TMR-200 Taping Machine Vision Checking Instructions

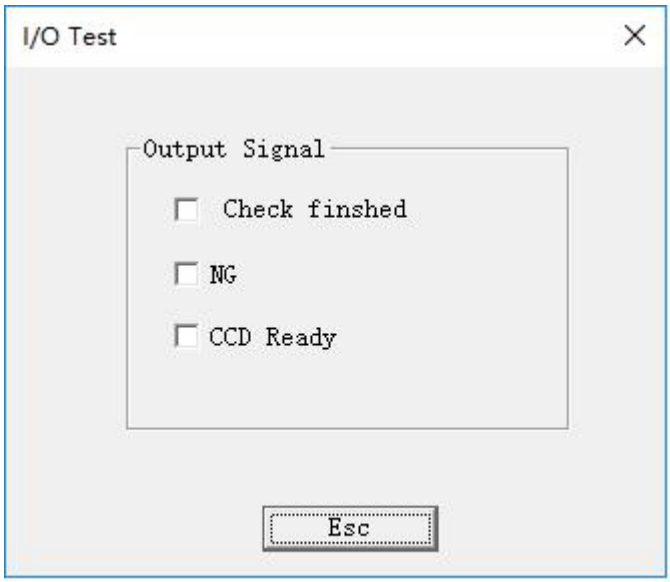
Preface

Congratulations on choosing the TMR-200 Automatic Taping Machine.This manual shows how to easily program and setup the machine for the best results. Make sure to read this manual carefully before using this product, so as to avoid delays or confusion with its operation. Please note that specifications and instructions are subject to change without notice to facilitate product improvement. Updates and changes will be integrated into the latest release. The manufacturer assumes no responsibility for any errors or omissions in outdated documents.

Content

1. Interface Testing

In main menu you can click【INTERFACE TESTING】button，like this

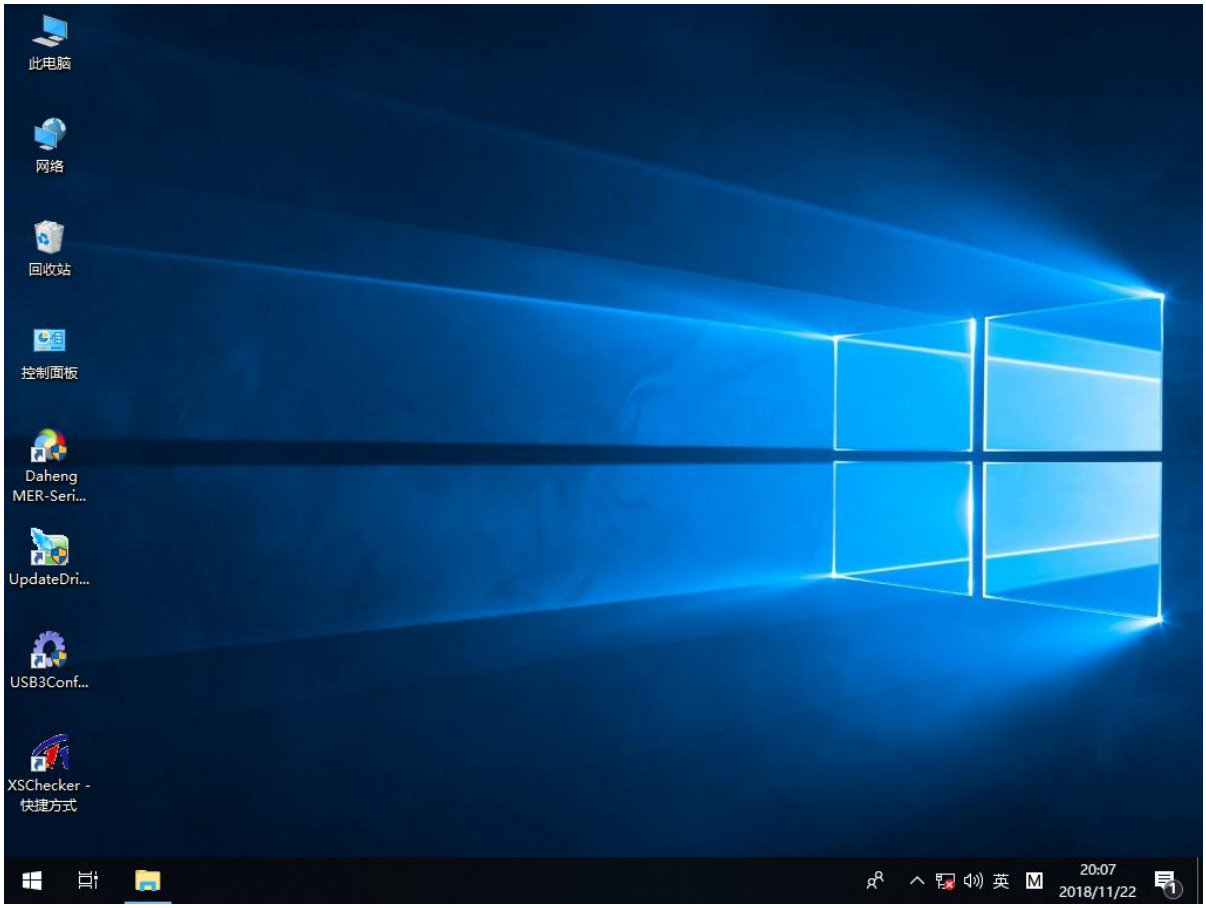


The external hardware interface of the detection software mainly includes three:

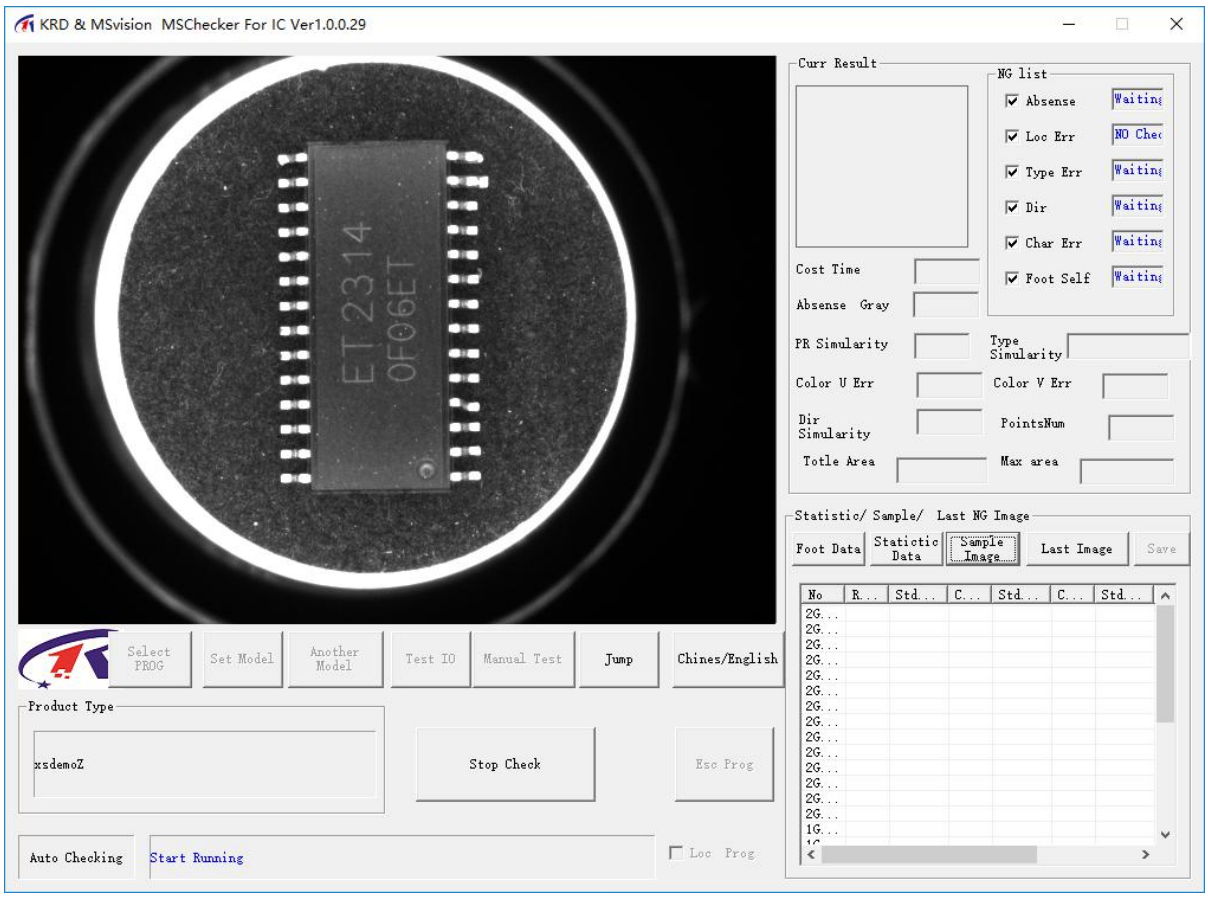
- The test completion signal, which belongs to the handshake signal to the PLC, the output, indicates that the detection flow has completed the specified action, the PLC can collect the related detection result signal; Click on the "test complete" check control of the interface test window, if selected, then detect the valid signal sent out, otherwise it will send out the invalid signal
- The output signal of the product detection result NG, output, indicating the detection result, If the NG sends out a valid signal; Click on the [product NG] check control of the interface test window, if selected, send out the NG effective signal, otherwise send out the invalid signal;
- The acquisition signal of the CCD industrial camera (external trigger control signal), input; External trigger signal detection: the main screen point [start detection], enter the detection process, click the PLC [pause] button, screen to generate updates to explain the external trigger work. Otherwise, external trigger interface failure. Check out, click exit to return to the main screen

2. Running the program

Click “MSChecker” on Desktop or running program in D:\mschecker\mschecker.exe.



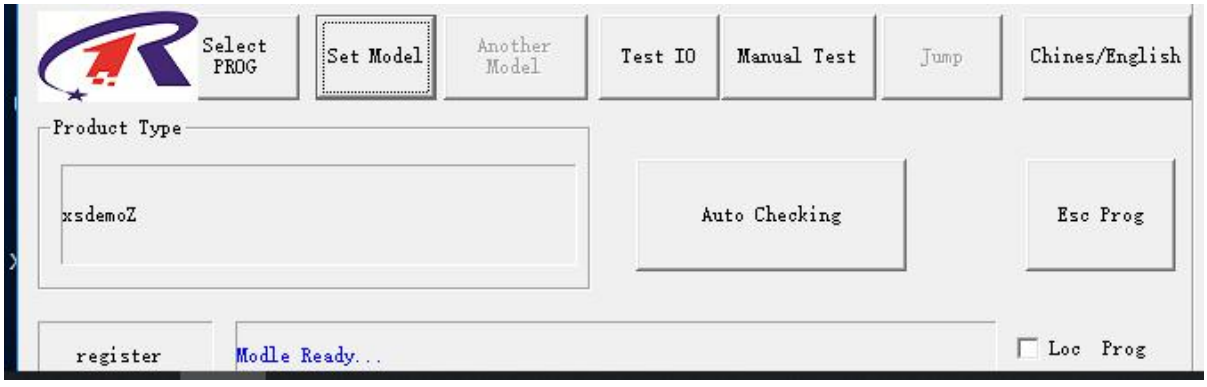
If the system starts the hardware detection normally, the main screen show is as follows：



3. Check setting instruction

3.1 Setting instruction

In the main menu, it include 5 main parts:



- Select PROG: The management of different testing products is convenient for the switching of different types of products；
- Set Model： it is the sample setting, Check parameters can be adjusted during detection, if the modified parameters are not appropriate, you can call this

function to re-call the previous correct parameters；

- Test ID: Hardware IO testing；
- Jump: Perform the detection operation when the result of the NG, needs to be ignored；
- English and Chinese switching;
- Esc Prog: Withdraw from the program。

Detection setting is a very important part of detection. Generally, the reliable and stable operation of detection depends on the collection of samples and the selection of parameters. First of all, the premise of detection should be a clear and stable photographic image, secondly, a correct and clear standard sample, and finally a suitable parameter.

