



Gaotiejian

GTJ-R800 Integrated Rebar Scanner

Operation Manual

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Chapter 1 Instrument Function and Introduction

1.1 Introduction

As a portable non-destructive testing instrument, GTJ-R800 integrated rebar (reinforced steel bar) scanner can be used to test the construction quality of reinforced concrete structures and is capable of measuring rebar position, thickness of rebar protective layer and rebar diameter in the concrete surface. In addition, it can also be used to measure positions of magnetic bodies and electric conductors inside the concrete structures, such as a cable, a plumbing pipe in a wall, and the like.

Applicable specification:

GB 50204-2015 Code for quality acceptance of concrete structure construction

GB 50010-2010 Code for design of concrete structures

GB/T50344-2004 Technical standard for inspection of building structure

JGT/T152-2008 Technical specification for test of reinforcing steel bar in concrete

1.2 Functions and Features

1. One-piece design, small size, light weight and easy to carry; with newly upgraded wireless cloud transmission, the rebar position can be precisely located by laser;
2. An intuitive thickness detection mode displays the rebar position and rebar spacing at the same time;
3. The thickness detection mode can automatically store the thickness and the spacing, which significantly improves detection efficiency;
4. A waveform scan mode visually displaying rebar distribution makes it more convenient to detect and analyze dense rebars;
5. The waveform scan mode simultaneously displays the determined thickness of the rebar protective layer and the spacing;
6. Measurement for intermediate position of adjacent rebars is available, and an aiming frame and an indicator light are designed to facilitate core-drilling;
7. The instrument automatically stores calibration value to achieve rapid measurement and eliminate the trouble of repetitive calibration;
8. Borderless grid / profile scan and waveform scan make up to 6m in one measurement is realizable;
9. TF card storage provides a large capacity and convenient transmission;
10. 2.8-inch high-resolution color LCD screen;
11. Professional data analysis software for PC makes data processing and report generation easy to complete.

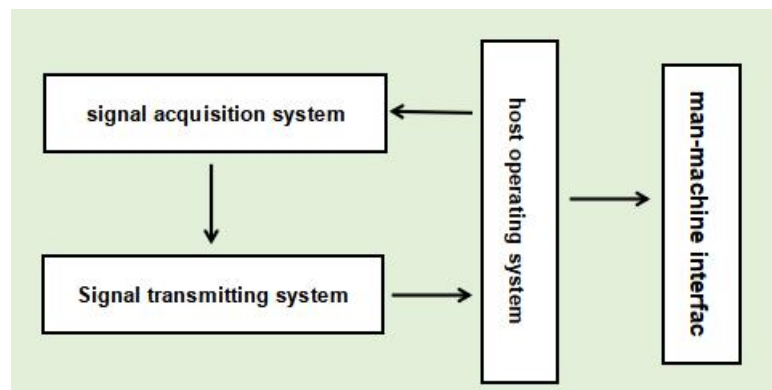
1.3 Specifications

Project		Specifications
Type		GTJ-R800
Measuring range (mm)	Small range	1-90mm
	Large range	1-210mm
Maximum allowable error of thickness of protective layer (mm)	±1(mm)	1 - 59mm
	±2(mm)	60 -69mm
	±4(mm)	70~119mm
	±6 (mm)	120~210mm

Range of diameter estimation (mm)		φ6mm ~φ32mm
Maximum error of displayed diameter		±1 specification
Profile scan		Yes
Grid scan		Yes
Waveform scan		Yes
Laser positioning		Yes
Probe self-calibration		Yes
Host parameters	Screen size	2.87 inches
	Resolution	240×320
	Volume	220×93×110mm
	Weight	0.6kg
Data transmission mode		TF card, wireless cloud transmission (optional)
Power supply		Lithium battery
Storage capacity		2000 objects * 1000 test points
Working environment		Temperature: -10°C - 40°C Humidity < 90% HR

1.4 Working Principle

The rebar detector consists of four parts: a host system, a signal transmission system, a signal acquisition system, and a human-machine interface, as shown in the following figure.



Under the control of the host, the signal transmitting system generates an excitation signal of a certain frequency to excite the probe. A primary magnetic field is induced by the instrument in its surrounding area, and when the instrument walks through rebar area, a secondary magnetic field is induced by rebars, which is received by the signal acquisition system and converted to digital signal to be sent to the host system for processing, thereby determining the rebar position and the thickness of the protective layer.

1.5 Precautions

1. Please read this manual carefully before use.
2. Requirements of operating environment:

Ambient temperature: -10°C ~ 40°C;

Relative humidity: < 90%RH;

Non-strong alternating electromagnetic field shall not be exposed to direct sunlight for long

periods of time.

Necessary precautions shall be taken when used in a damp, dust or corrosive gas environment.

3. Requirements for storage environment:

Ambient temperature: $-20^{\circ}\text{C} \sim +60^{\circ}\text{C}$;

Relative humidity: $<90\%\text{RH}$;

Please store the instrument in a ventilated, cool and dry environment and do not expose it to direct sunlight for long periods of time.







If the instrument won't be used for a long time, power on it at regular intervals to have a check.

4. Avoid water ingress.

5. Anti-magnetism: avoid violent vibration and shock during use and transportation.

Chapter 2 Instrument Description

2.1 Keyboard

Key	Function description
	Turn the instrument on or off: press this button to turn it on in a power-off state, or long press this button to turn it off in a power-on state, referred to as Startup hereinafter
	Move cursor up or increase number, referred to as Up hereinafter
	Move cursor left, referred to as Left hereinafter
	Move cursor right, referred to as Right hereinafter
	Move cursor down or decrease number, referred to as Down hereinafter
	Cancel the current operation and return to previous interface, referred to as Back hereinafter
OK	Confirm the menu item selected or measured data

2.2 Main Menu Interface

Press key **Startup**, the instrument will display the main menu interface, as shown in Figure 2.1.

