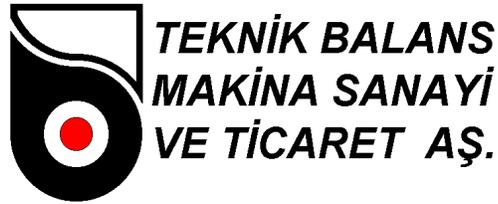




NOVA

3D WHEEL ALIGNMENT MACHINE

US **SOFTWARE OPERATION MANUAL**



ATATÜRK ORGANİZE SANAYİ BÖLGESİ, 10001 SOKAK NO:15 35620 CIGLI-IZMIR-TURKIYE
TEL. : (00-90-232) 376 84 40 – PBX FAX. : (00-90-232) 376 84 39

www.messmatic.com

Contents

Chapter 1 Overview	1
1.1 System Components	1
1.2 Software Features	1
1.3 The Main Technical Parameters.....	2
Chapter 2 Software Installation	2
2.1 Minimum System Requirements.....	2
2.2 Installation Steps.....	2
2.2 Software Startup	3
Chapter 3 Main Menu	4
3.1 Shortcut Button.....	5
3.2 Menu Button	6
Chapter 4 Priority Setting	7
4.1 System Settings	8
4.2 Unit Set.....	9
4.3 Name to Set Up	10
4.4 Language Selection	11
Chapter 5 Positioning Measurement	12
5.1 Select Vehicle	13
5.2 Customer Data	15
5.3 Measurement Carts.....	17
5.4 Kingpin Inclination Measurement.....	19
Chapter 6 Vehicle Adjustment and Printing	21
6.1 Three-Dimensional Adjustment Screen	21
6.2 Rear Wheel Adjustment	22
6.3 Front Wheel Adjustment.....	24
6.4 All Readings Screen	25
6.5 Printing Test Reports.....	26
Chapter 7 Maintenance	27
7.1 System Calibration	28
7.1.1 Fixture Compensation	29
7.1.2 The Mutual Position of the Camera Calibration	32
7.1.3 Camera status	32
7.2 Camera Diagnostics.....	33
7.2.1 Lens Sight	34
7.2.2 Data Check	35

Software Operation Manual

Chapter 1 Overview

1.1 System Components

Software mainly consists of two high-definition cameras, columns, beams, four small size of the target disk, fixtures, computers, monitors, Printers and matching cabinets. HD camera mounted on both ends of the beam, the computer and printer placed inside the cabinet. Beam mounted lift the front of the center, at least 2.2 meters from the turntable center and permanently fixed in column Floor. Since the majority of vehicle positioning during the operation, it is required to operate a computer operator at any time to watch the display to Then follow the prompts to correct computer to locate operations, so the cabinet is generally recommended to install between the uprights and lift.

1.2 Software Features

The software is based on the Qt development framework development, with strong cross-platform capabilities, the installed version runs on Windows operating systems. Most of the features of this software can be realized by clicking the mouse or touch-screen click realize, without the right mouse button. The software uses advanced Qt component layout function, you can adapt to different screen resolutions. H3D HD locator measured from the platform level of influence, the tilt of its accuracy cannot shadow. The entire measurement process requires only propel the vehicle or scroll wheel, you can complete all positioning parameters measurements. Target disk automatically tracking technology enables HD H3D vehicle locator in debugging process stability and accuracy greatly increased, no longer appear because the target board camera angle changes make the situation could not find the target board. At the same time to better adapt to different environmental conditions and lifting platforms, make the operation easier.

1.3 The Main Technical Parameters

Items	Accuracy	Range
Display Accuracy	0.01mm / 0.01°	/
SAI	±0.02°	±20°
Camber	±0.02°	±10°
Toe	±0.02°	±20°
Caster	±0.05°	±20°
Thrust angle	±0.02°	±5°
Back angle	±0.02°	±5°
Total Toe	±0.02°	±10°
Maximum Turns	±0.08°	±50°

Chapter 2 Software Installation

2.1 Minimum System Requirements

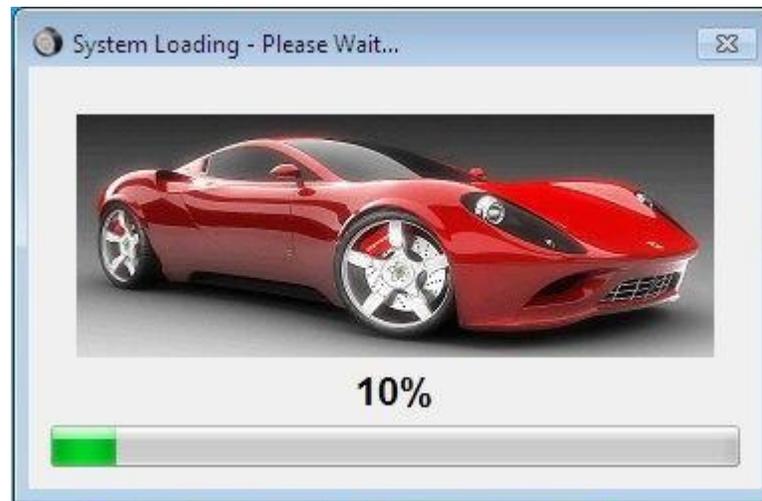
- Above Intel Core i3 2100 CPU;
- Microsoft Windows XP and later;
- 1G RAM or above;
- At least 10G hard disk space.
- VGA or above display
- Microsoft Windows 98- compatible mouse.

2.2 Installation Steps

- Run Setup.exe;
- Follow the prompts to complete the installation After installation is complete, generate H3DAligner.exe other documents in the target directory, the software generates a shortcut on your desktop. You can delete the following methods to achieve this software: Ø by [Control Panel] in the [Add / Remove Programs], select H3DAligner delete.

2.2 Software Startup

The power switch is turned on in sequence, after entering the Windows operating system, click on the software icon on the desktop, the software first HD camera to detect whether there is, if there is started initialization high-definition cameras, download HD Built H3D camera parameters, the screen prompts the following information:



If not detected high-definition camera, then prompt the following information:



After the high-definition camera initialization, if it is the first time you run the program, it will display the following software registration dialog:



Activation can telephone or SMS to obtain from the company or the dealer service staff by e-mail, enter the activation code in the future, the software can be used normally.

Click on the Welcome screen image of any location, you can access the main menu.

Chapter 3 Main Menu

After the program loads successfully, if the software does not detect the H3D- definition camera, the program proceeds to the demo mode, the system enters the main menu, as shown below;



The title bar of the main menu displays the name and current software whether the demo mode. Below the title bar is a toolbar shortcut buttons that allow users to quickly perform certain functions of the program. In the middle of the menu button when the mouse on a button above, when the button is represented by executive function appears on the screen. If you need to exit the program, you can click on the lower left corner of the "closed system" button.

3.1 Shortcut Button

Toolbar shortcut button function defines the main menu as follows:



From the **Home screen**, click the button to return to the main menu.



Help Click this button to display the help file.



Meter screen, click the button to enter full screen reading interface.



Print, click on the button to enter the print menu, to print the test report.



Welcome screen, click the button to enter the welcome screen.



Select the language, click this button to enter the language selection screen, you can switch languages.



About, the software version and copyright information.

3.2 Menu Button

Menu button in the main menu with large buttons and five minutes a small button functions are as follows:



Start Positioning Calibration

Click this button to start positioning calibration, followed by the completion of a standard four-wheel alignment procedure set by the system, including vehicle selection, customer data, vehicle measurements, vehicle regulation and printing functions.



Vehicle Selection

Click this button to select a standard test vehicle data, vehicle data including the system comes with a database and user- defined database, only the customer database can be edited.



Vehicle Specifications

Click this button to view the specification selected by the vehicle select the icon out of the vehicle. Vehicle specifications can be edited, and edit the vehicle specifications stored in the customer- defined database.



Customer Data

Click this button to enter customer data management interface, you can find, add and edit customer data.



Priority Setting

Click this button, enter the priority setting interface, system settings including system settings, unit settings, name settings, and language selection.



Maintenance

Click this button to enter equipment maintenance interface, including system calibration and diagnostic camera two parts.

Chapter 4 Priority Setting

Click on the main menu to set priority button, the screen displays the following:



The screen has four menu buttons:



System Settings, select the boot welcome screen picture.



Unit settings, select the display unit angle and distance.



Its name is set, for plant maintenance shop name address management.



Language selection, selection system

4.1 System Settings

Click the System Settings button, the screen appears the system settings interface, the screen as shown below.

