

User Manual - Smart Level ML100



Caution: The user is cautioned that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.



Before using Gemred Smart leveling, please read the manual carefully.

This user manual is intended as a guide to initial installation, integration and subsequent use and notes of the Gemred Smart Machine leveling system.

Notes:

- ① Without external interference, the data transmission distance can reach 10m;
- ② Before using the leveling, please use rust removing oil to remove debris and impurities on the machine surface and the measuring surface of the leveling, so as not to affect the validity of calibration and measurement accuracy by dust, grease, etc.
- ③ The leveling are calibrated at the factory. However, due to the change of external environment, it's recommended to calibrate before use in order to ensure the measurement accuracy. For specific instructions Please refer to calibration part in the manual. (See page 6、 10 for more details.)

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1、Introduction

This electronic leveling instrument can measure the angle (deviation) between the X-axis and the horizontal plane, and indicate the leveling direction. Combined with mobile display, it can guide operators to achieve simple and fast leveling of the equipment's working surface.

2、Parameters

Measurement range: $\pm 0.5\text{mm/m}$ or $\pm 0.028^\circ$

Resolution : 0.01mm/m or 0.001°

Within the measurement range, X-axis accuracy: $\pm 0.02\text{mm/m}$ (achievable when the Y-axis electronic level bubble only displays the green part)

Battery life: Continuous operation for about 30 hours.

The Bluetooth barrier free transmission distance: over 10m.

Bluetooth function: Bluetooth is automatically turned on when powered on, and data is automatically sent after connection.

The product automatically shuts down after 1 hour of no button operation.

Battery: :3*AAA

Stable time: <3s

Operating temperature : $10^\circ\text{C} \sim 40^\circ\text{C}$

Storage temperature : $-20^\circ\text{C} \sim 70^\circ\text{C}$

Operating humidity: $\leq 85\%$

EMC: Class II

Dimensions: $200\text{mm} \times 50\text{mm} \times 58\text{mm}$

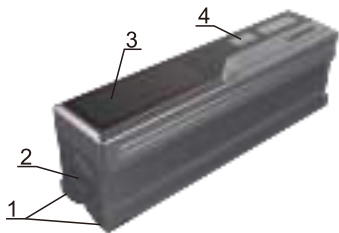
Flatness of the measurement surface: 0.003mm

3、Accessories

Name	Standard		Optional	
Smart Level ML100	Smart Level ML100	1	Universal Display Terminal *Wireless connection, independent display of measurement data	1
	AAA Battery	3		
	battery rack	1		
	Box	1		
	Manual	1		

4、Structure and Functions

4.1 Structure



- 1—measurement surface
- 2—Battery chamber cover
- 3—Display
- 4—Buttons

4.2 Buttons



 Short press to turn on, long press to turn off.

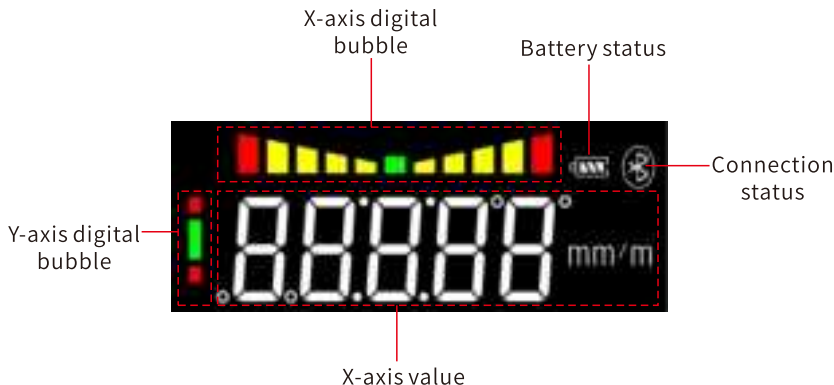
Note: When powered on, the default display unit is °. When turned off, the device will remember its unit state.

 Short press to hold the current value and short press again to exit hold mode.

When in the HOLD state, the LCD displays the "Hold" character.

 Short press to switch the display to inverse display, long press to switch units ("°" or "mm/m")

5、Display



5.1 Battery status

The battery level of the leveling instrument is displayed in the upper right corner of the LCD screen. Please replace the battery when the battery level is displayed as empty.

