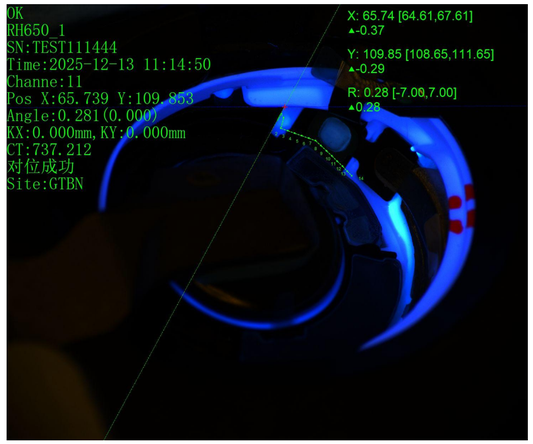
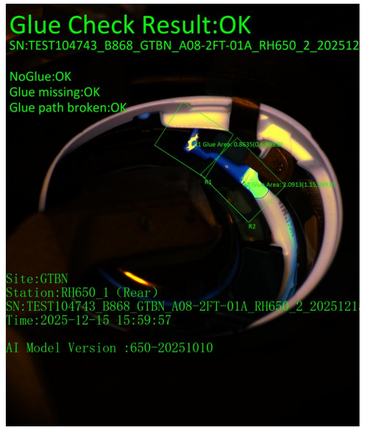
H650

Audio | B868 AM Vision/Glue Path Summary MIL

Legend: Ready | On-track | At risk (non-blocking) | At risk (blocking)

Station ID	Station Description	Vendor	Process Type		MIL
H650		BZ	Dispense		



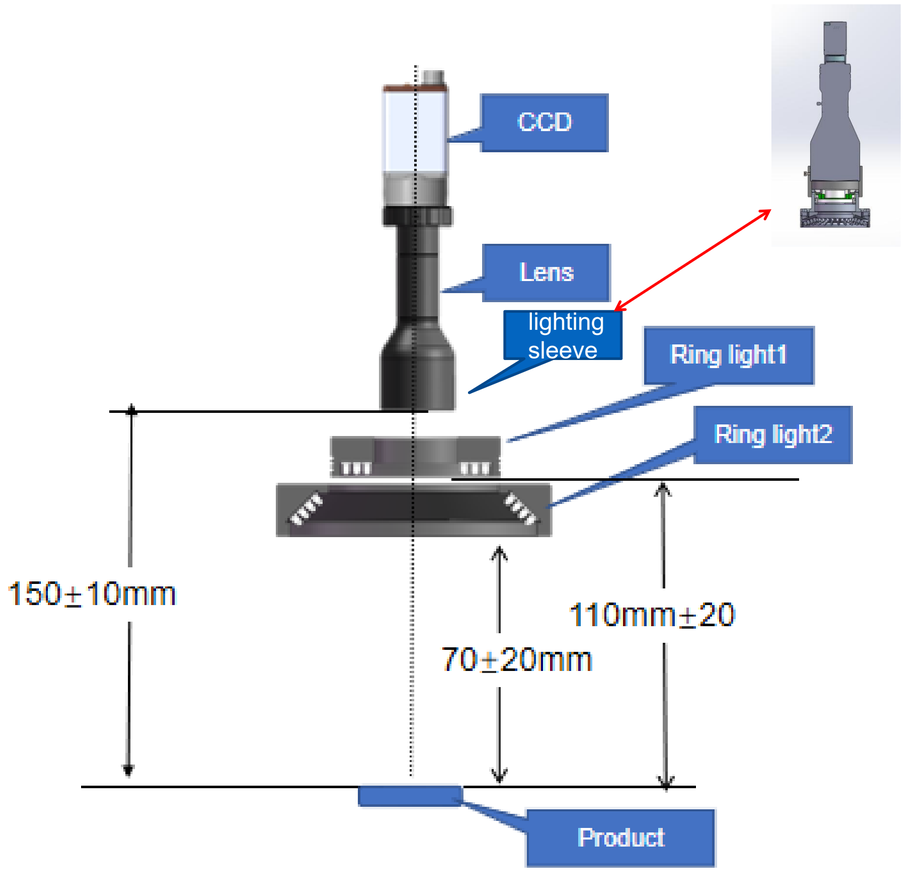


主程序 | 删除 | 单点参数 | 速度参数 | 生产模式

序号	指令类型	X	Y	Z	U	V	参数1	参数2	参数3	参数4	注释	X相对差值	Y相对差值	Z相对差值	U相对差值	V相对差值
1	定位	0	0	0	0	0	速度:300	TwoMark	次数:0							
2	线头	65.785	109.277	0	27	-70	速度:30	Z轴高...	飞行...	延后...	11	0.042	-0.435	0	0	0
3	延时						延时s...									
4	线中	65.896	108.836	0	27	-70	速度:24			延后...	22	0.153	-0.876	0	0	0
5	延时						延时s...									
6	线中	65.612	108.736	0	27	-70	速度:24			延后...	3	-0.131	-0.976	0	0	0
7	线中	65.328	108.637	0	27	-70	速度:24			延后...	4	-0.415	-1.075	0	0	0
8	线中	65.044	108.537	0	27	-70	速度:24			延后...	5	-0.699	-1.175	0	0	0
9	线中	64.76	108.437	0	27	-70	速度:24			延后...	6	-0.983	-1.275	0	0	0
10	线中	64.476	108.338	0	27	-70	速度:24			延后...	77	-1.267	-1.374	0	0	0
11	线中	64.257	108.129	0	27	-70	速度:24			延后...	8	-1.486	-1.583	0	0	0
12	线中	64.038	107.919	0	27	-70	速度:24			延后...	9	-1.705	-1.793	0	0	0
13	线中	63.82	107.71	0	27	-70	速度:24			延后...	10	-1.923	-2.002	0	0	0
14	线中	63.601	107.501	0	27	-70	速度:24			延后...	11	-2.142	-2.211	0	0	0
15	线中	63.382	107.292	0	27	-70	速度:30			延后...	122	-2.361	-2.42	0	0	0
16	延时						延时s...									
17	线中	63.189	107.098	0	27	-70	速度:30			延后...	13	-2.554	-2.614	0	0	0
18	线尾	62.997	106.905	0	27	-70	速度:30	Z轴高...	提前...		144	-2.746	-2.807	0	0	0
19	定位	0	0	0	0	0	速度:300	TwoMark	次数:99							
	结束															

