# Rebar Detector
# User Manual

Thank you for using our products!
In order to make you understand and use our products correctly, please read this manual carefully.

## Preface

Dear users,

Thank you for using the non-destructive testing products of..It is a great honor for us to be our customers. To help you use the product expertly and understand the performance of rebar detector including on-site measuring method and environment analysis, technical parameters and data processing etc., please be sure to read the manual carefully and other relevant information about the product.

The international advanced IC technology and the new-type LCD display have been adopted in rebar detector. Owning to its advanced design, excellent fabrication, high reliability as well as its rigorous technical evaluation in the research and fabrication process, the performance indexes have reached and even exceeded the international advanced level. To help you solve the technical problems conveniently you may encounter in use, we have made a detailed description and explanation in this manual. If you have any problems with the product, please refer to the relevant parts of this manual, or contact our company directly.

On the basis of the relevant technology, we strive to make the manual comprehensive and easy to understand. With the continuous accumulation of on-site detection experience, we upgrade and improve the product constantly. If there are any editing errors and improper rendering in the manual, we hope to obtain your correction sincerely.

Please check carefully whether the information of instrument is complete and the instrument & accessories are in line with the

packing list. If there are any problems, please contact our company. After purchasing it, please carefully read the relevant information of the instrument to ensure the right and service you have.

If you have any incomprehension in the manual, welcome you telephone us or write to us for further consultations and negotiations so that we can offer good service.

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The Operating Manual Instructions:

1. The symbol【】in this manual represents a button on the product panel, such as【⏻】.

2. Product options or menu names in screen are shown in texts with the gray background, such as Start Measuring.

3. The analysis command is shown in texts with the black block, such as Read the Recording and Confirm.

4. The symbol ☞ in this manual represents supplementary specifications.

5. In addition to the contents of this manual, there are some other prompts displayed automatically when operating, please follow the prompts.

6. The software interface and figure in this manual are just for illustrative purpose and may be subjected to change without prior notice as software upgrade and product improvement.

7. This is a general operating manual for the rebar detector series products. Please note the differences between the high and low version interface!

# 1 Abstract

## 1.1 Brief Introduction

The first generation portable rebar integrated detector uses an electromagnetic induction method, which can detect the rebar location and cover thickness & diameter accurately, store, transfer and analyze the real time test data. The model is the pinnacle of work with the modern simple design, incorporating the handy & durable features and sophisticated electronic technology.

series rebar detector is mainly used to test the location, distribution, direction, the thickness of rebar and the diameter of cover in concrete structure such as walls, columns, beam-slabs etc. It can also detect the location of pipelines and metal embedded parts. The multiple coil structure design make it more accurate & responsive and higher resolution.

## 1.2 Application Range

(1). Testing the location, distribution, direction, and diameter of the rebar and the thickness of cover in concrete structure projects.

(2). Inspecting and accepting concrete structural construction quality.

(3). Evaluating the quality of construction.

(4). Establishing the location of rebar for drilling, cutting and coring operations.

(5). Testing the distribution and direction of electric cables, pipelines and metalwork inside walls and floors.

(6). Testing the quantity of rebar when evaluating and developing the old structure, such as installation of furniture and air-condition.

**1.3 Features**

◆ The high resolution LCD display: 128 x 128 pixels;

◆ The intuitive operation and handheld ergonomic design with good durability;

◆ Accurately detect the location of the rebar;

◆ Help extend life of drill and avoid damage when drilling and coring;

◆ The multi coil structure design with high speed, high precision and high resolution;

◆ The built-in high capacity lithium battery, low power consumption, standby for no less than 20h.