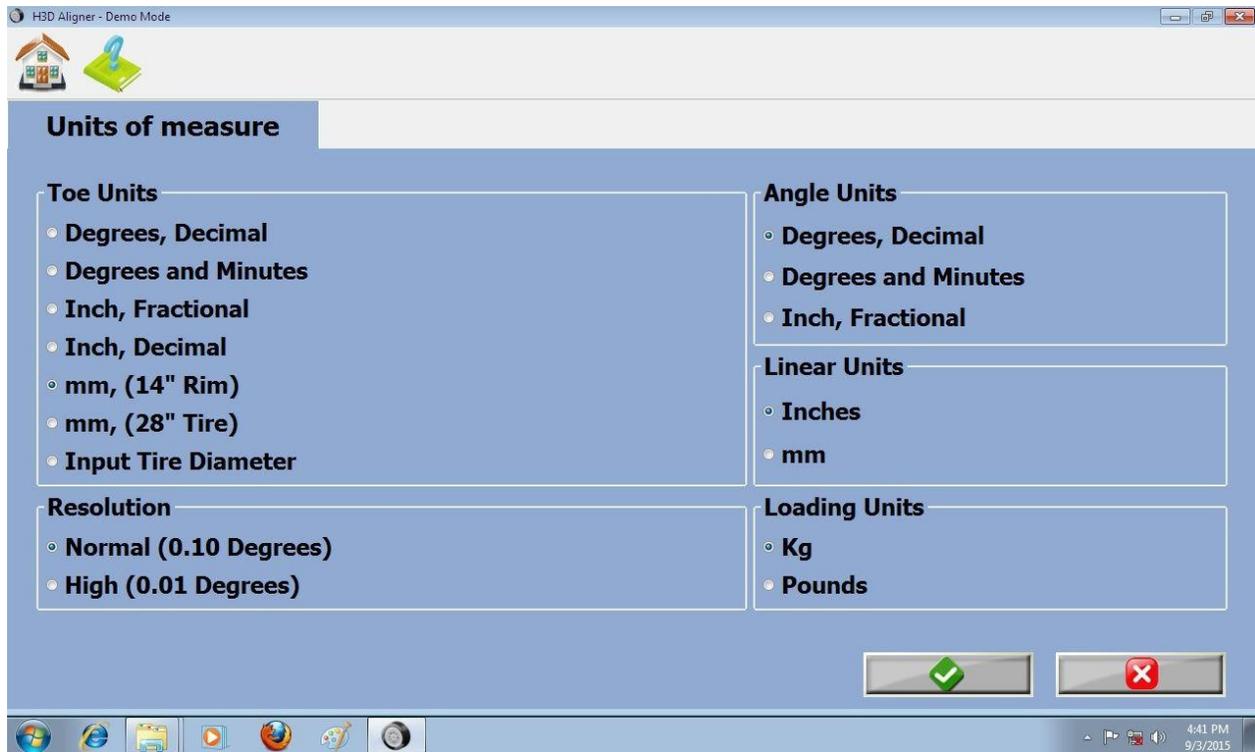


Trademarks selected for setting the Welcome screen displays pictures, you will need to show the picture into the directory installation directory Logos, The VGH "Use default initial screen" drop-down list which will list all the picture files in the Logos directory, select the required to display the welcome screen picture, the next boot is a custom picture shows.

Daily build setting is used to select appear in the printed report top marks, with the above operation is similar, except that you want to print Figure Slice into the installation directory Logos \ Report directory.

4.2 Unit Set

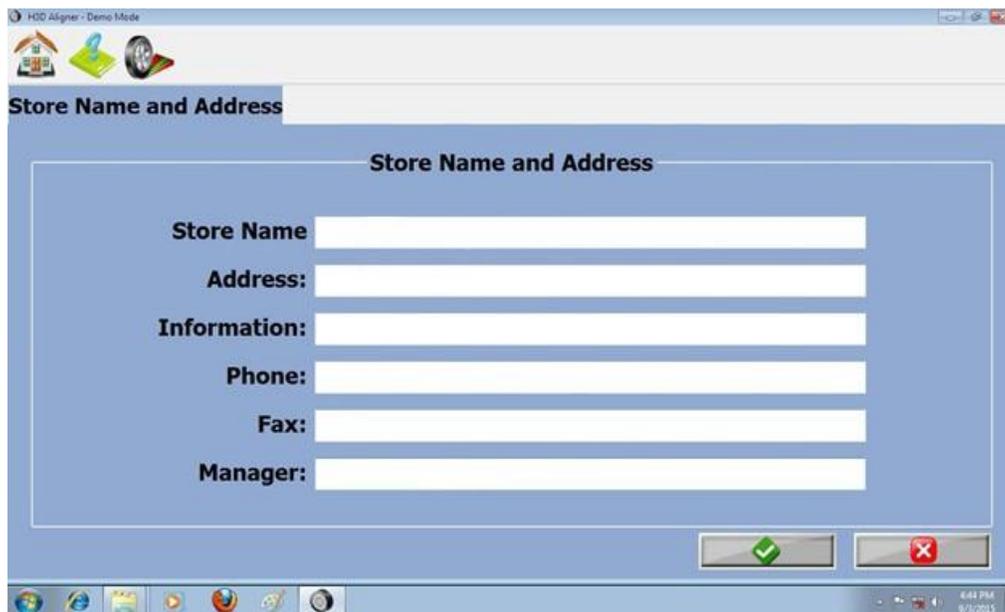
Click the Settings button unit, the screen appears units set interface, users can according to usage, the vehicle manufacturer's requirements, select the appropriate detection units.



After setting after data units, vehicle specification data, a variety of readings on the screen and printed reports are displayed as a unit. Resolution There are two options, display precision normal resolution of 0.1 °, and high-resolution display accuracy of 0.01 °, but no matter what choice will not affect the accuracy of final testing, but said after the decimal point a few.

4.3 Name to Set Up

Its name and address setting interface, the screen as shown below.

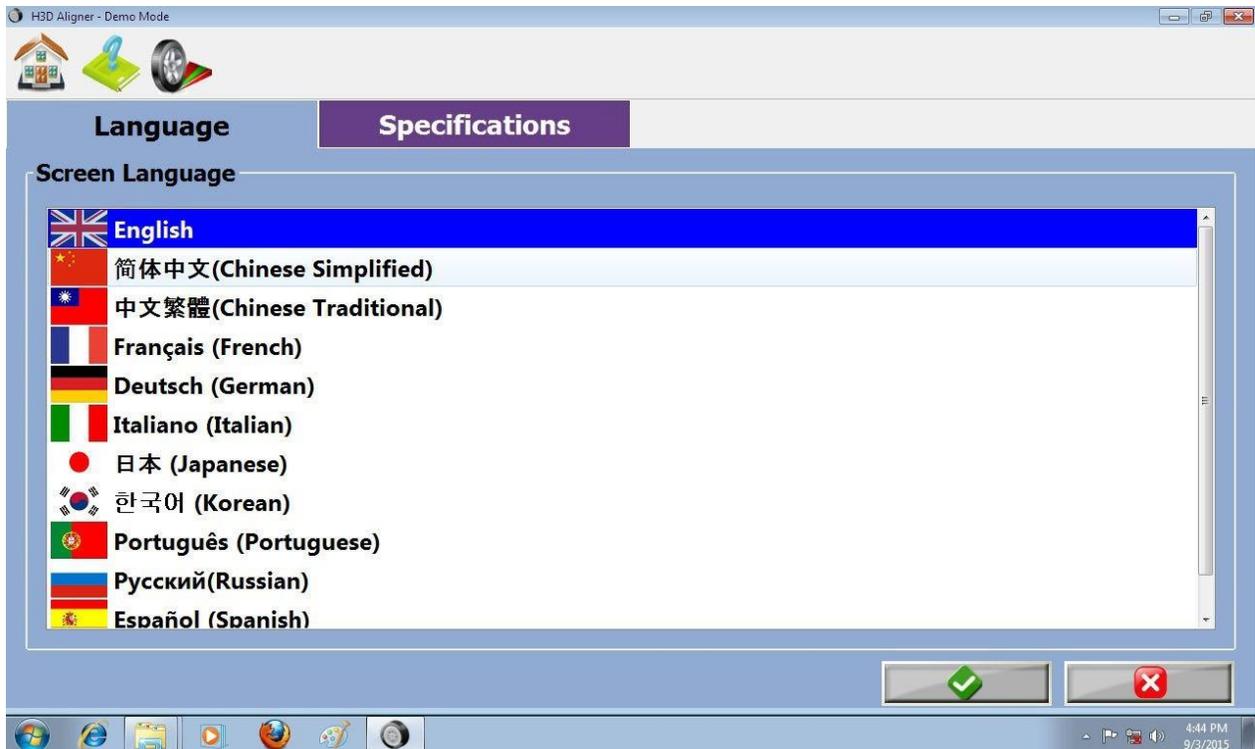


In the interface, the prompts were filled with "Store Name", "address", "information" in the appropriate input box,

"Telephone", "fax" and "Manager" and so on, these data are displayed in the print of "vehicle positioning Report" Out, it is recommended that the correct form.

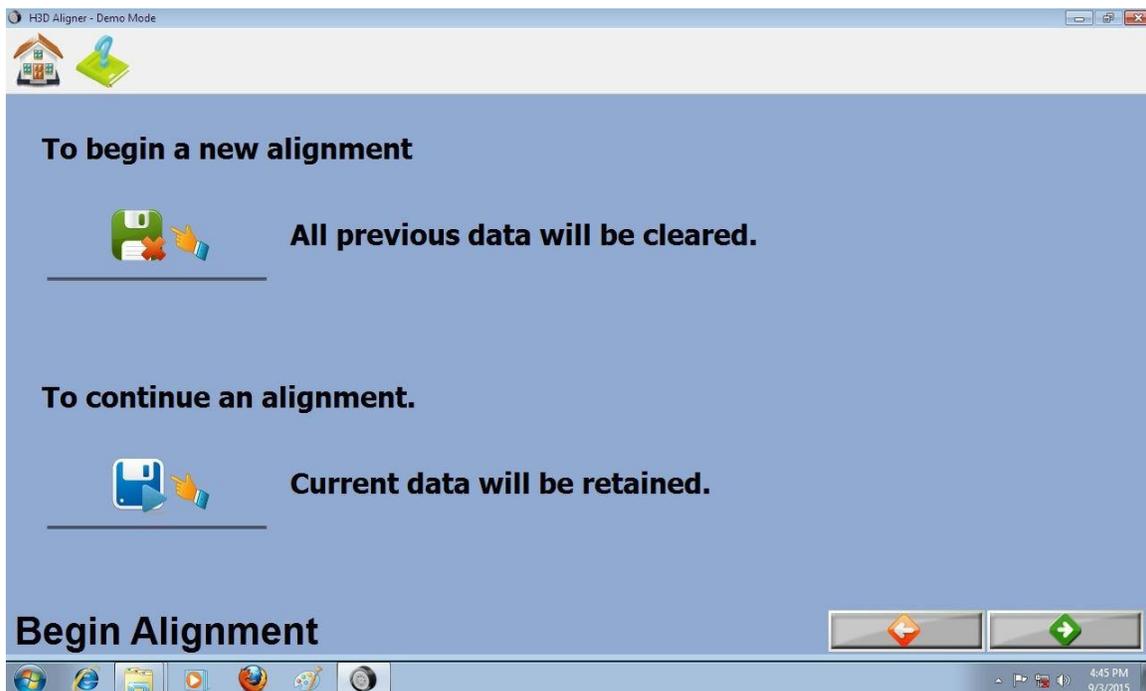
4.4 Language Selection

Click the System Setup icon on the far right of the screen, the user can choose to use their own language, select and press the Enter key after setting takes effect immediately, without having to exit the software.



