

3D IN-LINE INSPECTION SYSTEMS



Operation Manual

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Revision History

| Date | Version | Remark |
|---------------|---------|-----------------------------|
| June 2018 | 1.0 | Renewal of Operation Manual |
| November 2018 | 1.1 | Regular Update |
| February 2019 | 1.2 | Updated Safety Labels |
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Table of Contents

| | |
|---|-----------|
| Safety Precautions | 5 |
| Caution/Danger/Warning..... | 5 |
| Lock-out & Tag-out Procedures..... | 6 |
| Operating Switch | 7 |
| Interlock System Signal and Action | 9 |
| Safety Labels and Signs | 10 |
| Location of Safety Labels..... | 13 |
| Before Operation | 17 |
| During Operation | 18 |
| | |
| SPI Operation | 19 |
| Powering On the System | 19 |
| Starting Inspection | 20 |
| Defect Viewer | 22 |
| Changing JOB file..... | 22 |
| Shutting Down the System..... | 23 |
| S/W Bypass Mode | 23 |
| H/W Bypass Mode | 23 |
| | |
| AOI Operation | 24 |
| Powering on the System..... | 24 |
| Running the Program..... | 25 |
| Starting Inspection | 25 |
| Determining Defect Results on the Defect Viewer..... | 28 |
| Judgement..... | 28 |
| The Explanation of the Defect Viewer | 28 |
| Determining Defect Result on the Review Station. | 29 |
| Judgement..... | 29 |
| Screen Layout | 29 |
| Stopping Inspections..... | 30 |
| Bypass Modes | 30 |
| Minimizing Programs | 30 |
| AOIGUI..... | 30 |
| Review Station & AOI SPC | 30 |
| Closing Programs | 30 |
| AOIGUI..... | 30 |
| Review Station & AOI SPC | 30 |
| When appearing Fiducial Error window..... | 31 |
| When deactivating START button | 31 |
| Shortcut Keys | 32 |

Trademarks

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Product specifications may change without prior notice.

Safety Precautions

Incorrect operation may cause a safety accident or system malfunction. Please follow the following precautions.

Caution/Danger/Warning

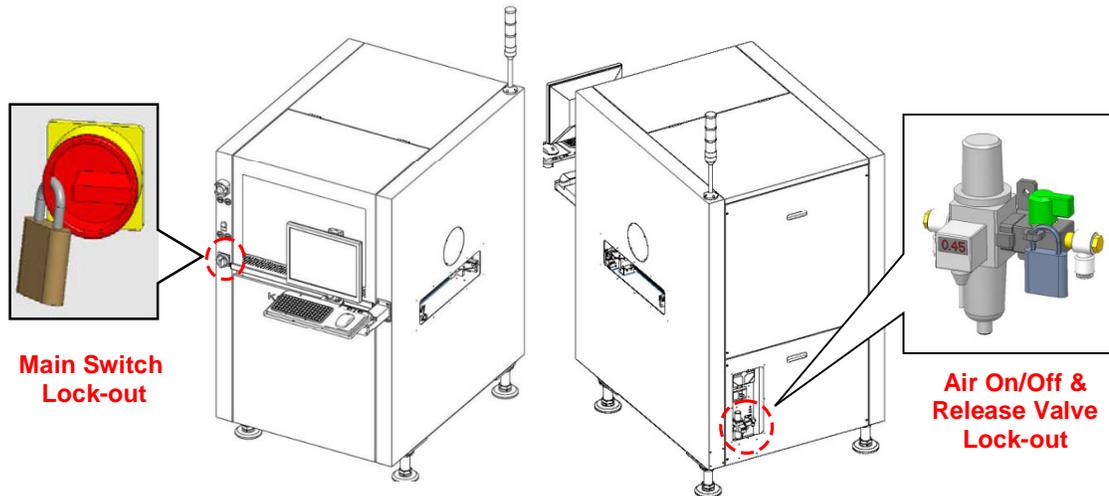
- ✓ Read and familiarize yourself with the following precautions before operating the system.
- ✓ Read and familiarize yourself with the precautions in safety labels placed on the system.
- ✓ Make sure to comply with these precautions to prevent any unexpected safety hazard or damage that may occur during system operation
- ✓ **Safety labels** are classified as Danger, Warning, Caution, Prohibition, and Mandatory as follows.

| | |
|---|--|
|  <p>Danger</p> | <p>Danger – An immediately hazardous situation that may result in death or major injury, or damage to the system.</p> |
|  <p>Warning</p> | <p>Warning – A potentially hazardous situation that may result in major or minor injury, or damage to the system.</p> |
|  <p>Caution</p> | <p>Caution – A potentially hazardous situation that may result in major or minor injury, or damage to the system.</p> |
|  <p>Prohibition</p> | <p>Prohibition – Prohibitive Actions.</p> |
|  <p>Mandatory</p> | <p>Mandatory – A required action to be taken to avoid the danger.</p> |

Lock-out & Tag-out Procedures

For safe maintenance and repair work of the machine, a lockable Main Switch is installed on the machine. This is a safety device that prevents other workers from turning on power or Air On/Off and Release Valve when the operator is performing maintenance and repair work. Lock-out & Tag-out is the required safety procedures which must be followed when carrying out Type 1 Task or other safety-related works.

For Lock-out & Tag-out, follow the steps below.



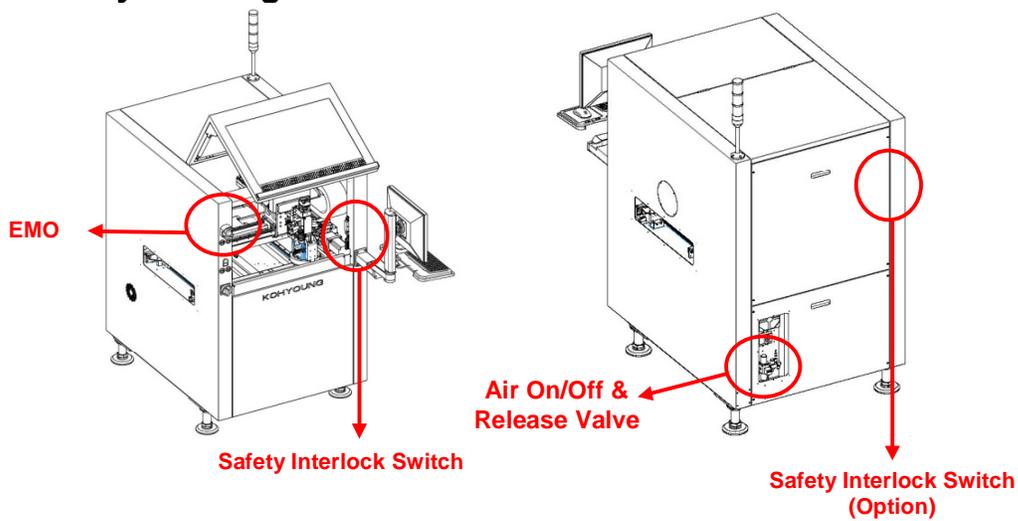
1. Turn off the Main Switch and the Air On/Off and Release Valve and lock them out, and then perform Tag-out indicating the maintenance is in progress (Lock-out & Tag-out). The operator should carry the key to the lock.
2. Proceed with the required work.
3. After completing the work, unlock the Main Switch and the Air On/Off and Release Valve and turn on the power.
4. Turn ON the computer power switch and then operate the control programs.