Vision solution description: The CCD takes pictures from top to bottom, locates the product position, guides the machine to dispense, and then rechecks after the dispense is completed.

CCD imaging structure;

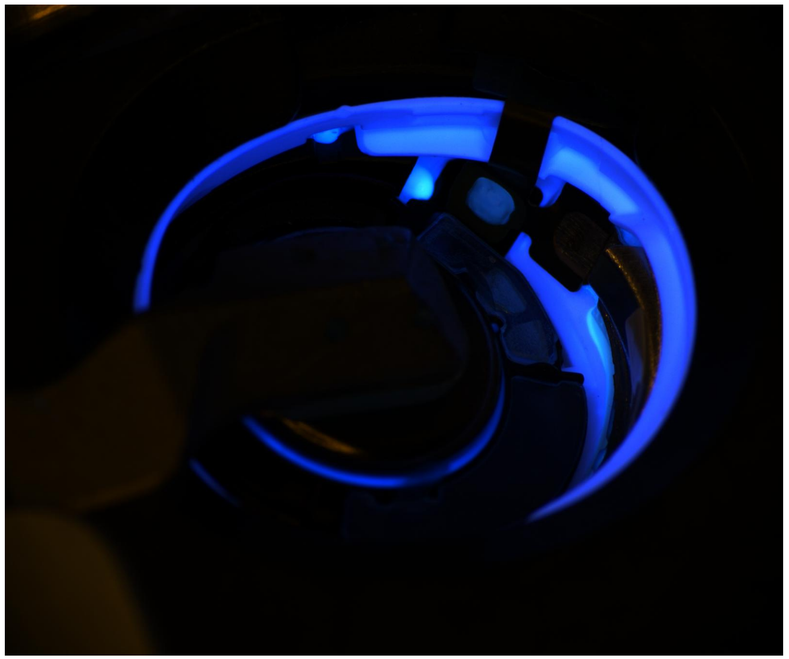


Vision System Diagram

Parameter		
Pixels	FOV	Resolution
2448*2048	21*17.5mm	0.008mm/pixel

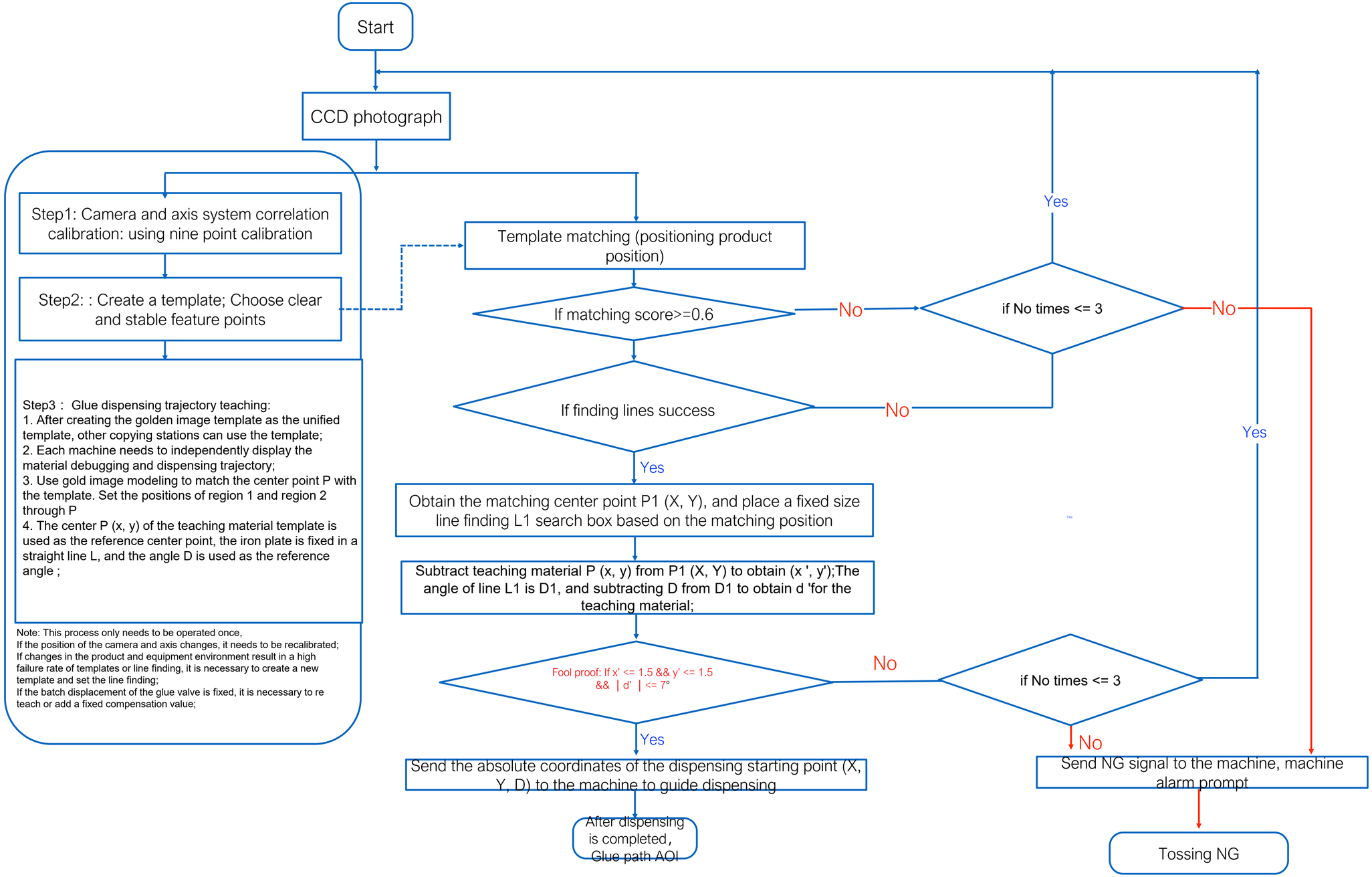
BOM(for Dual_station)			
Item	Type	Brand	Quantity
Camera	LY-H500C	Luster	1
Lens	EGXD-RDTD-150-04	Luster	1
Light1	RBM-HRL5390-W	Luster	1
Light2	RBM-HRL9070-UV365-PM	Luster	1
License	VW-VA-SW-GLUE10	Luster	1