### 1.4 Technical Specifications

| Items | Technical Spec. | |
|---|---|---|
| Diameter Measuring Range（mm） | Φ6～Φ50 | |
| Measuring Range（mm） | Location Range: 1～120<br>First Range: 1～60<br>Second Range: 30～120 | |
| Thickness Measuring Accuracy（mm） | 1～40 | ±1 |
| | 41～60 | ±2 |
| | 61～80 | ±3 |
| | 81～100 | ±5 |
| | 101～120 | ±8 |
| Rebar Location Accuracy | 1～60 | ±3 |
| | 61-120 | ±6 |
| Diameter Measuring Modes | Optional | |
| JGJ Measurement | Optional | |
| Data Storage | Optional | |
| Off Time | Automatic | |
| Power Supply | Rechargeable Lithium Battery | |
| Working Temperature | -10℃～+42℃ | |

| Size（mm） | 170×78×38 |
| --- | --- |
| Weight（kg） | 0.28 |

**1.5 Care and Maintenance**

(1). Operation Notice

Do not operate the button with too much force and stain it with oil and mud so as not to affect the button board life.

(2). Power Supply

This product built-in rechargeable lithium battery is left in standby model for at least 20h if fully charged. Please pay attention to battery indicator when using, if the battery is low, you should turn off the power as soon as possible and charge timely, otherwise the sudden power failure may cause loss of test data or even damage to the product.

Do not use other batteries or power supply for charging, otherwise it may cause the damage to the product, battery leakage, fire etc. If you have any problems, please contact us or distributor.

☞ Tips: The battery capacity will be insufficient after it is used for some time, which the symbol  will be displayed in the top right corner of the screen. The more the gray part, the more battery, the

symbol  shows that the product need charging as the little gray part displayed.

(3). Battery Charging

This product built-in lithium battery uses Micro USB standard port. It is recommended that the battery should be charged under the shutdown state. Please connect the power outlet to AC220±10%V power socket, the other end Micro USB port access to the bottom of the product, or connected directly on a computer with the USB cable.

If the indicator light turns red when charging, it shows the battery is being charged. When the red light turns green or off, it shows that battery has completely charged. The charger or USB cable should be pulled out in time so as not to overcharge the battery and affect the battery life. During the charging, there will be the normal phenomenon that battery and charger will produce a certain quantity of heat. It is recommended to place the product in a ventilated place.

☞ Tips: In order to ensure the battery completely being charged one time, please keep charging for 3 hours or so, and do not charge the battery in an environment exceeding 50℃. It is recommended that you should use the Producer's standard charger and USB cable,

or it may cause damage to the product.

(4). Lithium Battery

General life of rechargeable battery is for charging and discharging 500 times or so. If the battery does not work, no power and low power when charging, or working time is short every time, it may have been damaged. Please contact our after-sales service department to replace new battery. It is forbidden to short-circuit the battery and place it near the heat source. The battery capacity is 2000mAH (7.4Wh).

(5). Preserve & Clean

When the instrument is not used, please place it in a ventilated, cool and dry (relative humidity less than 90%) place of room temperature. If you do not use for a long time, please charge it before using, and regularly turn on it, and charge it once a month at least as well because rechargeable battery will discharge automatically resulting in power loss.

After using the instrument each time, it should be properly cleaned to prevent water, oil, mud and dust from the connector for fear of affecting the test performance.

☞ Tips: Do not immerse the instrument and accessories in water or scrub them with a damp cloth! Do not use any organic solvents or acid and alkaline liquid! Please use a clean, dry cloth to scrub the instrument and clean the jack with a soft brush!

(6). Fault and Handling Method

Instrument cannot boot: please check the battery power whether it is sufficient or directly insert it into the charger, turn on the soft switch. If the above method is invalid, connect the charger to charge the battery for half an hour before switching on.

Instrument automatic shutdown: the product has the function of the detecting power capacity. The product will automatically shut down when the power is too low, charge the battery for some time, or directly insert it into the charger before switching on.

☞ Tips: we provide a year warranty and life-long maintenance services. Please contact us or distributors if you need maintenance service. Repair it by yourself is not suggested.

**1.6 Liability**

The product is a precise instrument. In the following cases, the company does not undertake any liability.

(1). Abnormal operation

(2). Disassembling, repairing and refitting by the organizations or personnel that are not authorized by our company.

(3). Do not follow the requirements for working and storage environment mentioned above.

(4). Serious damage caused by man-made or accidental impact.

# 2 Introduction to Product

## 2.1 Product Appearance


(a) Top View


(b) Bottom View

Fig. 2.1 General View

☞ Tips: The actual instrument may differ from the schematic, please in kind prevail.