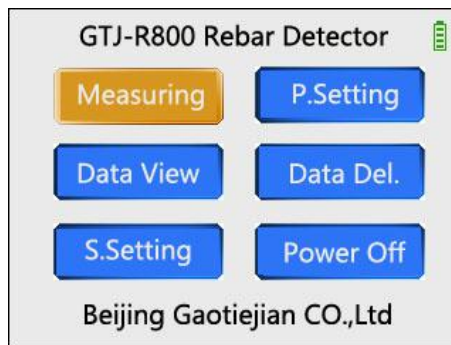


Figure 2.1

Select a corresponding function using keys **Up**, **Down**, **Left** and **Right** and press key **OK** to enter the corresponding function interface.

2.3 Start Detection

In the main menu, select key **Start Detection** to enter the detection setup interface, as shown in Figure 2.2. Use key **Up** or **Down** to select different measurement modes, which, from top to bottom, are thickness detection, waveform scan, profile scan, grid scan and specification scan, respectively.

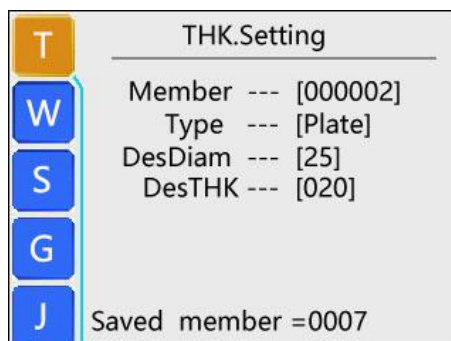


Figure 2.2

2.3.1 Thickness Detection

Thickness Detection Setup

In the detection setup interface (Figure 2.2). By default, object number is incremented by 1 on the object number stored last time, and other parameters default to object parameters stored last time.

In the thickness detection setup interface, if object parameters do not need to be modified, press key **OK** to enter the test interface, as shown in Figure 2.3. If object parameters need to be modified, press key **Right** to enter the object parameter selection interface, and press key **Up** or **Down** to select object parameters to be modified; then press key **Right** again to enter the parameter setup interface, and press key **Up** or **Down** to modify the parameters; press **OK** to confirm the modification and return to the object parameter selection interface.

Thickness Detection

After setting parameters in the thickness detection setup interface, press key **OK** to enter the thickness detection interface as shown in Figure 2.3.

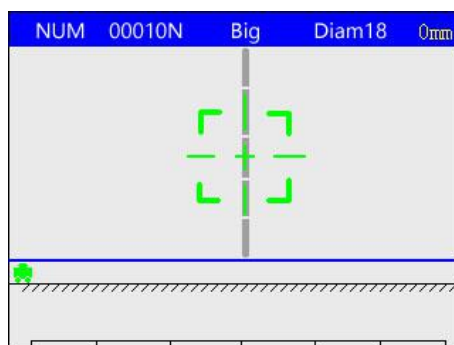


Figure 2.3 Thickness detection interface

In the thickness detection interface, slowly move a car to the right to start measuring. The green aiming frame changes position as the signal changes. When the aiming frame coincides with the centerline, the aiming frame turns red, the red indicator is on and the buzzer sounds, it indicates that a rebar is detected, which is located below the centerline of the car. The thickness of the measured protective layer is displayed in the lower right corner of the aiming frame, while the rebar position and the thickness of the protective layer are displayed at the bottom of the screen.

The car marked with the word "GTJ" indicates the current position, while the number in the upper right corner indicates the distance the car moves. When the scan distance exceeds the screen range, the system will automatically turn the page.

Press key **Right** to switch between large and small ranges in this interface.

When the car moves directly above the rebar, press key **Up** to estimate rebar diameter and thickness of the protective layer. The estimated diameter and thickness are relatively accurate only if the spacing of rebars being estimated is large and there are no other metal interferences such as stirrups nearby. Moreover, the thickness of the protective layer of the rebar being estimated should not be too thin or too thick. The recommended thickness range is 15mm-20mm.

2.3.2 Waveform Scan

Waveform Scan Setup

Select waveform scan setup in the detection setup interface (Figure 2.2). In the waveform scan setup, by default, object number is incremented by 1 on the object number stored last time, and other parameters default to the object parameters stored last time.

In the waveform scan setup interface, if object parameters do not need to be modified, press key **OK** to enter the test interface, as shown in Figure 2.4. If object parameters need to be modified, press key **Right** to enter the object parameter selection interface, and press key **Up** or **Down** to select object parameters to be modified; then press key **Right** again to enter the parameter setup interface, and press key **Up** or **Down** to modify the parameters; press **OK** to confirm the modification and return to the object parameter selection interface

Waveform Scan

After setting parameters in the waveform scan setup interface, press key **OK** to enter the waveform scan interface as shown in Figure 2.4.

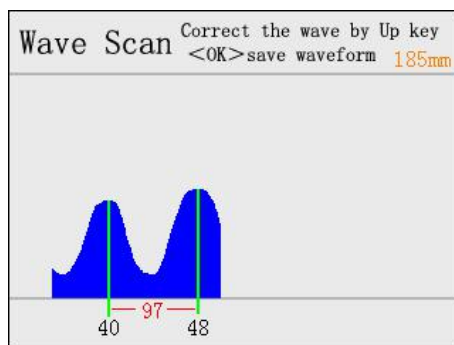


Figure 2.4 Waveform scan

In the waveform scan interface, place the instrument on the surface of the measured object and moved it to the right at a constant speed to start measuring. The screen will display the signal waveform and the distance the car moves in the upper right corner. The closer the rebar is to the instrument, the stronger the signal strength and the higher the waveform curve are, and meanwhile, a green line will be displayed at the highest peak of the curve, indicating that there is a rebar. The thickness of the protective layer of the current rebar is displayed below the green line. When the detected rebars is more than 2, the instrument will automatically display the spacing of adjacent rebars in mm.

When the car moves too fast, there will be a “moving too fast” prompt on the screen.

When the scan distance exceeds the distance the screen can display, the system will automatically turn the page. The maximum scan distance is 6000 mm, beyond which the buzzer will make a long sound. At this time, even if the car keeps moving to the right, data in the upper right corner of the screen will not be increased, and data measured afterwards will not be saved either.

Press key **Left** or **Right** to view the complete waveform of the present scan.

