Contents

Chapter One Introduction

1.1 Main Functions

The gauge is mainly used to detect and record crack width in concrete bridges, tunnels, abutments and so on.

The operation of the width gauge is simple and trouble free. The crack image could be easily recorded by the small instrument, and there is no need to use any laptop computer on the working spot. The detector head is installed with illumination device; therefore, the width gauge could work even in dark place. The gauge could automatically search, detect and calculate the crack width.

1.2 Main Technical Specifications

Hardware Platform	Embedded ARM9 Hardware Platform ，WinCe6.0 Operating System，True Color TFT Touch Screen
Crack Width Test Range	Standard Probe: 0.01mm～6.5mm;
Crack Width Test Accuracy	Standard Probe：≤±0.02mm;
Image Storage Format	BMP or JPEG
Power Supply	Rechargeable Lithium Battery
Working Time	≥28 Hours
Working Temperature	-10℃～＋50℃
Working Humidity	≤80%RH

1.3 Main Features

◆ Smart design: appearance design is compact and beautiful. It is convenient to measure remote area with an extension rod.

◆ Intelligent testing method: high accuracy and smart computing technology without adjusting the probe to display crack images.

◆ Scale testing method: it is convenient to detect the same crack several times and compare the testing data.

◆ Display clear images by adopting PDA and using color video to capture images.

◆ Standard probe and high grade probe.

◆ Save crack images quickly with the snapshot button which is embedded on the probe.

◆ Mass Storage: 4GB SD Card can storage more than 200,000 images.

◆ The leading technology can be proven in various aspects among the same kind of products in its appearance design, testing methods, intelligence and so on. Also, it has a good performance-and-price ratio.

◆ Powerful post-processing software: it can achieve effective management for the crack measurement data and images and can also print the measuring reports conveniently.

1.4 Main Parts

① PDA;

② Special Crack measurement and processing software package;

③ Detector head.

1.5 Services

Free software upgrade; free training for one time. Timely solutions for any problem emerged in

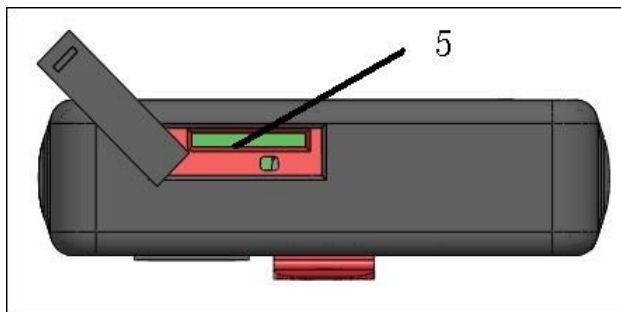usage.

Chapter Two Structure

2.1 PDA Structure Diagram

Figure 1 PDA Structure Diagram

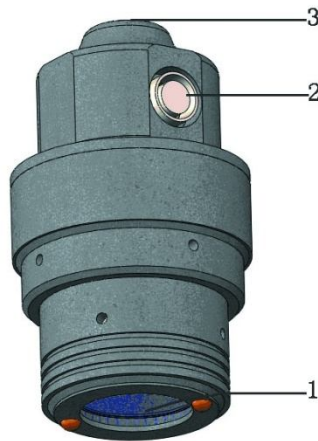| Number	Element	Description
1	Power indicator light	To be illuminated when the PDA is started.
2	Charging indicator light	Status description: Blue light on: in charging Blue light off: the battery is full.
3	LCD	Man-computer interaction display window
4	Power indicator light	If you turn on the switch, the red light shall be illuminated.
5	SD/MMC compatible extension slot	A 2G MMC card and a card reader are attached.
6	Digital pen slot	Put the digital pen into the slot to protect it when it is not in use. To use it, take it out from the slot; hold it like how you hold a pen or ball pen.
7	Signal connector	Connect it with the detector head signal wire. It could be connected to a computer through the attached USB cable to realize synchronization of the PDA with the computer.
8	PDA charging socket	Charging: the socket could be connected to a charger to charge the battery within the PDA. A sparrow charger is attached.