Normal setup steps:

(1) Choose a better product and put it under the camera。
(2) Adjust the camera parameters to ensure that the camera is stable, consistent and clear.
(3) After the image adjustment is completed, return to the main interface, click on the center of the sample with the mouse, and adjust the size of the detection template according to the size of the sample, so that the size of the circle of the template changes, so that the circle is 1 / 4 larger than the sample.;
(4) Click on the settings button in the main interface to create a preliminary sample.
(5) The parameters of the parameter interface can be adjusted by clicking on the per-detection. (12) it is usually possible to use the correct sample statically to check for false judgment, and to use the wrong sample to detect the omission. Misjudgment is the original product of OK, but NG, detection is not detected defective. Then adjust the parameters.
(6) Dynamic test run.
(7) The test parameters are preserved if the procession is carried out stably.

The program： here is a particular work-flow that performs different functions under different conditions. The setting of the detection program is the monitoring process and content, as well as the setting of the detection parameters.

Threshold: in image processing, the gray level segmentation parameters used to

distinguish the detection features are simply the basis of judgment. Each pixel of the image is represented by 8-bit data, which is 0-255, the gray value of each pixel. Is 0-255, for example, we specify that the gray value of more than 120 pixels as the bright spot, less than the normal point, then 120 is the normal value of the super bright spot segmentation;

Accept permission: image detection algorithm for each detection object, will be assessed according to certain scoring rules, get a 0-100 test score, accept permission, the equivalent of a few lines, if the license is 60, So it undefined 60. Over 60 is OK, below 60 is NG;. Acceptance permits can be set according to the degree of rigour of the test and the degree of difference in the object.

Output delay: when the detected object passes through the camera, the sensor triggers the camera to take pictures, the camera receives the photo, and the detection begins. When the detection is completed, the result is reported, and the culling action is carried out. In order to ensure the cooperation of each link in the detection process, we sometimes need to adjust the time sequence of the culling, that is, after getting the detection result, how much time delay will release the time parameter of the culling signal, in milliseconds.

Output holding: in order to cooperate with the PLC control, it is necessary to remove the signal with a certain pulse width, so there is the culling hold time, also in milliseconds.

Detection range: search the detection object in the whole image, because of the image interference and the use of mechanical positioning, track, fixture and so on, determine the detection range, can ensure the detection object, in the lens of a fixed area, In this way, the detection in this area can improve efficiency, save time, and eliminate interference to improve reliability.

The detection procedure was divided into 0-10 and 11 steps:

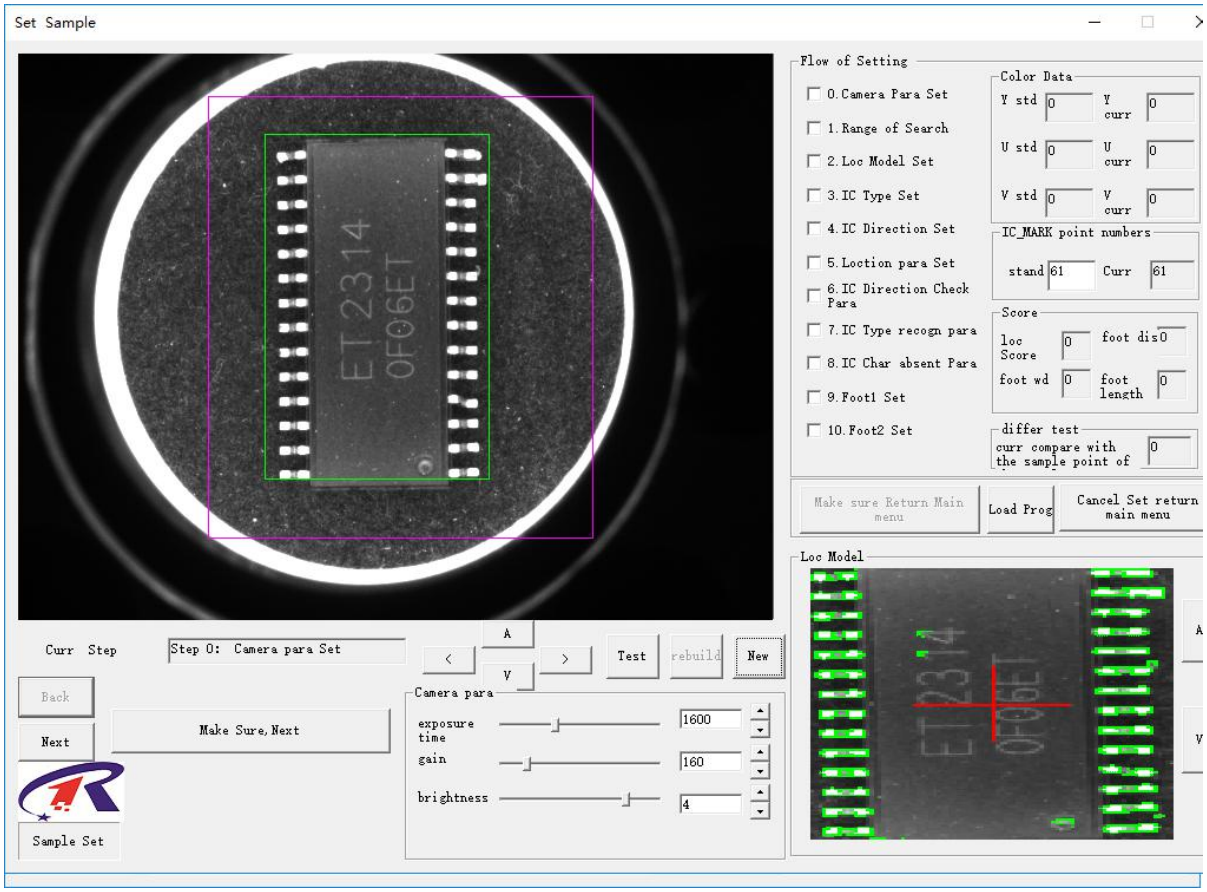
(1) Camera parameters set;
(2) Set the scope of work;
(3) Positioning template setting;
(4) IC model test setting;
(5) IC direction parameter setting;
(6) Setting and testing of positioning parameters;
(7) Direction detection parameters;
(8) IC model identification parameters;
(9) IC type words with incomplete parameters;

(10) Pin 1 setting (custom);

(11) Pin 2 settings (custom)

3.2 Set Model

Click “Set Model” button, as shown in the following image:



Camera parameter setting, mainly by adjusting exposure time, gain and brightness, to achieve a better image effect, this is the important basis of the whole detection work. The adjusting method changes the imaging effect of the image by increasing the button of sliding bar edit box to change the imaging effect of the image.

Of course, it also includes adjusting the selection of light source, adjusting the direction of lighting, and selecting the color of illumination lamp, aiming at different detection objects. Make reasonable choices; "how to choose a Light Source" is a big topic and a very professional one.

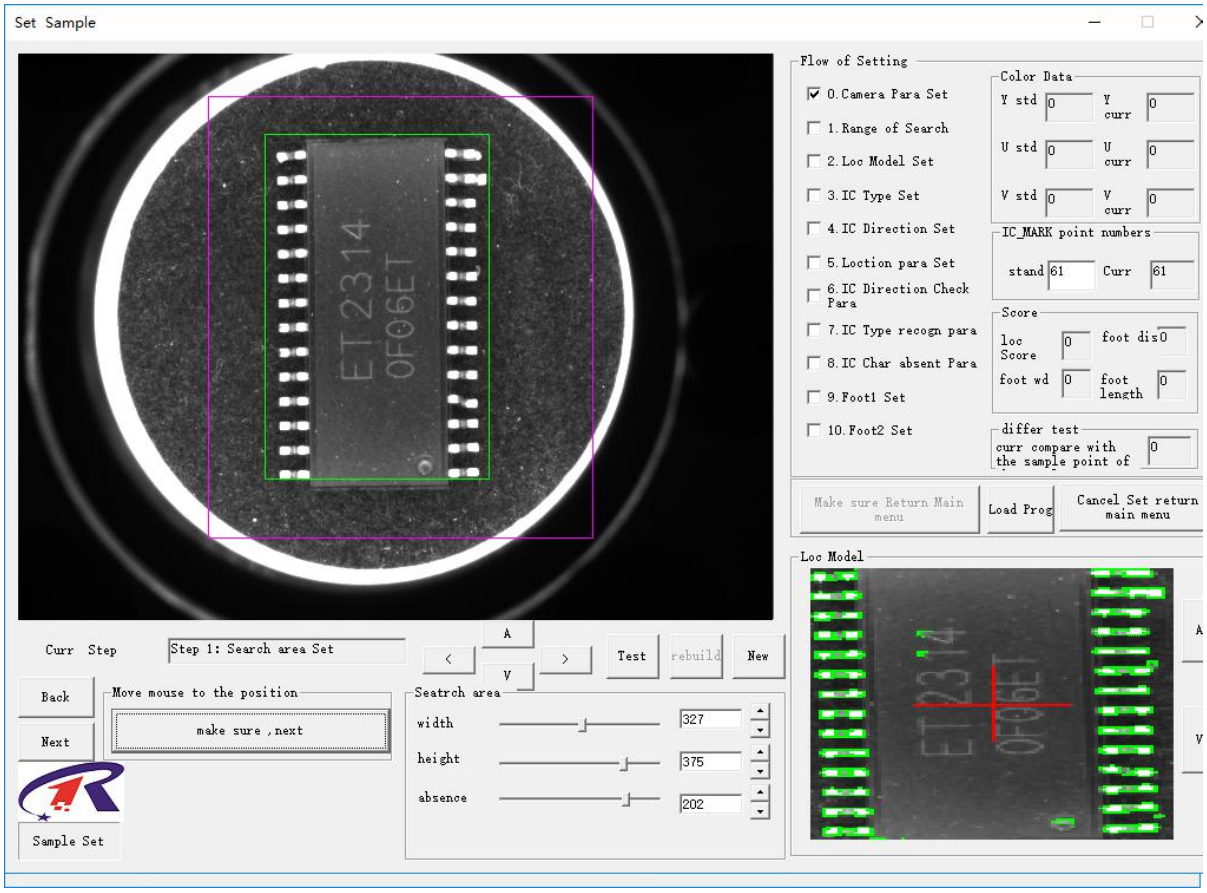
The principle described here is that the light source lighting should be helpful to distinguish the direction of the lack of angle of judgment, and to choose the suitable exposure time for the key content. Because the photo here is similar to shooting a moving object, because if you wait until the workpiece stops and take a picture, then the time is

too late to be completed within the time required for the detection. So we usually choose the 600 us or so, of course, if we can adjust the 2000 us for the poor imaging effect such as transparent glass, it really needs the operators to accumulate experience.

The adjustment of exposure time has its advantages and disadvantages. The gain is usually 150, the brightness is usually 3, or 4, so that the image has less interference and stability. Complete the parameter setting [confirm camera parameters into the next step] to set the scope of work, and you will find that the camera parameter setting options in the upper-right corner of the detection process are checked, indicating that this item is complete. Of course, it can also be adjusted according to the need to turn around;

3.3 Camera parameters set

Click “Next” and the interface will show as follow:



In fact, the scope of work, that is, the range of the workpiece that may appear in the lens, so that when the workpiece is detected, the workpiece can be searched and located within that range, thus reducing the time of searching and searching. Reduce the interference of complex background to image recognition.

