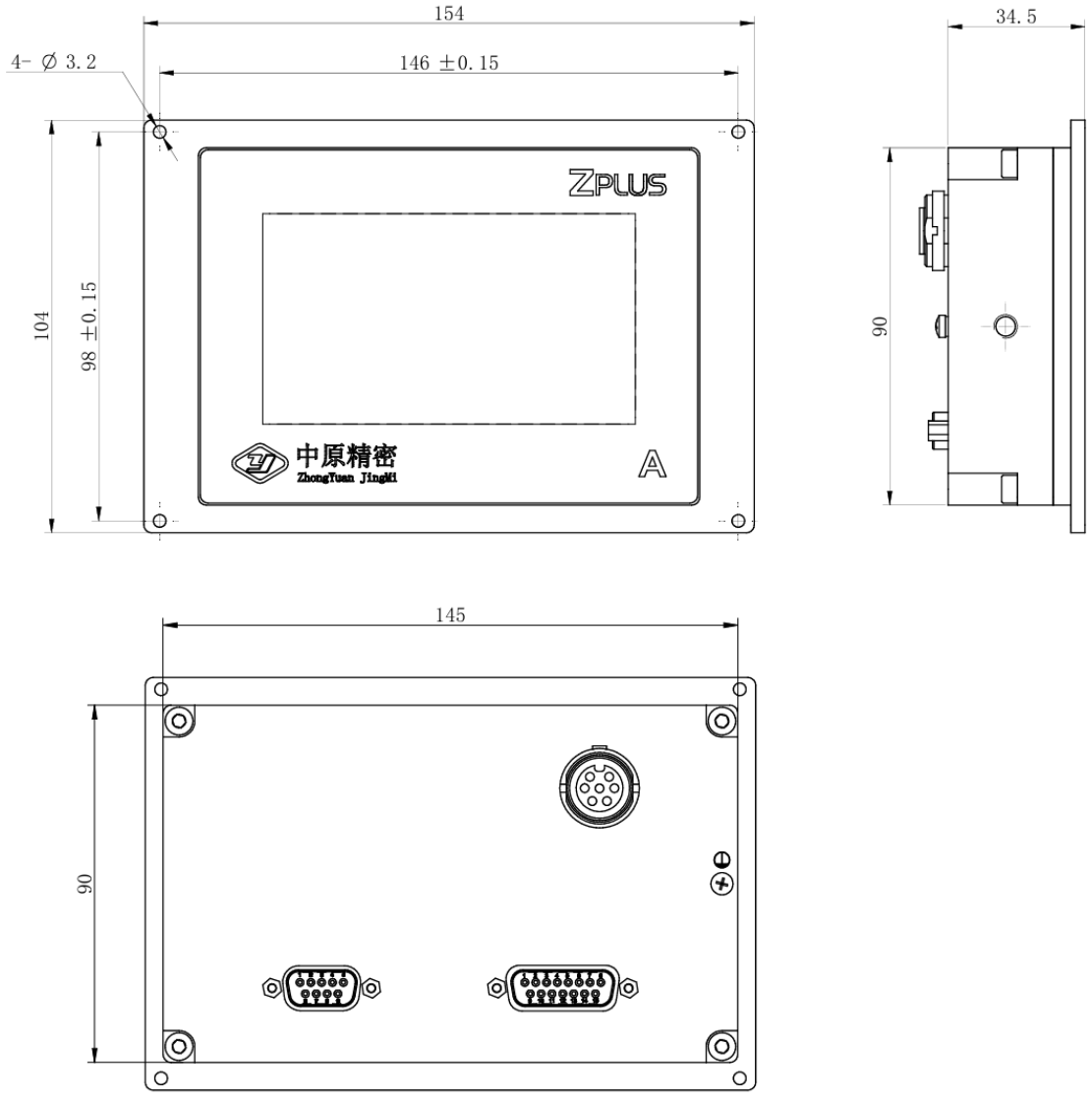
Catalogue

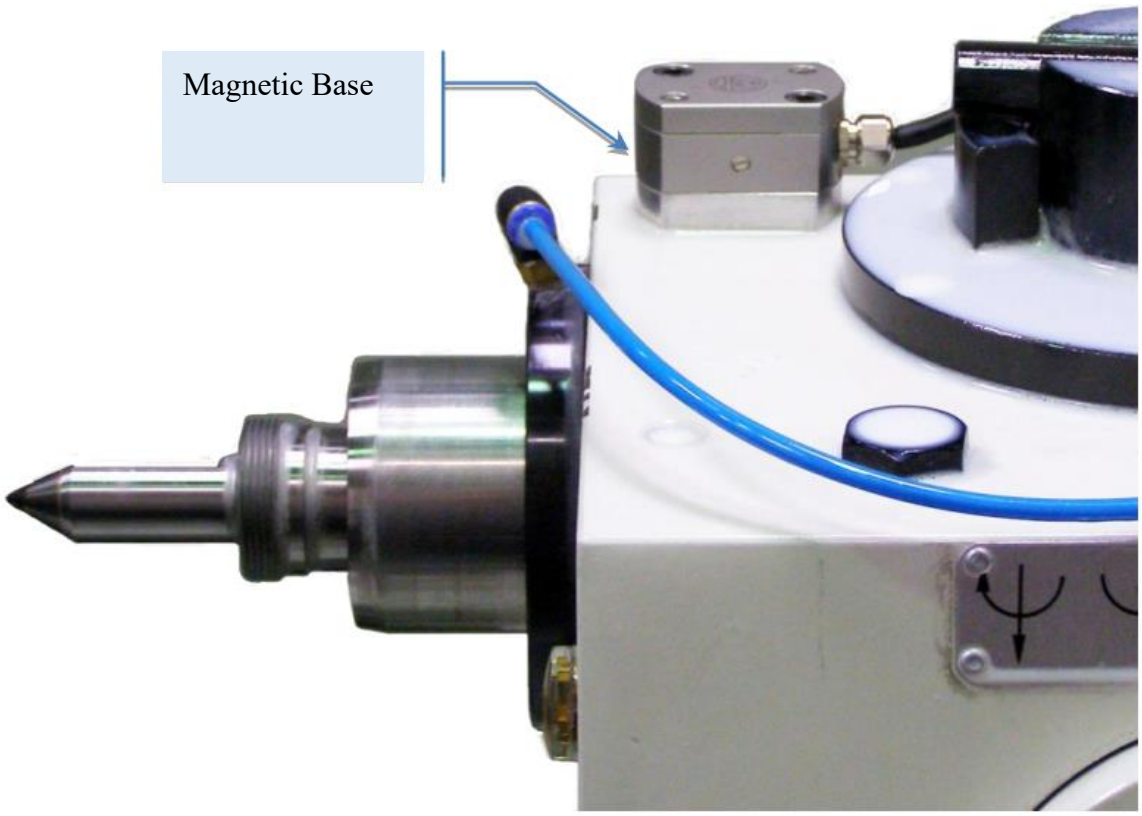
1、Summary

Zplus A is an electronic measuring device for grinding machines. It can perform the following functions using signals received from acoustic emission sensors (piezoelectric sensors).

〇Eliminate the gap: By setting a noise threshold, the contact state between the grinding wheel and the workpiece, from the approach speed to the transition to the cutting speed, can be detected.