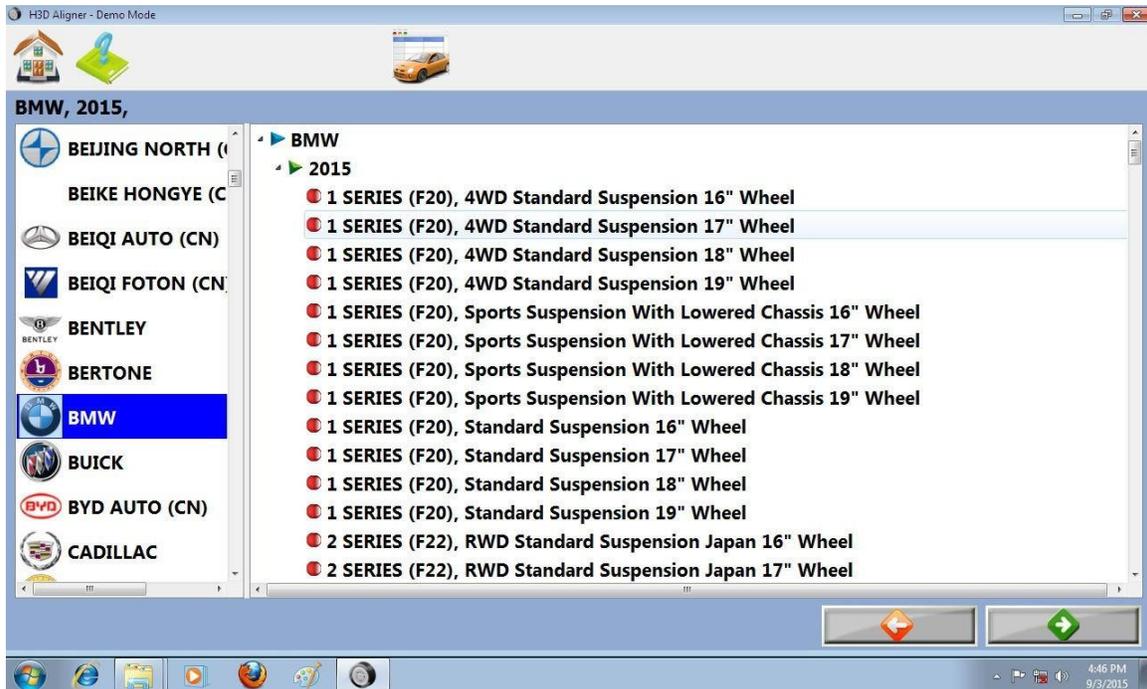
Chapter 5 Positioning Measurement

Software uses a standard set of wheel alignment process, each step has two buttons, "OK" button and enter the next step, "Cancel" button and return to the previous step. After positioning measurement screen gives choice to start a new position or to locate the calibration. If you select the "OK" button, the previous positioning data clear, we need to set up a new customer and vehicle information. If you select "Continue positioning Calibration", then keep all customer and vehicle informatio



5.1 Select Vehicle

After you select the type of positioning measurement, the next step, the screen displays the following:



According to the customer was seized vehicle manufacturer, year and model, select the corresponding models. Specifications can use the following

Shortcut button to switch display, user-defined specifications also can use shortcut button to delete.



Display original specifications

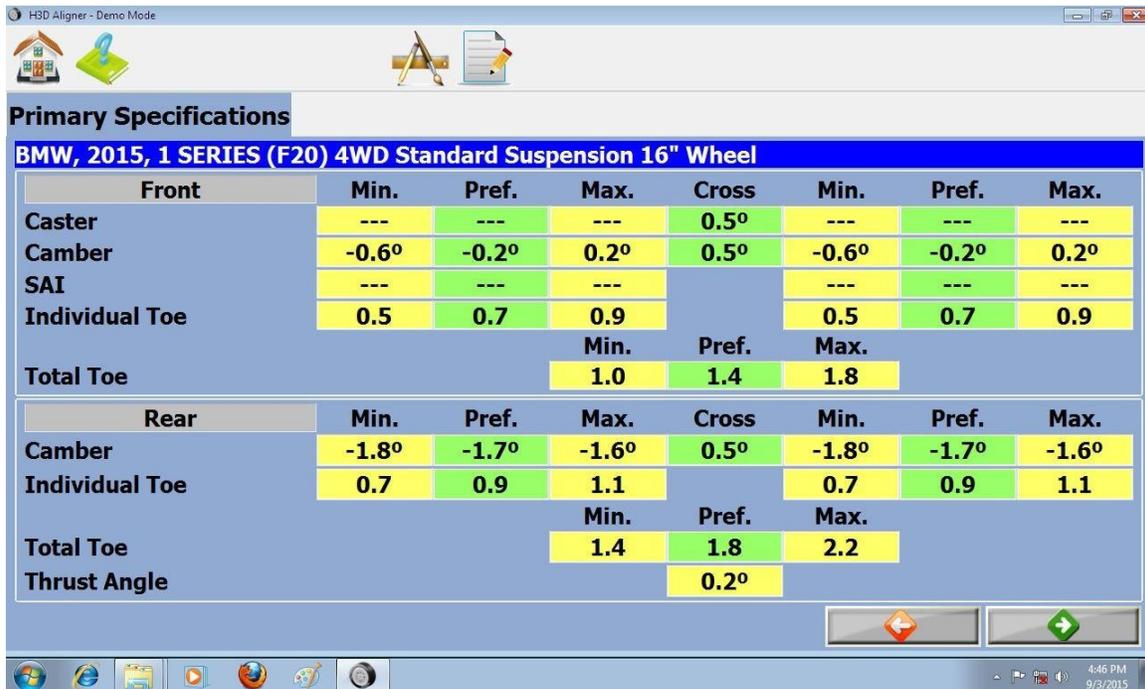


Display custom specifications



Delete for deleting user-defined specifications

Press the "OK" button to display the main specifications data of the vehicle, as shown below;



Primary Specifications							
BMW, 2015, 1 SERIES (F20) 4WD Standard Suspension 16" Wheel							
Front	Min.	Pref.	Max.	Cross	Min.	Pref.	Max.
Caster	---	---	---	0.5°	---	---	---
Camber	-0.6°	-0.2°	0.2°	0.5°	-0.6°	-0.2°	0.2°
SAI	---	---	---		---	---	---
Individual Toe	0.5	0.7	0.9		0.5	0.7	0.9
Total Toe			Min. 1.0	Pref. 1.4	Max. 1.8		
Rear	Min.	Pref.	Max.	Cross	Min.	Pref.	Max.
Camber	-1.8°	-1.7°	-1.6°	0.5°	-1.8°	-1.7°	-1.6°
Individual Toe	0.7	0.9	1.1		0.7	0.9	1.1
Total Toe			Min. 1.4	Pref. 1.8	Max. 2.2		
Thrust Angle				0.2°			

Screen display to select the vehicle manufacturer, year and model, as well as front and rear wheels of the minimum, maximum, ideal specifications. The dotted line indicates that the angle at any position value without the manufacturer's specifications. Specifications can use the following shortcut buttons to edit.



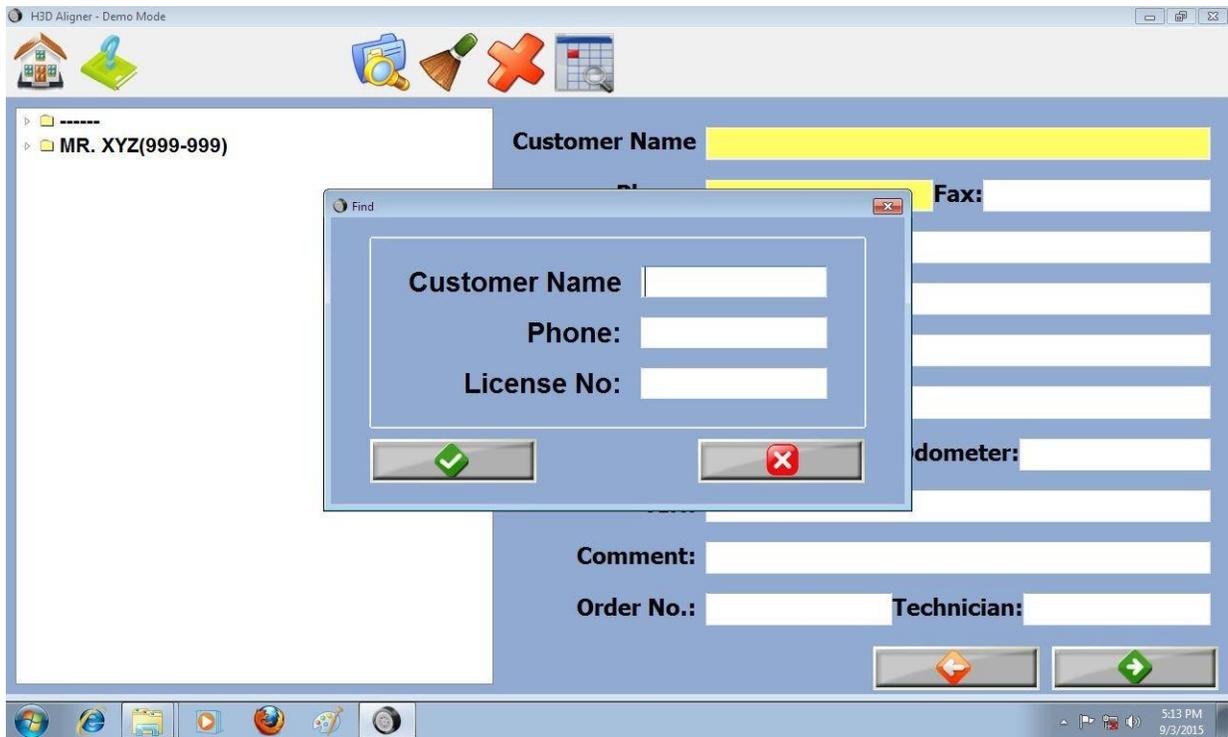
Positioning specification editor, click on the shortcut buttons, you can select the vehicle specification data for editing, after editing press "OK" button to save.