2.2 Probe Structure Diagram

Figure 2 Probe Structure Diagram

Number	Element	Description
1	Probe	The probe is used to read crack data. Please attach it closely to the object it is measuring.
2	Signal Output	Signal output: connect it to the signal wire (7 core plug); then connect it to the 7 core socket of PDA.
3	Probe Handle	The handle to hold when measuring cracks.

Chapter Three PDA software operation

3.1 Turn PDA on/off

Use key 2 (shown in Figure 1) to turn PDA on/off. Press key 2 for several seconds to turn PDA on; the screen shall display the desktop interface. To turn PDA off, press key 2 again for several seconds.

3.2 Operate the Software

Connect the probe and PDA by a signal line. Then, open PDA and the measuring software will run automatically.

3.3 Measuring Software Interface

1）The following dialog will popup if the probe is not connected with PDA. Plug in detector head and re-run the programs by selecting the [restart] key under the [File] menu. Or shutoff the PDA and reboot it to enter the measuring program.
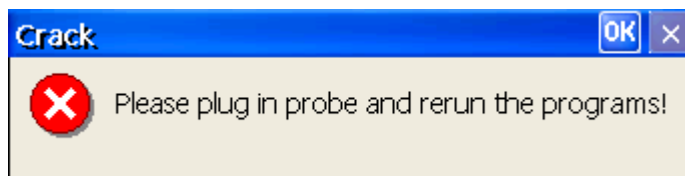

Figure 3 Failure Connection Dialog Box

2）Figure 4 shows the interface of the crack measuring software in running. The software automatically enters intelligent testing mode and shall display the measuring results of current crack.

Figure 4 Measuring Software Interface

3）Figure 5 shows the operating menu.

Figure 5 File Menu

【Restart】——It will auto collect and display the image of crack. Select this option to restart the collection of crack image when it says "Plug in detector head and re-run the programs!"

【Stop】——Stop collecting crack-image information.

【View】——View the saved pictures.

Note: User must click 【Stop】 before pull out the probe.
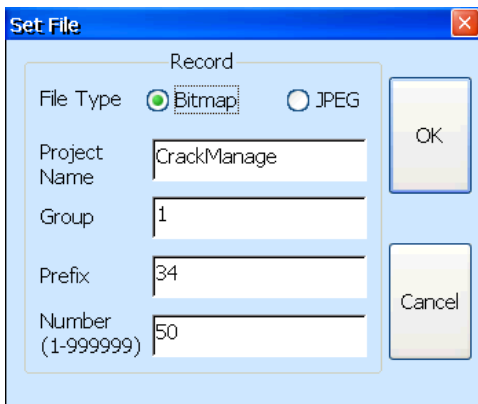
4) Figure 6 shows the tools menu.

Figure 6 Tools Menu

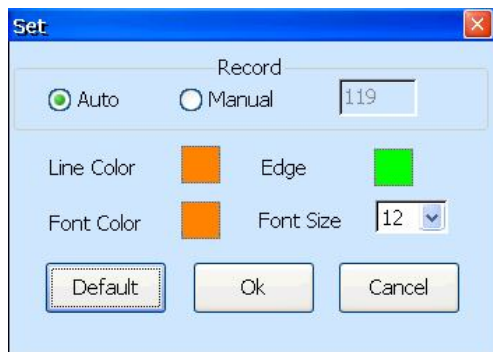Figure 7 Set File Menu   Figure 8 Set Menu

It will display the figure 7 by click 【Set File】 and figure 8 by click 【Set Parameters】.

"Type"——Probe type. The measuring range of standard lens is 6.5mm. User can optional choose the high grade lens with 3.5mm testing range.