〇Avoid crash: By setting a correct noise threshold, it is possible to detect whether an accidental collision of the grinding wheel has occurred.
〇Inspection of grinding wheel position: By setting a noise threshold, the position of the grinding wheel relative to a known reference point can be detected.
〇Continuity inspection during grinding wheel dressing: By detecting ultrasonic radiation, the dressing cycle can be optimized (not applicable to diamond roller dressers).



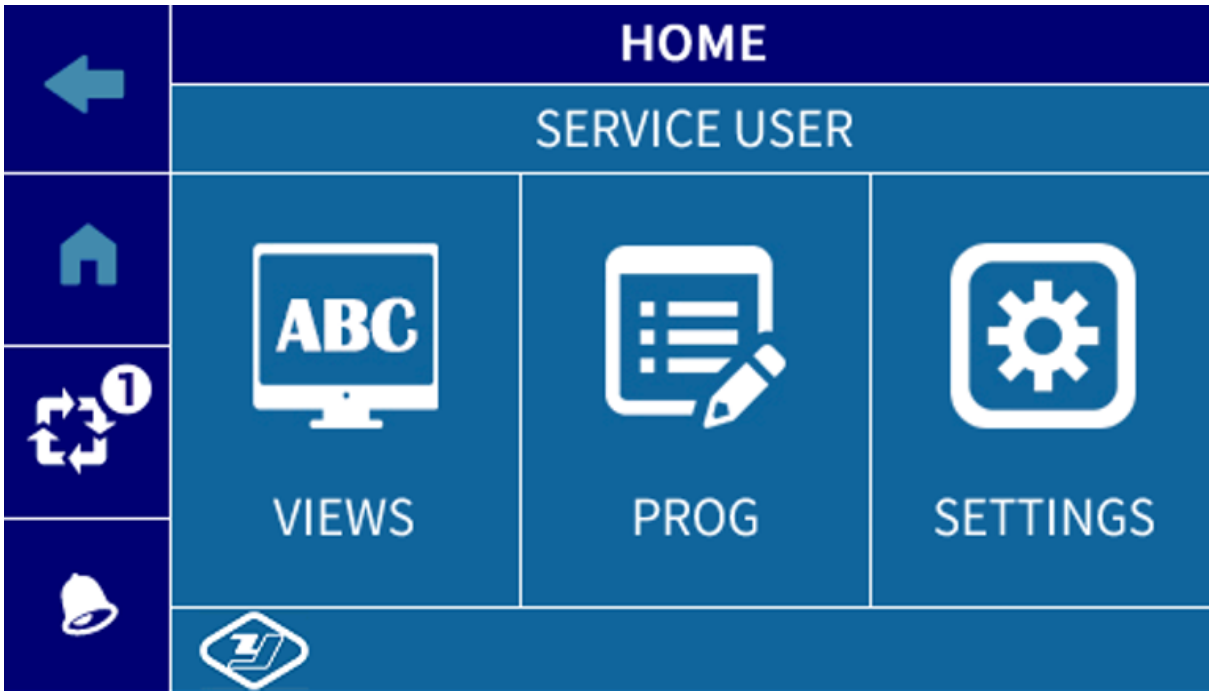
2、AE sensor installation



Suggested installation location for sensors:

• Installed on the tailstock: close to the rotating axis of the workpiece;
Installed on the top of the workpiece fixture: near the spindle position;
• Installed on the grinding wheel bracket: as close as possible to the grinding wheel position.
Regardless, it is necessary to always find the optimal position, as the position differences between different machine tools are significant. Under no circumstances should the AE sensor be fixed on the grinder bed.
Explanation: Before installing the AE sensor, the paint on the fixed surface should be removed, and silicone grease should be applied between the AE sensor and the supporting surface to improve the sound transmission performance of the AE sensor.

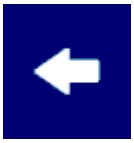
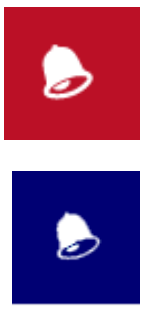
3、Interface



Explain:

The Zplus A controller is divided into three function windows: viewing, programming, and setting. The system defaults to the main page display interface.

The user bar contains the following command keys:

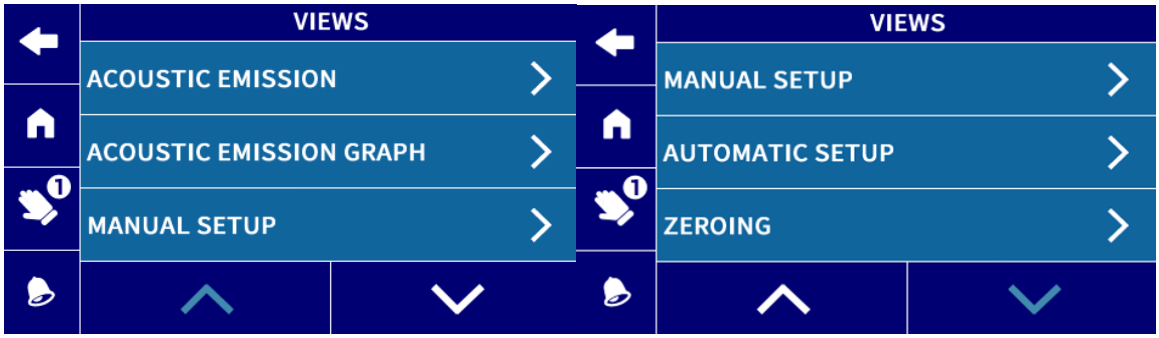
	**Arrow**	Press this button to return to the previous page.
	**Main Menu**	Press this button to return to the 'main page'.
	**Alarm bell**	Blue=Normal Red=Alarm prompt

Manual/Auto

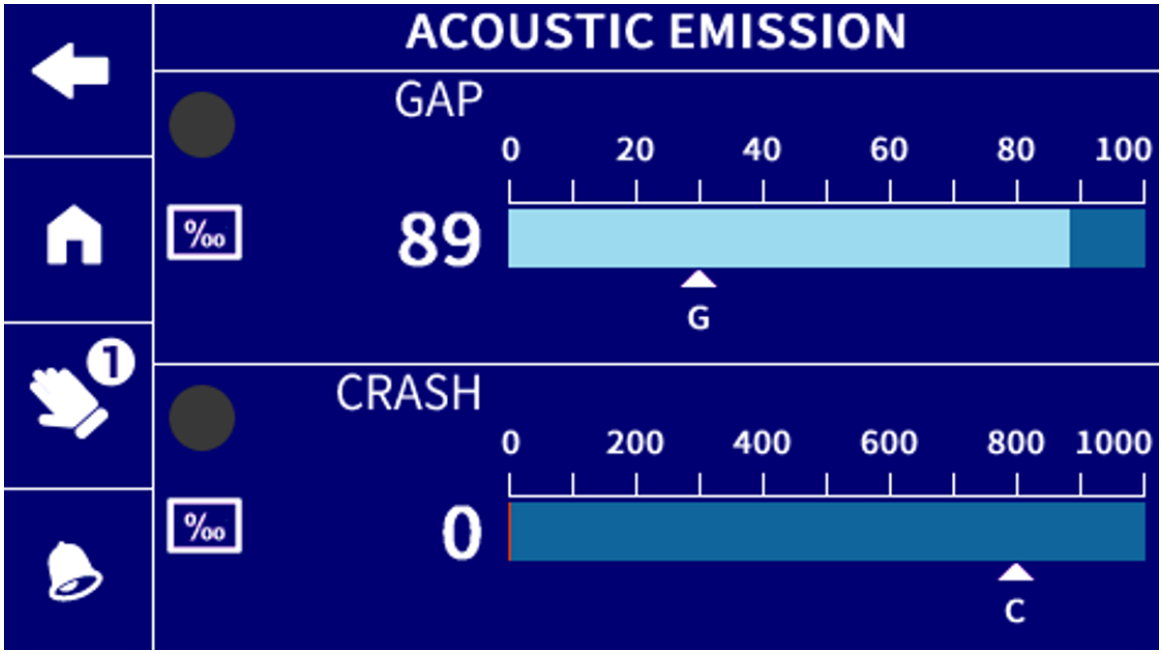
Operation Mode
Small hand symbol=manual mode
(① represents Programming 1)
Loop flag=Automatic mode