If the rebar position determined by the program is found to be incorrect after one waveform scan, you can manually correct it. The specific steps are as follows:

1. Press key **Up** to enter the manual modification state, as shown in Figure 2.5. A cursor, as shown by the yellow vertical line in Figure 2.5, will appear, and value in the upper right corner of the screen becomes the position corresponding to the current cursor;
2. Press key **Up** or **Down** to quickly select the rebar that has been determined;
3. After finding a rebar that has been misjudged, long press key **Down** to delete the rebar;
4. Repeat steps 2 and 3 to delete the remaining misjudged rebars;
5. Press key **Left** or **Right** to move the cursor to position of a missing rebar, and long press key **Up** to add the rebar here, where thickness of protective layer of the rebar and its spacing with adjacent rebars will be displayed.
6. Repeat step 5 to add multiple rebars.

The general rule for determining a rebar according to waveforms: there is a rebar in the peak of a waveform.

Press key **OK** to save a waveform or press key **Back** to return the waveform scan setup interface without saving the waveform.

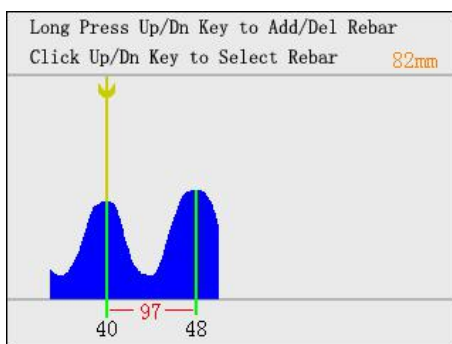


Figure 2.5 Manual modification

2.3.3 Profile Scan

Select profile scan setup in the detection setup interface (Figure. 2.2). Press key **OK** after setting parameters or directly press **OK** to enter the profile scan interface, as shown in Figure 2.6.

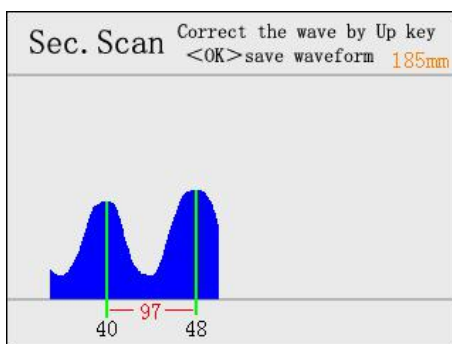


Figure 2.6 Profile scan

In the profile scan interface, place the instrument on the surface of the measured object and moved it to the right at a constant speed to start measuring. Press key **Left** or **Right** to check the complete waveform of the present scan.

If the rebar position determined by the program is found to be incorrect after one profile scan, press

key **Up** to modify it manually. For details, refer to the manual modification steps in the description of the waveform scan.

Press key **OK** to store the present scan results and a schematic diagram of the stored data of the object is displayed on the screen. At this time, if the whole profile scan process has not been completed, press key **OK** to continue scanning from the last stopped position. Press key **Left** or **Right** to view the complete waveform of the present scan, and press **OK** to store the present scan results. The above steps may be repeated to perform borderless profile scan. Press key **Back** to exit the measurement.

2.3.4 Grid Scan

Select grid scan setup in the detection setup interface (Figure. 2.2). Press key **OK** after setting parameters or directly press **OK** to enter the grid scan interface, as shown in Figure 2.7.

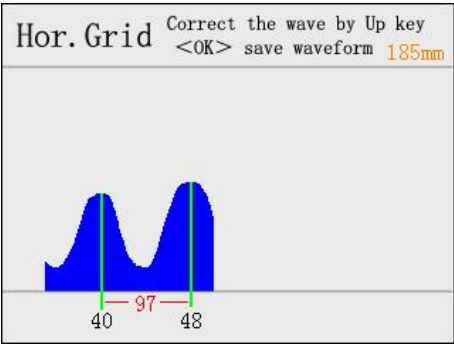


Figure 2.7 Horizontal grid scan

In the profile scan interface, horizontal grid scan is performed first. Place the instrument on the surface of the measured object and moved it to the right at a constant speed to start measuring. Press key **Left** or **Right** to check the complete waveform of the present scan.

If the rebar position determined by the program is found to be incorrect after one horizontal grid scan, press key **Up** to modify it manually. For details, refer to the manual modification steps in the description of the waveform scan.

Press key **OK** to store the present scan results. A horizontal scan diagram of the object is displayed on the screen, as shown in Figure 2.8.

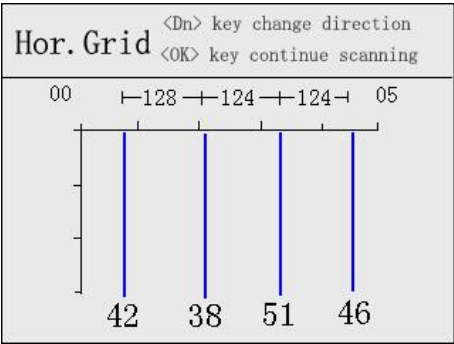


Figure 2.8 Schematic diagram of horizontal grid scan

In this interface, press key **Left** or **Right** to scroll through data. At this time, if the whole horizontal grid scan process has not been completed, press key **OK** to continue scanning from the last stopped position. And if the horizontal grid scan process has been completed, press key **Down** to switch to vertical grid scan.

After finishing one vertical grid scan, press key **OK** to store the present scan results, and horizontal and vertical schematic diagrams of the object are displayed on the screen. Press key **Left** or **Right** to scroll horizontally, press key **Up** or **Down** to scroll vertically, press key **OK** to continue the vertical scan, or press key **Back** to exit scanning.

2.3.5 Specification Scan

Specification scan is a unique scan mode, which can realize two scans for one rebar and automatically calculate the average value of protective layers. It can accurately measure thickness of the protective layer, diameter and pass rate of the rebar.

In the detection setup interface (Fig. 2.2), select the specification scan setup. Press key **OK** after setting parameters or directly press **OK** to enter the specification scan interface, as shown in Figure 2.9.