Glue path 1
Golden image1

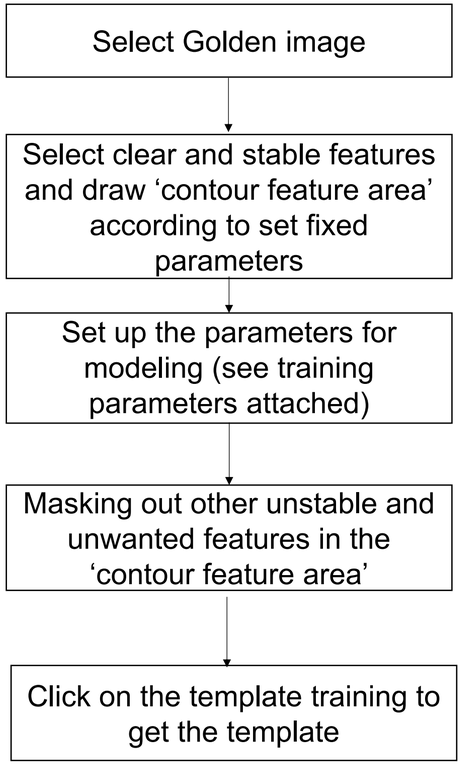


Detailed parameters of golden image1	
Pixel dimension	0.008mm/pixel
CCD resolution	2448*2048
Lens resolution	1000W, 1’
FOV	21*17.5mm
DOV	2.5mm
Lightning Brightness	200
Exposure time	50ms

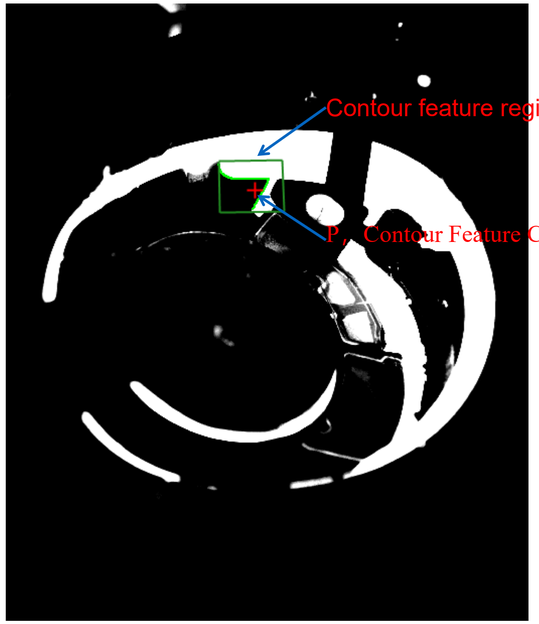
Audio | RH650 Vision Flow | Glue path 1 – Workflow