Operating Switch

| | | |
|---|---|--|
|  | <p>Main Switch</p> | <p>A switch to turn ON or OFF the main power of the system</p> |
|  | <p>Emergency Stop/ Emergency Off</p> | <p>A switch to use when an emergency or safety hazard occurs during system operation.</p> <ul style="list-style-type: none"> • How to operate: 3 Tower lamps will flash when (EMS/EMO) switch is pressed. The system will stop immediately, and the main power will be turned off. • How to repair: Pull the (EMS/EMO) switch after the problem is fixed. Then press the start button or click the start button on the screen. |
|  | <p>Start Button</p> | <p>A button to activate the PCB inspection. When the green button is pressed or the start button on the main program is clicked, PCB inspection will be activated.</p> |
|  | <p>Stop Button</p> | <p>A button to pause the system momentarily. When the red button is pressed or the stop button on the main program is clicked, the system will be paused.</p> |
|  | <p>Control Power Switch</p> | <p>Supplies power to the sensors and control boards of the system.</p> |
|  | <p>Control Power Lamp</p> | <p>Displays whether the control power is on or not.</p> |

| | | |
|---|---------------------------------------|--|
|  | <p>Main Power Lamp</p> | <p>Displays whether the main power is on or not.</p> |
|  | <p>Safety Interlock Switch</p> | <ul style="list-style-type: none"> • How to operate: When the cover of the device is opened the safety interlock switch will automatically stop the system. • How to repair: Close the cover of the device and press the start button or click the start button on the left side of the monitor. |

Interlock System Signal and Action



| Interlock System | Related Switch | Delay Time | Tower Lamp Color | H/W S/W | Action 1 Actuator Power | Action 2 Power State of Machine-Safety circuits and computer systems excluded |
|---|------------------------------|------------|------------------|---------|--------------------------|---|
| If EMO is Activated | EMO | 0 sec | Red | H/W | Servo Motor Power Off | Turn Off Machine |
| If EMO is Inactivated | EMO | 0 sec | Green | H/W | Servo Motor Power On | Turn On Machine |
| If Door Interlock Switch is Activated (Lockable Type Safety Interlock Switch) | Door Interlock Switch1 | 0 sec | Red | H/W | Servo Motor Power Off | Turn Off Machine |
| If Door Interlock Switch is Inactivated (Lockable Type Safety Interlock Switch) | Door Interlock Switch1 | 0 sec | Green | H/W | Servo Motor Power On | Turn On Machine |
| If Door Interlock Switch is Activated (Magnetic Type Safety Interlock Switch) | Door Interlock Switch2 | 0 sec | Red | H/W | Servo Motor Power Off | Turn Off Machine |
| If Door Interlock Switch is Inactivated (Magnetic Type Safety Interlock Switch) | Door Interlock Switch2 | 0 sec | Green | H/W | Servo Motor Power On | Turn On Machine |
| Air On/Off and Release Valve is Activated (at Low Pressure) | Air On/Off and Release Valve | 0 sec | Red | S/W | Servo Motor Control Stop | Turn On Machine |
| Air On/Off and Release Valve Activated (at High Pressure) | Air On/Off and Release Valve | 0 sec | Red | S/W | Servo Motor Control Stop | Turn On Machine |

Safety Labels and Signs

| | |
|---|-------------------------------|
|  | <h3>General Safety Rules</h3> |
| <ul style="list-style-type: none"> • Only authorized personnel who have completed the training can use the machine, while others cannot use the machine. • If the machine is to be turned off for a long period of time, disconnect the power cable and the Air On/Off and Release Valve, and perform Lock-out & Tag-out. • When installing the machine, make sure to connect PE wire (Green and Yellow stripe). • Be careful not to contaminate the machine with foreign objects. • Perform maintenance activities according to the safety procedures specified in this document. • Do not insert your hands into the board inlet/outlet on the left and right sides of the machine when the machine is switched on. | |

| | |
|---|---|
| <h3>Electrical Danger</h3> | |
|  | <ul style="list-style-type: none"> • DANGER As a general rule, electrical work must be performed after turning off the Main Switch and performing Lock-out & Tag-out. • DANGER When the Main Switch is turned on, electrical work must be carried out according to the specified operating procedures in this document. |
|  | <ul style="list-style-type: none"> • WARNING Electrical power could still be in flow after the main power is cut. • WARNING Authorized person only. |
|  | <ul style="list-style-type: none"> • DANGER As a general rule, electrical work must be performed after turning off the Main Switch and performing Lock-out & Tag-out. • DANGER When the Main Switch is turned on, electrical work must be carried out according to the specified operating procedures in this document. |
|  | <ul style="list-style-type: none"> • WARNING Improper grounding may lead to electric shock or malfunction of the machine. • WARNING Establish and maintain protective earth grounding according to the operator's manual |

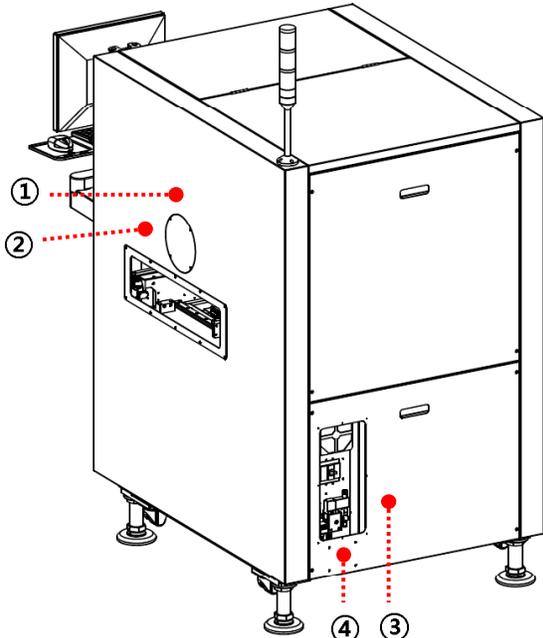
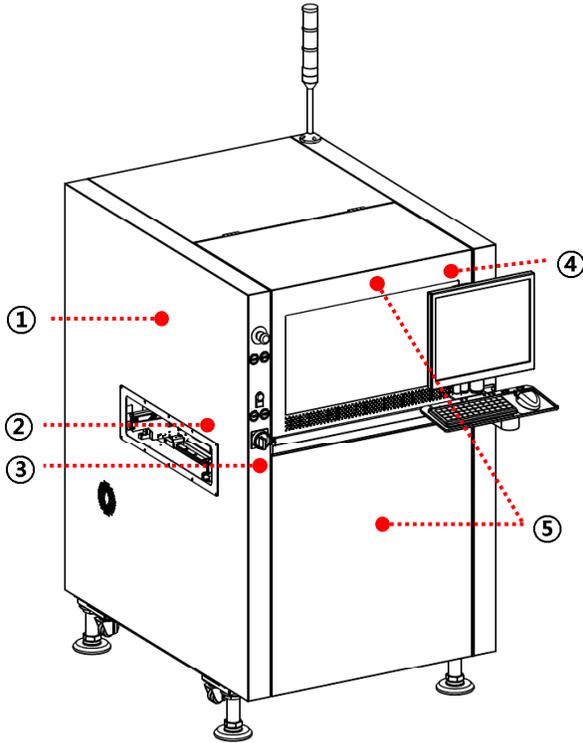
| Mechanical Danger | |
|---|---|
|  | <ul style="list-style-type: none"> • WARNING When opening the Fixed Cover, make sure to turn off the Main Switch or turn off the Control Power Switch to stop the machine. • WARNING Do not insert your hands into the PCB inlet/outlet on the left and right sides of the machine. |
|  | <ul style="list-style-type: none"> • WARNING Do not spray compressed air on skin or eyes. • WARNING When repairing pneumatic device, perform Lock-out & Tag-out on the pneumatic valves of the machine. |
|  | <ul style="list-style-type: none"> • DANGER Do not put your head into the machine while power is supplied. • DANGER Before putting any part of your body into the machine, make sure to turn OFF the Main Switch and perform Lock-out, or turn OFF the Control Power Switch. • DANGER Indicate “Danger” sign on moving parts of the device. |
|  | <ul style="list-style-type: none"> • WARNING Do not touch the device while running. • WARNING Before putting any part of your body into the machine, make sure to turn OFF the Main Switch and perform Lock-out, or turn OFF the Control Power Switch |
|  | <ul style="list-style-type: none"> • WARNING Do not open the door of the device while running. • WARNING Before putting any part of your body into the machine, make sure to turn OFF the Main Switch and perform Lock-out, or turn OFF the Control Power Switch |
|  | <ul style="list-style-type: none"> • WARNING Before conducting maintenance, make sure to turn OFF the Main Switch and perform Lock-out, or turn OFF the Control Power Switch • WARNING Before conducting maintenance, make sure to cut off the main air and release the air. |
|  | <ul style="list-style-type: none"> • DANGER Do not put your head into the machine while power is supplied. • DANGER Before putting any part of your body into the machine, make sure to turn OFF the Main Switch and perform Lock-out, or turn OFF the Control Power Switch. • DANGER Indicate “Danger” sign on moving parts of the device. |
|  | <ul style="list-style-type: none"> • WARNING When opening the Fixed Cover, make sure to turn off the Main Switch or turn off the Control Power Switch to stop the machine. • WARNING Do not insert your hands into the PCB inlet/outlet on the left and right sides of the machine. |