## 2.2 Button Board Instructions

Each button is on the host panel and the function specifications are shown in the table 2.2.

Table 2.2 List of Function Buttons

| Button Symbol | Function Spec. |
|---|---|
| 【⏻】 | Power On/Off, Confirm, Move Right Option |
| 【▲】 | Move Up Option, Switch Numbers and Letters |
| 【▼】 | Move Down Option, Switch Numbers and Letters |
| 【⮌】 | Return, Move Left Option |
| 【Side Upper Button】 | Shortcut key, Return |
| 【Side Lower Button】 | Delete Data, Diameter Measuring, Return |

Tips: Some buttons have different functions in different

interfaces as shown in the relevant introduction.

### 2.3 Accessories Instructions

1. USB Cable

Micro USB cable is used to connect the instrument and the charger for charging as well as connect the instrument and the computer for data upload as shown in Figure 2.3.

Fig. 2.3 USB Cable General View

2. Charger

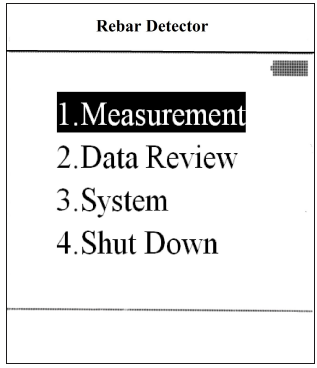
It is used for charging the battery with the USB cable.

Fig. 2.4 Charger General View

# 3 Product Instructions

## 3.1 Boot Instructions

Press the button 【⏻】 to power on, 3 seconds later, the main menu is displayed as shown in figure 3.1.




The Main Menu Interface

Fig. 3.1 Boot and Main Menu Interface (limited to different models)

Tips: The manual is applicable to the series products. The note "limited to different models" shows that there are some differences in different models.

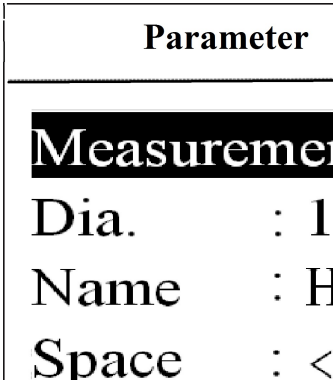
## 3.2 Operating Instructions

The main menu includes Start Measuring, Data Management (limited to different models), System Setting, and Power Off.

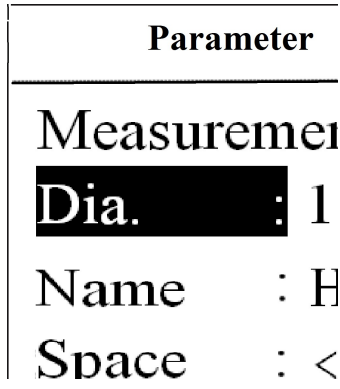
In the main menu, Start Measuring is by default, and the current function menu displays in gray background. The different function menus can be chosen through pressing the【▲】&【▼】and confirming to enter the chosen function menu.

### 3.2.1 Start Measuring

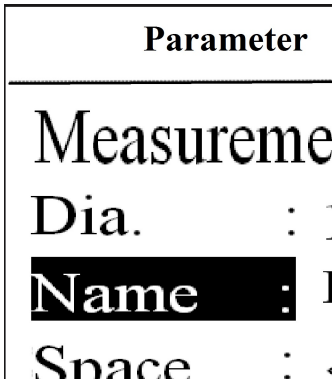
The start measuring menu mainly realized these functions such as measurement setting, rebar diameter setting (limited to different models), component name setting (limited to different models), stirrup spacing setting, JGJ scanning setting(limited to different models), instrument calibration setting etc., as shown in figure 3.2 (a, b, c, d, e, f).