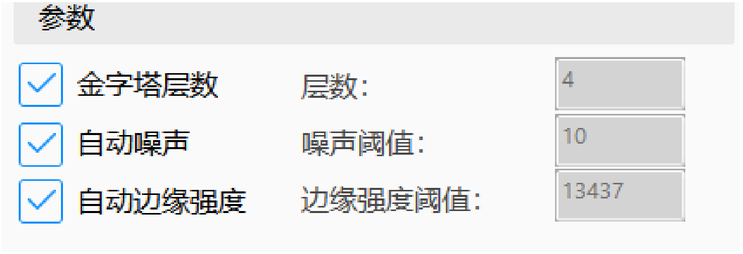
Pose 1 Vision Workflow



Modeling Process



Template



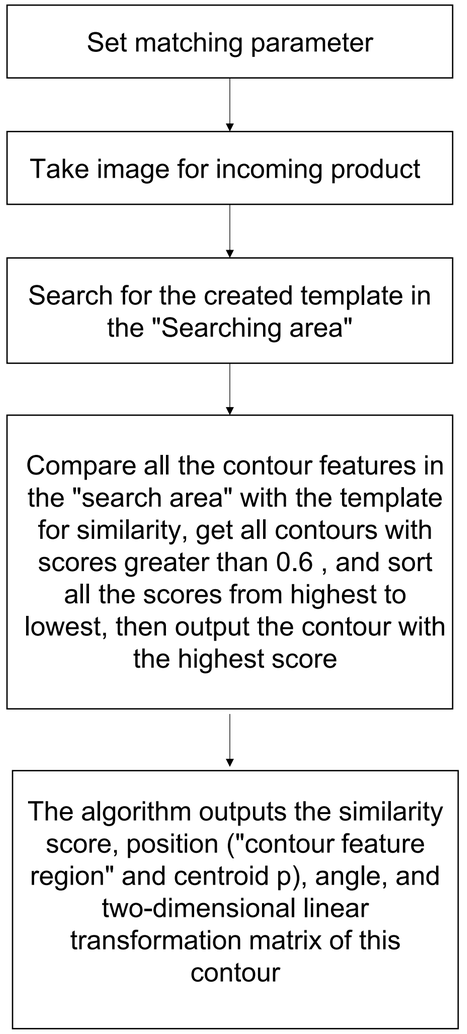
Training parameters

Modeling feature requirements：
1. Stable and clear outline edge, no dirty
2. Do not have multi-layer, complex contours
3. Search area, do not have a close shape of the edge of the contour

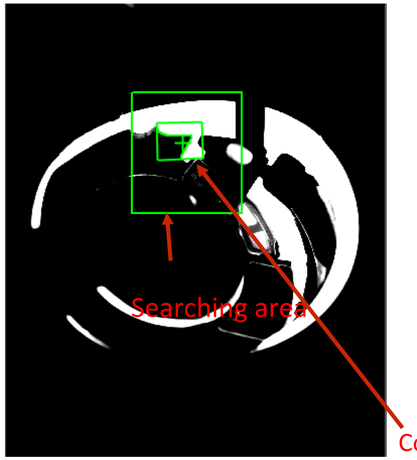
When modeling, make good use of the masking function to mask out the unwanted edge contour features. Leaving only stable and clear contour features

After the modeling is completed, need offline test with all the previous material images to confirm the compatibility of this template for all incoming materials.

Subsequent parameter changes need to be synchronized and updated to all other machines in this station.



Matching process



Actual Materials

Matching parameter

According to the template, establish the coordinate system, use the p point as a fixed offset, get the search box's center of finding line tool and finding contour tool

↓

According to the set parameters and caliper parameters, find the correct line L1 and correct line L2

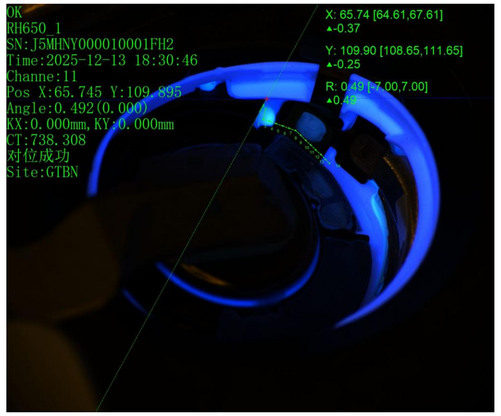
↓

Get intersection P as the demonstrate point by L1 and L2

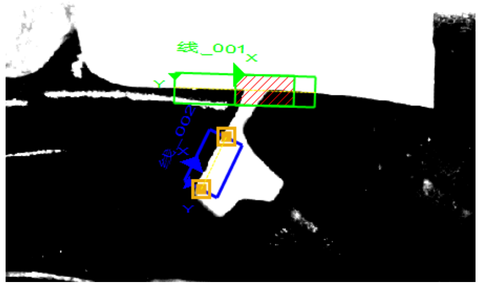
↓

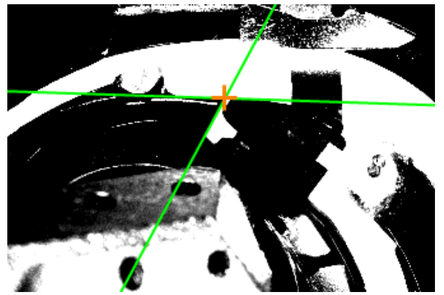
Point P is the guiding point

Point demonstration process



Actual Materials





L1 Caliper parameters

L2 Caliper parameters

Incoming material requirements:
1. to ensure that the difference between the material and the modeled material can not be too large (visual inspection can not have obvious differences in the structure)
2. dirty, foreign matter also can not have a lot, can not obscure the modeled features;

According to the template, establish the coordinate system, use the p point as a fixed offset, get the search box's center of finding line tool and finding contour tool

↓

According to the set parameters and caliper parameters, find the correct line L1 and correct line L2

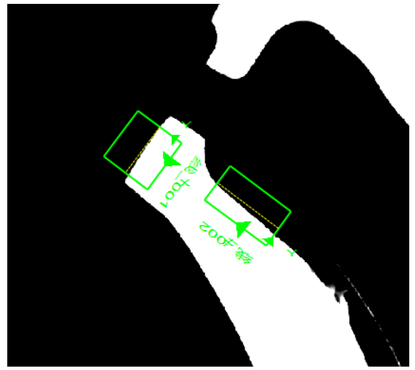
↓

Get intersection P as the demonstrate point by L1 and L2

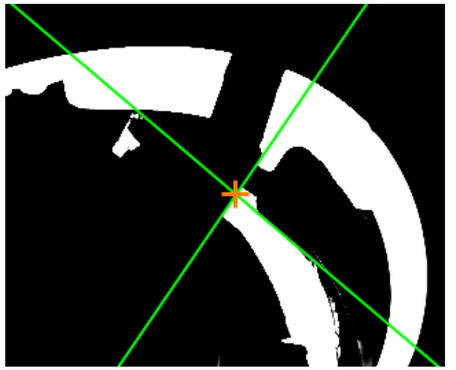
↓

Point P is the guiding point

Point demonstration process



L1 Caliper parameters



L2 Caliper parameters

Incoming material requirements:
1. to ensure that the difference between the material and the modeled material can not be too large (visual inspection can not have obvious differences in the structure)
2. dirty, foreign matter also can not have a lot, can not obscure the modeled features;

Glue Path AOI MSOP

The algorithm, inspection definition and spec of the glue path AOI.