Recovery, click on the shortcut button Edit mode, you can cancel the changes to vehicle specifications, exit edit mode.

5.2 Customer Data

To find the subject vehicle data, the software will remind you to enter customer information, as shown below.



Dedicated shortcut button function defines client data interface is as follows;



Find Customer



Clear all fields



Delete Customer



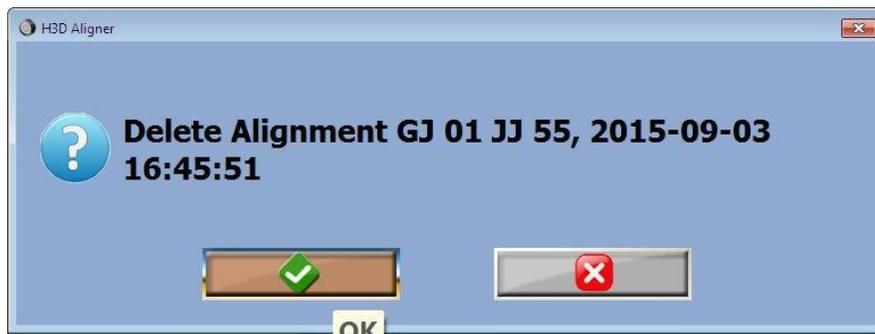
Call the previous test results

After the end of the test vehicle, the system will automatically save the customer information and the current test results. If the vehicle is detected, then come back in the future, customers can retrieve historical measurement date and the test results of the car. Find based on customer name, phone, license plate number to find, as shown below:



The screenshot shows a window titled "Find" with a search form. The form contains three text input fields labeled "Customer Name", "Phone:", and "License No:". Below the form are two buttons: a green checkmark button and a red "X" button.

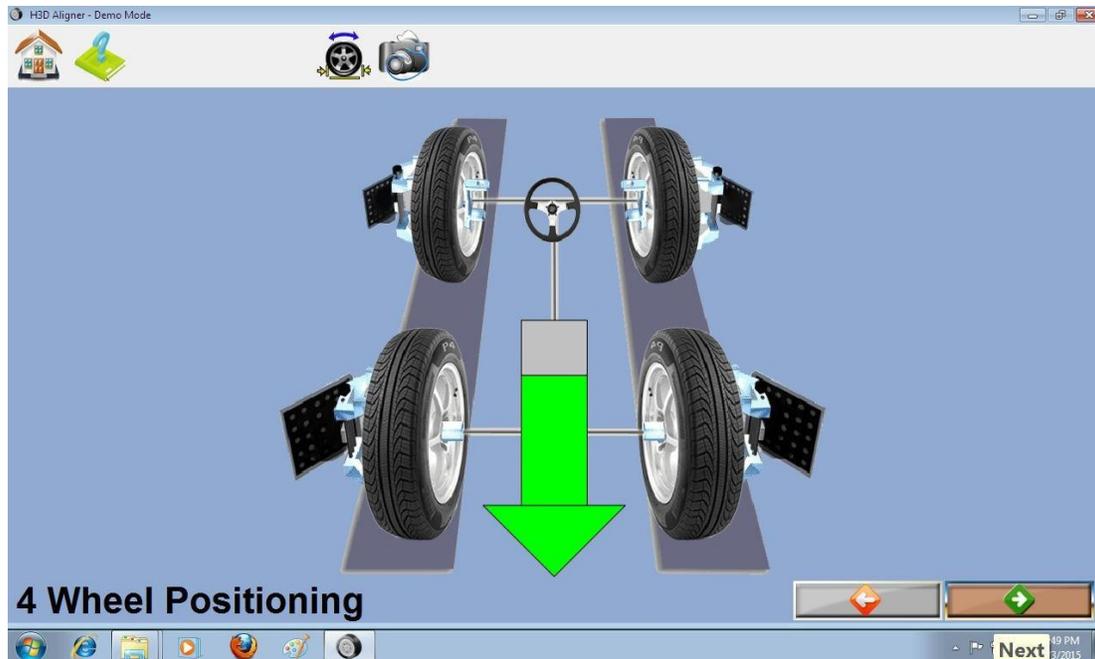
If the customer needs to delete a customer record, then click on the toolbar Delete button, the program will prompt you to confirm the deletion, As shown below;



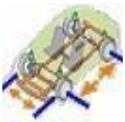
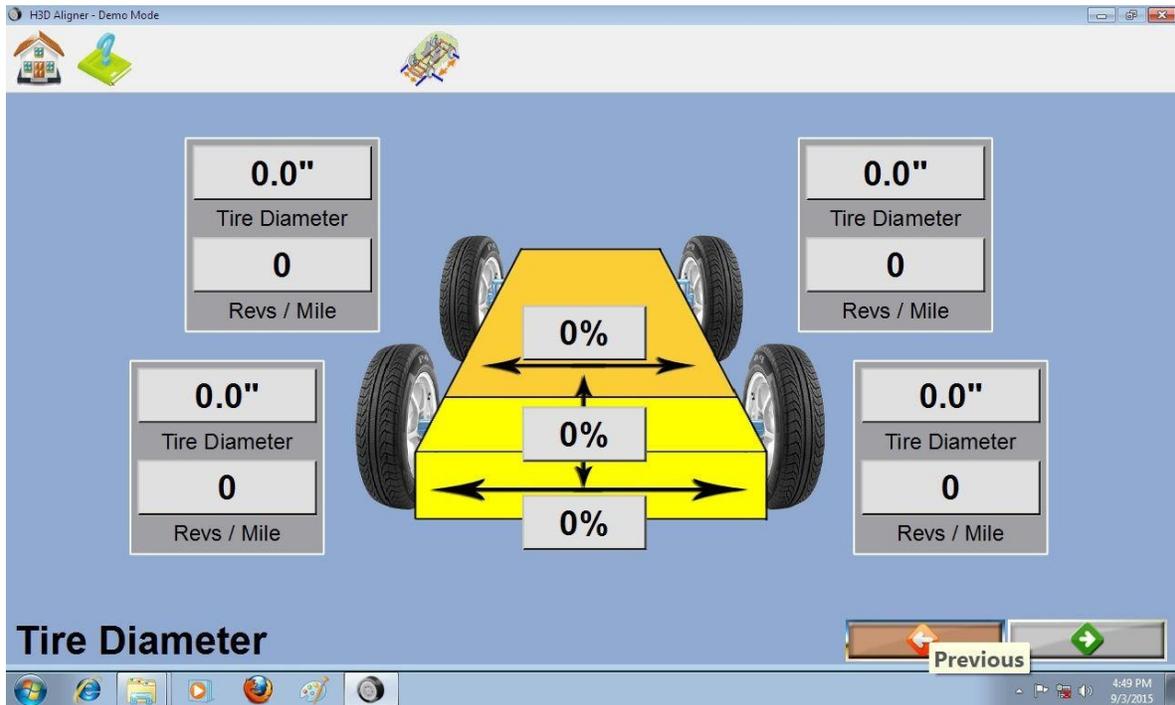
Click "OK" button to delete the record.

5.3 Measurement Carts

After the establishment of customer information and data, the system automatically enters carts measurement screen, as shown below. Trolley vehicle needs to be moved during the measurement 20 cm, the procedure according to the initial target disk status and final destination disk status, scroll to calculate the trajectory of each wheel.



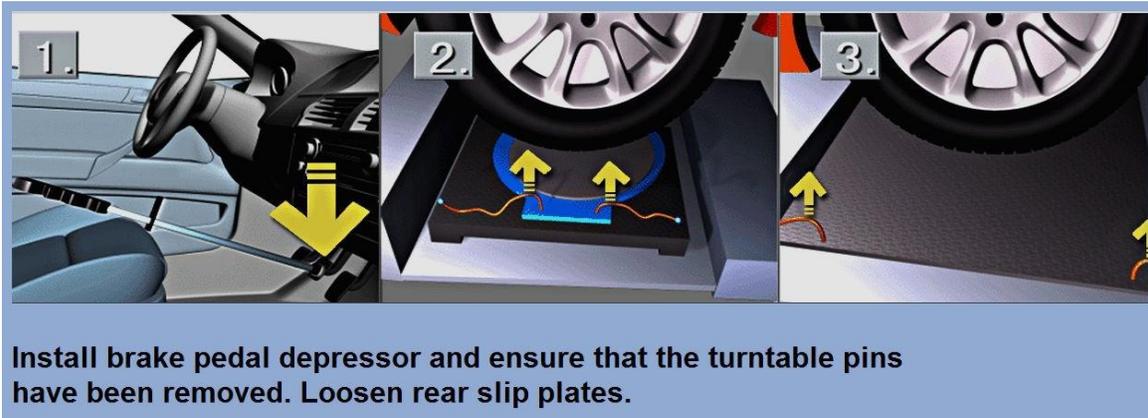
Direction of the arrows in the figure on behalf of the cart, the camera LED will simultaneously display carts direction, when the screen displays the Stop icon to stop the cart, and keep the body stable until the screen prompts stroller orientation. If the orange arrows, the moving distance is too large, it takes the vehicle to move in the opposite direction a small amount. The figure represented four tires locked state of the target disk, if the display is red, it indicates the target disk is not locked, you need to Select "Lens Horizon" shortcut button to see the camera capture the image has not been blocked. After the carts measurement is complete, it will show the rolling radius of the vehicle.