Note: User must select the probe type when replace a new one or else the testing result will be

wrong

"bmp" and"JPEG"——Select the image storage format

"Prefix"——User can name the prefixed name of files. The software will save your files by prefixed name plus file NO.

"Number."——User can set the starting sequence number of files. The file number can realize automatic accumulation.

"Auto" and "Manual"——Setting method of the threshold. It will auto set the threshold if you select "Auto". User can select "Manual" and input a threshold.

"Line Color"、" Font Color" and "Font Size" can be edited according to user's requirements.

Please click【Save】when your finish the above setting.

5) Button

Click ,you can save the current picture. And click , the software will be closed.

6) There are 3 ways to measure cracks: manual testing, intelligent testing and scale testing. The concrete operation can be described in section 3.4.

3.4 Crack Test

There are 3 ways to measure cracks: auto testing, scale testing and accurate testing. User can switch the method by click【Method】

【Intelligent Testing】

This is the default testing method. The software will analyze the width and display the result when there appears a crack. It will analyze the middle one when there appear various cracks, but the testing result is the average width of these cracks. User can move the probe to do continuous test. Click to save images.

Note: User does not need to move the probe and make the crack perpendicular to the scale. We suggest the crack be beveled at an angle of 30~70 with the scale. Please move the probe up or down with manual and keep away from the big unevenness test points if the deviation of cracks is large.

Figure 9 Intelligent Testing

【Scale Testing】

Turn the probe to make the measured crack perpendicular to the scale. Use the scale to measure the

width of crack. It will display the result (unit mm) automatically. Click ![folder icon] to save the image.

This method is especially suitable to measure and compare the width of dynamic cracks.

Figure 10 Scale Testing

【Accurate Testing】

Turn the probe to make the measured crack perpendicular to the scale. And move the crack into the

box. It will display the result (unit mm) automatically. Click to save the image.

Figure 11 Saved Crack Image

Note: User should stick the probe closely to crack. We suggest use manual test method if the crack image is blur.

Chapter Four Post-processing Software

4.1 Software Installation

Click CrackManage.exe in installation package to complete the installation.

4.2 Crack Width Management Software

With this crack management software, user is able to view, manage and print the crack data obtained by the crack-width measurement. The software supports single image display and multi-image display, owns functions of sequencing and checking the items of crack information, deleting and combining crack files. In addition, user could modify information for each crack and finally get corresponding report form. Therefore, managing crack images becomes easy and trouble free.

4.2.1 Data Transmission

Remove the SD card from the concrete crack integrated tester. Then, copy the folder [CrackManage] to your desktop.