| | |
|---|--|
|  | <ul style="list-style-type: none"> • WARNING Do not touch the device while running. • WARNING Before putting any part of your body into the machine, make sure to turn OFF the Main Switch and perform Lock-out, or turn OFF the Control Power Switch. |
|---|--|

| | |
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| <h3>Prohibition</h3> | |
|  | <ul style="list-style-type: none"> • CAUTION Do not disassemble or modify the machine. Doing so may damage the machine. |
|  <p>WARNING Do Not Touch. Do not remove/detach the Door Safeguard Interlock Key from the keyholder. Do not disassemble without permission.</p> | <ul style="list-style-type: none"> • WARNING Do not remove or disassemble Door Interlock Switch |

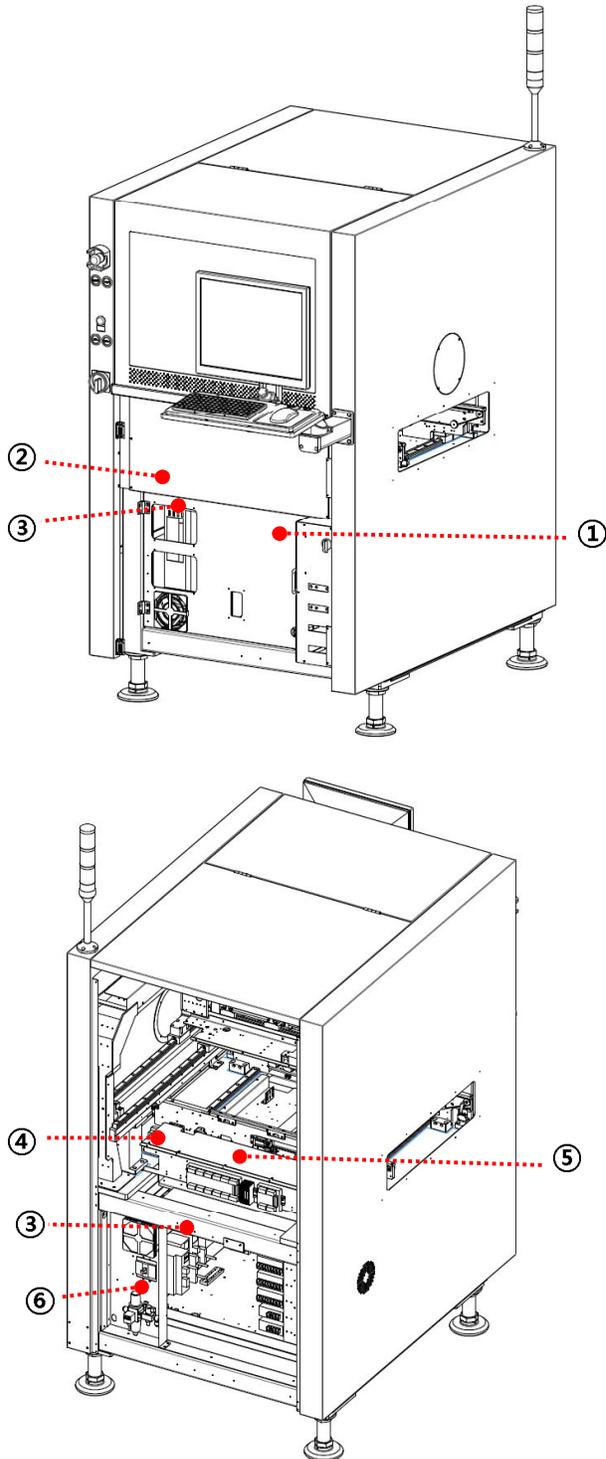
| | |
|---|---|
| <h3>Mandatory</h3> | |
|  | <ul style="list-style-type: none"> • Please read this manual thoroughly before using the machine. |
|  | <ul style="list-style-type: none"> • Please observe the procedure of Lock-out & Tag-out during maintenance work. |
|  <p>System Error. Attempting to backup data while the machine is operating may result in system error.</p> | <ul style="list-style-type: none"> • Stop the device when it is saving data. • Not stopping the device may lead to malfunctioning. |
|  <p>Use Only Specified Grease Grease Type : PS2 (NSK)</p>  <p>Use Only Specified Grease Grease Type : AFB (THK)</p> | <ul style="list-style-type: none"> • Use designated grease only. • For LM of NSK, it is recommended to use GREASE PS2. • For LM of THK, it is recommended to use GREASE AFB. |
|  <p>Pack Vision-PC separately from the equipment. Transport Vision-PC separately HDD crash may result if packaged together.</p> | <ul style="list-style-type: none"> • Separate the PC when moving the device. • Moving with the PC attached may lead to hard disk damage. |