3.1、VIEWS

Click on 【VIEWS】on the main page to select the following items:

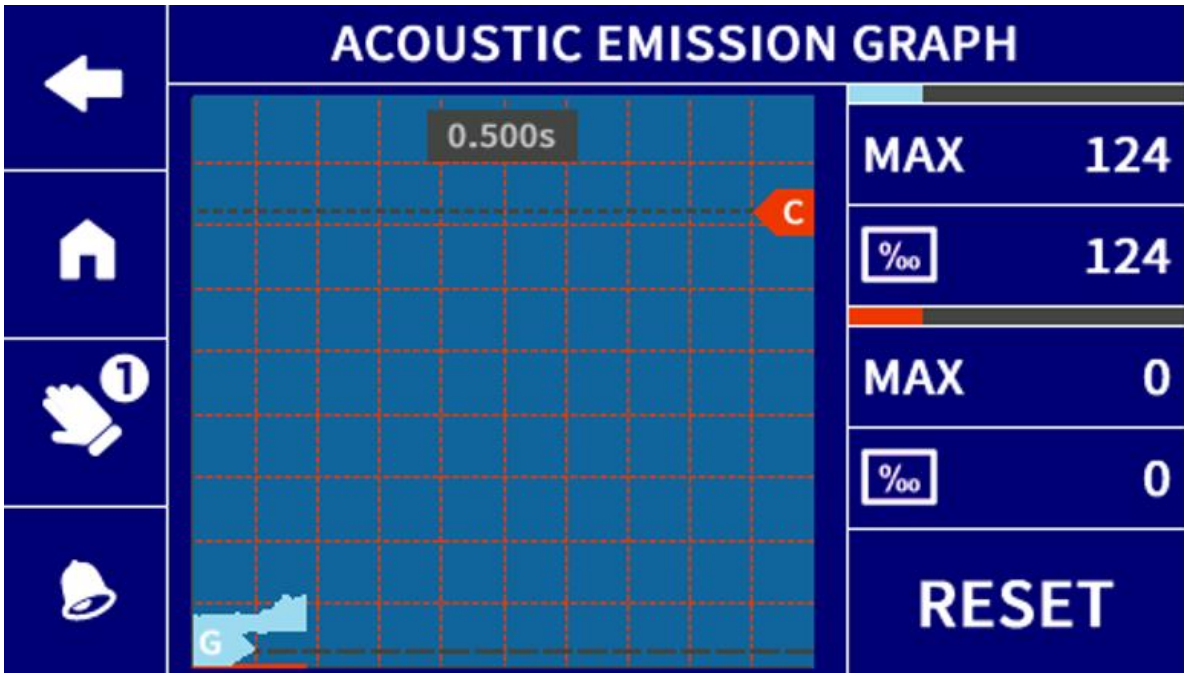


①【ACOUSTIC EMISSION】is the measurement monitoring interface, which allows viewing of measurement values and signal point status.