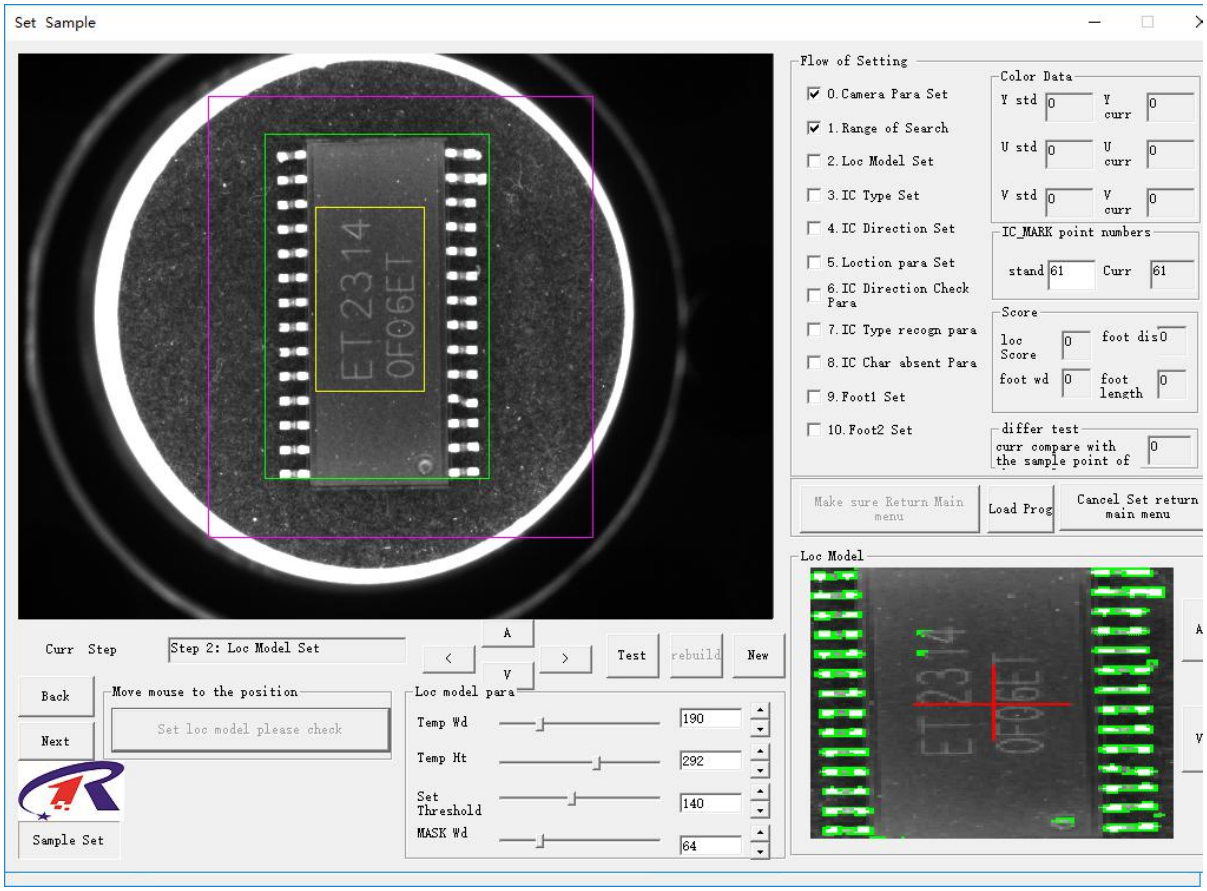
The default working range is the purple rectangular region with the center of the image as the center and the width of the image as the width and height of the image.

When you need to specify the range of work, depending on the image, click the center of the work piece in the image with a mouse, change the width range and height range to set the range of work, you can use [<] in the screen to the left. [>] to the right, [A] up [V] down, move the button to fine tune the center position, resize the area by increasing and reducing the button, if the center point and width range specified by the mouse,

The range of height is beyond the range of the image, indicating that this setting is not reasonable, then the display purple range box will not appear.

3.4 Location Model Set

Click “Next” and the interface will show as follow:



First move the mouse to the center of the display, click on the left mouse button, and then the green positioning box appears around the workpiece, resizing the width and height of the template

To the left and [>]， to the right through [<] in the screen. [A] up ，[V] down, move the button to fine-tune the center position of the template, adjust the size of the green template box by increasing and reducing the button;

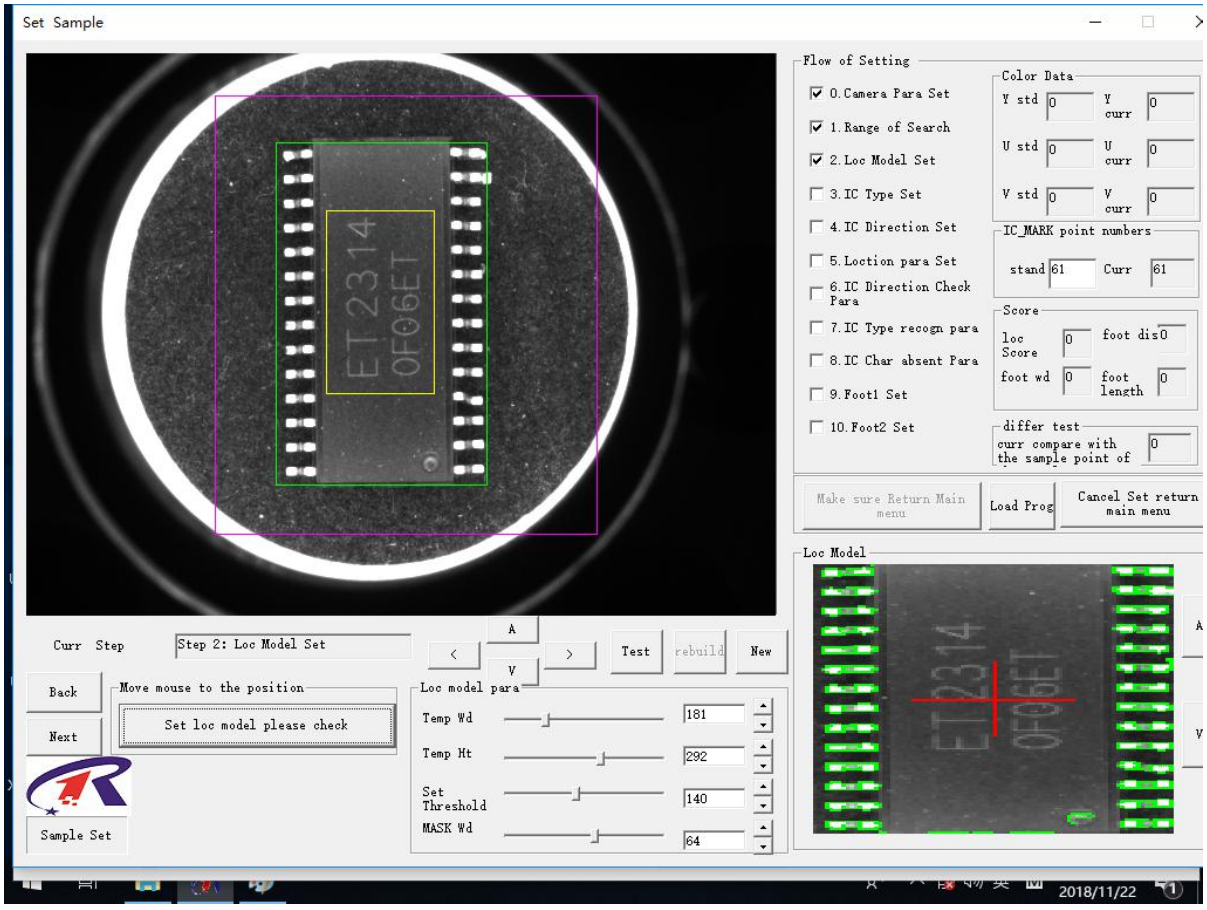
Finally, the green location template box is slightly larger than the workpiece, and can completely cover the entire workpiece, which can adjust the threshold value, that is, the image segmentation threshold (as explained by the preceding noun), and the MASK width,

Click on the settings template in the screen to go to the next step, and the image of the opposite template (lower right) will show the result of the setting of the corresponding template.

The best effect should be, The outermost contour of the workpiece is shown in green in the template. If it is not continuous, it needs to reduce the threshold value. If there is an extra contour line or a random disturbance green spot, the threshold value should be increased.

3.5 IC Type Set:

Click “Next” and the interface will show as follow:



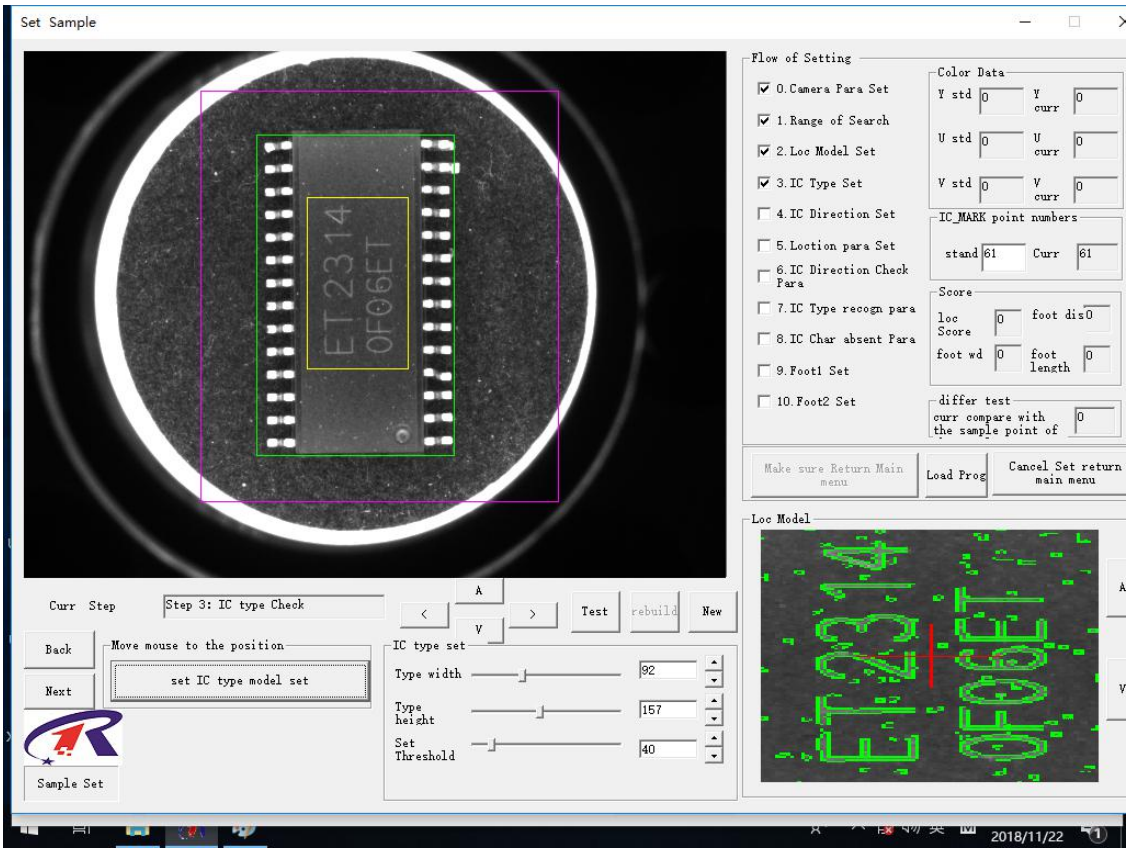
The yellow rectangle box is used to indicate the area that needs to be checked to distinguish different types of products to prevent mixing problems.

The yellow rectangle should be within the green template.

Move the mouse to the center of the area that needs to be detected, click on the left mouse button, confirm the color detection center, change the width and height of the detection to change the size of the yellow box. You can use the [<] left, [>] right, [A] upward [V] downward, moving buttons to detect the location of the area.