Location of Safety Labels



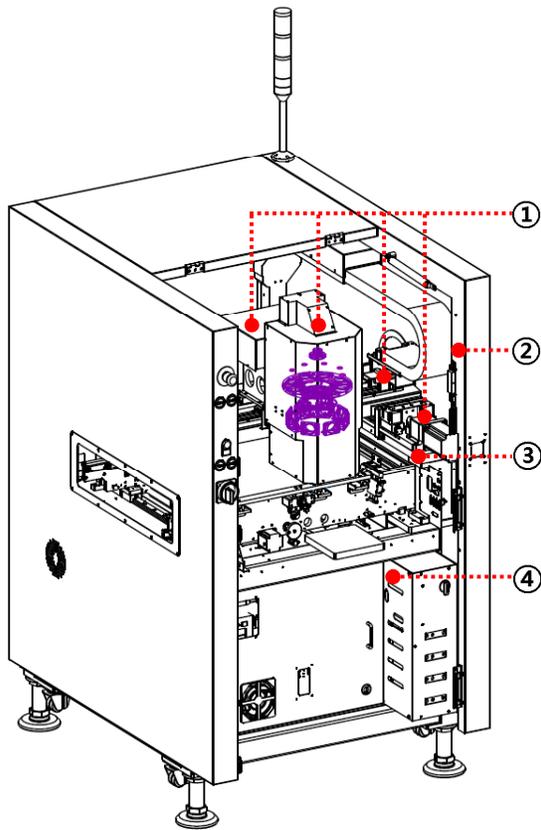
| ① | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------|--|--------------|----------------------------------|--------------|----------|---------------|----------------------|------------|------------------|---------------------|---------------------------|---------------|----------|----------------------|----------|-----------------|---------------------|----------|----------|--------|-------------------|--------------------|----------------------|----------|---------|-------------|--------|---------------------|-------|
| ② | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ③ | <div style="border: 1px solid gray; padding: 5px;"> <p style="text-align: center; margin: 0;">Maintenance Checklist</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Unit</th> <th style="text-align: left;">Checkpoints</th> <th style="text-align: center;">min</th> <th style="text-align: center;">max</th> </tr> </thead> <tbody> <tr> <td rowspan="2">X Gantry</td> <td>Lubricate Ball Screw</td> <td style="text-align: center;">V</td> <td></td> </tr> <tr> <td>Lubricate LM Guides</td> <td style="text-align: center;">V</td> <td></td> </tr> <tr> <td rowspan="2">Y Gantry</td> <td>Lubricate Ball Screw</td> <td style="text-align: center;">V</td> <td></td> </tr> <tr> <td>Lubricate LM Guides</td> <td style="text-align: center;">V</td> <td></td> </tr> <tr> <td>Filter</td> <td>Clean FAN Filters</td> <td style="text-align: center;">V</td> <td></td> </tr> </tbody> </table> <p style="font-size: small; margin-top: 5px;">※ Check regularly to avoid system malfunction and excessive noise.</p> </div> | Unit | Checkpoints | min | max | X Gantry | Lubricate Ball Screw | V | | Lubricate LM Guides | V | | Y Gantry | Lubricate Ball Screw | V | | Lubricate LM Guides | V | | Filter | Clean FAN Filters | V | | | | | | | |
| Unit | Checkpoints | min | max | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X Gantry | Lubricate Ball Screw | V | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Lubricate LM Guides | V | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y Gantry | Lubricate Ball Screw | V | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Lubricate LM Guides | V | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Filter | Clean FAN Filters | V | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ④ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ⑤ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ① | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ② | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ③ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ④ | <div style="border: 1px solid gray; padding: 5px;"> <p style="text-align: center; margin: 0; font-size: x-small;">KOH YOUNG TECHNOLOGY Inc.</p> <table style="width: 100%; font-size: x-small;"> <tr><td>Product Name</td><td>: Advanced 3D Inspection Machine</td></tr> <tr><td>Model Number</td><td>: KYB30C</td></tr> <tr><td>Serial Number</td><td>: CP_01_2019P_XXXX</td></tr> <tr><td>Trade Name</td><td>: Advanced V1930</td></tr> <tr><td>Voltage</td><td>: 220VAC, 1Phase, 50/60Hz</td></tr> <tr><td>Rated Current</td><td>: 1.4A</td></tr> <tr><td>Control Mode</td><td>: G-Code</td></tr> <tr><td>Proximate Power</td><td>: 0.5 ~ 0.8 W/m</td></tr> <tr><td>Capacity</td><td>: 2.0 kg</td></tr> <tr><td>Weight</td><td>: 600 kg</td></tr> <tr><td>Machine Dimensions</td><td>: 1000 x 1200 x 1927</td></tr> <tr><td>IP Class</td><td>: IP 20</td></tr> <tr><td>Drawing No.</td><td>: KYB3</td></tr> <tr><td>Year of Manufacture</td><td>: '19</td></tr> </table> <p style="font-size: x-small; margin-top: 5px;">Manufactured by KOH YOUNG TECHNOLOGY Inc. 10F, Hyeon Digma Valley, 345-1, G0, Gyeongsan-Do [Sales/Service Dept.] : 82-2-8343-6000 Fax : 82-2-8343-6001 Home page : www.kohyoung.com</p> <div style="text-align: right; font-size: 2em; font-weight: bold; margin-top: 10px;">CE</div> <p style="text-align: right; font-size: x-small; margin-top: 5px;">Made in Korea</p> </div> | Product Name | : Advanced 3D Inspection Machine | Model Number | : KYB30C | Serial Number | : CP_01_2019P_XXXX | Trade Name | : Advanced V1930 | Voltage | : 220VAC, 1Phase, 50/60Hz | Rated Current | : 1.4A | Control Mode | : G-Code | Proximate Power | : 0.5 ~ 0.8 W/m | Capacity | : 2.0 kg | Weight | : 600 kg | Machine Dimensions | : 1000 x 1200 x 1927 | IP Class | : IP 20 | Drawing No. | : KYB3 | Year of Manufacture | : '19 |
| Product Name | : Advanced 3D Inspection Machine | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Voltage | : 220VAC, 1Phase, 50/60Hz | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Control Mode | : G-Code | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Machine Dimensions | : 1000 x 1200 x 1927 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IP Class | : IP 20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Drawing No. | : KYB3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Year of Manufacture | : '19 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

※ **Note:** The location of the safety labels and the appearance of the machine may vary depending on the model.

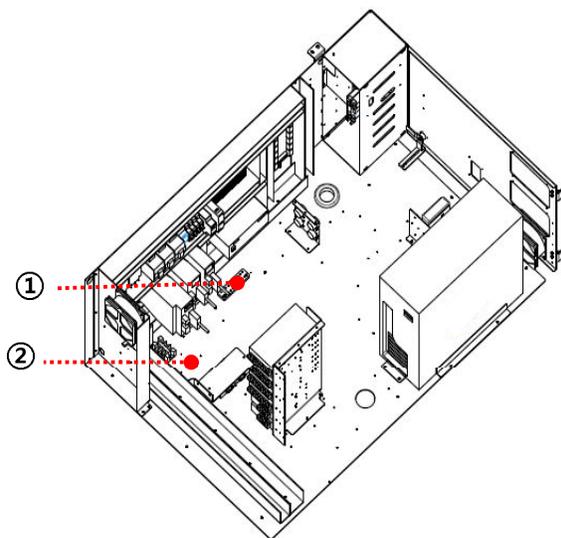


| | |
|---|--|
| ① |  <p>Pack Vision-PC separately from the equipment. Transport Vision-PC separately. HDD crash may result if packaged together.</p> |
| ② |  <p>System Error. Attempting to backup data while the machine is operating may result in system error.</p> |
| ③ |  |
| ④ |  <p>Solenoid Valve</p> <p>This unit is to be serviced by authorized personnel only. 此設備僅由合格人員操作。 禁止接近(特許人員除外) 許可された者以外は触れない事</p> |
| ⑤ |  <p>⚠ DANGER</p> <p>Electric Shock Hazard Turn off main power before performing maintenance.</p> |
| ⑥ |  |

※ **Note:** The location of the safety labels and the appearance of the machine may vary depending on the model.