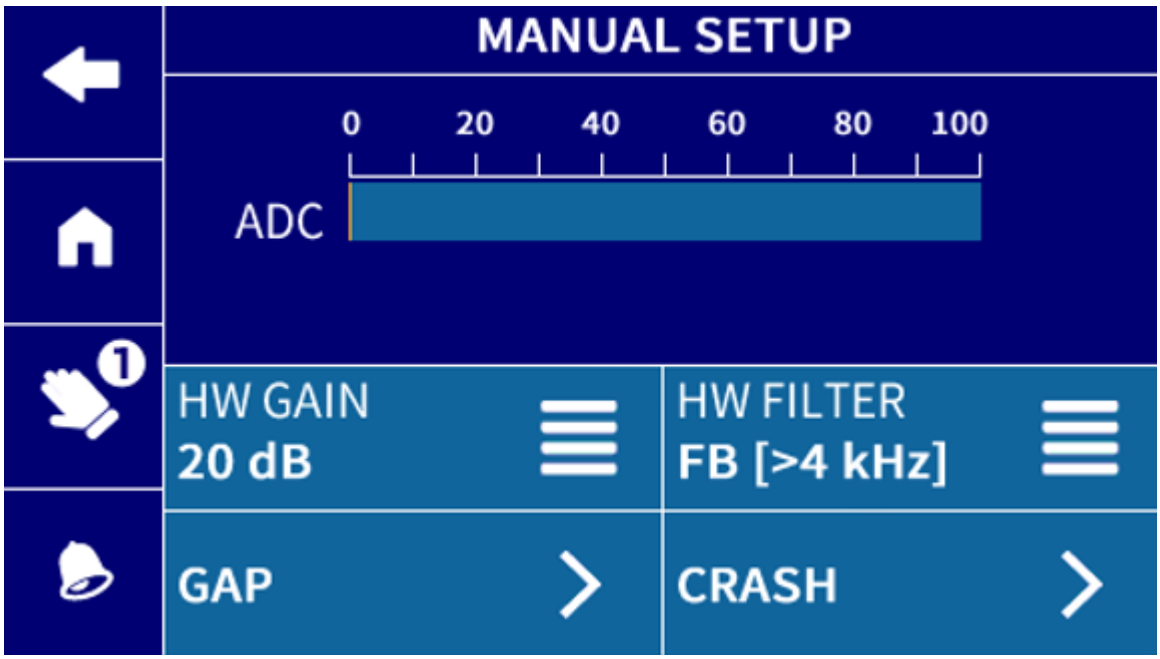


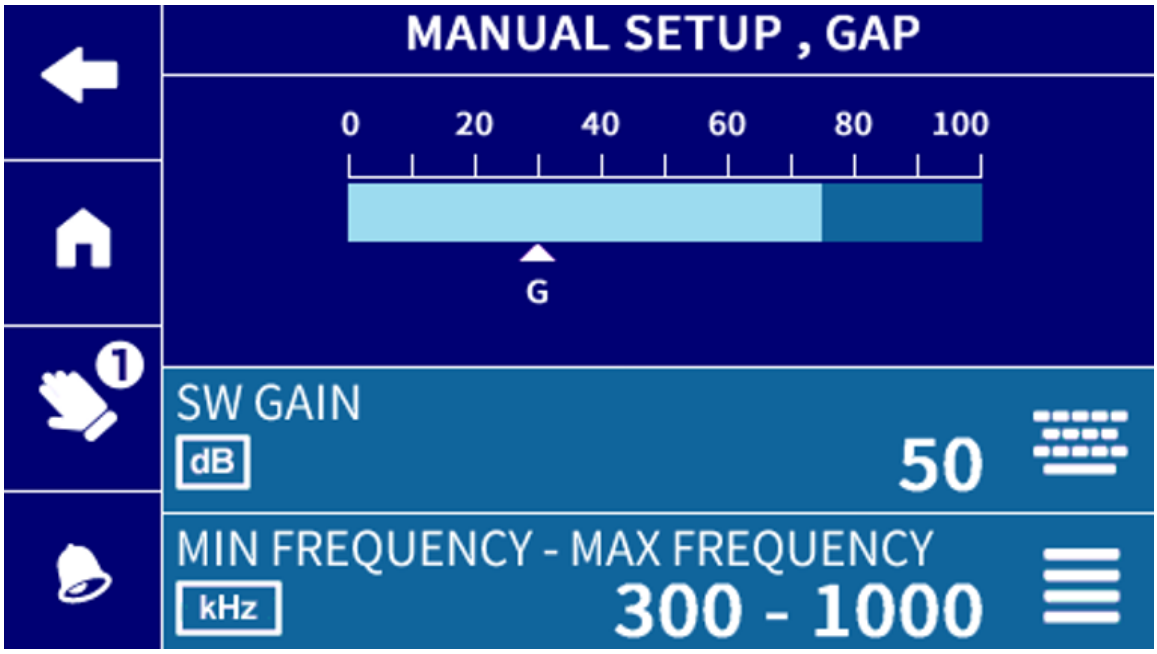
②【ACOUSTIC EMISSION GRAPH】can view the detection curve and record

the maximum value, and click【RESET】to clear the recorded maximum value. G represents gap, C represents crash。