H650 | Glue path AOI Product Glue Path Edge

No Glue

The areas of the glue > 0mm²

Glue Coverage-Shift

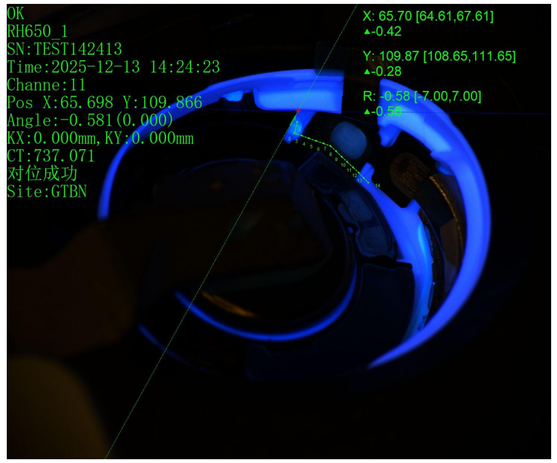
The R1 coverage line should be >= 80% covered by glue path

Glue Missing

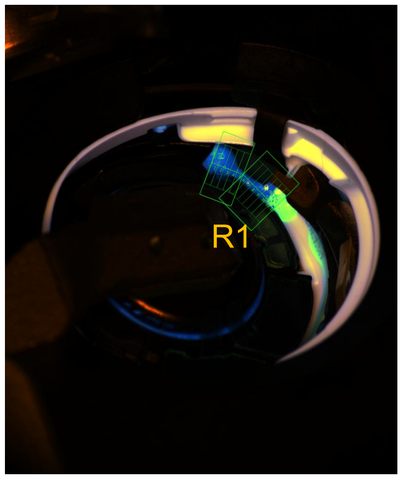
Glue Broken

The gap of glue breakage ≤ 0.1 mm

Pre-dispense image



Post-dispense image



Legend:

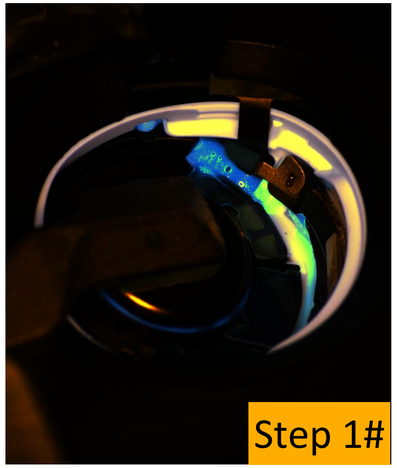
- Glue Path Edge
- Glue Coverage Line
- Glue Area Region
- Keep out zone

Pix accuracy:0.0086mm/pix

Region	No Glue	Glue Coverage-Shift	Glue Missing-Area	Glue Broken
R1	Glue area > 0mm²	≥80%	Glue area > 0.6mm²	≤0.1mm

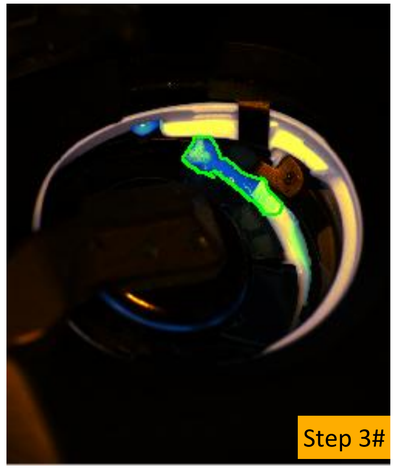
Region	No Glue	Glue Coverage-Shift	Glue Missing-Area	Glue Broken
R2	Glue area > 0mm²	≥80%	Glue area > 1.12mm²	≤0.1mm

Audio | Glue path AOI Product Glue Path Edge



Source image (post-dispense)

extract glue color



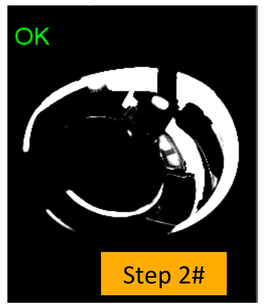
extract result

missing
Step 2#

The purpose of this process is used to extract the Glue path
Step 1# Capture pose1 source image
Step 2# Extract the color of glue path
Step 3# Inspect the glue path