3.6 IC direction detection Set

Click “Next” and the interface will show as follow:

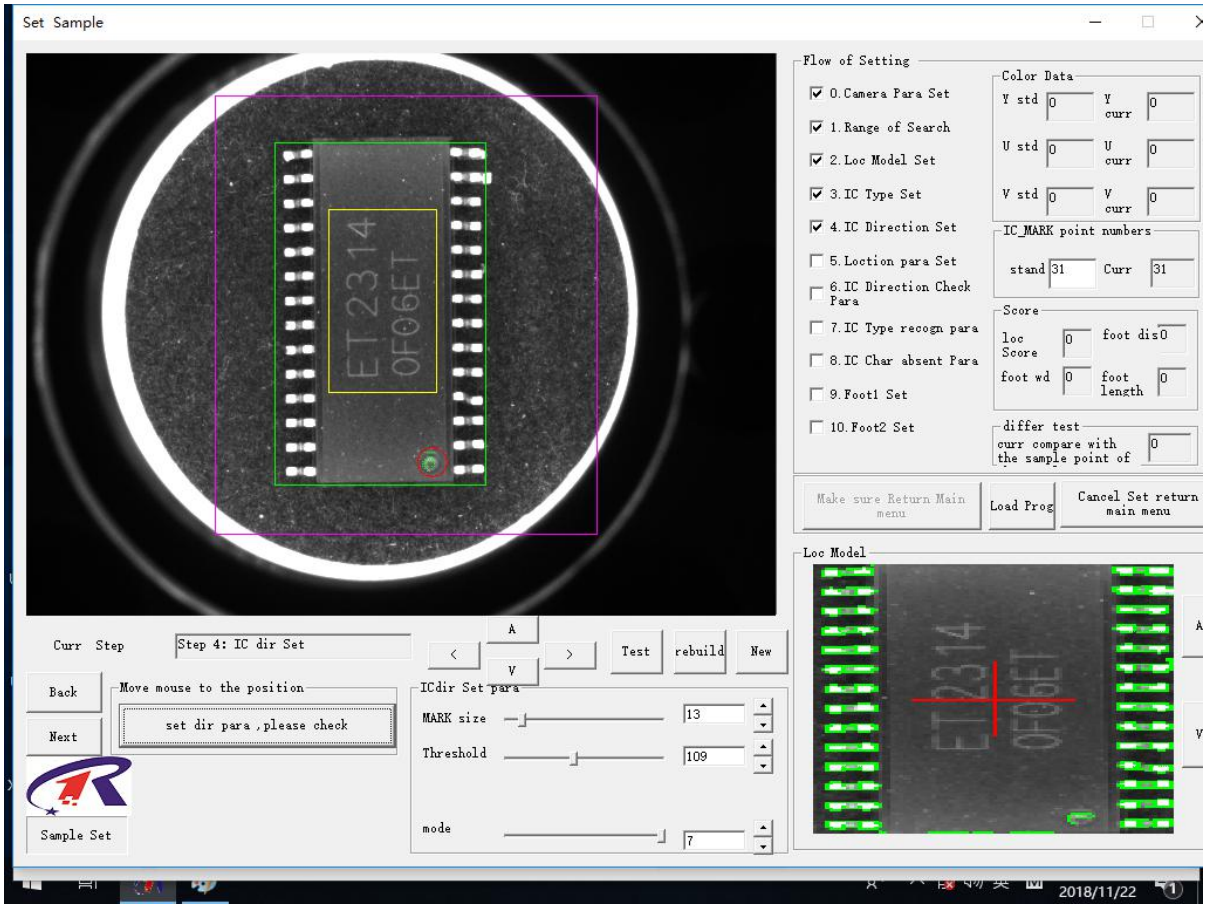


The basis for judging the direction of IC: the gray value of the pixels in the circle is considered as a white spot if it is greater than the binarization value set if it is greater than it and if the black spot is considered as a black spot if the value is greater than the set binary value.

When the mode is set to 6, the number of pixels in the region is counted. If the mode is set to 7, it counts white points, that is, the number of pixels in the region.

3.7 Set & Test Location parameters：

Click “Next” and the interface will show as follow:



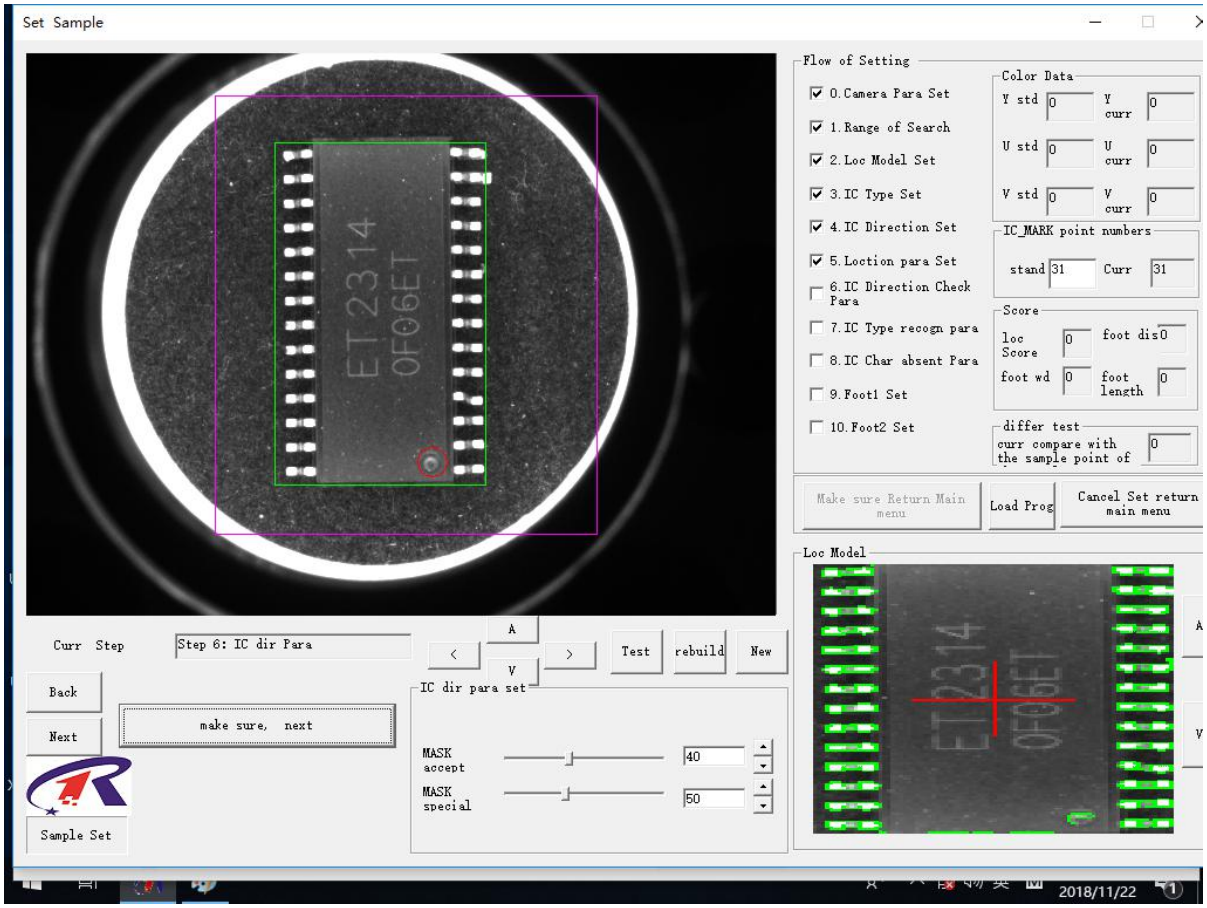
Location similarity 1: meaning is the pass score of primary search in the process of image recognition, that is, if the score of primary search is higher than this value, it is possible to carry out the subsequent advanced search;

Location similarity 2: the meaning is the pass score of advanced search in image recognition process, and only if the pass score is exceeded in advanced search, can it be considered successful to find the sample. Search binarization: the mathematical segmentation threshold of the location feature is confirmed, that is, the contour point of the feature is considered to exist when the change rate of the gray level is greater than this value.

The "test" button, which can test different samples and standard sample recognition scores to determine the appropriate level of permission, the test score, the positioning score on the right screen can be displayed.

3.8 Set the parameters for IC direction detection

Click “Next” and the interface will show as follow:



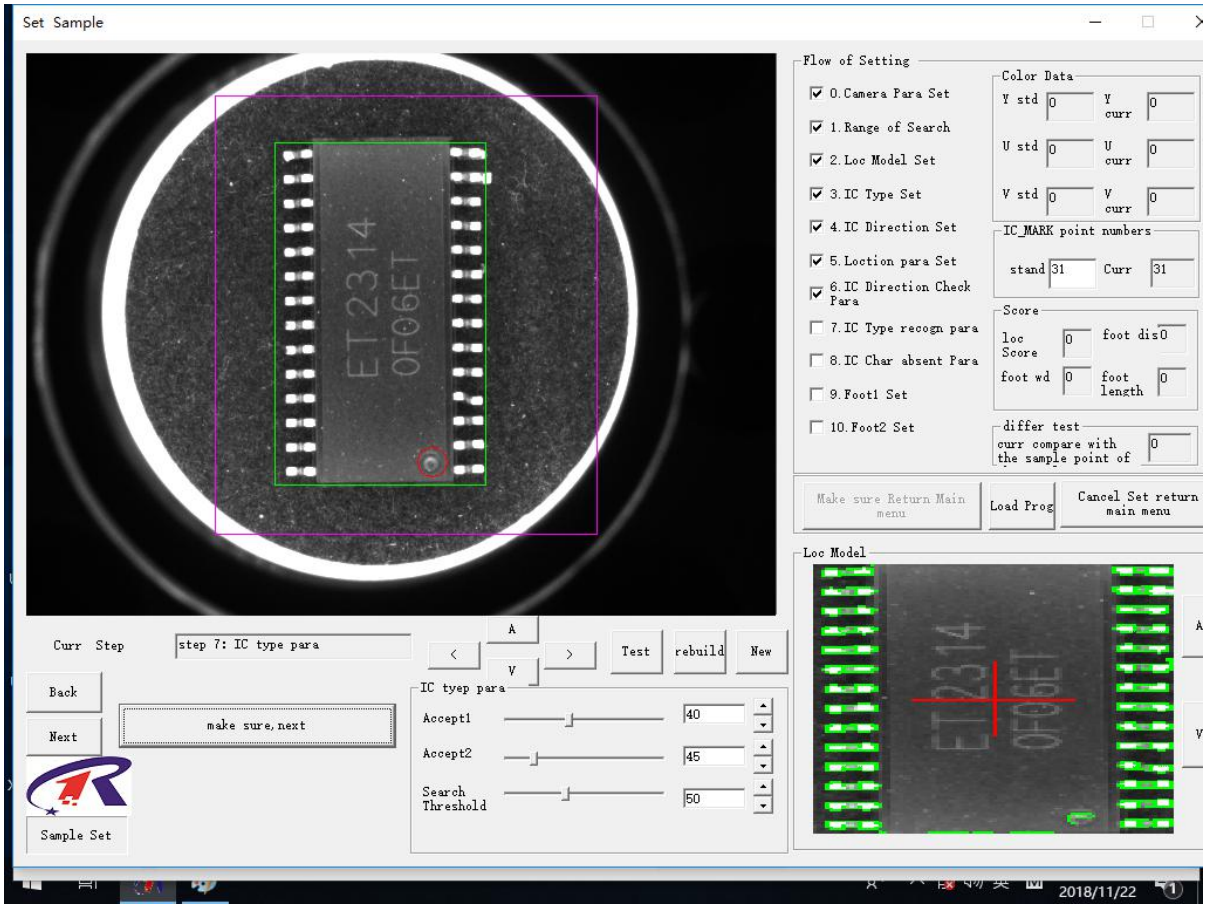
Parameter description:

MASK similarity: MASK is the feature of the specified directional region, and the similarity is the similarity between the current direction region and the image feature of the set direction region template.

Generally set to 60, if the image effect is not good, not in line with the standard also found, the value will be increased. The opposite is true. The ratio of blackspots (percentage) of MASK: the number of blackspots fixed in the direction as the benchmark (think 100%), the current number of detected blackspots and the percentage of the benchmark example; Generally set to 50, if the image effect is not good, not in line with the standard also found, the value will be increased. The opposite is true.