5.2 Connection

After the Bluetooth connection with the GemRed universal display terminal is successful, the ML100 will display the Bluetooth symbol.

5.3 X-axis Display

1、X-axis digital bubble

Icons	Name	Explain
	Green Bubble	Zero position
	Yellow Bubble	The number of yellow bubbles increases towards the higher side of the device Each yellow bubble represents 0.02mm/m, with a maximum display of 4 bubbles
	Red Bubble	The number of Red bubbles increases towards the higher side of the device When the X-axis inclination is greater than 0.08mm/m, a red level bubble will be displayed

Example:

Icons	Explain
	$\leq 0.02\text{mm/m}$
	$\leq 0.04\text{mm/m}$
	$\leq 0.08\text{mm/m}$
	$> 0.08\text{mm/m}$

2、X-axis value display

Real time display of X-axis measurement data, with two display units: mm/m and °.

5.4 Y-axis

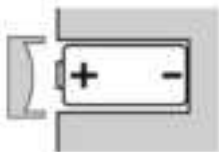
1、Y-axis digital bubble

Icons	Name	Explain
	Green Bubbles	When the Y-axis level bubble only displays a green grid, it indicates that the Y-axis tilt angle is $\leq 0.2^{\circ}$. The device can only achieve an accuracy of 0.02mm/m within the measurement range when only the green bubble is displayed.
	Red Bubble	The number of Red bubbles increases towards the higher side of the device. Display a green and a red bubble indicating a Y-axis inclination greater than 0.2° .

6、Basic Operation

6.1 Battery

Rotate the battery cover counterclockwise to open the battery compartment of the device. Use the battery rack to connect three AAA batteries in series. Place the battery rack in the correct direction of the positive and negative poles, and rotate clockwise to tighten the battery cover.



Positive and
Negative Pole



Battery Rack

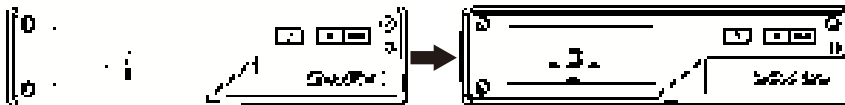
6.2 Calibration

Attention

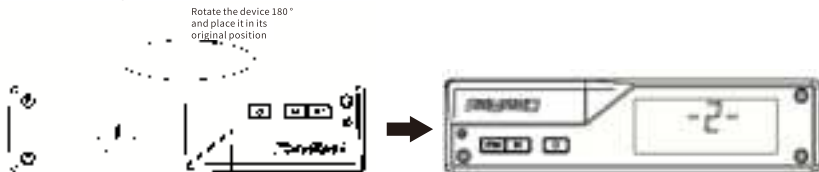
- ① Calibration has been performed before leaving the factory, but due to changes in the usage environment, it is recommended to perform a new calibration operation before use to ensure measurement accuracy.
- ② When calibrating, please keep the device in full contact with the countertop, rotate it as much as possible to 180°, and ensure that the platform is flat, free of vibration, impurities, or grease accumulation. It is recommended to rotate the device into position with the help of a right angle ruler within a flatness of 1mm/m on the platform, if necessary.
- ③ If the user needs to exit the calibration process, they can short press the M button on the leveling instrument.

The specific operation steps are as follows:

Step 1: Place the device on the calibration plane, press and hold the HOLD button, and the display will display "-1-" to start the device calibration. Then press the power button, and the display will flash and display "-1-". Keep the device stationary until stabilized displays "-2-", indicating that the first step of calibration is completed.



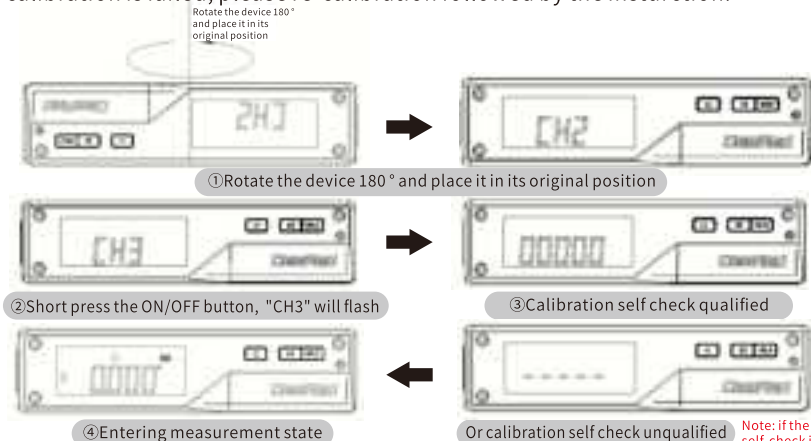
Step 2: At this time, displays "-2-", rotate the device 180 degrees and place it on the calibration platform.