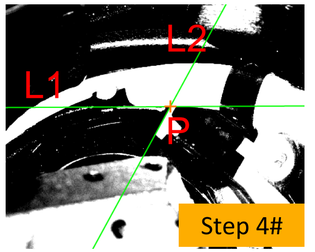
Audio | Glue path AOI Glue Area Region

RGB to gray

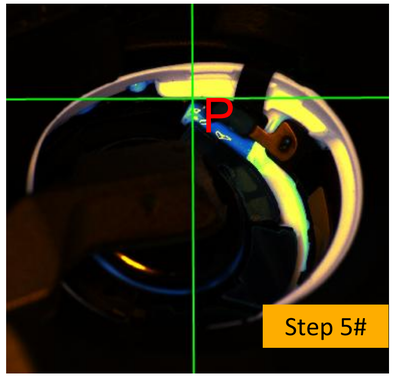


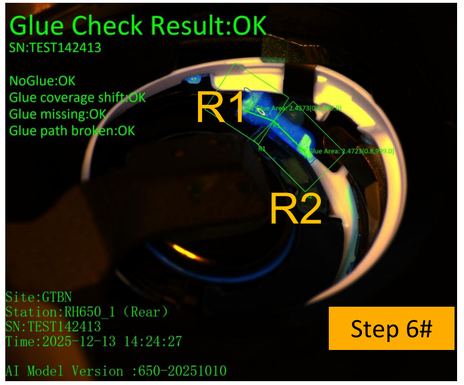
pattern match

find line/circle



Create
coordinate system





Index	CenterX	CenterY	StartAngle	Angle	R	Width	Length
1	-0.583	-1.344	--	32.524	--	2.599	3.018

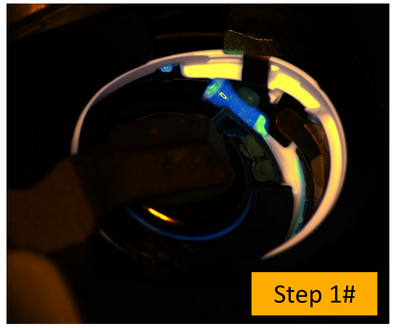
R1

Index	CenterX	CenterY	StartAngle	Angle	R	Width	Length
1	2.174	0.448	--	44.503	--	2.599	3.404

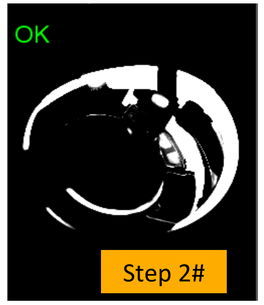
R2

The purpose of this process is used to find the position for dispense and region for coverage inspection:
Step 1# Capture pos1 source image
Step 2# RGB image to gray image
Step 3# Pattern match to get the place of the product
Step 4# Grab the product characteristics of line to obtain L1&L2, P is intersection point of L1&L2
Step 5# Establish a product coordinate system by using P and golden line
Step 6# Place the glue inspection region according to product coordinate system

Audio | Glue path AOI Glue Area Region

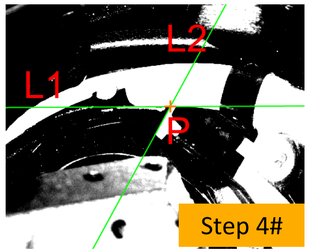


RGB to gray

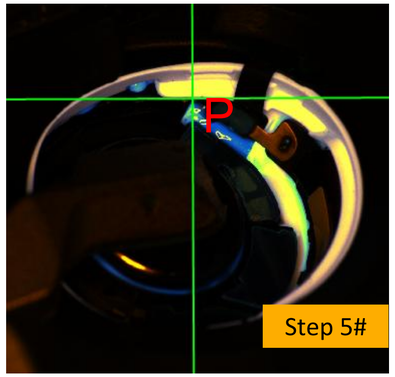


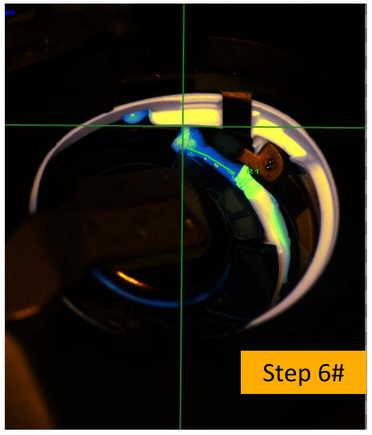
pattern match

find line/circle



Create
coordinate system





Index	CenterX	CenterY	StartAngle	Angle	R	Width	Length
1	-0.153	0.870	--	19.290	--	0.017	1.503