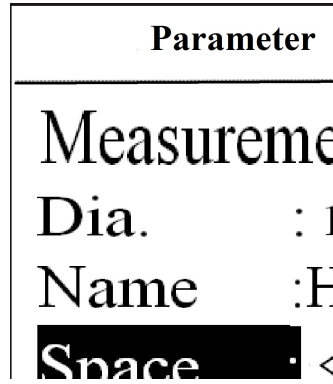

a. Start Measuring Interface



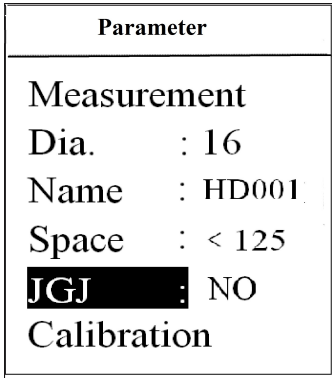

b. Rebar Diameter Setting



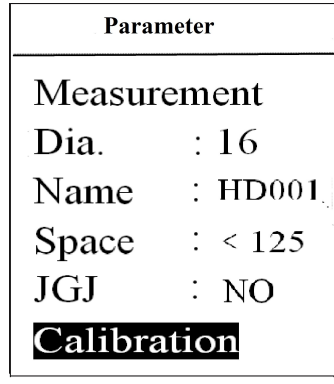

c. Component Name Setting




d. Stirrup Spacing Setting




e. JGJ Measurement Setting




f. Instrument Calibration

Fig. 3.2 Start Measuring Menu Interface

In the start measuring interface, please operate the following buttons to select the function.

【▲】: Select the function upwards to set and adjust the value of parameters (recyclable used)

【▼】: Select the function downwards to set and adjust the value of parameters (recyclable used)

【⏻】: Enter selected setting and set cursor parameter (right-click)

【⮌】: Return to previous menu (left-click)

Use the rebar diameter setting menu as an example in the following operation.

When you press【▼】to select Rebar Diameter Setting option, it will be displayed in gray background. When you press【⏻】to go into diameter size setting, gray the background of diameter figures display will turn gray. Then adjust the value to change the diameter size by pressing the【▼】,【▲】until appropriate value appeared. Finally, press 【⮌】to return to rebar diameter setting option. The same operation applies to Component Name Setting (limited to different models), Stirrup Spacing Setting, JGJ Measuring Setting (limited to different models).

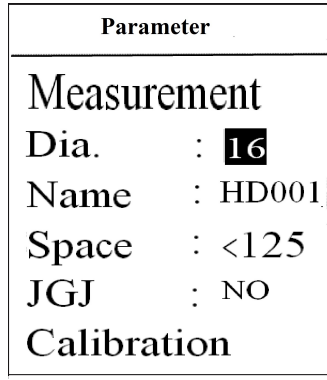



Fig. 3.3 Rebar Diameter Size Setting

Calibration: When the measuring environment is changed or error measurement result is appeared, you should perform zeroing, as shown in figure 3.4.

In calibrating, keep the instrument away from ferromagnetic metal objects, just in the air. Select the Calibration by pressing【▼】, 【▲】, and press the 【 】 to calibrate. When the interface display Calibration Completed, press any key to return. Once the exception has been displayed, please recalibrate.


Fig. 3. 4 The Instrument Calibration

**The parameters setting of each option as follows:**

**(1)** Rear Diameter (limited to different models)

A range of rebar specifications: 6、8、10、12、14、16、18、20、22、25、28、32、36、40、50.

**(2)** Component Name (limited to different model products)

Component name consists of two letters and three digits, which are A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, 1, 2, 3, 4, 5, 6, 7, 8, 9, 0 respectively, its default setting is HD001.

The default setting is HD001, which automatically plus one after the confirming, and the users manually adjust as needed.

**(3)** Stirrup Spacing (limited to different models)

The stirrup spacing parameter setting: if the on-site stirrup

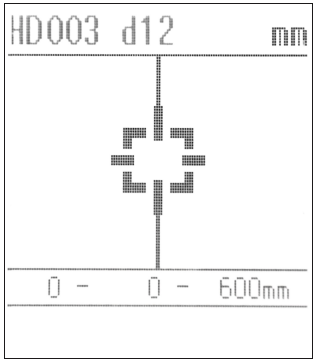
spacing is less than 125mm, the parameter is set to ＜125, compensated automatically. If the on-site spacing is greater than 125mm, the parameter is set to ＞125.