3.9 Set IC Model identification parameters

Click “Next” and the interface will show as follow:



Parameter description:

Similarity 1: meaning is the pass score of primary search in the process of image recognition, that is to say, only when the score of primary search exceeds this value, can we carry out the subsequent advanced search;

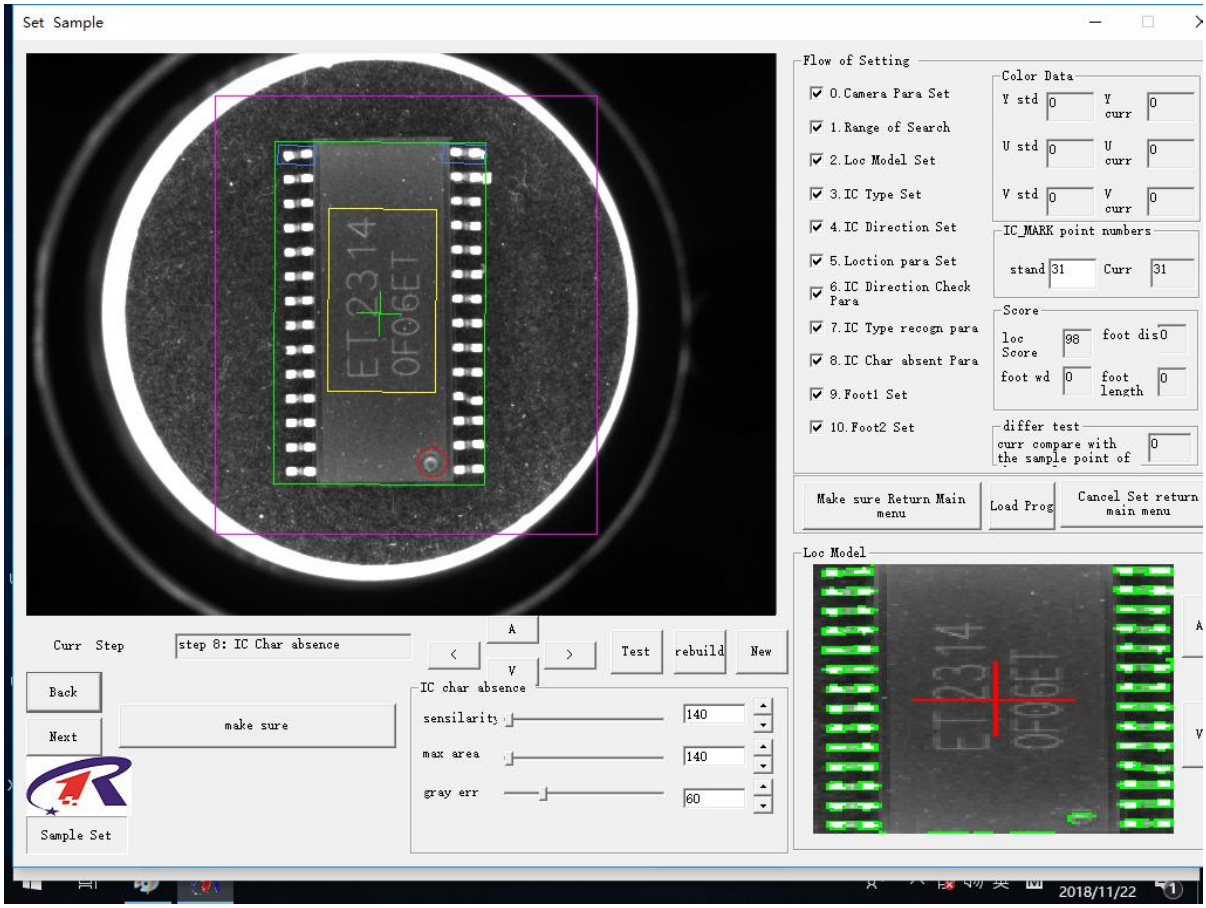
Similarity 2: the meaning is the pass score of the advanced search in the image recognition process, and only if the pass score is exceeded in the advanced search, can it be considered successful to find the sample.

Search binarization: the mathematical segmentation threshold of the location feature is confirmed, that is, the contour point of the feature is considered to exist when the change rate of the gray level is greater than this value.

"Test" button, click on the button, the right color data in the right column will display the current YUV color data, you can set the error between the data and sample data parameters

3.10 Set IC Model character incomplete parameters

Click “Next” and the interface will show as follow:



Parameter description:

Incomplete sensitivity: generally set at 20; total area allowed for incomplete:

The minimum area of dirty or defective allowed in image alignment, this parameter can be adjusted to change the sensitivity of detection to meet different detection requirements;

The maximum allowable error of gray level: according to the sensitivity of human eye to black and white grayscale grade, increase the compensation coefficient, make the judgment of computer more close to the sense of human eye;

3.11 Set the pin 1 (custom citation)

Click “Next” and the interface will show as follow:

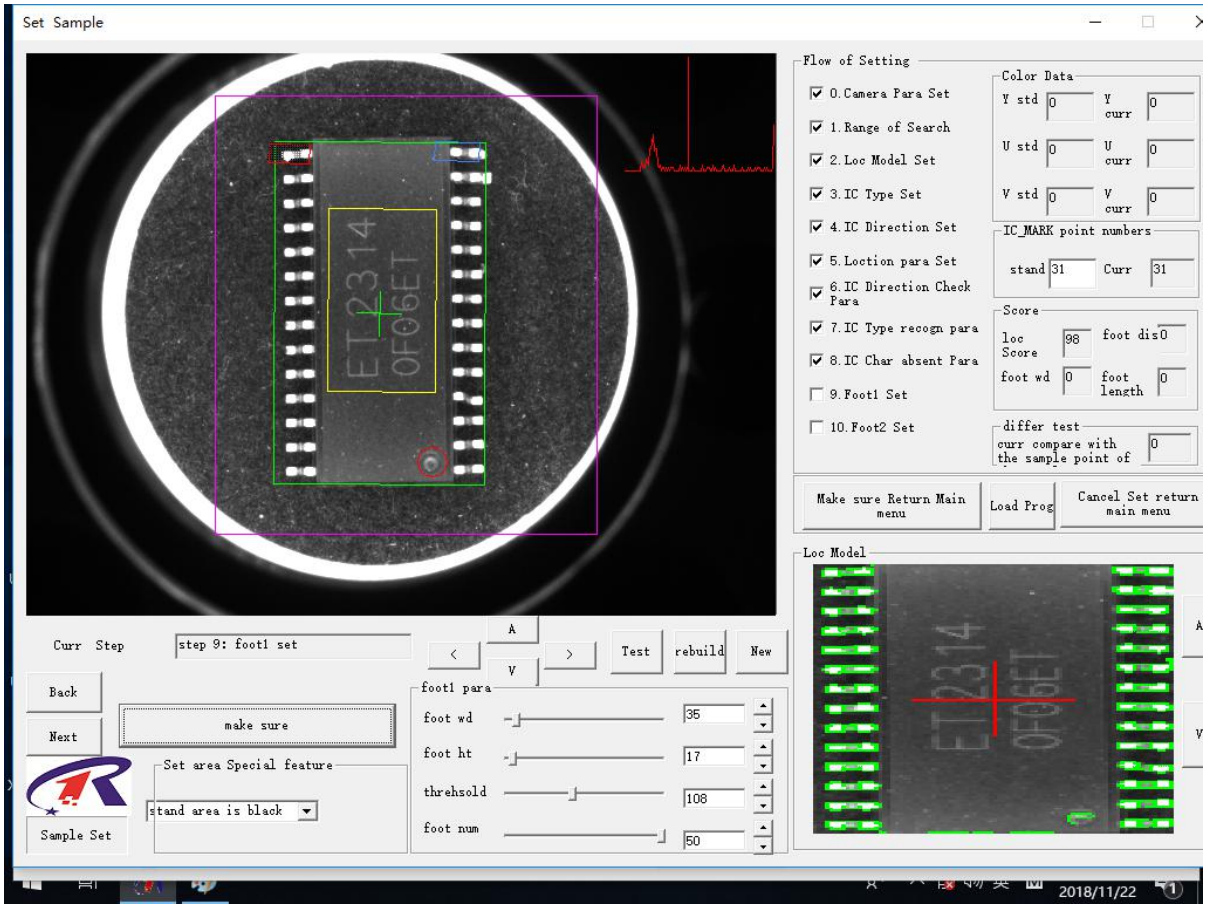


Image gray level refers to the brightness of each pixel is represented by 0 to 255 steps, 0 for the darkest, 255 for the brightest.

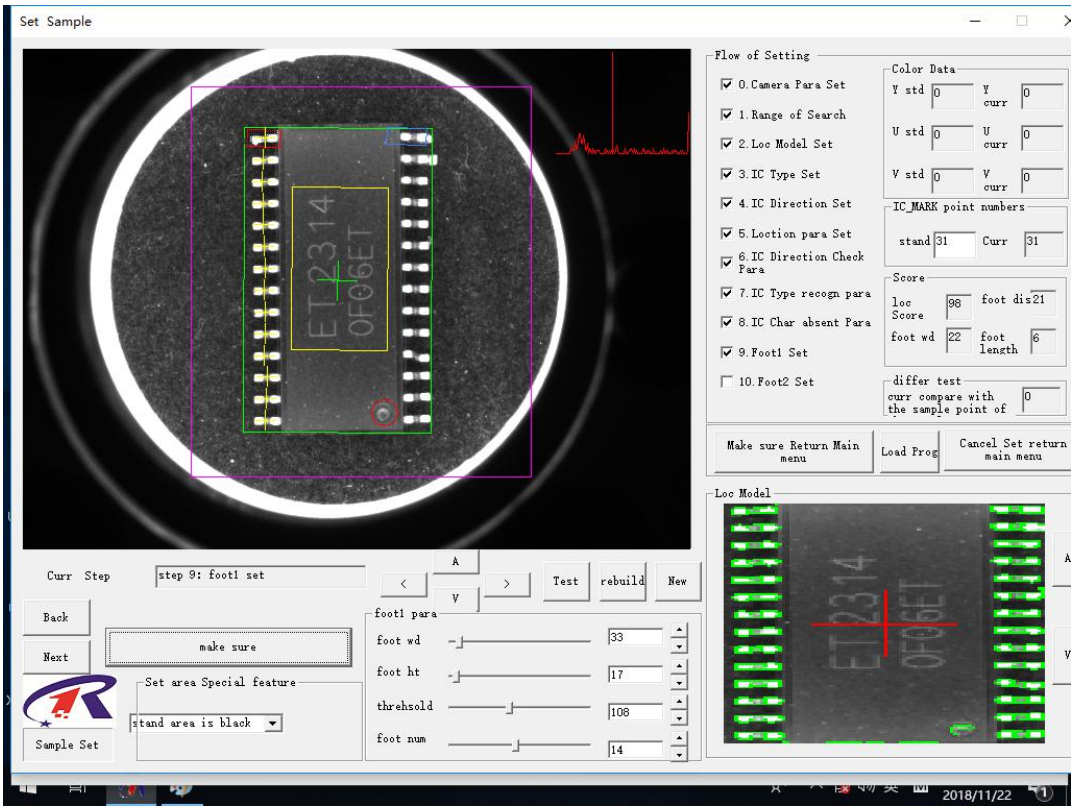
Gray limit: the image in the selected area sets the lower limit of the grayscale grade and the luminance limit of the pixel in accordance with the requirement; the total area is the sum of the pixel points automatically obtained according to the upper and lower limits of the gray scale in the selected region according to the requirements of bright reading.