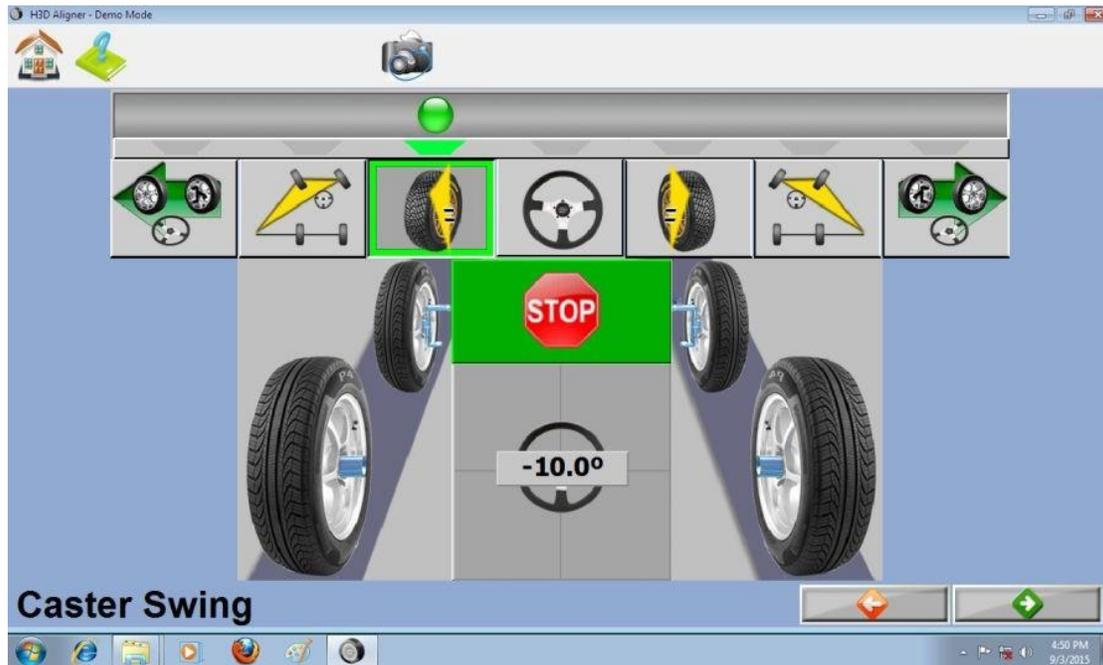
Car size, click on the shortcut button, enter the car size screen, display size information of the vehicle.

5.4 Kingpin Inclination Measurement

After the carts measurement is complete, the system will remind install pedal holder, unplug the wheel bolt, after releasing the slide plate, as shown below. To carry out the work, it is to prevent the wheels rolling swing angle of the rear wheel kingpin period. Scroll wheel will cause incorrect caster angle measurement.



In the prompt screen, click "OK" button, enter the angle measurement screen, as shown below

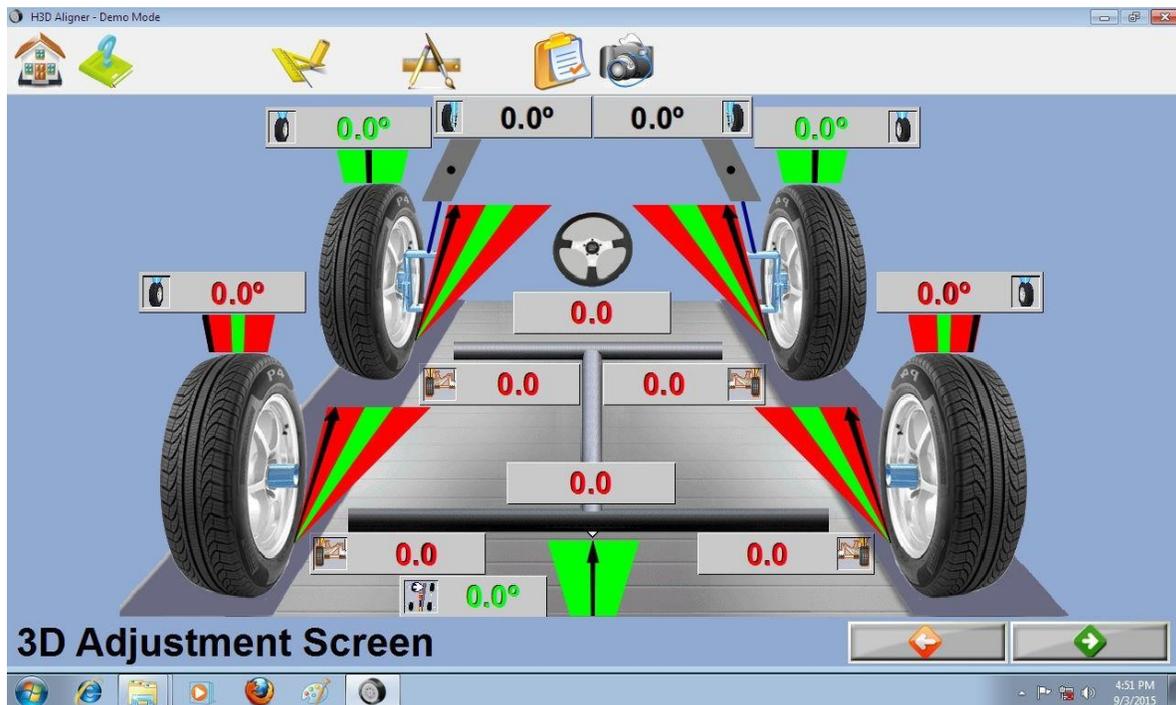


Top of the screen is turned to the measurement location icon, three icons used to measure a right turn, left turn three icons used to measure, in Between the steering wheel icon. For the simultaneous measurement of the kingpin inclination after the steering angle before the show and the maximum steering angle. When the steering wheel is rotated, the ball trajectory within the top of the screen and follow the corresponding movement of the steering wheel, a red state Flags will be displayed at the top of the current measurement position of the icon. With each measurement location near the wheel, the ball turns yellow, indicating that it should slow down the speed of the direction of play. After the wheel reaches the correct position, the ball turns green, the middle of the screen appears a red stop signal. When complete the measuring position, corresponding to the position of the pattern will be a green box, above the state flag will turn green. The current target disk after the inclination measurement, four wheels in the middle on both sides of the display icons indicate the locked state, if it is displayed in red, indicating that the target disk is lost. Rear-wheel target disk will not affect the measurement results, but if the first process in the direction of play Round destination disk is lost, should stop turning, see if the target disk is blocked, wait for the system to re-lock the target disk.

Chapter 6 Vehicle Adjustment and Printing

6.1 Three-Dimensional Adjustment Screen

After the end of angle measurement, so that the four target disk can be shine camera, the software also see four goals late, three-dimensional Adjust the screen displays the measured vehicle location information in an intuitive three-dimensional format. If both sides of the tire icon is displayed in red, the table it shows the target disk is obscured.



Camber display showing the relationship between the standard value in the top of each wheel, black lines. Wheel front beam projection on the ground in front of each tire, indicated by an arrow after toe kingpin inclination angle in a straight line in front of each wheel on behalf of, the kingpin backward values displayed above the icon. A green icon indicates the measured values within specification. A red icon contains a green band indicates the need to adjust the direction, gray icon indicates that the parameter unregulated. Values on the screen are the actual measured values, reading the screen, the steering wheel must be centered. So if you need to adjust Any point of the whole must be fixed to ensure good brake pedal, the steering wheel is centered locked. With the adjustment of the angle, all the display is changed, reflecting the new readings. Click the "OK" button, go to the next screen reading

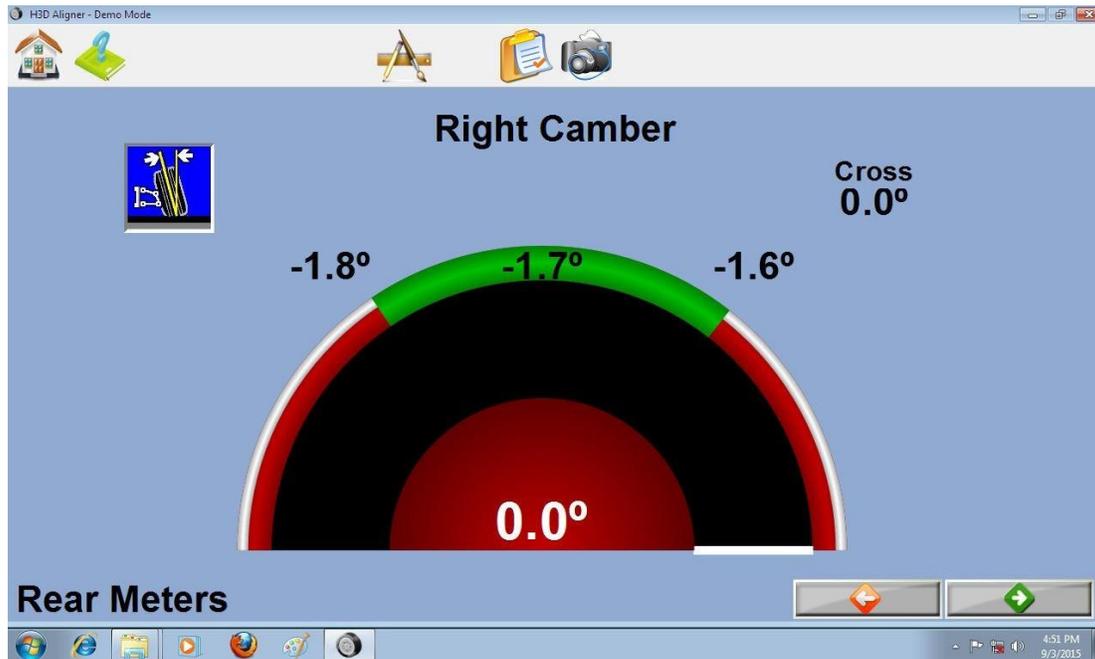
6.2 Rear Wheel Adjustment

After the vehicle is completed the system will automatically adjust the screen into the vehicle, the first test results show that the rear wheel, including camber, Toe and thrust line. As shown below:



The screen displays the angle measured values and vehicle specification information in the form and value of the instrument. Display is divided into three lines. Camber at the top of the screen shows the toe angle display in the center of the screen, advancing angle is displayed at the bottom of the screen. Camber, toe angle and propulsion Angle updated in real time, can be viewed during the adjustment. When the measured value reading is within specification, the central portion of the meter is green.