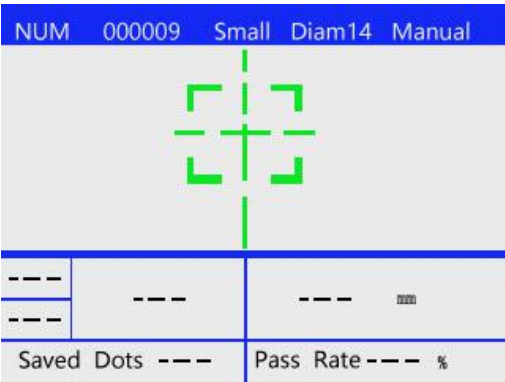


Figure 2.9 Specification scan

In the specification scan interface, slowly move the car to the right. The green aiming frame changes position as the signal changes. When the aiming frame coincides with the centerline, the aiming frame turns red, the red indicator is on and the buzzer sounds, it indicates that a rebar is detected, which is located below the centerline of the car. Press key **OK** to store the value. The measured thickness of the protective layer is displayed at the lower left corner of the aiming frame. Scan the test point for the second time with the same method as the first scan. Press key **OK**, and the thickness of the protective layers of the rebars, average values, and pass rates of the two measurements are displayed at the bottom of the screen.

2.4 Data View

Select **Data View** in the main menu and press key **OK** to enter the data view interface, as shown in Figure 2.10.

Data View			1/7
000002	2019-03-06	15:03	
000001	Test Type	GRIO	
000001	Direction	X	Y
000001	Diameter	14	14
000001	Thickness	10	10
000002	Save Dots	3	4
000001			

Figure 2.10 Data View

In the data view interface, press key **Up** or **Down** to select objects, and press key **Left** or **Right** to scroll through pages. Values in the upper right corner of the screen indicate the number of objects selected and the total number of objects, respectively.

2.4.1 Thickness Data View

Thickness data view is shown in Figure 2.11. The measured thickness value is qualified when it is within the range of allowed upper deviation and allowed lower deviation. Press key **Left** or **Right** to turn the page to view test points in the front and rear positions. Press key **OK** to enter the thickness data table view, as shown in Figure 2.12.

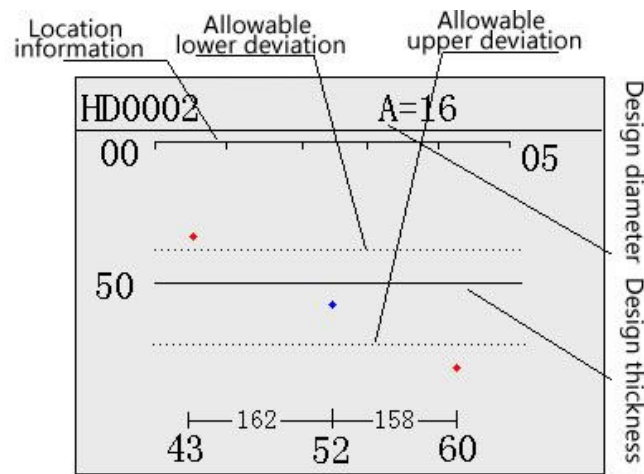


Figure 2.11 Thickness data view

HD0002 THK. A=16 H=50				
NUM	H	ΔH	S	ΔS
1	43	-7	87	0
2	52	2	249	162
3	60	10	407	158
4	57	7	563	156
5	53	3	680	117
6	65	15	815	135

Figure 2.12 Thickness data table view

In the thickness data table view interface, Φ in the first row represents the design diameter and H represents the design thickness. In the head, H represents the measured thickness, ΔH represents the difference between the measured thickness and the design thickness, S represents the position corresponding to the test point, and ΔS represents the distance between the present point and the last point

Press key **Up** or **Down** to turn the page, and press key **Back** to exit data table view.

2.4.2 Waveform Data View

Waveform data view is shown in Figure 2.13, where Φ represents the design diameter, H represents the design thickness, the vertical lines in the center of the crest represent rebars, values beneath represent the measured thickness, and values in the middle of two vertical lines represent spacing of two rebars.

Press key **Left/Right** or key **Up/Down** to turn the page to view test points in the front and rear positions. Press key **OK** to enter the waveform data table view. The waveform data table view is similar to the thickness data table view, please refer to the thickness data table view in the previous section.

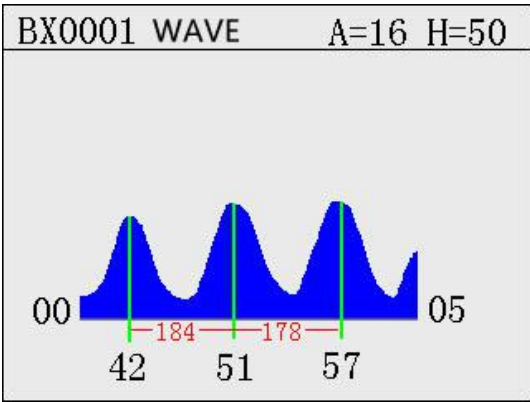


Figure 2.13 Waveform data view

2.4.3 Profile Data View

Profile data view is similar to the thickness data view, please refer to the thickness data view in the previous section.

2.4.4 Grid Data View

Gird data view is shown in Figure 2.14, where the vertical lines perpendicular to the horizontal axis represent the transversely scanned rebars, values beneath represent thickness of the corresponding protective layers under the rebars; the horizontal lines perpendicular to the vertical axis represent the longitudinally scanned rebars, and values on the right side represent thickness of the corresponding protective layers under the rebars.

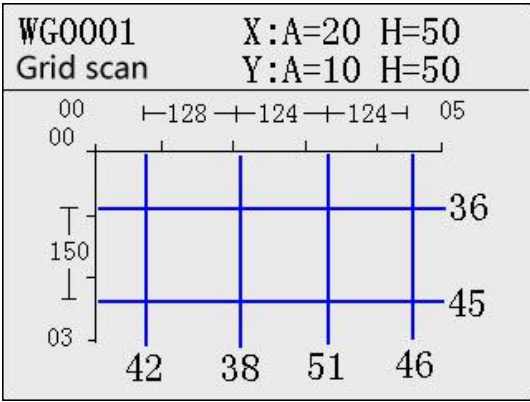


Figure 2.14 Grid data

Press key **Left** or **Right** to scroll horizontally, and press key **Up** or **Down** to scroll vertically. Press key **OK** to enter the grid data table view interface.

In the grid data table view interface, press key **Up** or **Down** to scroll through pages, and press key **Left** or **Right** to switch display of X and Y axes.