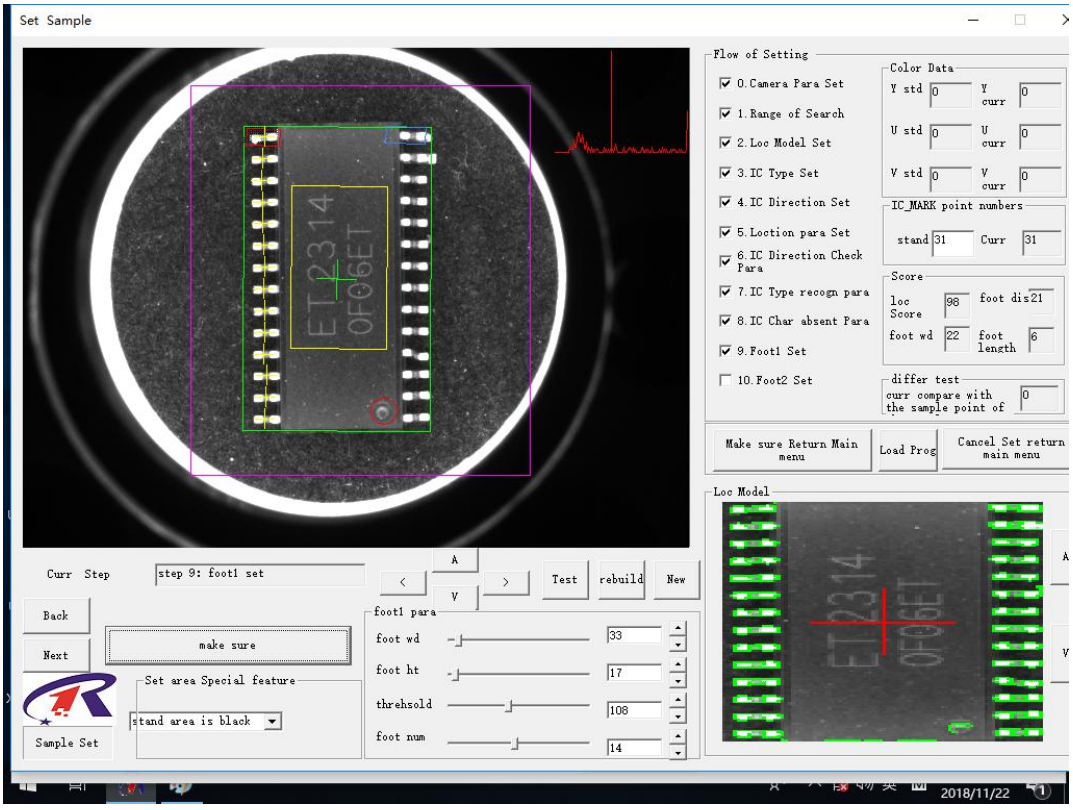
If the current sample is set as a standard sample, the current sample area is considered to be 100. Percentage permission: take the set sample as the reference datum, the number of pixels that accord with the luminance requirement namely area, compare with the sample standard, get the percentage of the score; according to the test request, determine that the measured percentage value belongs to the range of the good product.

For example, the allowable area is a little larger than the sample area, then the percentage limit can be set to 125, the allowable area is slightly smaller than the sample area by 20, then the percentage lower limit is set to 80.

3.12 Set The pin 2 settings (custom):

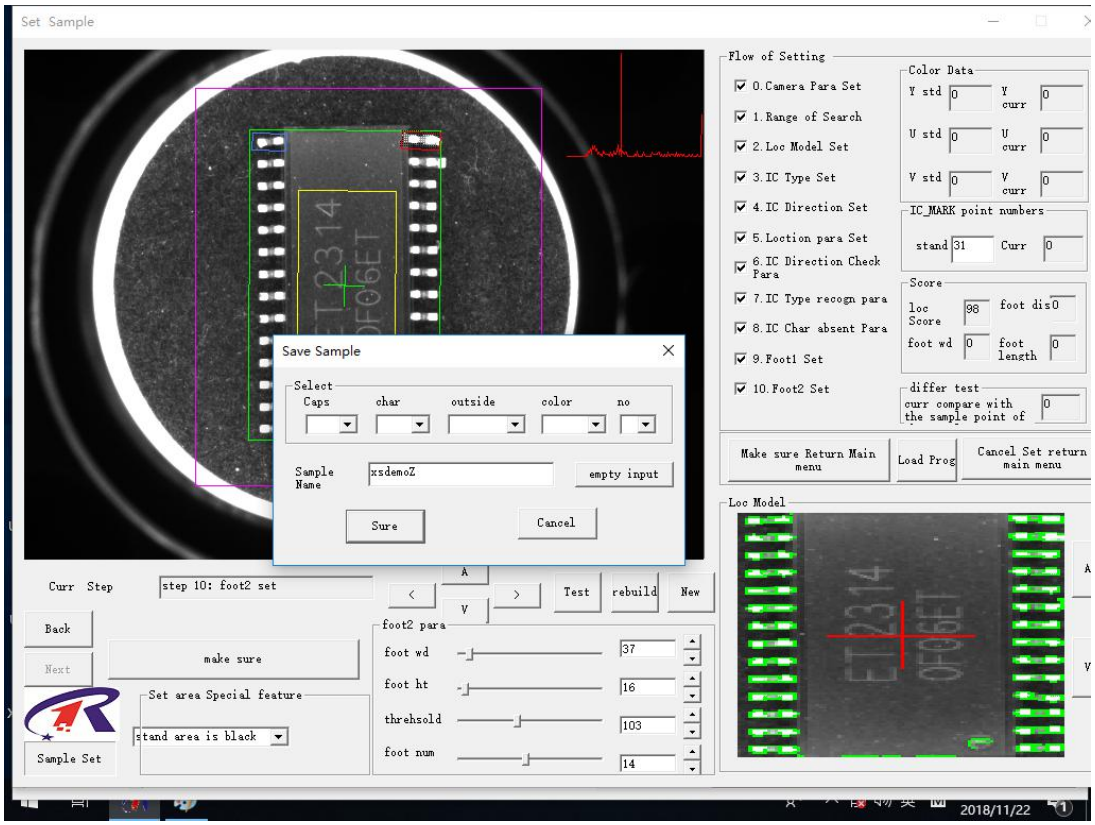
Click “Next” and the interface will show as follow. Same as pin 1 setting





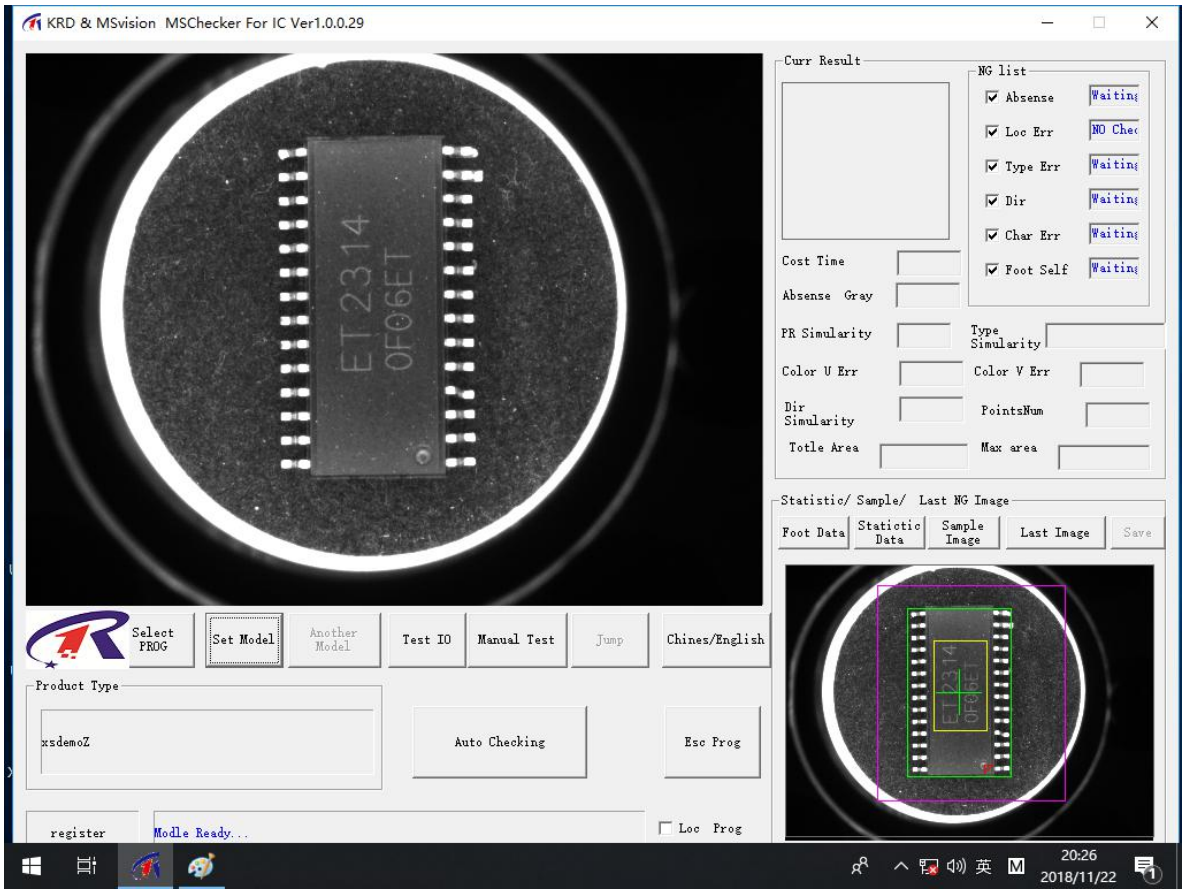
3.13 Save settings and Return

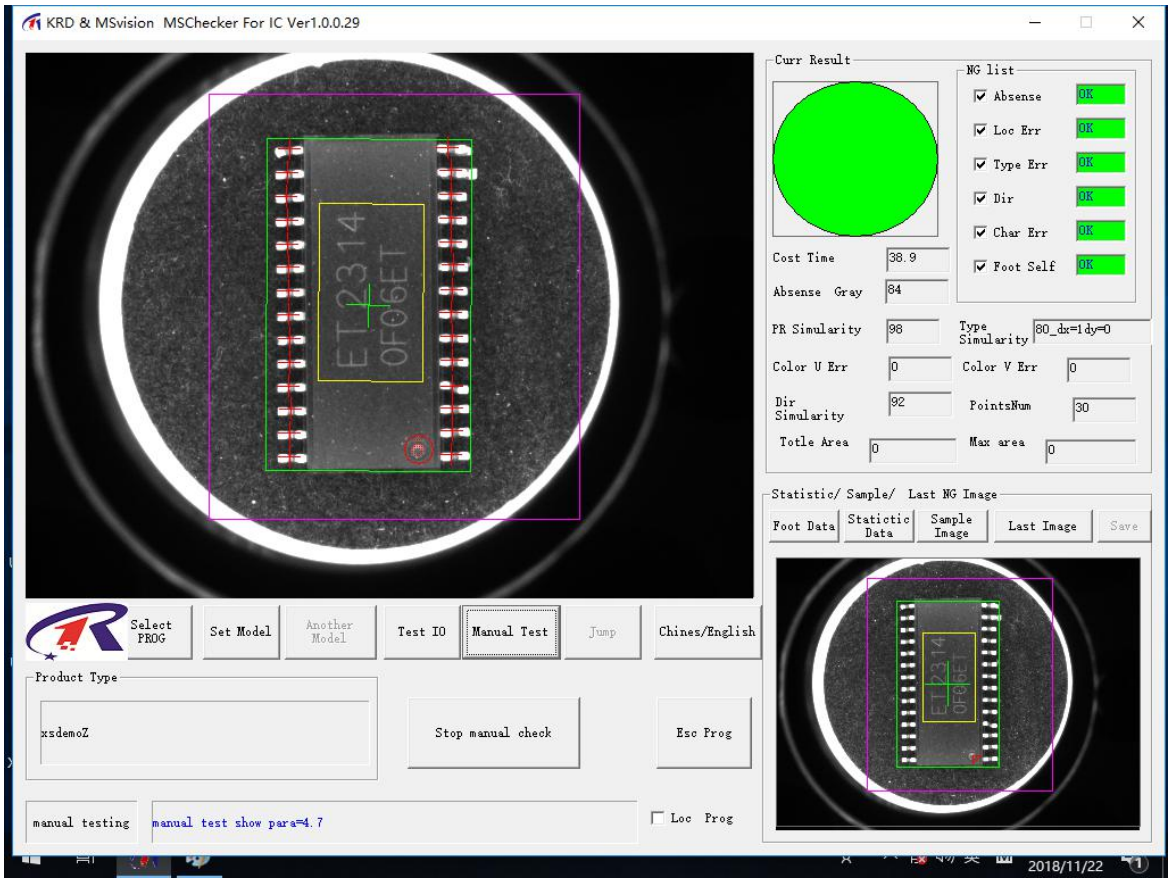
Click to “Make sure Return main menu” to confirm the settings and return to the main menu: when the settings are complete or the parameters have been modified successfully, then if the settings are set successfully, the parameters can be saved, or if the settings are not set well, then cancel. Only if 0-11 parameters are set successfully, then confirm the settings are complete and return to the main menu.