Step 3: Short press the  button, the display will flash and display "-2-". Keep the device stationary until the display flashes and displays "CH1", indicating that the second step of calibration is completed. At this time, it enters the calibration self check mode. Keep the device stationary until the LCD displays "CH2"



Step 4: Rotate the device 180° and place it in its original position, then short press . At this time, the LCD "CH3" will flash, keep the product not moving. If the calibration self check is qualified, "CH3" will flash and display "00000" for about 2 seconds before entering the measurement state; if the calibration self-test fails, "CH3" will flash and display "-----" for about 2 seconds before entering the measurement state and the calibration is failed, please re-calibration followed by the instruction.



7、Cautions

- 1、The device must be temperature balanced before use. Placed it in working environment for more than 2 hours (power on is not necessary).
- 2、The device can work normally only after being powered on for 5 minutes.
- 3、For the high-precision measurement, the foundation shall be firm and free from vibration.
- 4、The working temperature should be kept stable, and the temperature change per hour should not exceed 1 °C.

Note

- * When the environmental conditions fail to meet the above requirements, the device may have deviation.
- * If you want to change the working environment during use, please reserve enough time for temperature balance.

8、Trouble Shooting

Phenomenons	Possible Reasons	Solutions
1.Display Errors	Battery problems	Reinstall or replace the batteries
2.Flashing	Battery Low	Replace the batteries
3.Unstable numbers display	Internal Error	Remove the battery and wait for 1 minute before reinstalling

9、Maintenance

Thank you for your trust and support in our company's products. Please perform maintenance according to the following requirements.

- 1、Keep the device dry and do not store it in damp places.
- 2、The devices stored for a long time should be boxed and stored.
- 3、The sensor of the device is a sensitive element with high sensitivity. It should be handled gently during use to prevent it from being subjected to severe vibration.
- 4、Avoid using the device in dusty environments.
- 5、Pay attention to rust prevention on the measurement surface. If not used for a long time, apply rust proof grease for protection.
- 6、If you stop using the device for a long time, please remove the battery.
- 7、During transportation, please use the specialized box provided by our company. Its shock-absorbing pad can effectively prevent damage to the instrument caused by vibration.



Service Warranty Card

Thank you for your trust and support in Guilin GemRed Sensor Technology Co., Ltd.'s electronic measurement products. We will wholeheartedly provide you with satisfactory services. In order to protect your legitimate rights and interests, GemRed makes the following commitments to you:

1. For products sold by our company, users can enjoy a one-year warranty service for the electronic part from the date of purchase with a purchase invoice and valid proof.
2. The company promises to complete the maintenance within seven working days from the date of receiving the repaired product. In case of special circumstances, we will negotiate with you to resolve the issue.
3. If one of the following situations occurs, it is not covered by the warranty. For non warranty products, our company will provide paid repair services.
 - a. The product has exceeded its warranty period;
 - b. Damage caused by water immersion, falling, collision, high temperature, strong magnetism, corrosion, and other reasons;
 - c. Damage caused by unauthorized disassembly or repair by non designated personnel;
 - d. Damage caused by accidents or other force majeure;
 - e. Other damages caused by not following the user manual's requirements for use, maintenance, and upkeep.
4. Our company reserves the right to improve our products. The product specifications and designs are subject to change without prior notice.

Dear user, this warranty service card will serve as your warranty certificate to protect your legitimate rights and interests. Please keep it safe. When filling out the warranty card, company buyers should pay attention to filling in the full name of the company. For personal purchases, please fill in the buyer's real name. Thank you for your cooperation!



Service Warranty Card

Customer	Name			
	Address			
	Telephone		E-Mail	
Product	Name		Serial Nr.	
	Invoice Nr.			
Service provider	Name			
	Address			
	Telephone		Date of Sale	