2.5 Instrument Setup

2.5.1 Instrument Setup

Select **Instrument Setup** in the main menu to enter the instrument setup interface, as shown in Figure

2.15. In the instrument setup interface, measuring range, shutdown time, backlight brightness, stirrup spacing and laser settings may be set. The shutdown time is in minutes.

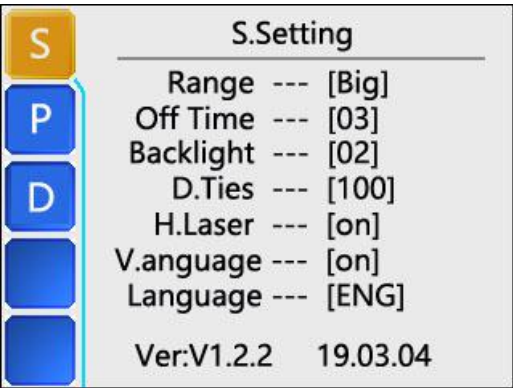


Figure 2.15 Instrument setup

Press key **Right** to enter time modification interface. Press key **Up** or **Down** to select modification items, press key **Left** or **Right** to modify parameters, press key **OK** to save the modification, and press key **Back** to give up saving the modification

2.5.2 Parameter Setup

Select **Parameter Setup** in the main menu to enter parameter setup interface, as shown in Figure 2.16. The instrument's clock can be set in the instrument setup.

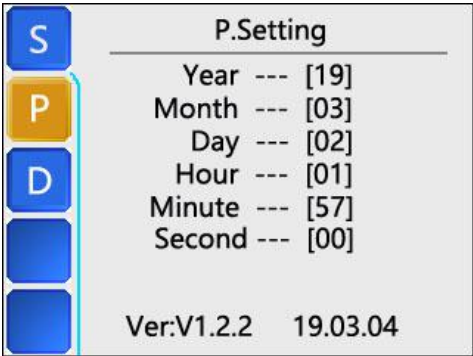


Figure 2.16 Parameter setup

Press key **Right** to enter parameter modification interface. Press key **Up** or **Down** to select modification items, press key **Left** or **Right** to modify parameters, press key **OK** to save the modification, and press key **Back** to give up saving the modification

2.5.3 Data Deleting

Select **Data Deleting** in the main menu to enter data deleting interface, as shown in Figure 2.17. Press key **OK** to delete data.



Figure 2.17 Data deleting

Note: Data deletion is to delete all the object data in the memory card, and it cannot be recovered after deletion. It is recommended to transfer the YTRBL.rbl file on the memory card to the computer before deleting the data.

2.6 Data Transmission

Remove the memory card from the instrument, insert the memory card into the card reader and connect it to the computer. Copy the YTRBL.rbl file on the memory card to your computer. **In order to store as much data as possible, it is recommended that no other files be stored on the memory card.**

2.7 About Shutdown

Select **Shutdown** in the main menu interface and press **OK** to shut down, or press and hold key **Startup** on any interface to shut down.

Chapter 3 Maintenance and Preservation

3.1 Pre-use inspection

Check if the battery is fully charged. When the main screen shows that the battery is empty after turning on the host, please charge the instrument.

3.2 Cleanness

Do not put the instrument and accessories in water or use a damp cloth to scrub! Do not scrub the instrument and accessories with organic solvents! Wipe the instrument and accessories with a clean, soft, dry cloth. Clean the socket with a clean, soft brush.

3.3 Battery

The host is powered by a built-in dedicated rechargeable lithium battery. It takes about 3 hours to fully charge the battery. After the battery is fully charged, it can work continuously for 8 hours. When the power of the instrument is insufficient, the battery displayed on the main interface of the instrument is empty. At this time, please perform measurement after charging.

If the instrument and the probe won't be used for a long time, the rechargeable battery would naturally discharge, resulting in decreasing of battery level. Re-charge the instrument before use. During the charging process, the power adapter will be heated to a certain extent, which is a normal phenomenon. Good ventilation shall be kept for the instrument to facilitate heat dissipation.

Chapter 4 Software Operation

4.1 Software Introduction

The rebar inspection software is a multi-function analysis software for rebar data processing, which can post-process measured data of the scanning type rebar location detector. The software may run on a computer with a Windows operating system.

4.2 Installation

Open the TF card that comes with the instrument and copy the R800 rebar inspection and analysis software in the TF card to the host. Please choose a copy directory, and run the R800 rebar inspection and analysis software .exe file under the folder.

4.3 Software Structure and Function

4.3.1 Software Interface Introduction

The operation method and interface form of the rebar inspection software are completely in line with the Windows style, thus it will be easy for users who have been familiar with Windows operation to master the operation of the software. The software interface is mainly composed of the following four parts (as shown in Figure 4.1): a menu bar, a toolbar, a control panel and a schematic display area. **Note: Users who use the software for the first time can adjust the proportion of each part according to their own habits.**

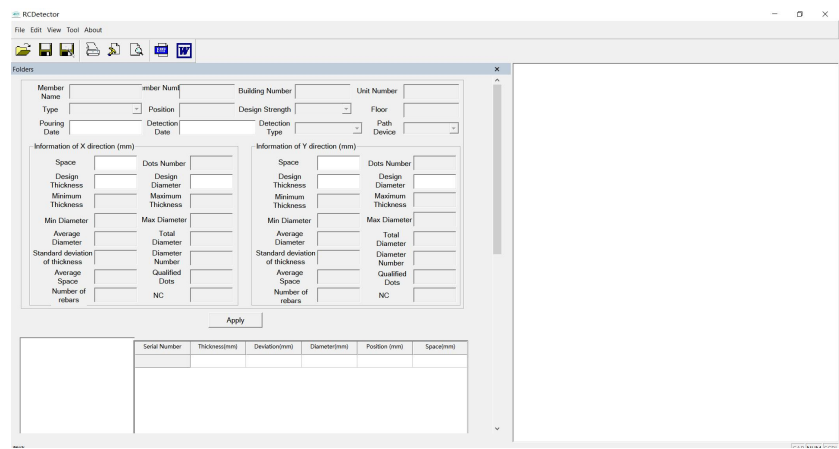


图 1 Figure 4.1

The menu bar consists of 4 drop-down menu items, as shown in Figure 4.2. Clicking on each menu item will bring up a drop-down menu, each corresponding to a set of functions. When a menu item is grayed out, this function is invalid in the current state.