4.2.2 Main Interface

Click "Crack Management Software" on the desktop to enter the main interface; click **Start** button; select the file **Index** under folder [CrackManage] so as to import the crack information into the software. See Figure 12
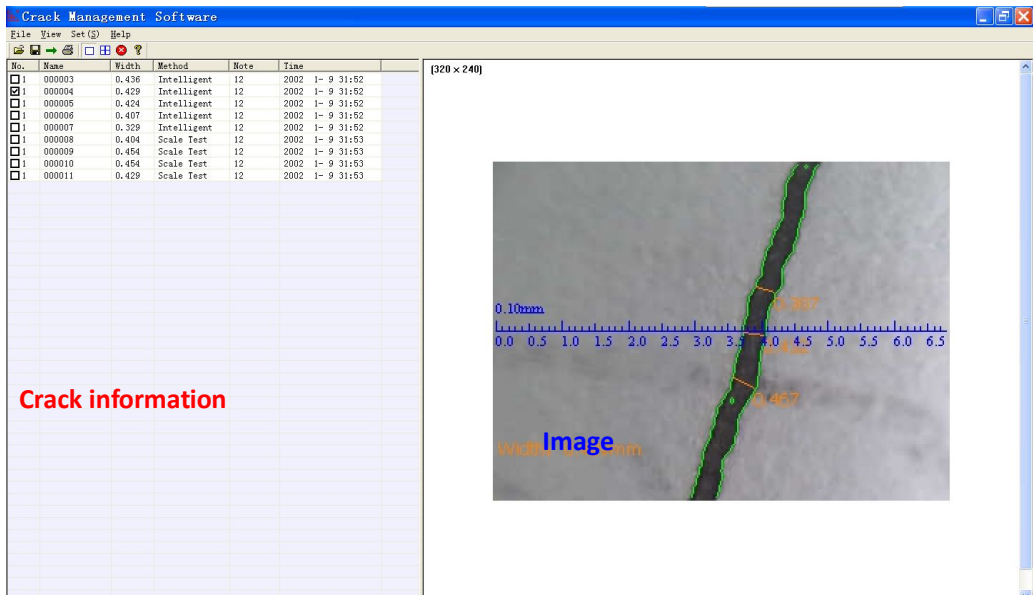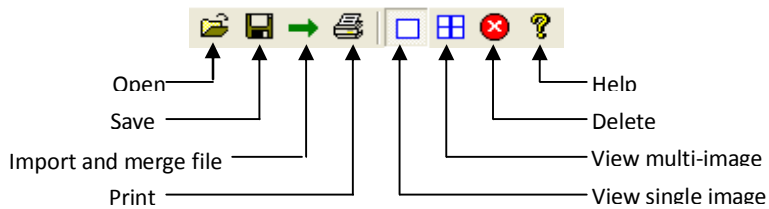
Figure 12 Main interface

Figure 13 Toolbar

4.2.3 Sequencing

User could view the crack information according to certain sequence. He could view the information by ascending or descending order of the numbers, by names, or by crack width. This software provides contrast checking function for convenience. See Figure 14.

No.	Name	Width	Method	Note	Time
☐1	000003	0.436	Intelligent	12	2002 1- 9 31:52
☑1	000004	0.429	Intelligent	12	2002 1- 9 31:52
☐1	000005	0.424	Intelligent	12	2002 1- 9 31:52
☐1	000006	0.407	Intelligent	12	2002 1- 9 31:52
☐1	000007	0.329	Intelligent	12	2002 1- 9 31:52
☐1	000008	0.404	Scale Test	12	2002 1- 9 31:53
☐1	000009	0.454	Scale Test	12	2002 1- 9 31:53
☐1	000010	0.454	Scale Test	12	2002 1- 9 31:53
☐1	000011	0.429	Scale Test	12	2002 1- 9 31:53