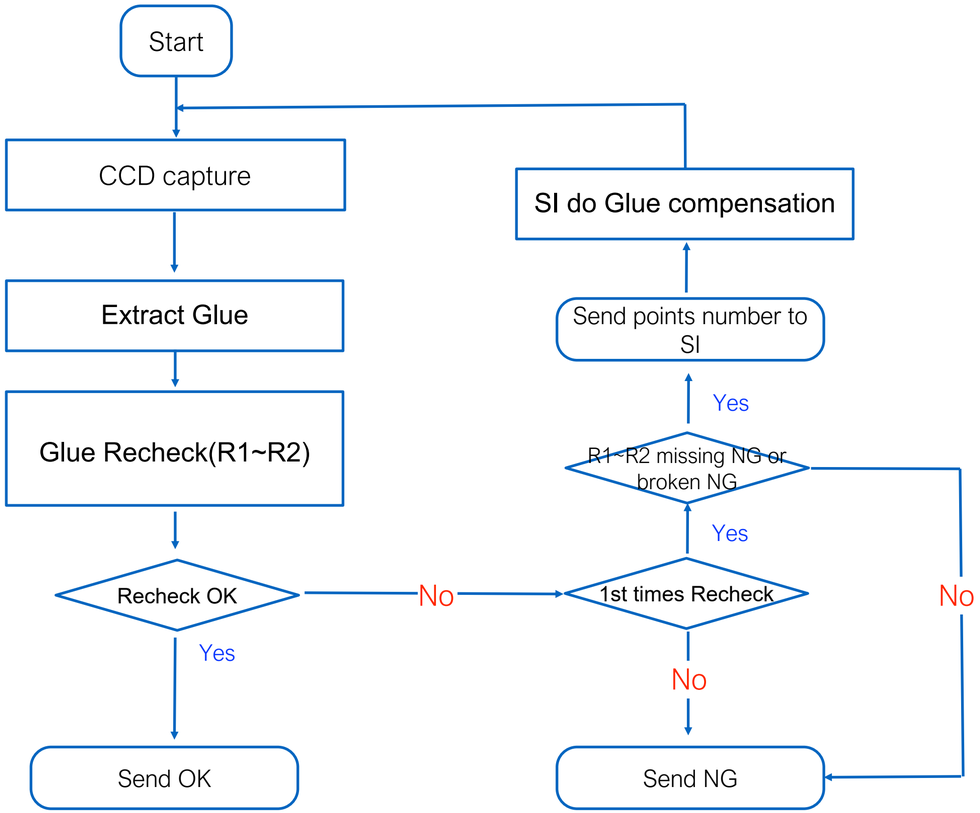
R1

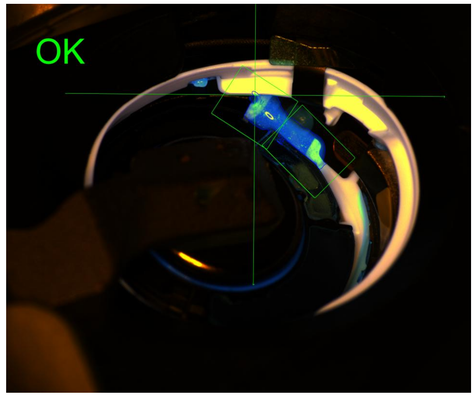
Index	CenterX	CenterY	StartAngle	Angle	R	Width	Length
1	1.269	1.368	--	44.177	--	0.017	2.057

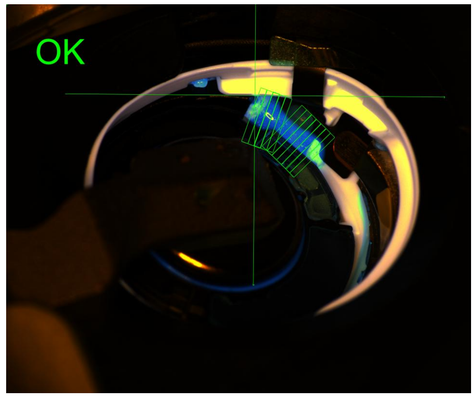
R2

The purpose of this process is used to find the position for dispense and region for coverage inspection:
Step 1# Capture pos1 source image
Step 2# RGB image to gray image
Step 3# Pattern match to get the place of the product
Step 4# Grab the product characteristics of line to obtain L1&L2, P is intersection point of L1&L2
Step 5# Establish a product coordinate system by using P and golden line
Step 6# Place the glue inspection region according to product coordinate system