Figure 4.2

The toolbar consists of a series of buttons, as shown in Figure 4.3. Each button can implement a common function. Although these commands are already included in the menu bar, it is more convenient

for these common commands to be implemented by the toolbar buttons. If you mouse over a button, the function of the button is automatically displayed on the screen. The toolbar buttons correspond to Open, Save, Save As, Print, Print Settings, Print Preview, Save bmp File, Generate Word or Excel Report, respectively. Their functions are the same as that of the related items in the menu bar.



Figure 4.3

Control panel: Users can complete various operations on measured data in the control panel. For details, please refer to 3.7.

Schematic display area: display schematic diagrams of objects and processing information of measured data.

4.3.2 File Menu

Open: open the file to be processed or viewed, and its operation window is shown in Figure 4.4.

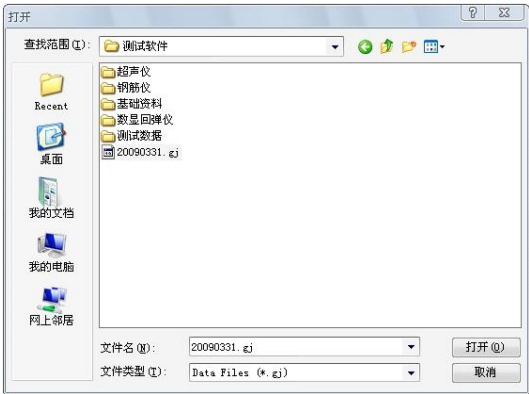


Figure 4.4

This is a standard Windows open file dialog box. Select the folder where you want to open a file from **Search Range**, select the file type to open from **File Type**, enter the file name in **File Name** or select the file to open from the file list box, and then press the **Open** button to open the file. The system will perform a corresponding operation according to the type of the opened file. Note: The suffix of file to be opened is .rbl by default.

Save: save the result of the current processing to a file, and the system overwrites the original file by default.

Save As: save the current data in a changed path and file name, as shown in Figure 4.5.

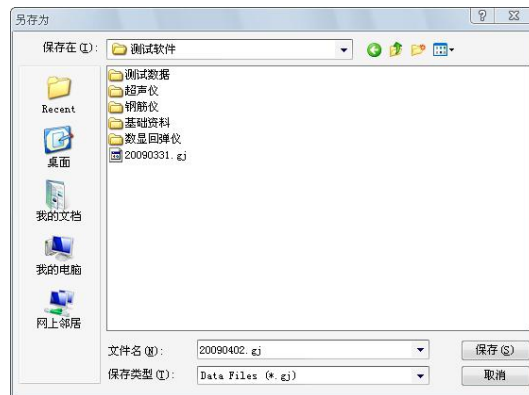


Figure 4.5

Print: print data content under the current serial number.

Print Preview: preview the actual effect of printing.

Print Settings: set print content, print format, page number, footer and header information, as shown in Figure 4.6.

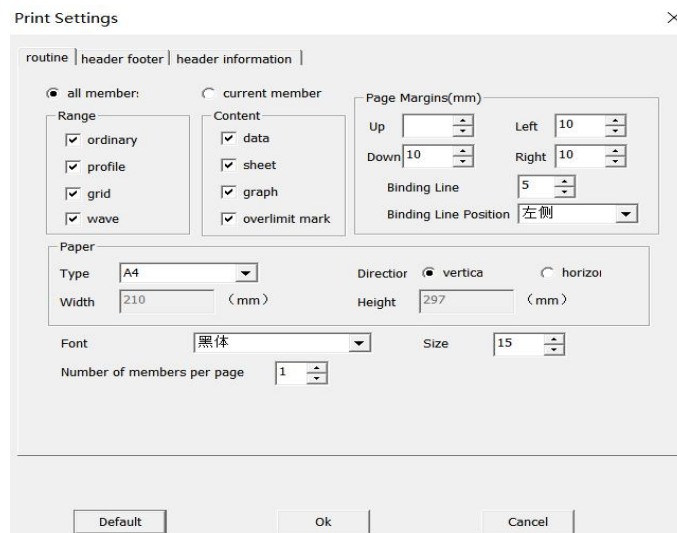


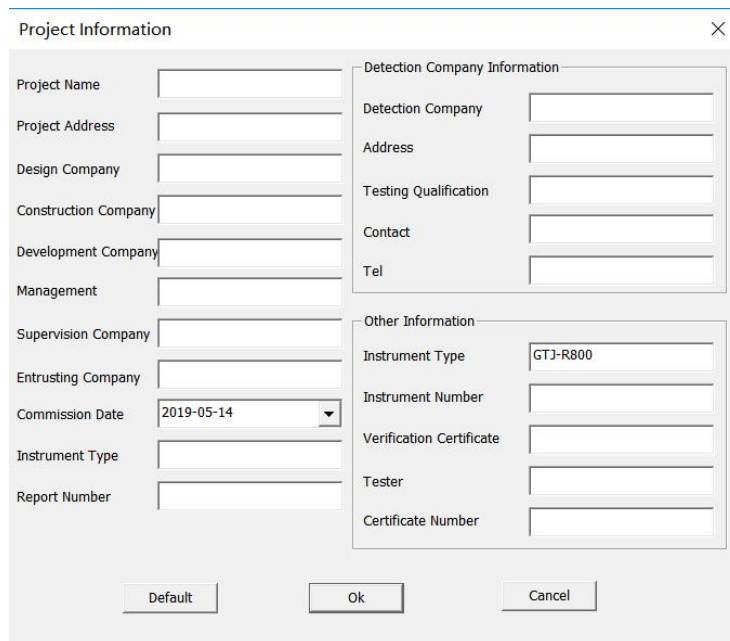
Figure 4.6

Close: close the software.

4.3.3 Edit Menu

Edit menu includes engineering information and options.

Engineering information: the engineering information is shown in Figure 4.7. Please fill in the following information before generating a Word report or an Excel report.