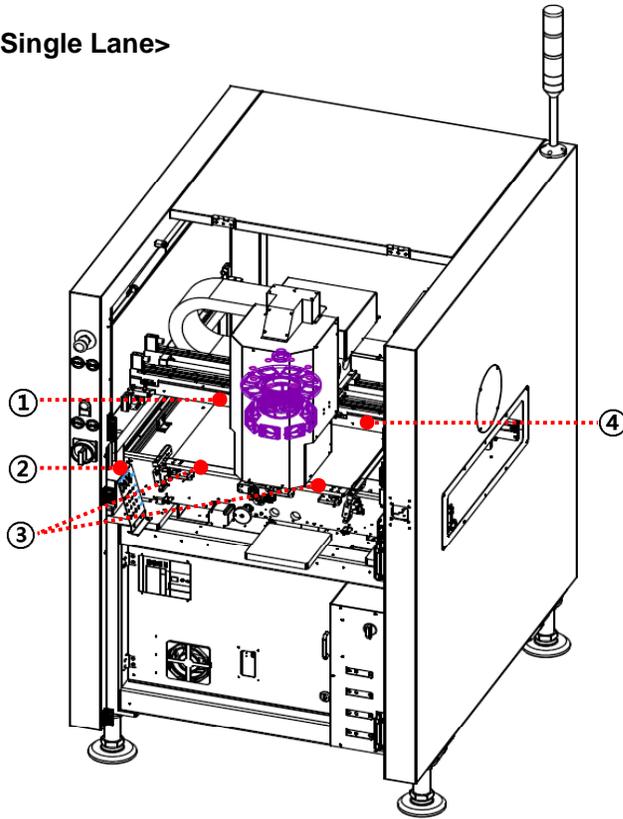
| | |
|---|--|
| ① |  |
| ② |  <div data-bbox="1073 426 1247 537"> <p>⚠ WARNING Do Not Touch. Do not remove/detach the Door Safeguard interlock Key from the keyholder. Do not disassemble without permission.</p> </div> |
| ③ |  <div data-bbox="1073 573 1247 684"> <p>Use Only Specified Grease Grease Type : AFB (THK)</p> </div> |
| ③ |  <div data-bbox="1073 720 1247 831"> <p>Use Only Specified Grease Grease Type : PS2 (NSK)</p> </div> |
| ④ |  <div data-bbox="1073 867 1247 978"> <p>⚠ DANGER Electric Shock Hazard Turn off main power before performing maintenance.</p> </div> |



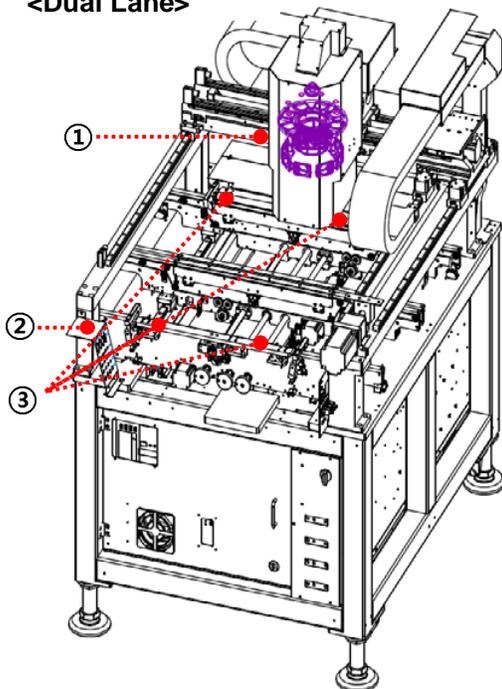
| | |
|---|---|
| ① |  <div data-bbox="1073 1209 1247 1320"> <p>⚠ WARNING PROTECTIVE EARTH. Establish and maintain protective earth ground according to the operator's manual.</p> </div> |
| ② |  <div data-bbox="1073 1356 1247 1467"> <p>⚠ WARNING Electric Shock Hazard Electric current is live even when the machine is idle. Unit must be serviced by authorized personnel only.</p> </div> |

※ **Note:** The location of the safety labels and the appearance of the machine may vary depending on the model.

<Single Lane>



<Dual Lane>



| | |
|---|--|
| ① |  <div style="border: 1px solid black; padding: 5px;"> <p>DANGER</p> <p>Crush hazard</p> </div> |
| ② |  |
| ③ |  |
| ④ | <div style="border: 1px solid black; padding: 5px;">  <p>Use Only Specified Grease Grease Type : AFB (THK)</p> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;">  <p>Use Only Specified Grease Grease Type : PS2 (NSK)</p> </div> |

※ **Note:** The location of the safety labels and the appearance of the machine may vary depending on the model.

Before Operation

- ✓ **DANGER:** Ground the GND terminal using a copper wire with a cross-section area greater than 2.0mm² before using the system. Otherwise, there may be an electric shock or noise.
- ✓ **DANGER:** Avoid contact between the system's moving mechanical parts and your body, clothing or other objects. Make sure to check if it is safe before supplying power to the system.
- ✓ **CAUTION:** Make sure that the system is turned off before slowly supplying compressed air to the system for normal system operation.
- ✓ **CAUTION:** Make sure to check the system before connecting its power cable to the power supply.
- ✓ **WARNING:** Restrict use or maintenance of the system to persons trained for system operation and maintenance.
- ✓ **CAUTION:** If a natural disaster such as an earthquake, flood or fire occurs, stop system operation immediately and remove the power cable.
- ✓ **CAUTION:** Do not locate flammable materials or gas near the system. This may lead to explosion or fire.

During Operation

- ✓ **DANGER:** If a hazardous situation occurs during system operation, press the Emergency OFF Switch (EMO) immediately and set the Main Switch to OFF.
- ✓ **DANGER:** When more than one person is engaged in system operation, ensure proper communication to prevent any unforeseen accidents.
- ✓ **DANGER:** Do not open the Fixed Cover during system operation. This may lead to personal injury or damage.
- ✓ **DANGER:** If abnormal conditions occur during system operation, make sure to shut down power to the system before taking necessary actions.
- ✓ **DANGER:** When the green tower lamp is ON, handle the system with care as the system is in automatic operation even though it appears to have stopped.
- ✓ **DANGER:** If users notice anything unusual in the operation of the system, stop the system first and then shut down the power.
- ✓ **DANGER:** Do not attempt to stop the operation of safety interlock. Also, periodically check that interlocks are working properly. Malfunctioning of the safety interlock may lead to system errors or personal injury or damage.
- ✓ **DANGER:** Do not operate the system when the Fixed Cover is open. Ignoring this safety instruction can lead to operator wounds / injuries.
- ✓ **WARNING:** Turn the system off during part replacement or system calibration. When the system has completely stopped, remove the power cable from the power supply and then follow the required steps for replacement or calibration.
- ✓ **WARNING:** Make sure to keep hands and other objects out of the buffer conveyor on either side. Ignoring safety instructions can lead to operator wounds / injuries.
- ✓ **WARNING:** No person other than an operator should be allowed into the system operation area.
- ✓ **CAUTION:** Do not attempt to manipulate the various sensors attached to the conveyors on the left and right sides of the system by yourself. This may lead to system errors or other problems.