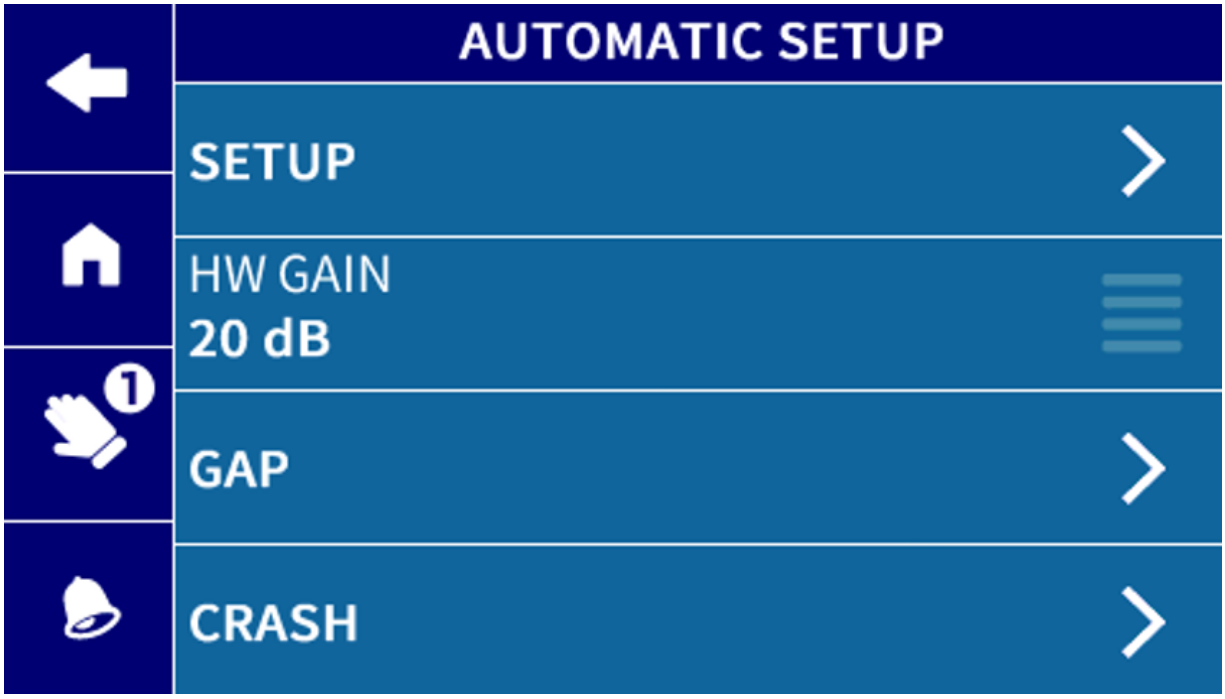


③【MANUAL SETUP】 After entering, you can modify hardware parameters. Clicking【GAP】or【CRASH】allows you to modify the corresponding software parameters.

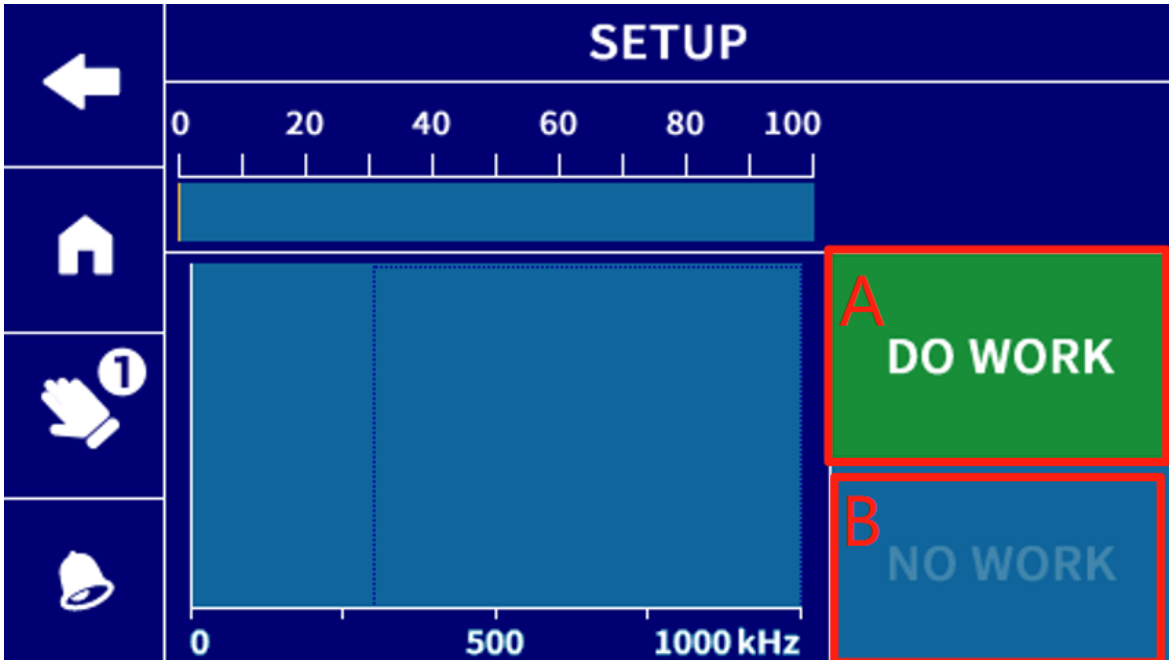




④【AUTOMATIC SETUP】Self-learning parameter setting is available, with the following steps:



Click 【SETUP】 to enter the learning interface:



Area A corresponds to the contact between the grinding wheel and the workpiece, while Area B corresponds to the non-contact between the grinding wheel and the workpiece.

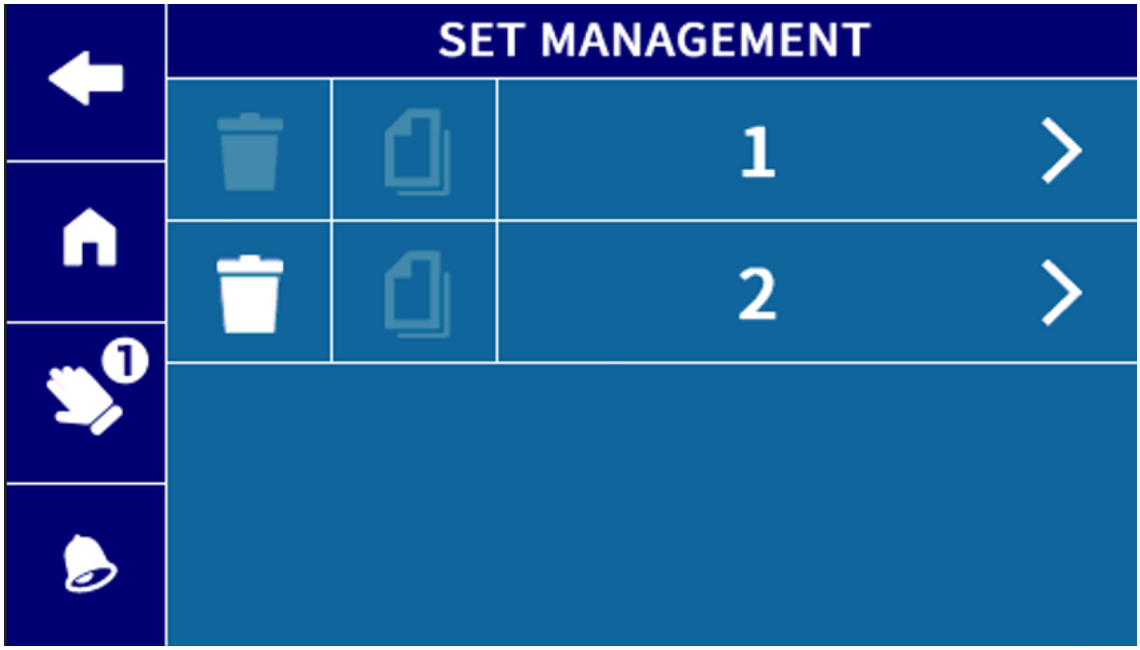
Click on Area A when the grinding wheel comes into contact with the workpiece, and the learning process will end once the set learning time is reached.