When reading the measured value exceeds the norm, red. Gray meter indicates the angle unregulated. If you want to zoom in to display a certain angle such as the left rear wheel toe, you can click on the figure on behalf of the left rear wheel toe-meter Disk, screen full screen displays of measured values immediately left rear wheel toe, as shown below.



The upper display shows the name of the angle, the middle of a row of three specifications for representing data value of the vehicle, the actual measured value displayed at the bottom, adjust the value with the technical personnel changes, until the yellow pointer into the middle of the green zone, indicating that the angle adjustment end. Click the "OK" button to return to the rear reading screen.

6.3 Front Wheel Adjustment

After the adjustment wheel, click "OK" button to enter the front wheel to adjust the screen, as shown below:



Before reading the front wheel adjustment, the steering wheel will be prompted to put straight, and lock the steering wheel with holder, click "OK" After the button to enter the front reading interface, as shown below.



Similar front and rear reading table, caster angle at the top of the screen display, center of the screen display camber, toe angle is displayed at the bottom of the screen. Caster angle, camber, toe angle updated in real time, can be viewed during the adjustment. When the measured value reading is within specification, the central portion of the meter is green. When reading the measured value exceeds the norm, red. Gray meter indicates the angle unregulated. If the reading is dashed line indicates that the angle was not measured.

And rear reading table similar to the dashboard display above Click to enlarge. After too much into the front wheel adjustment, click "OK Set "button to enter all readings screen.

6.4 All Readings Screen



	Left	Cross	Right
Front			
Caster	0.0°	0.0°	0.0°
Camber	0.0°	0.0°	0.0°
Toe	0.0	0.0	0.0
SAI	0.0°		0.0°
Included Angle	----		----
Toe Out On Turns	0.0°		0.0°
Max Turn	0.0°		0.0°
Setback		0.0"	
Rear			
Camber	0.0°	0.0°	0.0°
Toe	0.0	0.0	0.0
Thrust Angle		0.0°	

All Reading Screen [OK] [Print]

All readings screen positioning readings for all these values with color, showing the relationship between the reading and the vehicle specification. Green indicates that the measured value reading is within specification, red indicates the measured readings out of specification, gray indicates that no specification value. Click the "OK" button to enter the print interface.

6.5 Printing Test Reports

After the measurement, the system automatically displays the measurement results, drag the scroll bar on the right to view different parameters.

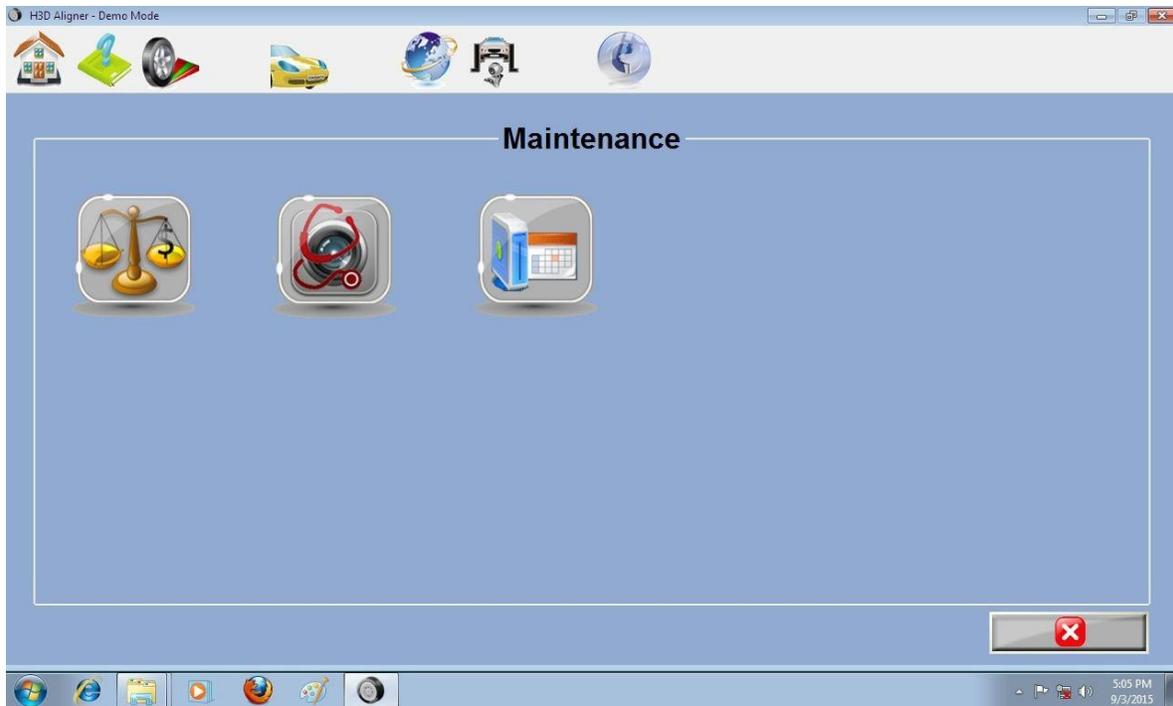
The screenshot displays the 'HDD Aligner - Demo Mode' software interface. The main window shows a 'VEHICLE ALIGNMENT REPORT' for a BMW 2015 1 SERIES (F20) 4WD Standard Suspension 16" Wheel. The report includes customer information, date, VIN, technician name, and order number. The primary angles section is a table with columns for 'Initial', 'Specifications Min', 'Specifications Max', and 'Final'. The report is displayed on a Windows desktop with a taskbar at the bottom and a 'Print' button on the right side of the window.

Primary Angles		Initial	Specifications		Final	
			Min	Max		
Front	Caster	Left	0.0°	---	0.0°	
		Right	0.0°	---	0.0°	
	Camber	Left	0.0°	-0.6°	0.2°	0.0°
		Right	0.0°	-0.6°	0.2°	0.0°
	Toe	Left	0.0	0.5	0.9	0.0
		Right	0.0	0.5	0.9	0.0
Total		0.0	1.0	1.8	0.0	
Rear	Camber	Left	0.0°	-1.8°	-1.8°	0.0°
		Right	0.0°	-1.8°	-1.8°	0.0°

"Print" button on the right is sent to the printer to print the test results. "Save to File" button to the detection results If saved to a PDF file.

Chapter 7 Maintenance

Maintenance menu can be general maintenance H3D HD locator. As shown below:



The screen has two menu buttons:



System calibration for high-definition locator system calibration procedures.



Camera diagnosis, for fault diagnosis and rule out high- definition camera.

7.1 System Calibration

System calibration for performing a high-definition four Locator general maintenance. If a target disk needs replacement, or

Who accidentally lost, the repair personnel can use the jig compensation (TID) program for calibration. If a high-definition camera is broken, or repaired, you can use the camera positional relationship (RCP) program for calibration. Screen display as follows:



This screen has three menu buttons:



The relative position of fixture compensation, measured between the fixture and the target disk



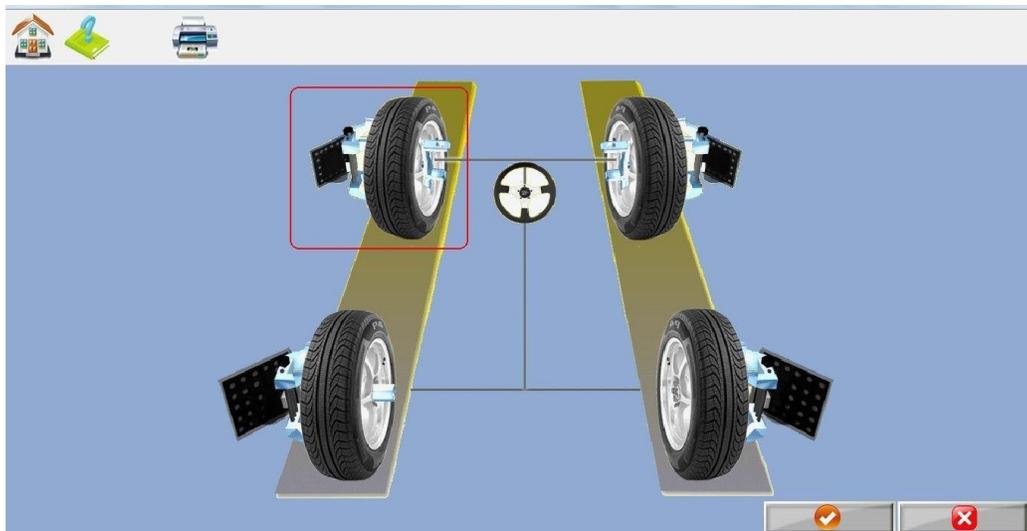
Camera positional relationship between each measure of the relative position of the camera



The identity of the installation position of the camera, the camera's identification.