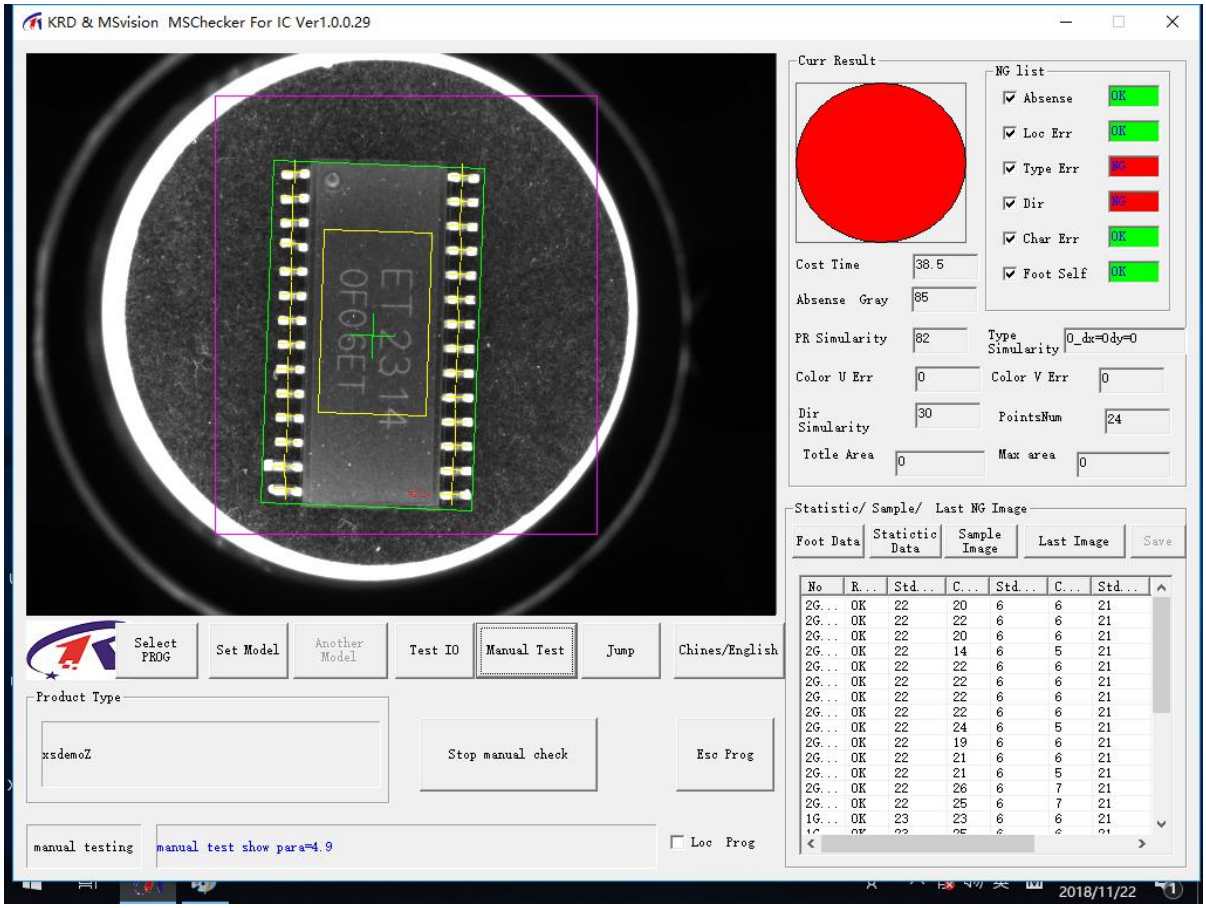


3.14 Test result interface

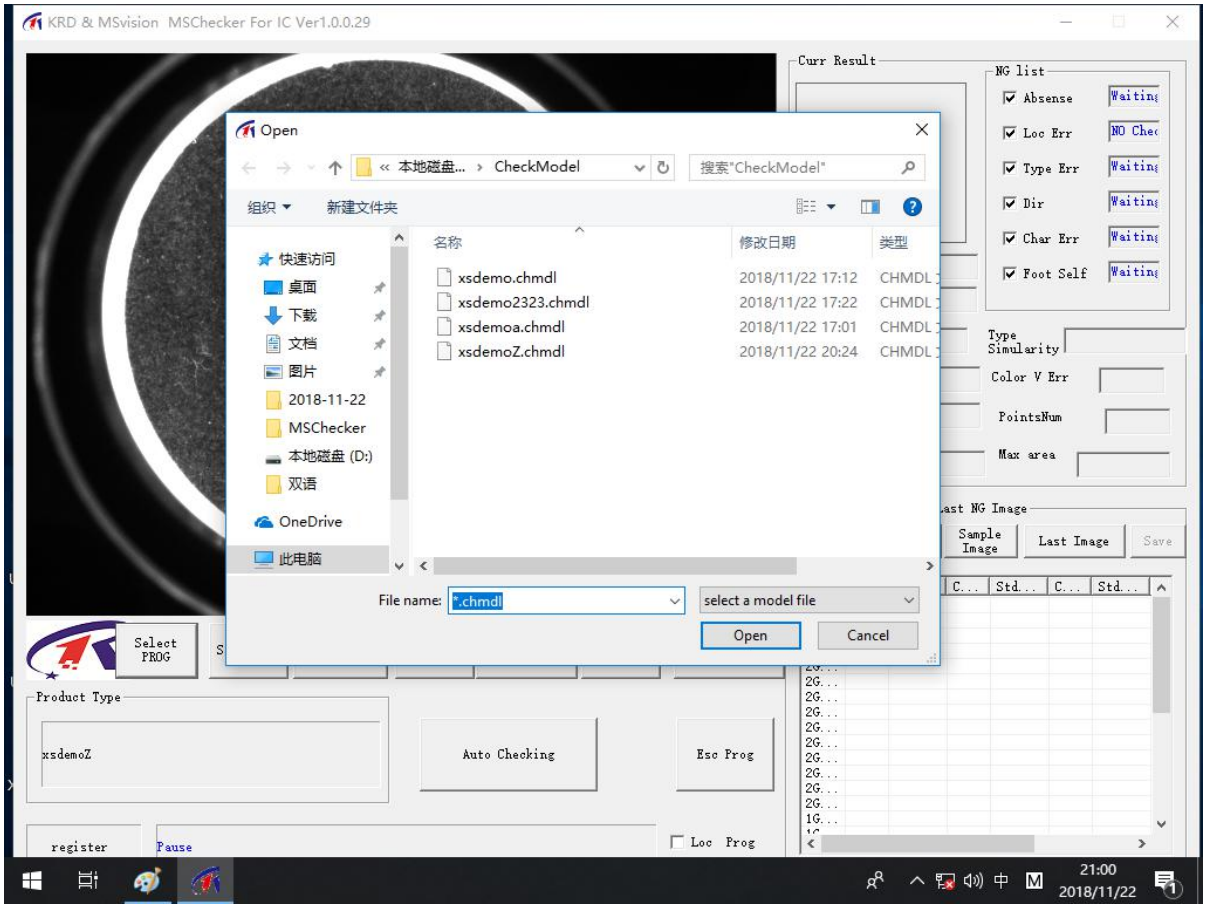
After return to the test interface for testing, the product OK/NG is shown in figure:


KRD & MSvision MSChecker For IC Ver1.0.0.29
Curr Result
NG list
Absense
Loc Err
Type Err
Dir
Char Err
Foot Self
Cost Time
Absense Gray
PR Simularity
Type Simularity
Color U Err
Color V Err
Dir Simularity
PointsNum
Totle Area
Max area
Statistic/ Sample/ Last NG Image
Foot Data
Statictic Data
Sample Image
Last Image
Save
Select PROG
Set Model
Another Model
Test IO
Manual Test
Jump
Chines/English
Product Type
xsdemoZ
Auto Checking
Esc Prog
register
Modle Ready...
Loc Prog
20:26
2018/11/22

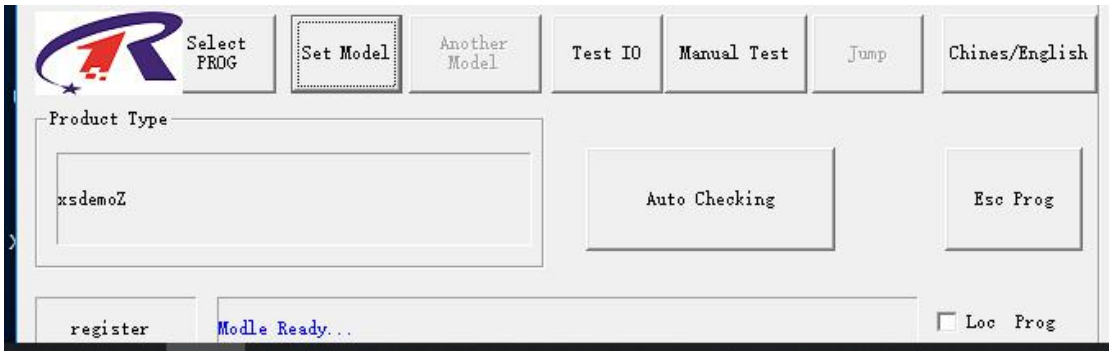

KRD & MSvision MSChecker For IC Ver1.0.0.29
Curr Result
NG list
Absense
Loc Err
Type Err
Dir
Char Err
Foot Self
Cost Time
38.9
Absense Gray
84
PR Simularity
98
Type Simularity
80_dx=1dy=0
Color U Err
0
Color V Err
0
Dir Simularity
92
PointsNum
30
Totle Area
0
Max area
0
Statistic/ Sample/ Last NG Image
Foot Data
Statictic Data
Sample Image
Last Image
Save
Select PROG
Set Model
Another Model
Test IO
Manual Test
Jump
Chines/English
Product Type
xsdemoZ
Stop manual check
Esc Prog
manual testing
manual test show para=4.7
Loc Prog
2018/11/22