**(4)** JGJ Measurement (limited to different models)

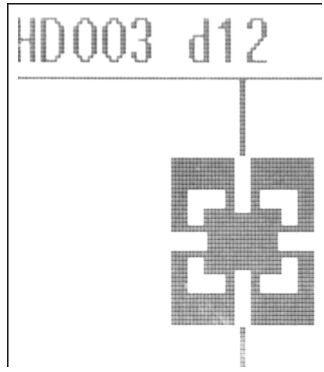
No: unused, Yes: used.

### 3.2.2 Rebar Position ＆ Thickness Measuring

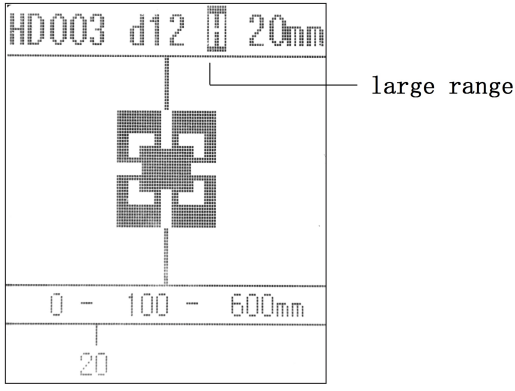
Select the Start Measuring and move the instrument rightwards slowly and evenly along the concrete surface until the alignment mark displayed as square-shaped frame is changed from  (hollow square) to  (cross-line in solid square) , indicator light in the front of screen turns red accompanied by the beep prompt tone, which shows the instrument is precisely aboove the rebar and the rebar has been detected yet. The current thickness value is displayed in the upper right corner of the screen, as shown in figure 3.4.




a. Measuring Interface




b. Measuring Location Interface




c. Measuring Location Interface(Second Range)

Fig. 3.4 Rebar Position & Thickness Measurement (a, b,c)

As the instrument moves away from the rebar, the square-shaped frame moves away from the centerline again and gradually moves towards the edge of the screen. When the measuring signal completely disappears, the square-shaped frame and the centerline

overlap without displaying cross-line in the square-shaped frame.

In the start measuring interface, the scope by default is 600mm each page, and automatically increase or decrease in multiples of 600 each time. In the process of scanning, the system will automatically page if the display is beyond the scope, press the 【▼】& 【▲】to view the previous screen data, the before and after data in every screen will change accordingly, except the middle data. Besides, during the measurement, data thickness interval is automatically increased by 100mm each time.

In the measuring interface, please operate the following buttons to select the functions:

【⏻】: Save the measuring data and restart the next measuring

【⮌】: Clear the measuring data and restart measuring.

【▲】, 【▼】: Page up and down to view the before and after data page.

【Side Upper Button】: Switch the large & small range.

【Side Lower Button】: The rebar diameter & the corresponding thickness measuring.

Tips: The measuring modes are divided into the large range and small range (by default).If the thickness is less than 80mm, please use the small range. If the thickness is more than 80mm, please use the large range.

Quickly enter the measuring interface: 1. Press the Side Upper Button at the main menu, and press it again back to the main menu. 2. Press【⏻】twice in rapid succession.

### 3.2.3 Rebar Diameter Measurement(Limited to Different Models)

Enter the measuring interface after detecting the position of rebar, press Side Upper Button, the value of rebar diameter can be displayed as shown in figure 3.5.