Project Information

Project Name:

Project Address:

Design Company:

Construction Company:

Development Company:

Management:

Supervision Company:

Entrusting Company:

Commission Date:

Instrument Type:

Report Number:

Detection Company Information

Detection Company:

Address:

Testing Qualification:

Contact:

Tel:

Other Information

Instrument Type:

Instrument Number:

Verification Certificate:

Tester:

Certificate Number:

Default Ok Cancel

Figure 4.7

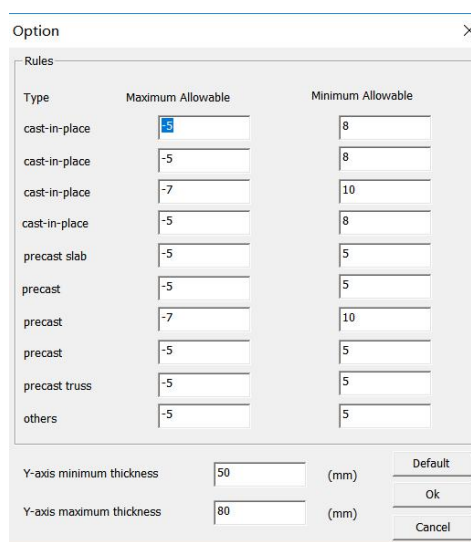
Options: settings of the allowable lower deviation, the allowable upper deviation, and the minimum and maximum values of Y-axis (thickness).

Allowable upper deviation limit: upper limit of allowable deviation of thickness, the input value being positive;

Allowable lower deviation limit: lower limit of allowable deviation of thickness, noting that the input value should be negative;

Minimum of Y-axis (thickness): set the minimum value of the Y-axis when the test type is thickness or profile;

Maximum of Y-axis (thickness): set the maximum value of the Y-axis when the test type is thickness or profile.



Option

Rules

Type	Maximum Allowable	Minimum Allowable
cast-in-place	<input type="text" value="5"/>	<input type="text" value="8"/>
cast-in-place	<input type="text" value="-5"/>	<input type="text" value="8"/>
cast-in-place	<input type="text" value="-7"/>	<input type="text" value="10"/>
cast-in-place	<input type="text" value="-5"/>	<input type="text" value="8"/>
precast slab	<input type="text" value="-5"/>	<input type="text" value="5"/>
precast	<input type="text" value="-5"/>	<input type="text" value="5"/>
precast	<input type="text" value="-7"/>	<input type="text" value="10"/>
precast	<input type="text" value="-5"/>	<input type="text" value="5"/>
precast truss	<input type="text" value="-5"/>	<input type="text" value="5"/>
others	<input type="text" value="-5"/>	<input type="text" value="5"/>

Y-axis minimum thickness: (mm)

Y-axis maximum thickness: (mm)

Default Ok Cancel


Figure 4.8

4.3.4 Window

The function of the control panel in the window is to show or hide the control panel. For details of the

control panel, see Control Panel in section 3.7.

4.3.5 BMP Icon

The function of the BMP icon in the toolbar is to generate a BMP bitmap. Click  to pop up the bitmap setting prompt, as shown in Figure 4.9. Bitmaps of all objects are generated by default.

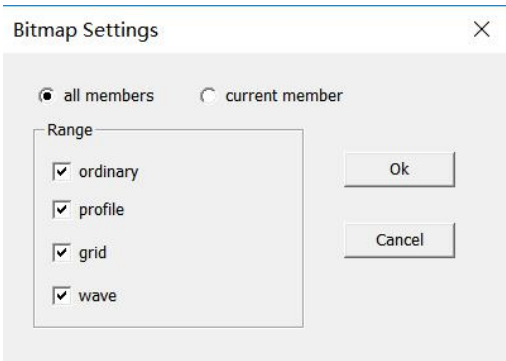



Figure 4.9

4.3.6 Word Icon

The function of the Word icon in the toolbar is to generate a Word report or an Excel report. Click  to pop up the inspection report generation dialog box, as shown in Figure 4.10. Click the drop-down triangle after Report Format to select a format of a report or a report form to be generated. There are 4 formats for Word report and 2 formats for Excel report. Click **Select** button again to select the location you want to save.

The computer should be equipped with Microsoft Word and Microsoft Excel software, otherwise this operation will not continue.



Figure 4.10

4.3.7 Control Panel

The control panel includes an object parameter area, an object list area, and a data area, as shown in Figure 4.11.

Serial Number	Thickness(mm)
X01-1	61
X01-2	58
X01-3	58
X01-4	57
X01-5	58

Figure 4.11

Object parameter area: when an object in the object list is selected, the corresponding parameter of the project will be displayed in this area. Data in the gray box is unmodifiable data, and data in the white box is modifiable data. **Note: pour date and test date should be modified in English input state, with format "XX-XX-XX XX:XX:XX".**

Object list area: this area shows all the objects in the open file. Right-click on the object name to delete the current object or add other objects that have been inspected.

Data area: this area shows the measured thickness data of the protective layer of the current object and determines whether the thickness is qualified, where yellow mark data represents data higher than the allowable upper deviation, and red mark data represents data lower than the allowable lower deviation.

Right-click on the cell in the data area, and pop up options of Delete Data, Add Data, and Insert Data to perform corresponding operations on the test points. The difference between adding data and inserting data is that adding data is to add a test point below all the test points, and inserting data is to add a test point above the current test point.

4.3.8 Schematic Display Area

Schematic display area shows a schematic diagram of the current object.

(1) General scan: when users view an object of general scan, the interface shown in Figure 4.12 will be displayed, where the Y coordinate represents thickness of protective layers, the X coordinate represents test points, each circle represents a rebar, the blue circle represents it is within the allowable upper and lower deviation range, the red circle represents it is below the allowable deviation, and the yellow circle represents it is above the allowable upper deviation.