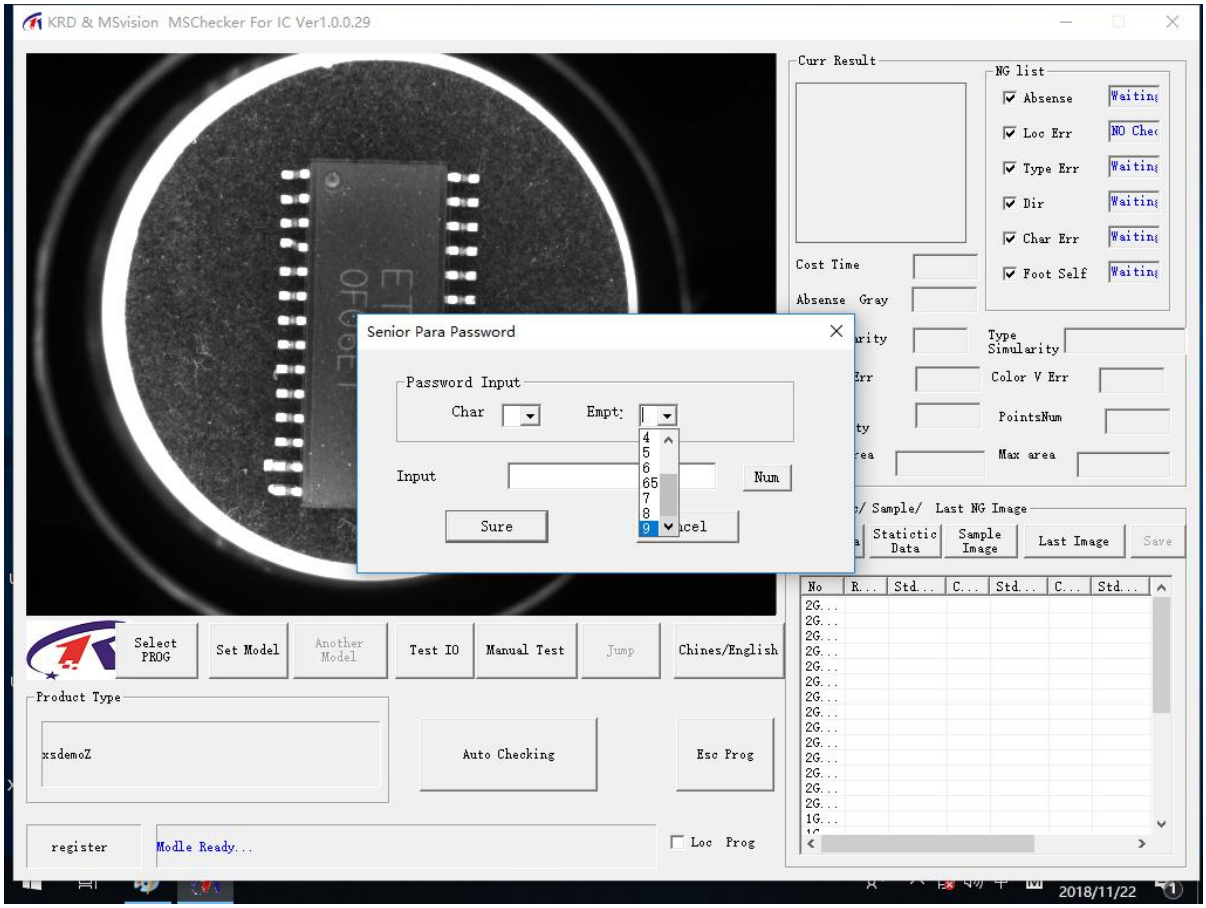


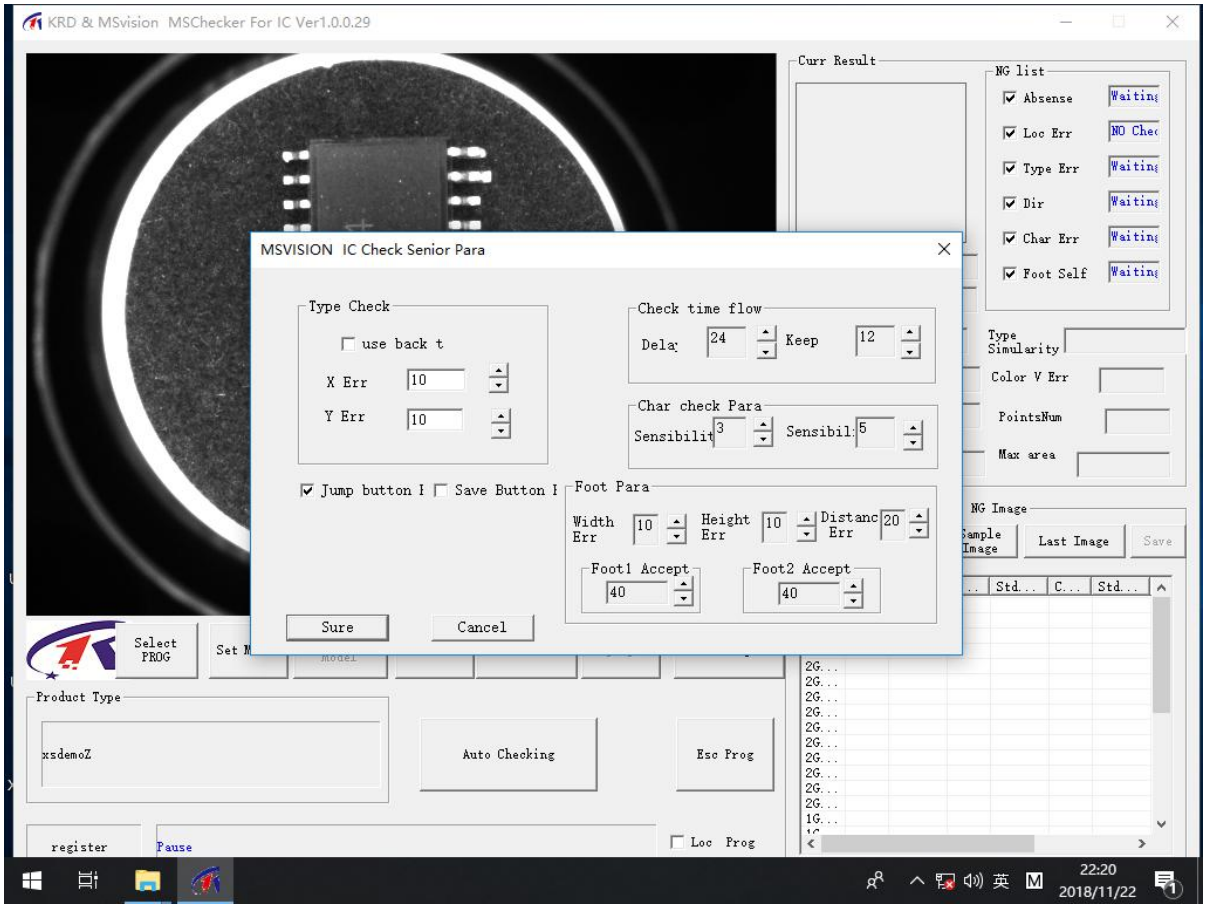
4. Program Select

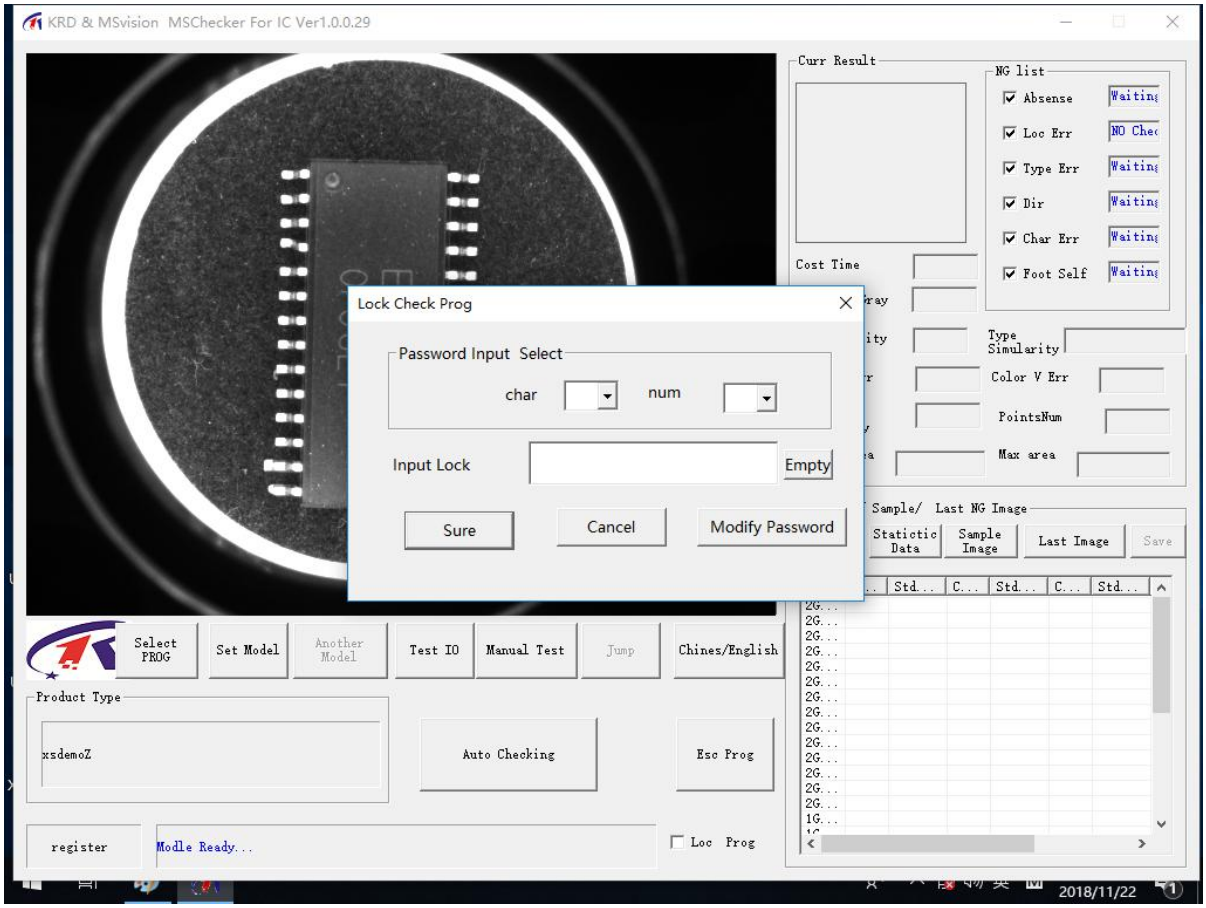


Program: check the process; Program of checking,which is stored in the D:\ checkmodel directory, according to the user definition of the product model name, by selecting the program file way, select a different product; Once the program is choose, then all the test parameters are called in. If you successfully call in, you can see that the new product model name is displayed in the product model, and the standard inspection sample image or NG image in the lower right corner of the screen shows the sample image of the model product. Check it against it and confirm that it is correct. Then the test can be carried out.




KRD & MSvision MSChecker For IC Ver1.0.0.29
Curr Result
NG list
Absense
Loc Err
Type Err
Dir
Char Err
Foot Self
Cost Time
Absense Gray
Type Simularity
Color V Err
PointsNum
Max area
Senior Para Password
Password Input
Char
Empt:
Input
Num
Sure
Cancel
Sample/ Last NG Image
Statictic Data
Sample Image
Last Image
Save
Select PROG
Set Model
Another Model
Test IO
Manual Test
Jump
Chines/English
Product Type
xsdemoZ
Auto Checking
Esc Prog
register
Modle Ready...
Loc Prog
2018/11/22


KRD & MSvision MSChecker For IC Ver1.0.0.29
Curr Result
NG list
Absense
Loc Err
Type Err
Dir
Char Err
Foot Self
MSVISION IC Check Senior Para
Type Check
use back t
X Err
Y Err
Check time flow
Dela
Keep
Char check Para
Sensibilit
Sensibil
Jump button I
Save Button I
Foot Para
Width Err
Height Err
Distanc Err
Foot1 Accept
Foot2 Accept
Sure
Cancel
Type Simularity
Color V Err
PointsNum
Max area
NG Image
Last Image
Save
Select PROG
Product Type
xsdemoZ
Auto Checking
Esc Prog
register
Pause
Loc Prog
22:20
2018/11/22



(End of Documents).

Any questions please do not hesitate to contact us:

Shenzhen Mictrack Electronics Co.,Ltd.

Add: B305-306, Kangsheng Electronic Industrial Park, Zhonghua Rd, Longhua District, Shenzhen, China 518131

Tel: +86-755-21014699

Web: www.tapereelmachine.com

Email: info@tapereelmachine.com