Then, move the grinding wheel away from the workpiece and click on Area B to start learning. Once the set learning time is reached, the learning process will end.

Note: The learning time can be modified on the [Main Page] → [Options] → [Auto Set Time]. You can also stop learning by clicking the corresponding area again after starting.

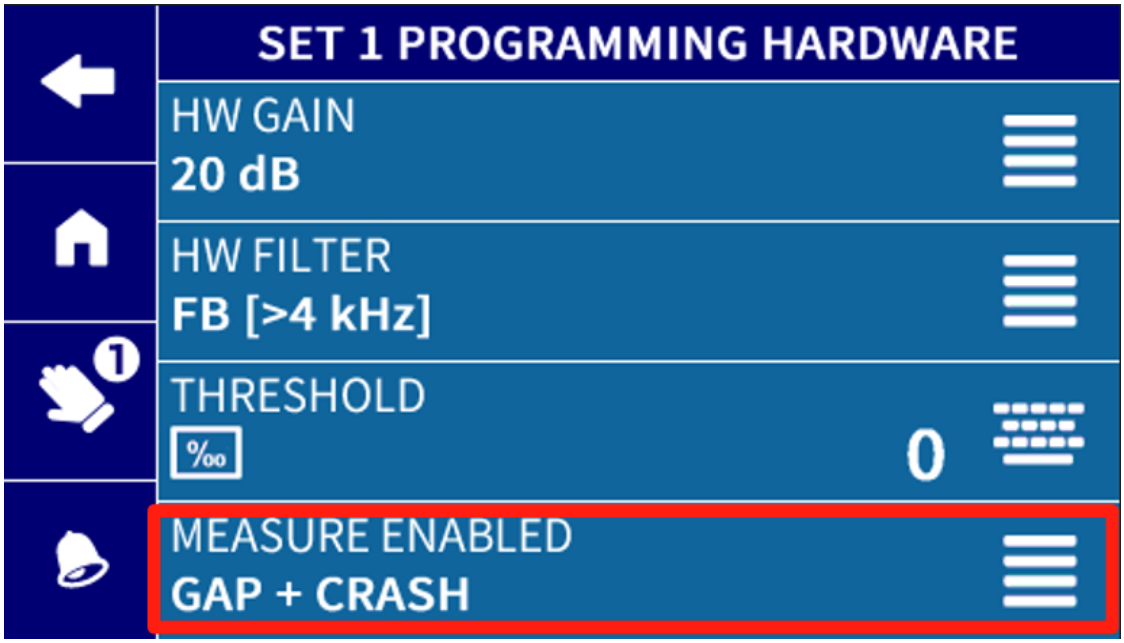
3.2、PROG

Click 【PROG】 on the main page to enter the programming options, where "1" represents "Programming 1" and "2" represents "Programming 2".



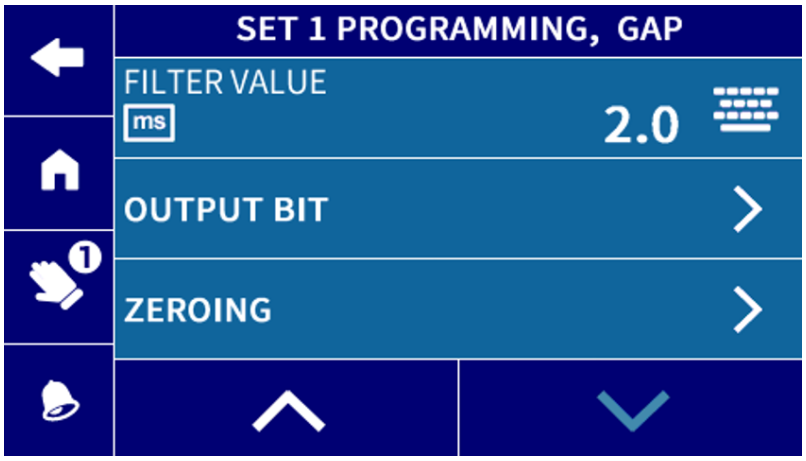
Each set of programming settings is configured separately. Taking Programming 1 as an example, it is divided into【HARDWARE】, 【GAP】, and 【CRASH】.