Figure 14 Sequencing by Width

4.2.4 Single Image Display

Click **Single Image Viewing**; click the crack information to be viewed at the left side; it shall display the corresponding crack image at the right side. See Figure 15.
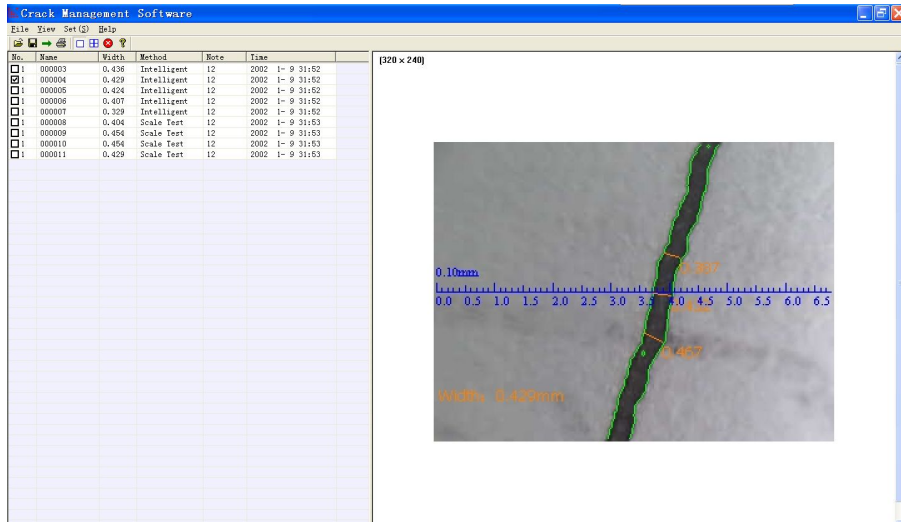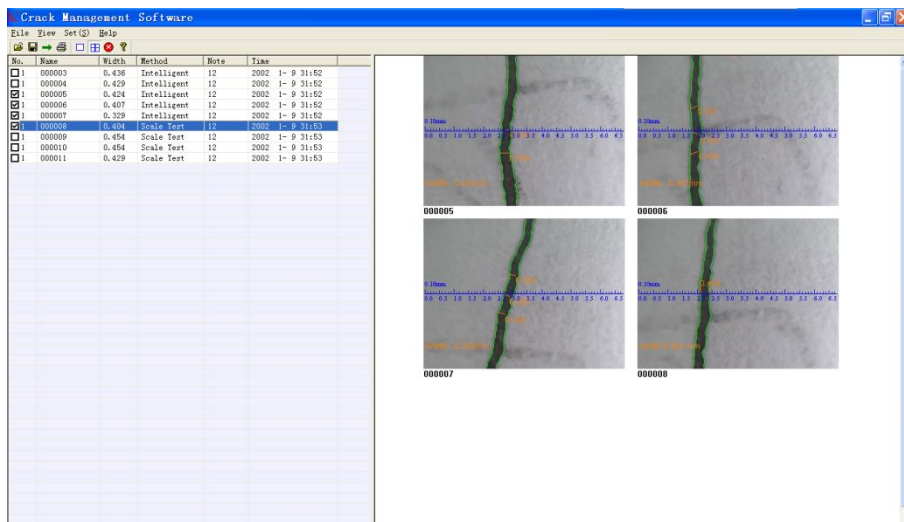

Figure 16 Single Image Checking Function

4.2.5 Multi-image Display

Click **Viewing Multi-image** button; click several items of crack information at the left side and corresponding crack images shall display at the right side. It supports At most 6 images on display simultaneously. See Figure 16.

Figure 16 Multi-image Checking Function

4.2.6 Combination Function

Click **Merge and Import file** button; the software shall automatically combine the crack information and import the combined information into the present document, and meanwhile automatically copy the corresponding images into the present document. In addition, the software provides duplication removal function; it shall remove the crack information that is the same.

4.2.7 Deletion Function

After selecting one or several items of the crack information, click **Delete** button; the software shall delete the corresponding crack information.

4.2.8 Modification Function

Right-click an item of the crack information so that you can modify the group number, name and note of the crack. See Figure 17.
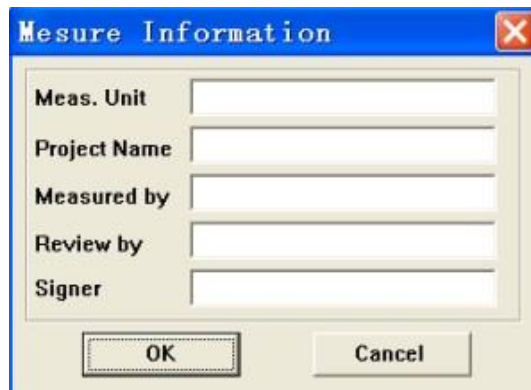
Figure 17   Modification   Figure 18 Information Settings

4.2.9 Information Settings

It will display the Figure 18 by click the button "Set". User can edit relative information such as Measurement Unit, Project Name, Review by, Measured by, Signer and so on. Such information shall be viewed when report

4.2.10 Print Preview and Print Function

After selecting one or several items of crack information, click **Print Preview** button to see the crack information that will be printed; click **Print** button to print the crack information. See Figure 19.

Figure 19 Print Preview

Notes:

The contents of this operation manual are subject to change without prior notice.