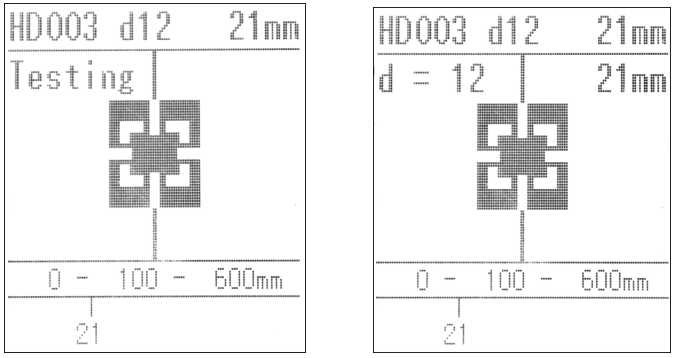



Fig. 3.5 Rebar Diameter Measurement Process

### 3.2.4 JGJ Measurement (Limited to Different Models)

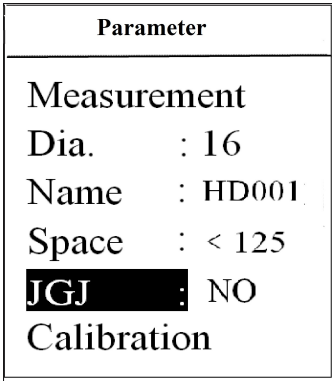
JGJ measurement is used to do remeasurement on the single rebar by measuring it six times and calculating the average automatically.

No: unused, Yes: used, as shown in figure 3.6.

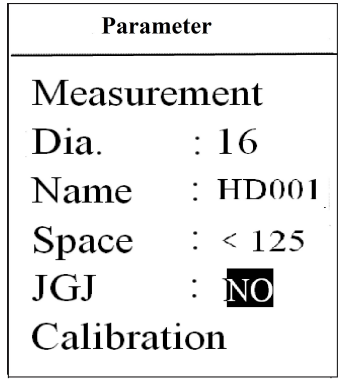
In the JGJ measurement interface, please operate the following buttons to select the functions:

【▲】,【▼】: Switch the up and down cursor position and choose Yes or No (recyclable used).

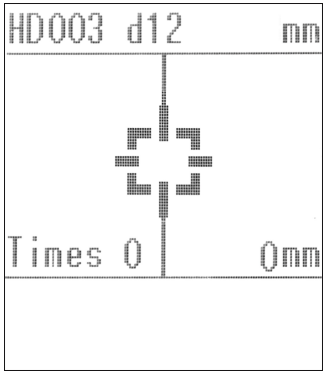
【 】、【 】: Switch the left and right cursor position.




a. JGJ Measurement Setting




b. JGJ Measurement Setting



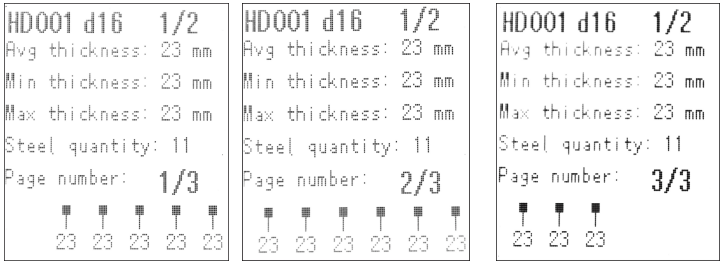

c. JGJ Measuring Interface b. JGJ Measuring Data

Fig. 3.6 JGJ Measurement Setting

### 3.2.5 Data Management (Limited to Different Models)

Data management is mainly to view data, upload data, delete data, etc., as shown in figure 3.7.

1. Data View




a. Data View b. Data View c. Data View

Fig. 3.7 Data View

The data view interface mainly displays the following

information:

(1) Component name number, total number of components and the current page number

(2) Rebar diameter(dXX)

(3) Average cover thickness;

(4) Minimum cover thickness

(5) Maximum cover thickness

(6) The total points of measuring thickness

(7) The total number of pages and the current page number

(8) The thickness value of each rebar

In the data view interface, please operate the following buttons to select the functions:

【▲】, 【▼】: To page up and down and switch the name and data of the different components (recyclable used).

【⮌】, 【⏻】: To page left and right and switch current component name and measuring data.

【side upper button】: Return to the main menu.

【side lower button】: Enter the data delete interface.

2. Data Upload

There is a USB port at the bottom of the instrument, and users can upload measuring data by connecting PC with standard Micro USB cable as needed.

Install the data processing software, connect the USB cable and power on and click on Read the Recording. If the connection is successful, the data will be transferred, and the instrument will display the corresponding prompt after completion of data transfer.

3. Data Delete

Press【side lower button】to remove current data in the data view interface. Press 【⏻】 to delete the all data. Press other buttons to cancel the deletion, as shown in figure 3.8.