SPI Operation

Powering On the System

1. Open the back door and set the **Main Power Circuit Breaker (MCCB)** to ON.



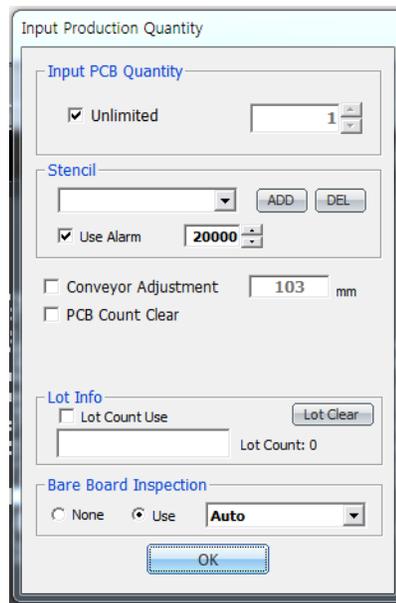
2. Turn on the **Main Switch** on the left front of the machine clockwise to supply the power and wait for about 40 seconds.



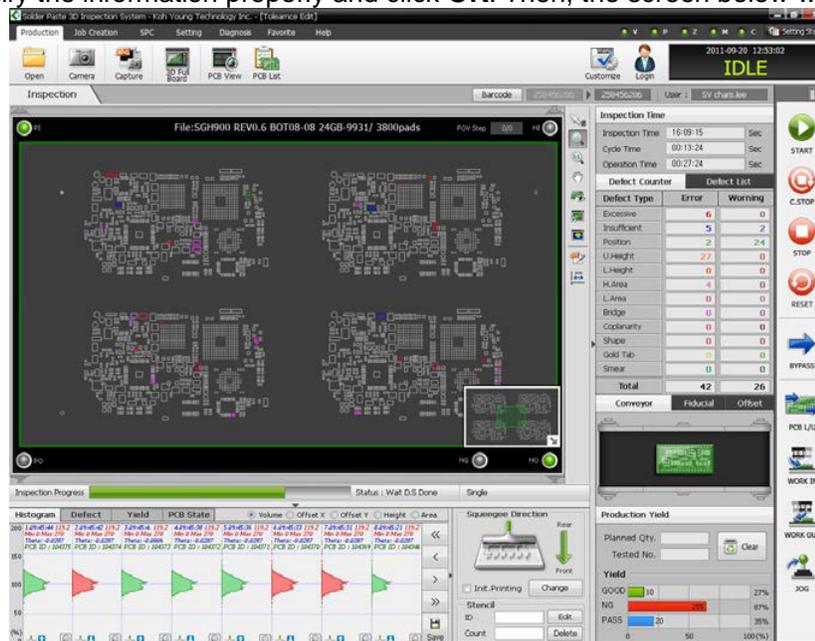
3. Once the computer is turned on, turn on the **Main Switch**.
4. Once the computer booting process is completed, turn on the **Control Power Switch** and wait for about 10 seconds.
5. When running the GUI() by clicking its icon on desktop, wait until the GUI window is opened after GUI initialization.
6. Return to the desktop and click the WinMCS() icon to run the program. Then, the system starts homing in about 20 secs.
7. When the Homing message box disappears from **GUI**, start PCB inspection.

Starting Inspection

1. Once the computer booting process is completed, double-click **KY3030.exe** on the desktop to run the program.
2. The JOB file recently used will be loaded and **Input Production Quantity** dialog box will pop up.



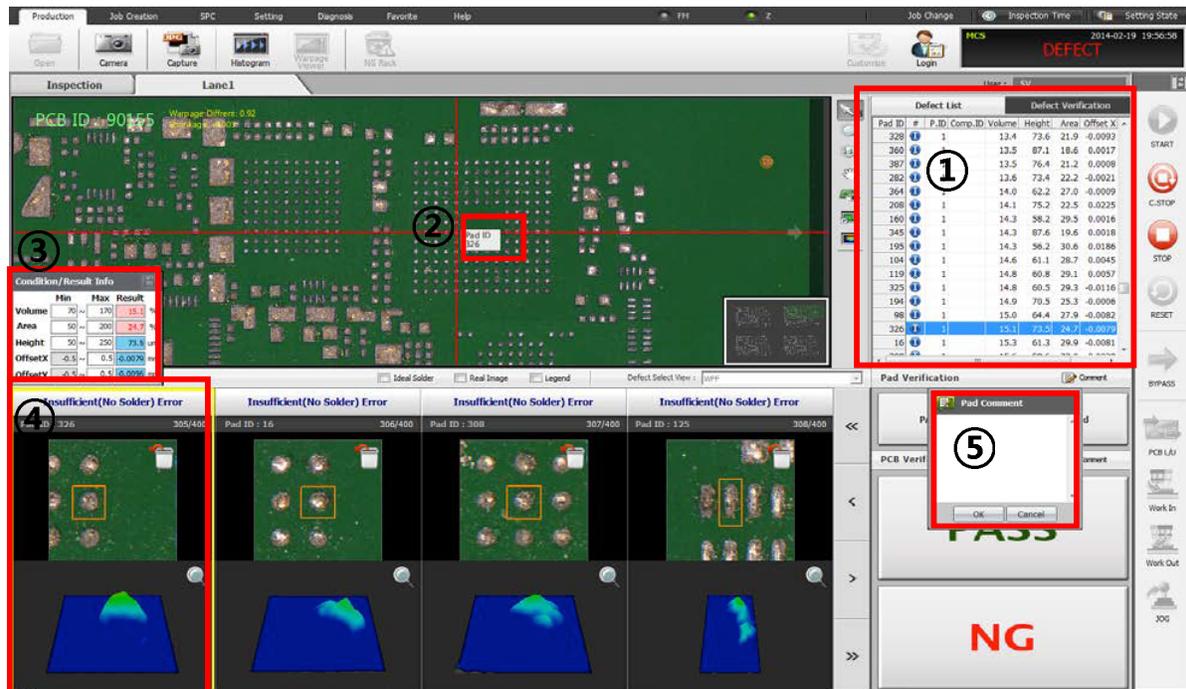
3. Specify the information properly and click **OK**. Then, the screen below will be displayed.



※ **Note:** When the Program Status Bar indicates OFF-Line, nothing is activated on the Inspection Execution Tool Bar.

4. Once the home-checking process for the system is completed, the status of machine will change into IDLE. It takes about 3 minutes.
5. Click the **Start** button on the Inspection Execution Tool Bar.
6. PCB inspection will be started.
7. If you select either 'NG' or 'Pass', the corresponding board will be ejected, and the next board will be ready for inspection.

Defect Viewer



| Item | Description |
|---------------------------------|---|
| Defect List (①) | Selects the defect pad in this list, then PCB view moves to the selected pad |
| Pad ID (②) | Displays the pad's location and Pad ID |
| Condition Info/ Result Info (③) | Displays the inspection results |
| Defect image and result (④) | Displays the selected component in PCB view Double-click the defect list to display the pads |
| Comment (⑤) | Inputs comments to the selected pad |

Changing JOB file

1. Click **Import** in main UI.
2. Once **Select JOB File** window appears, select a JOB file and click **OK**.
3. The selected JOB file will be automatically loaded.