①HARDWARE

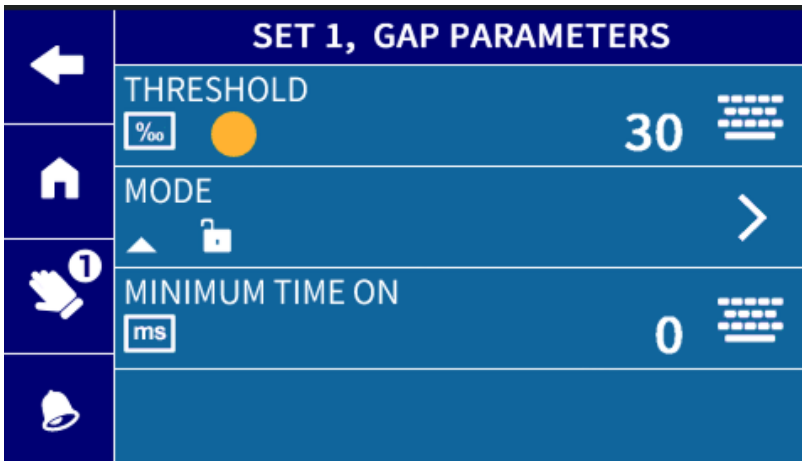


Clicking 【MEASURE ENABLED】 allows you to choose whether 【GAP】 and 【CRASH】 are working.

②The setting methods for GAP and CRASH are the same, with GAP travel as an example



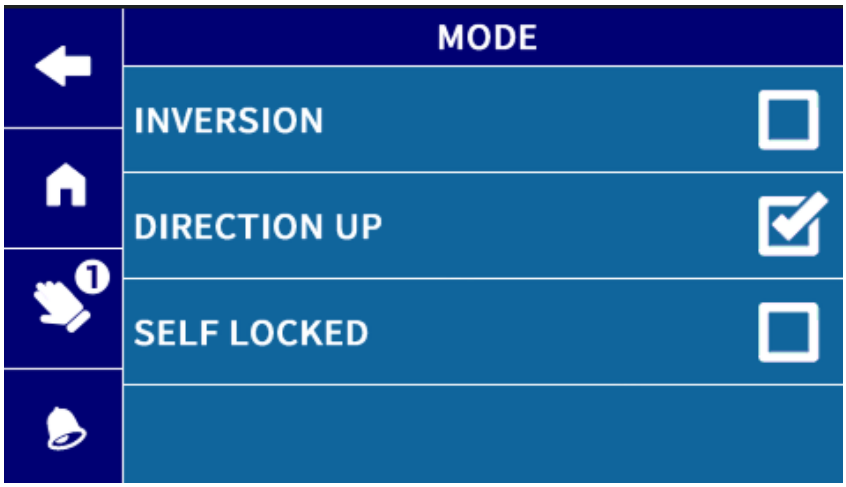
Click on 【OUTPUT BIT】 to set the idle output signal points



[Threshold] is the trigger point for signal points.

[Minimum startup time] refers to the minimum time required to be maintained after the measured value meets the triggering condition, and it will be triggered after exceeding the set time.

[Mode] is set for signal point trigger logic. (Modifications are required in SERVICE USER mode)



[INVERSION] Checking this option will cause the function to invert the state of the output signal based on the control logic conditions.
[DIRECTION UP] Check to trigger when the corresponding value is above the threshold.
[SELF LOCKED] Check the corresponding trigger to enable signal self-locking.

4、I/O interface and connection

Zplus A I/O Interface Outlet Color Comparison Table		
PIN	Line color	Function
2	Pink	OUT-GAP
3	Pink and Gray	OUT-CRASH
4	Yellow	OUT-ALARM
7	White and Yellow	IN-SET
10	Green and Brown	DC:+24V
11	Green and White	DC:0V
12	Brown	IN-GAP
13	White	IN-CRASH
14	Purple	COM-IN
15	Red	COM-OUT

※Note: The in/out common terminals cannot be connected in parallel.

5、Instructions for use

After the sensor and output cable are installed and connected, the user can turn on the device for usage settings.

①Refer to **3.1-④** to enter the automatic setting interface, and follow the steps to perform self-learning. After the self-learning is completed, the corresponding [Software Gain] and [Maximum and Minimum Frequency] settings will be automatically completed.

②Start simulating the machining process, view the curve graph of the machining process on the 【ACOUSTIC EMISSION GRAPH】 interface, and observe whether the measured value of the idle stroke curve graph during machining exceeds the range of 1000. If it exceeds the range, you can reduce the [Software Gain] of the idle stroke in [Manual Settings].

③Refer to **3.2-②** and set appropriate signal points based on the final 【ACOUSTIC EMISSION GRAPH】. Set the idle signal point to the measurement value obtained when just touching the workpiece.

④Regarding the setting of CRASH, as an alarm signal, it is sufficient to ensure that it is not triggered during normal processing.

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中原精密

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