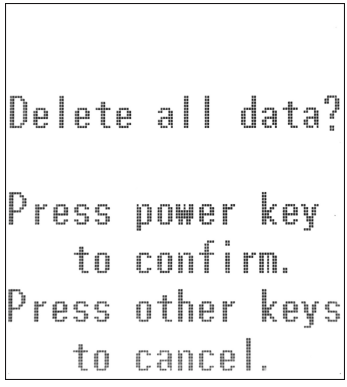



Fig. 3.8 Data Delete

**Tips**：The instrument contains is about two hundred thousand measuring points of storage. Please upload the data to the PC and delete the data timely when the measuring data is close to the limit for the lack of storage space. Otherwise, it cannot be used normally.

### 3.2.6 System Setting

System setting menu interface involves system configuration parameters, including automatic shutdown time, product ID, contact information, website, etc., which can be configured by users easily, as shown in figure 3.9.

press【▼】,【▲】 to select the system setting in the main menu, press 【⏻】to enter the system setting interface.


Fig. 3.9 System Setting

In the system setting interface, please operate the following

buttons to select the functions:

【▲】,【▼】: Switch the different off time (recyclable used).

【⏻】: Confirm to enter the system interface.

【⮌】【side button】: Return to the main menu.

**Tips:** The range of automatic shutdown time includes: 5 min, 10min, 15min, 30min, 60min, 90min.

### 3.2.7 Power Off

The instrument has some cases about power off, which include pressing the power off button, automatic shutdown, pressing and hold to 【⏻】 in the state of power-on, shut automatic shutdown if low power.

(1). Press the Power Off Button

In the main menu, press 【▼】、【▲】 to choose the power off, then press the【⏻】, system will shut down ,as shown in figure 3.10.

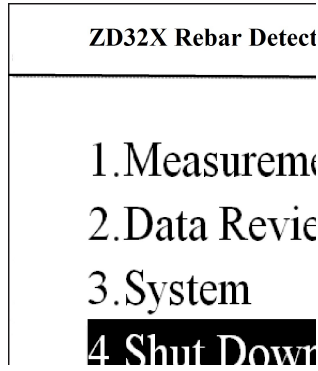



Fig. 3.10 Power Off Interface

(2). Automatic Shutdown

If there is no button operation for long time, the system will shut down automatically, which can be configured in the system setting interface by users easily.

(3). Low Power Shutdown

The instrument in the state of power-on will display battery capacity. If the power is too low, the no gray icon representing enough battery capacity in the top right corner of menu will become the red frame. Please stop using it, and charge it timely. If you continue to use it, the system will be automatically shut down.

Special explanation：

Export data for this product, please read the software help guide

**Appendix Ⅰ: On-site Notice**

(1) As the measuring surface is generally rough or concavo-convex concrete surface, which will affect the measuring accuracy, it is quite necessary to make the surface smooth, no protrusions. If the surface is too rough to clean up, you can place a non-magnetic sheet (such as wood) on it, the thickness of the sheet should be subtracted from the final measurement results at last.

(2) When measuring, rotate the product clockwise until making the product and rebar into a 90-degree angle, otherwise, it may cause misjudgment of the thickness.

(3) In the scanning process, try to keep the product moving slowly and evenly.

(4) In double layer arrangements, the outer rebar will be detected firstly before detecting the inner rebar in the middle of the two outer rebars.

(5) When the measuring environment is changed or error measuring results is appeared, you should perform the calibration. It is recommended to perform the calibration procedure before switching on each time in order to eliminate the impact of the external

environment on the measurement results.

(6) For the measuring parameters of the rebar diameter, please be sure to enter the correct value according to the drawings in order to reduce the corresponding misjudgment of thickness.

**Appendix Ⅱ: Menu Quick Index**

| Main Menu | Submenu | Function Spec. |
|---|---|---|
| Start Measuring | Start Measuring | Detect the location, thickness, and diameter of rebar |
| | Rebar Diameter | Preset actual component rebar diameter |
| | Component Name | Set the component name and number |
| | Stirrup Spacing | Set stirrup spacing according to the actual component |
| | JGJ Measuring | Remeasure the single point of each rebar |
| | Calibration | Reset and perform zeroing |
| Data Management | Data View | View measuring data |
| | Data Upload | Data transferred to computer |

| | | |
|---|---|---|
| | Data Delete | Delete measuring data |
| System Setting | Off Time | Set up automatic shutdown time |
| | Company Introduction | Product ID, contact information, Website, Company Name |
| Power Off | Power Off | Shut off the power |

**Appendix Ⅲ Measurement and Calibration**

series rebar detector has been qualified based on the relevant standards before delivery.