7.1.1 Fixture Compensation

Calibration Fixture compensation is mainly used in conjunction with compensation jig and target disks. Jig after a period of time, will qualify some deviations on mechanical fit, to reduce measurement error resulting requires regular calibration fixture compensation. Click on the image above calibration jig compensation icon, the screen display is as follows:



This screen is used to select the fixture needs to be done to compensate the calibration target disk. Click the wheel icon, there will be a red check

Box. Click the "OK" button, enter the fixture compensation calibration process.

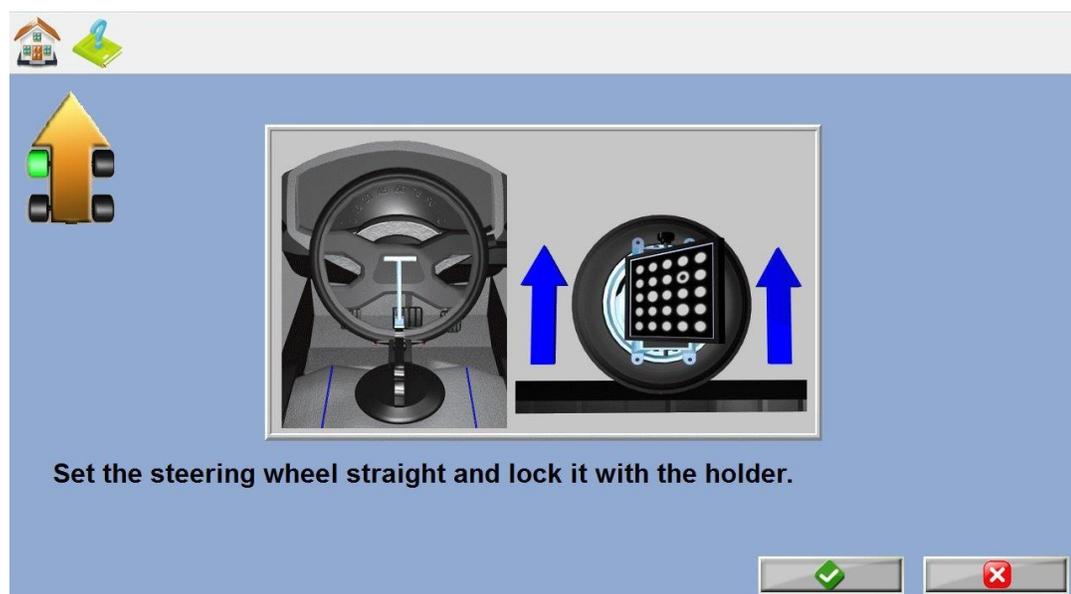
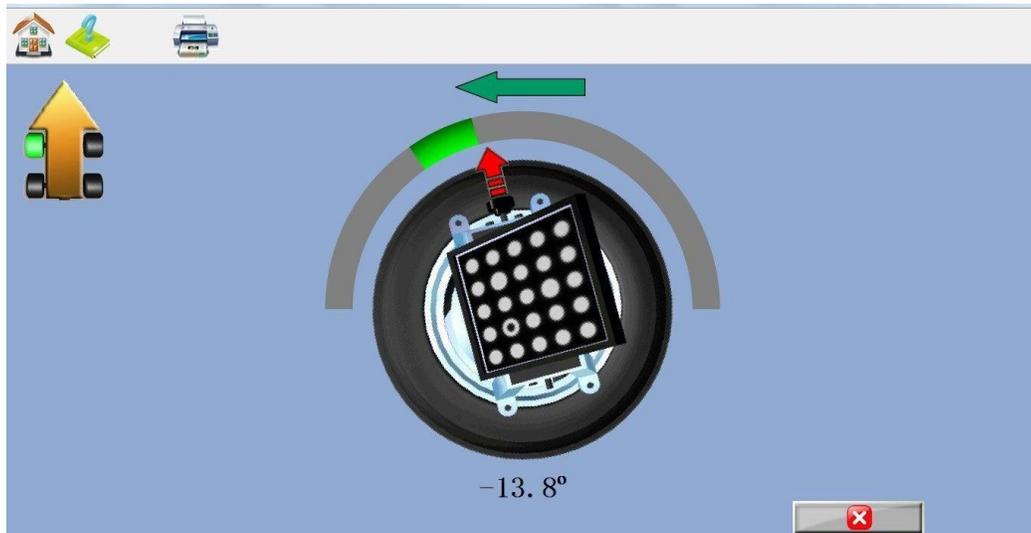


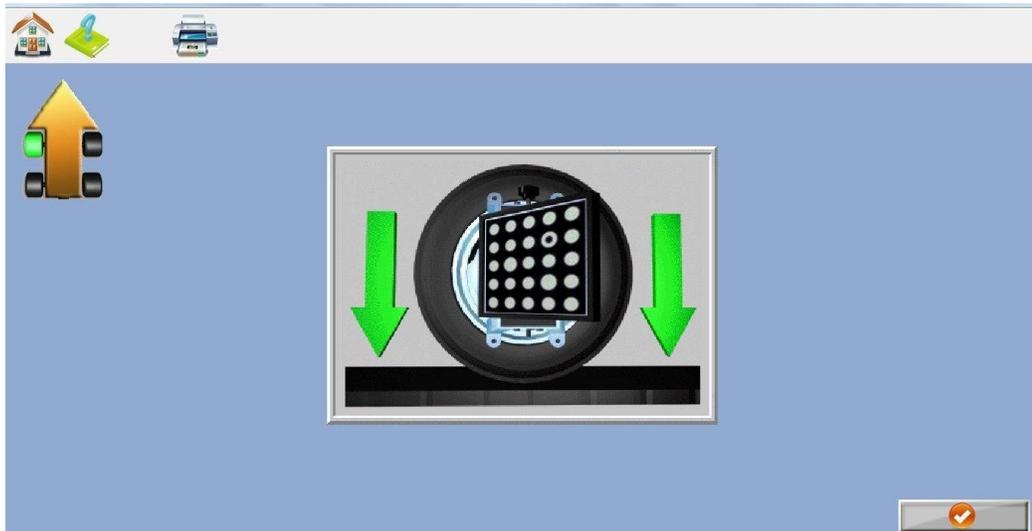
Figure in the upper left side to remind the user to do the calibration fixture compensation is only what the target disk. Installation of the steering wheel holder, adjust the target disk jig knob upwards. This step ensures that the target disk identification process, the wheels do not move laterally. The next step is to raise the front of the screen, so that they can rotate freely. Everything is ready, click on the "OK" button.

Note: When making the calibration fixture compensation, always before and after the target disk, or the target disk is installed on the front wheels.

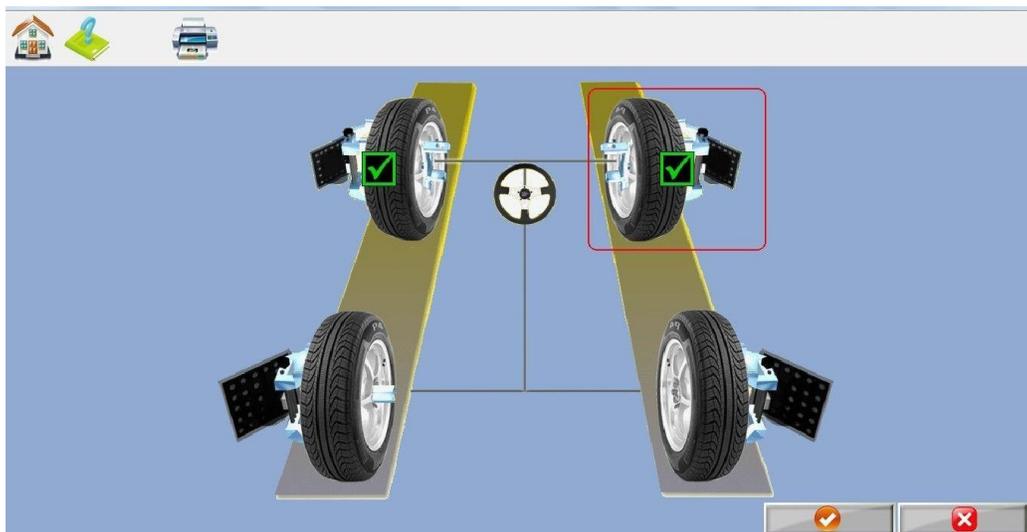


Follow the onscreen instructions to rotate the wheel to be determined according to the indicator on the direction of the rotational direction of the camera 4, camera lights above represent the forward rotation, the following lights that turn back. During the rotation of the screen prompts case after STOP stops the rotation, reverse rotation of the wheel waiting for the screen prompts.

After the end of the fixture compensation calibration procedures, on-screen instructions to put down the wheels. If there are other also need to identify the target disk, Then the above step is not necessary. Click the "OK" button to select the next target disk.



Target disk appears around the fixture compensation calibration is complete calibration by a green box. Screen as shown below:



After four full calibration target disk, put the wheels. After calibration is complete, you need to re-run the software, so that the new parameters Number can take effect.

7.1.2 The Mutual Position of the Camera Calibration

The purpose mutual position of the camera calibration procedure is to measure the relative distance H3D HD camera between each other, so that the software accurately measure the distance between the left and right sides of the vehicle. So we must measure the camera position after each other, in order to locate the measurement process. The mutual position of the camera calibration in the factory has already done, the mutual position of the camera without the need for on-site calibration. Under these circumstances, the need to re-calibrate:

- 1. Camera Malfunction, Repaired by Professional Maintenance Staff;**
- 2. Move to Any Position of a Camera;**
- 3. Replace Any One Camera.**

Enter the mutual position of the camera calibration procedure requires a password, please contact the company when the calibration service personnel or dealer System, the customer cannot self-calibration.