Shutting Down the System

1. Close all programs.
2. In Windows, click the Start button and choose **Turn Off Computer**. Then, the **Turn off computer** dialog box will appear.
3. Choose **Turn Off** and click the **OK** button.
4. When the computer is turned off, turn the **Control Power Switch** counter-clockwise. Then, the **Control Power Lamp** (Green) will turn off.
5. Turn the **Main Switch** counter-clockwise. Then, the **Main Power lamp** (Red) will turn off.
6. Set the **MCCB** switch to OFF.

S/W Bypass Mode

1. Make sure that the status of the machine is IDLE.
2. Click **BYPASS** on the Left Button Bar.
3. The status of the machine will be changed to BYPASS.
4. The machine will let boards through without any inspection.

H/W Bypass Mode

※ **WARNING:** You must use this mode only in the EMERGENCY situation where the computer does not work.

1. Control Power should be turned off.
2. Open the bottom side door of the machine and turn the conveyor S/W clockwise.
3. Turn control power S/W clockwise, then the conveyor switch lamp will be turned on. The **Conveyor Only Mode** is started to work.
4. The machine will be used as a conveyor.
5. In order to go back to the normal mode, take the reverse order.

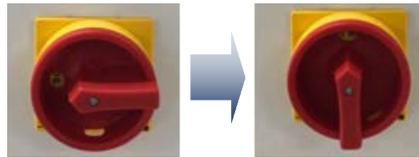
AOI Operation

Powering on the System

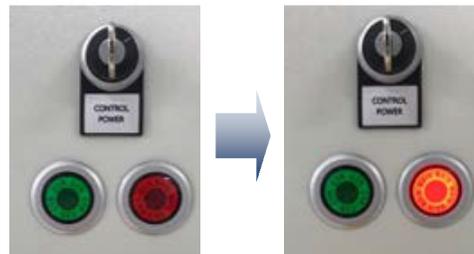
1. Switch the **Main Power Circuit Breaker** on the back of the machine to **ON**.



2. Change the **Main Switch** on the left side of the machine to **ON**.



3. Check that the **MAIN LED** lamp is lit.



4. Press the **Vision PC Power** button.
5. When the OS of the computer is completely booted, change the **Control Power Switch** located on the left side of the front to **ON**.



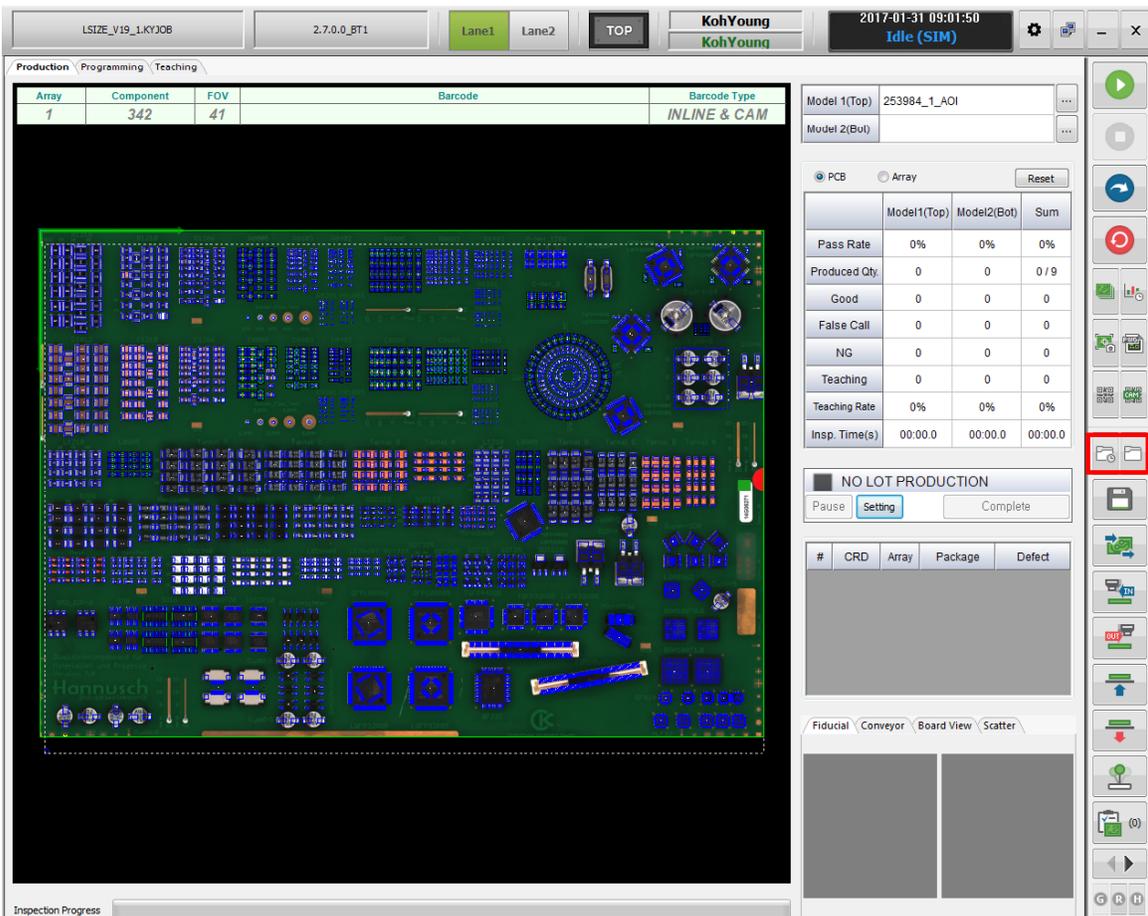
6. Check that the **Control Power Lamp** is **ON**.

Running the Program

1. Run AOIGUI.exe and WinMCS by clicking  and  on the desktop.
2. After approximately 20 seconds, the system starts homing.
3. When the Homing message box disappears on the GUI, start PCB inspection.

Starting Inspection

1. Click the  button in the AOIGUI menu to load a new JOB file. Or click the  next  button to select the JOB file you recently loaded.