Calibration contents and procedures as follows:

F3.1. Verification Environment

(1). Room temperature

(2). No strong electromagnetic interference

(3). Air does not contain corrosive gases, relative humidity less than 80%.

F3.2. Verification Instrument

(1). A set of organic glass or plastic(acrylic) plate

(2). No less than 500mm in length, diameter,

respectivelyΦ12, Φ16, Φ20 normal Ⅱ grade rebar.

(3). A set of bracket with standard thickness.

F3.3. Verification items and method

(1). Appearance

a. Connectors and fasteners with reliable contact.

b. Electroplating, oxidation treatment surface should be smooth with gloss consistency, no peeling, corrosion, scratches and other defects.

c. Clear texts, symbols and logos

(2). Verification Method

a. Scan the three key points of the sample fromΦ12、Φ16、Φ20 normal Ⅱ grade rebar, continuously measure the thickness of the cover thickness 3 to 6 times, calculate an average and check the qualified rate.

b. Measurement commonly used cover thickness values areas: each rebar diameter area are generally divided into three values 20,30,50, continuously measure the diameter of the rebar 3 to 6 times, calculate the average of rebar diameter.

**Appendix Ⅳ: Relevant Standards**

The relevant standards for the product as follows:

1. 《Code for acceptance of construction quality of concrete structures》（GB50204—2015）
2. 《Technical specification for test of reinforcing steel bar in concrete》（JGJ/T152—2008）
3. 《Technical standard for inspection of building structure》（GB/T50344—2004）
4. 《Technical standard for in-site inspection of concrete structure》GBT50784-2013
5. 《Technical specification for inspection of the depth of coverage and the diameter of reinforcing bars in concrete by electromagnetic meth》(DB11/T365-2006)
6. 《Calibration Specification for Reinforced Concrete Covermeter Floorslab Thickness tester》JJF1224-2009

Thanks for your cooperation!

## Producer Certificate

**Product Name：** **Rebar Detector**

**Product Model Number：** _____

**Serial Number:** _____

**Inspection Date：** _____

Stamp:

**Inspector**_____

**Check Member**_____

**Packing List of Rebar Detector**

| No. | Name | Unit | Quantity | Remarks |
|---|---|---|---|---|
| 1 | Product Host | piece | 1 | / |
| 2 | Charger | piece | 1 | / |
| 3 | USB Cable | piece | 1 | / |
| 4 | User Manual | piece | 1 | / |
| 5 | Producer Certificate | piece | 1 | / |
| 6 | Warranty Card | piece | 1 | / |
| 7 | Product Suites/Box | piece | 1 | / |
| 8 | Software CD | piece | 1 | Limited to Different Models |

## Product Warranty Card

Thank you very much for using our products, our company will provide you with the best products and after-sale service. The specific warranty content as follows:

1. Offer a three-year warranty service since the date of purchasing the product, and provide life-long software upgrade, technical services and maintenance services.

2. This warranty card (stamp valid) and the formal purchase vouchers (such as invoice, etc.) will be used together as a basis for warranty.

3. During the warranty period, if the failure occurs under normal circumstances, the maintenance fee is exempted after the technical personnel of our company verify it. In excess of warranty period, the cost and maintenance fee will be charged according to the failure condition of the product.

4. Please check the product carefully after receiving it. If you have any problems, please suggest it within 5 days, otherwise it will be deemed acceptable.

5. In the following cases, the company shall provide paid services:

(1) Abnormal operation, installation and maintenance, not in

accordance with the operating manual, cause failure.

(2) Disassembling, repairing and refitting by the organizations or personnel that are not authorized by our company.

(3) Damage caused by natural disasters such as earthquakes, etc.

(4) Damage caused by an accident (such as shock, overpressure).