7.1.3 Camera status

After the H3D-definition camera installed, you need to tell the software to install new camera on which side. Cameras identity products The factory has been specified, the site is no longer required to set the camera status. Under these circumstances, we need to re-set:

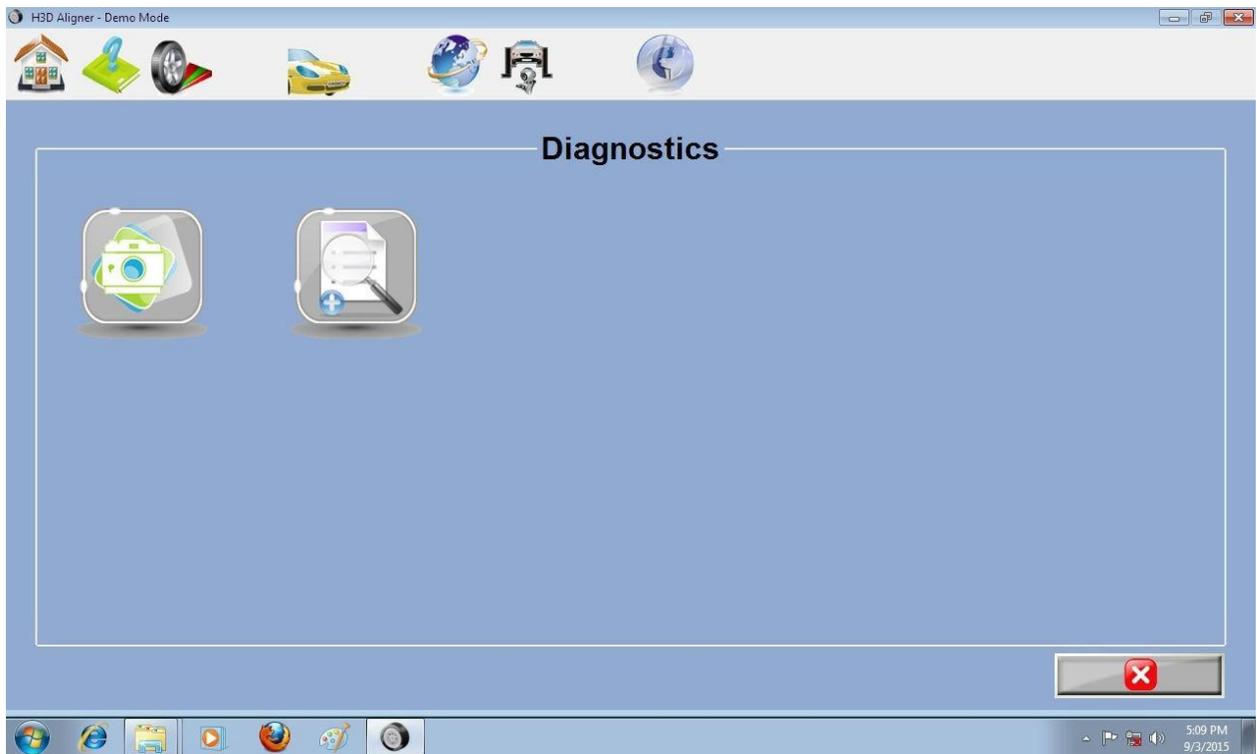
- 1. Swap Over the Position of the Camera Around;**
- 2. Replace Any One Camera.**

Into the camera identification process requires a password, please contact service personnel or distributor company specified when the camera status Contact the customer can not specify the identity of their own camera.

7.2 Camera Diagnostics

The camera interface is mainly used in the system diagnostic testing process for high-definition camera work state is detected. Screen display screen

Surface as follow.



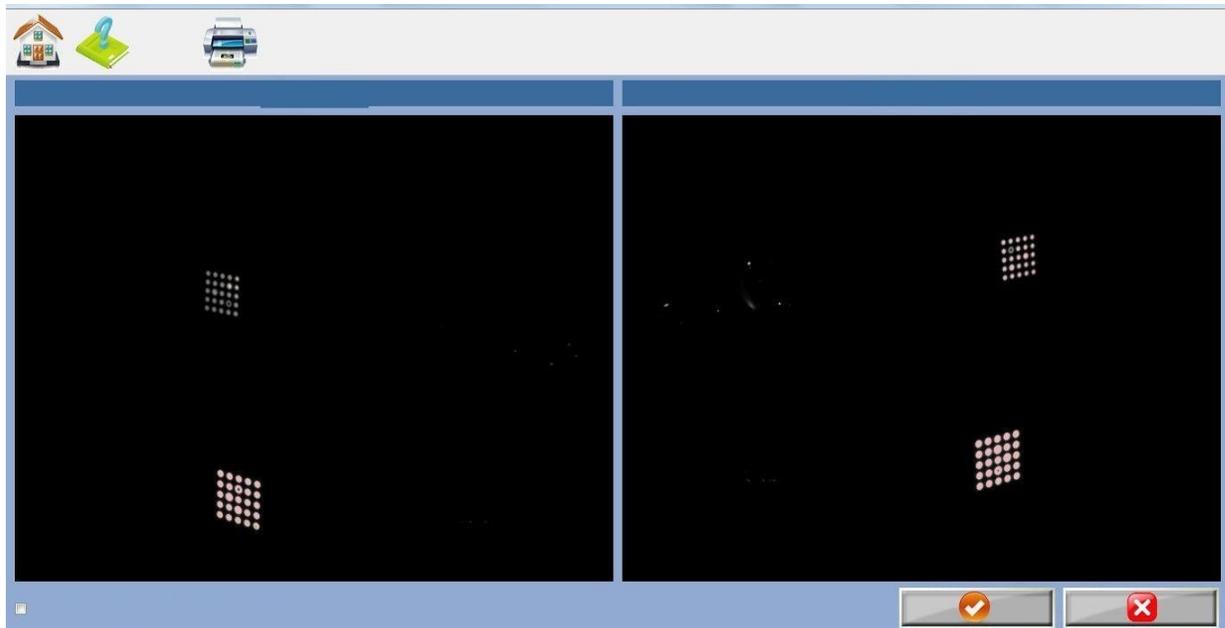
The screen has two menu buttons:



Lens sight, the screen can display the camera see the original image, it is an effective tool for testing the camera issue.



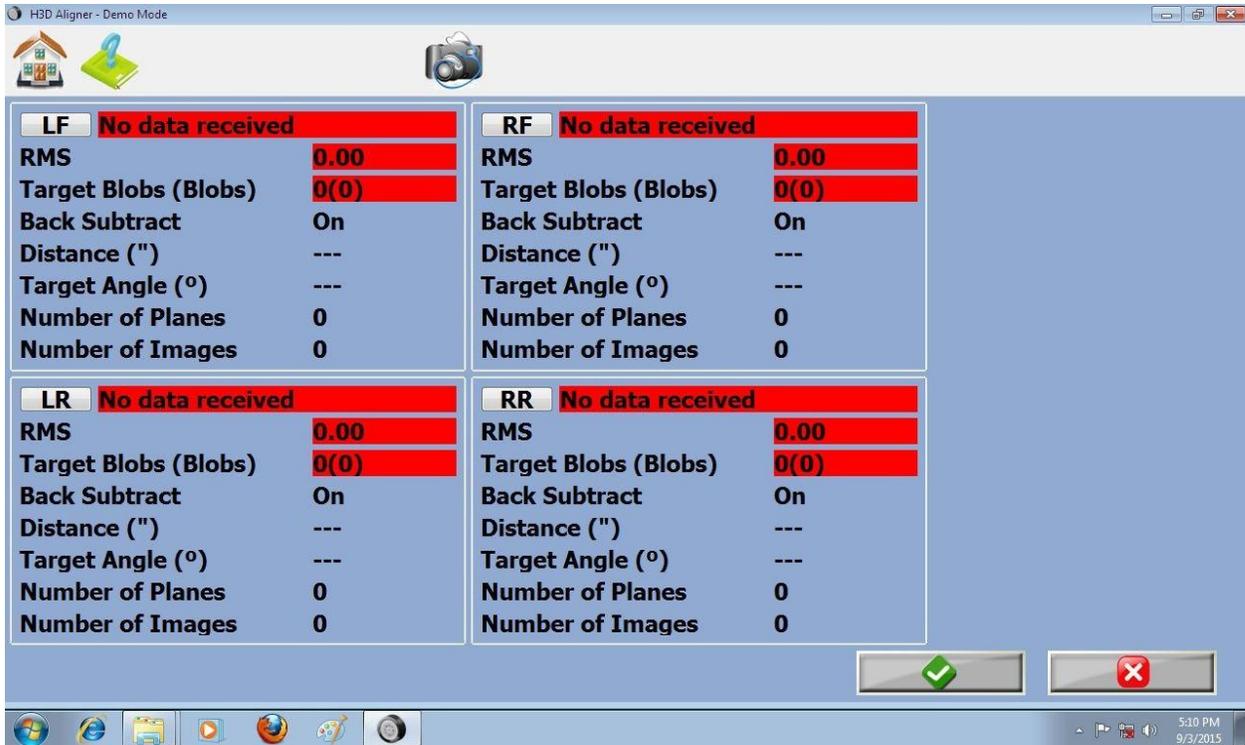
Data checking, the screen displays the target disk status information. When positioning the measurement process fails, it is You can use this information to judge.

7.2.1 Lens Sight

The upper display shows the number of images collected from each side of the camera. If a camera image captured less than another camera's image too much, it indicates that the camera may be faulty. If the camera cannot capture the image, the screen displays a camera position corresponding fault icon.

Options screen below the target disk is whether to use automatic tracking function. After this function is enabled, when the angle of the target disk, Height, light case of less than optimal positioning required camera angle when the camera locator beam hoist motor up and down automatically Adjusted to achieve the best results.

7.2.2 Data Check



The screen displays the raw data of the four target disk. It contains projection error (RMS), the target disk spot number, distance, angle and other parameters. Green indicates normal parameters, if that becomes red, it indicates LR the target disk is blocked improper angle or distance.