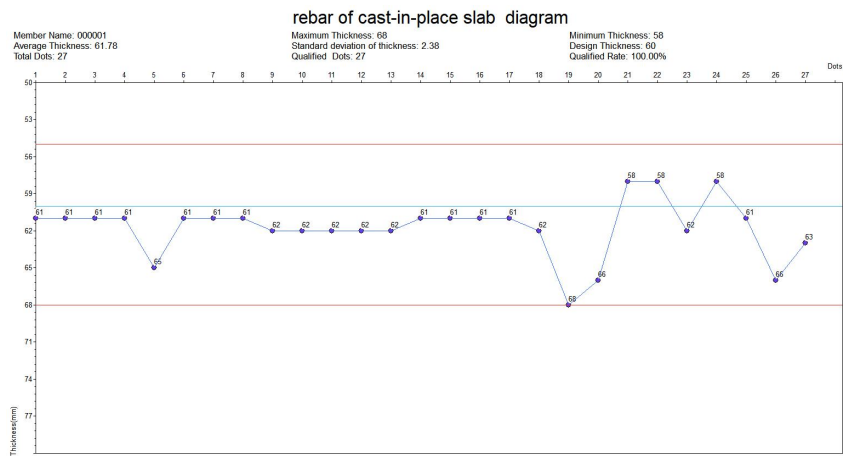


Figure 4.12

(2) Profile scan: when users view an object of profile scan, the interface shown in Figure 4.13 is displayed, where the Y coordinate represents thickness of protective layers, the X coordinate represents specific positions of rebars, each dot represents a rebar, the blue dot represents it is within the allowable upper and lower deviation range, the red dot represents it is below the allowable deviation, and the yellow dot represents it is above the allowable deviation.

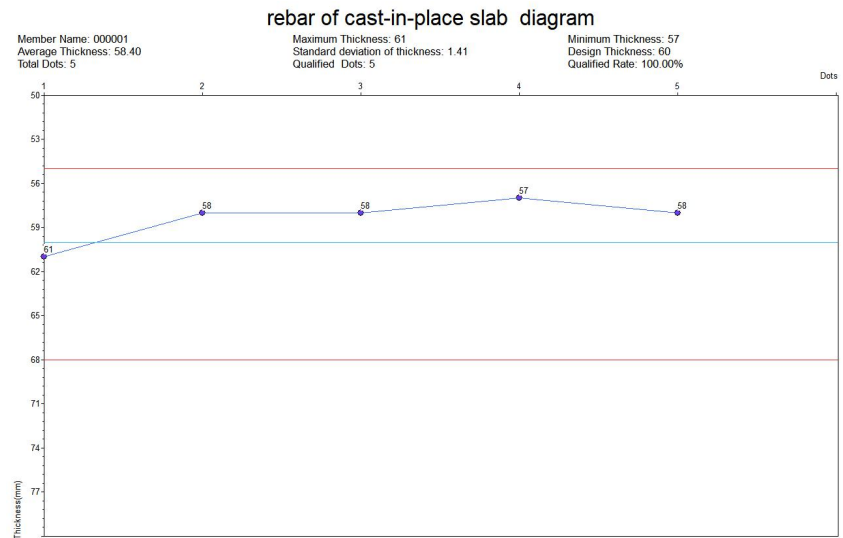


Figure 4.13

(3) Grid scan: when users view an object of grid scan, the interface shown in Figure 4.14 is displayed.

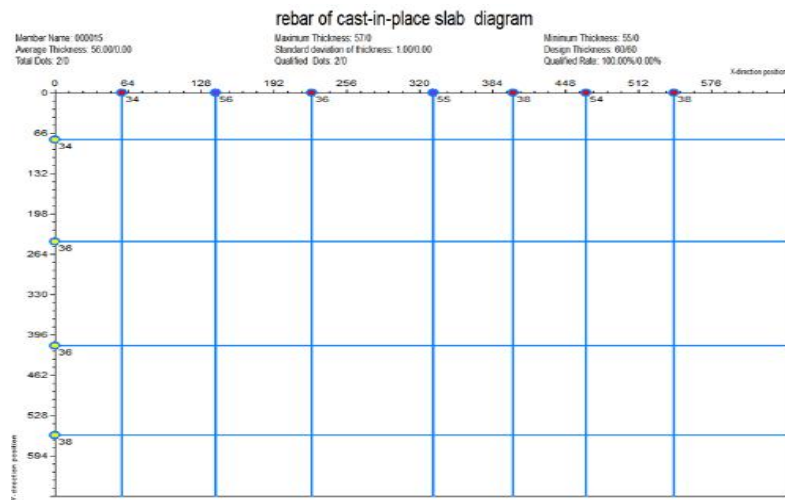


Figure 4.14

(4) Waveform scan: when users view an object of waveform scan, the interface shown in Figure 4.15 is displayed, where the X coordinate represents specific positions of rebars, and each green vertical line represents a rebar.

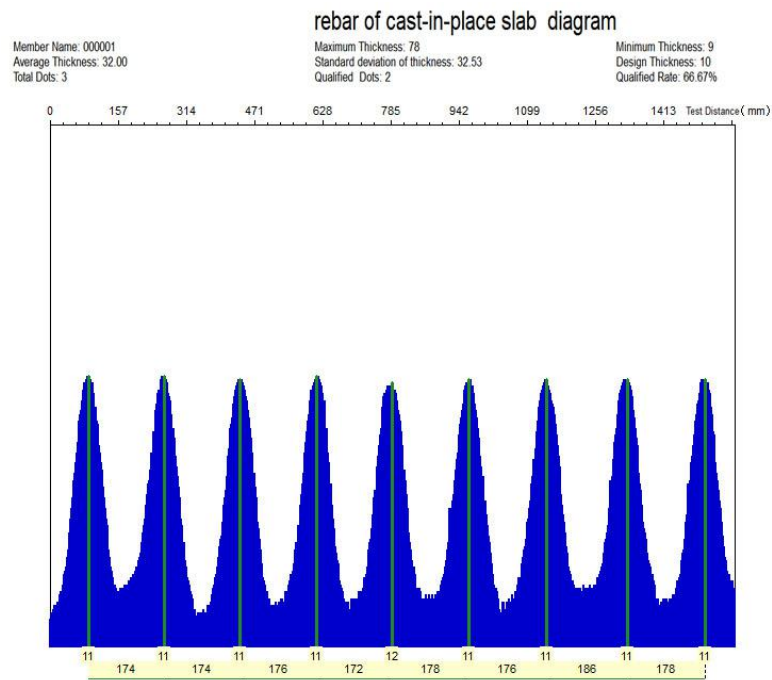


Figure 4.15

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