H650 | Glue path AOI Product Glue Compensation



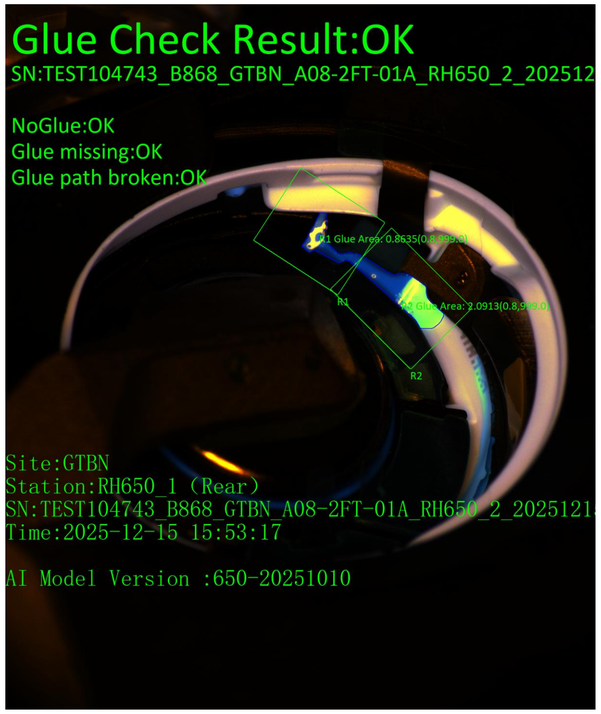


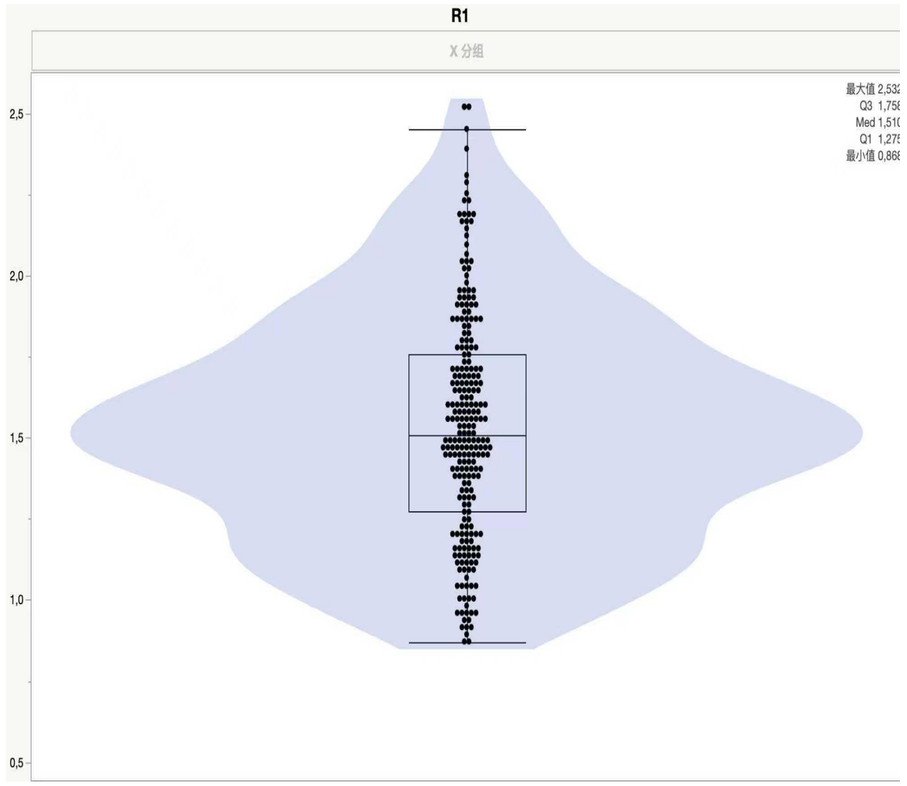


Pose1_Missing_R1 MIN: 0.868

Pose1_Missing_R1 MAX: 2.5318

Pose1_Missing_R1 Data





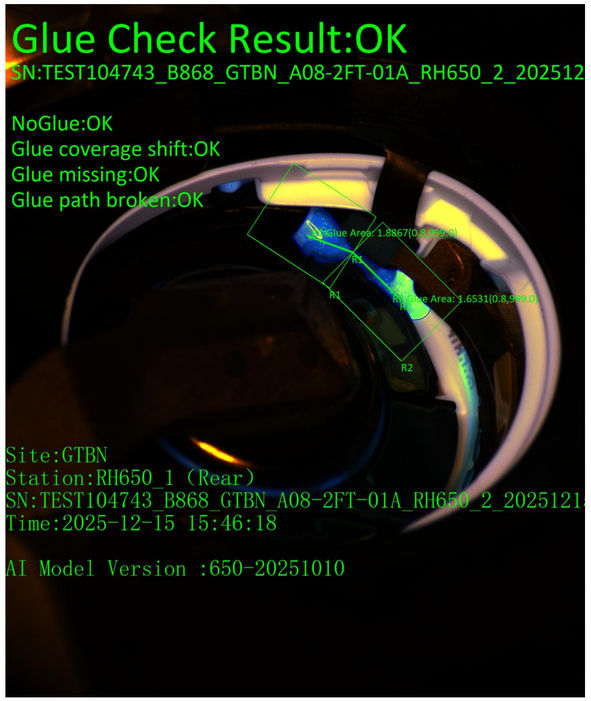
R1 Missing spec= Pose1_Missing_R1 MIN*0.7=0.868*0.7=0.6076

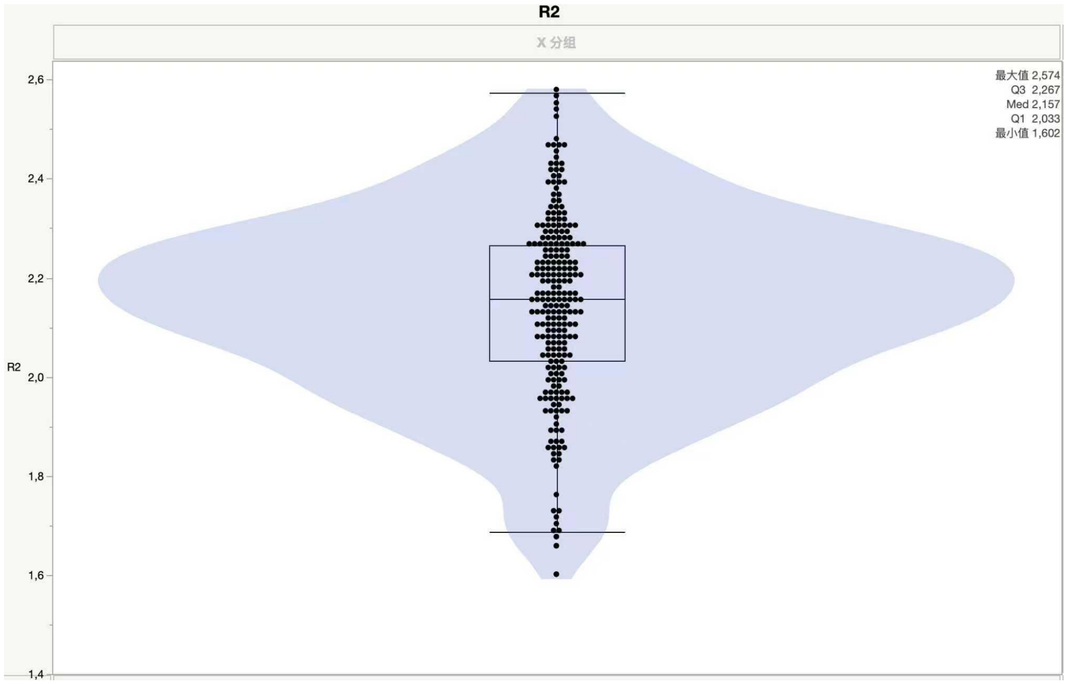
H650 | Glue path AOI Product glue Inspection logic

Pose1_Missing_R2 MIN: 1.602

Pose1_Missing_R2 MAX: 2.5742

Pose1_Missing_R2 Data





R2 Missing spec= Pose1_Missing_R2 MIN*0.7=1.602*0.7=1.1214