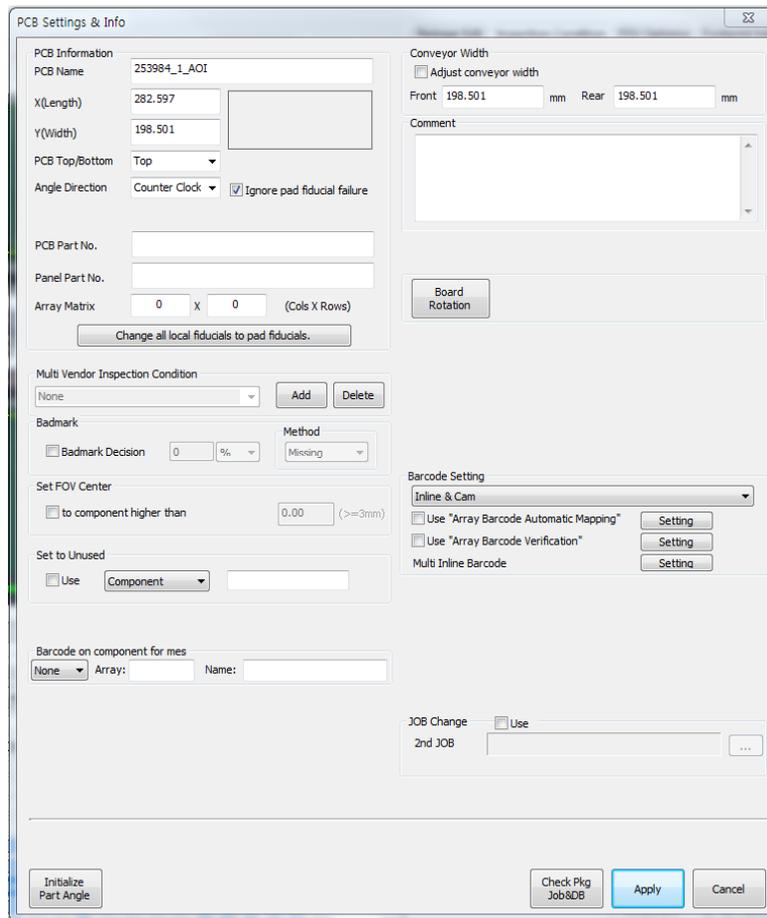


The screenshot displays the AOIGUI software interface. At the top, there are status bars for 'LSIZE_V19_1_KYJOB', '2.7.0.0_BT1', 'Lane1 Lane2', 'TOP', 'KohYoung KohYoung', and '2017-01-31 09:01:50 Idle (SIM)'. The main area is divided into several sections:

- Table:** A table with columns 'Array', 'Component', 'FOV', 'Barcode', and 'Barcode Type'. The first row shows '1', '342', '41', and 'INLINE & CAM'.
- PCB View:** A large central image showing a detailed layout of a green PCB with various components and fiducials.
- Right Panel:** Contains a 'Model' section with 'Model 1(Top)' and 'Model 2(Bot)'. Below it is a 'Pass Rate' table:

| | Model1(Top) | Model2(Bot) | Sum |
|---------------|-------------|-------------|---------|
| Pass Rate | 0% | 0% | 0% |
| Produced Qty | 0 | 0 | 0 / 9 |
| Good | 0 | 0 | 0 |
| False Call | 0 | 0 | 0 |
| NG | 0 | 0 | 0 |
| Teaching | 0 | 0 | 0 |
| Teaching Rate | 0% | 0% | 0% |
| Insp. Time(s) | 00:00.0 | 00:00.0 | 00:00.0 |
- Bottom Panel:** Shows 'NO LOT PRODUCTION' with 'Pause', 'Setting', and 'Complete' buttons. Below is a table with columns '#', 'CRD', 'Array', 'Package', and 'Defect'. At the bottom, there are tabs for 'Fiducial', 'Conveyor', 'Board View', and 'Scatter'.

2. The **PCB Settings & Info** window appears when loading a JOB file.



PCB Settings & Info

PCB Information
 PCB Name: 253984_1_AOI
 X(Length): 282.597
 Y(Width): 198.501
 PCB Top/Bottom: Top
 Angle Direction: Counter Clock Ignore pad fiducial failure

Conveyor Width
 Adjust conveyor width
 Front: 198.501 mm Rear: 198.501 mm

Comment

Board Rotation

Multi Vendor Inspection Condition
 None [Add] [Delete]

Badmark
 Badmark Decision 0 % Method: Missing

Set FOV Center
 to component higher than 0.00 (>=3mm)

Set to Unused
 Use Component

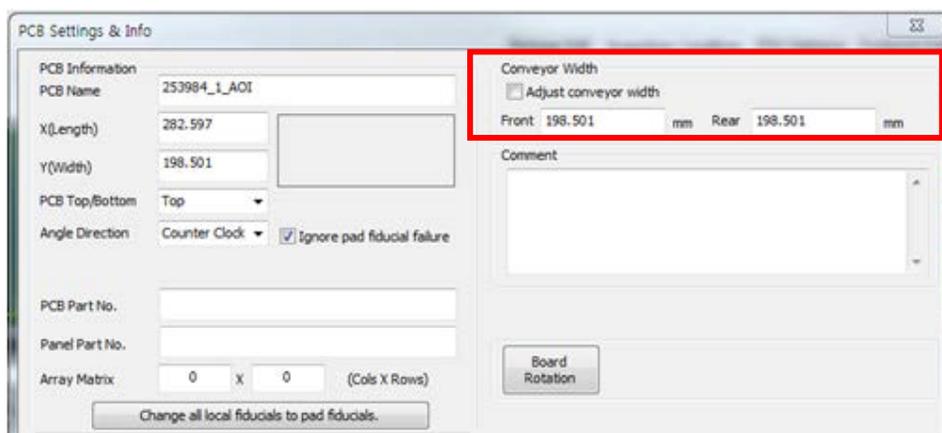
Barcode on component for mes
 None Array: Name:

Barcode Setting
 Inline & Cam
 Use "Array Barcode Automatic Mapping" [Setting]
 Use "Array Barcode Verification" [Setting]
 Multi Inline Barcode [Setting]

JOB Change Use
 2nd JOB

Initialize Part Angle [Check Pkg Job&DB] [Apply] [Cancel]

3. Click 'Adjust conveyor width' in **Conveyor Width**.



PCB Settings & Info

PCB Information
 PCB Name: 253984_1_AOI
 X(Length): 282.597
 Y(Width): 198.501
 PCB Top/Bottom: Top
 Angle Direction: Counter Clock Ignore pad fiducial failure

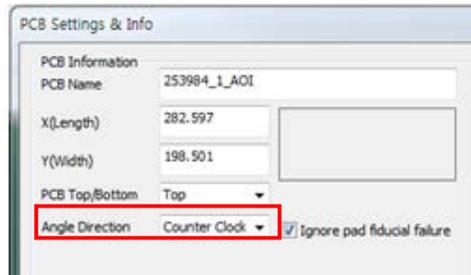
Conveyor Width
 Adjust conveyor width
 Front: 198.501 mm Rear: 198.501 mm

Comment

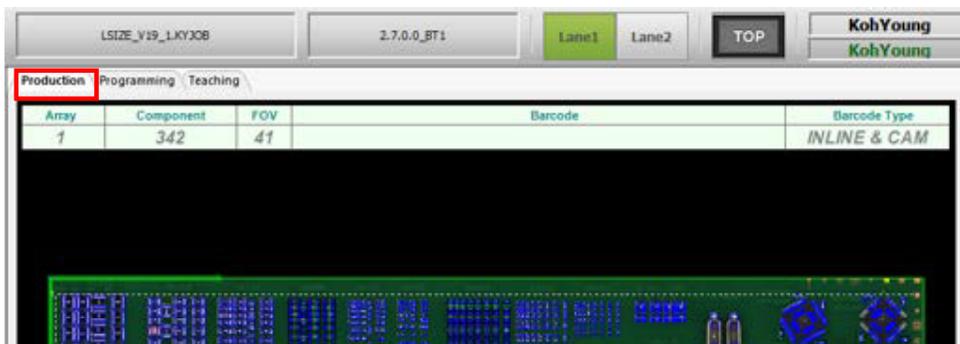
Board Rotation

Change all local fiducials to pad fiducials.

4. Set **Angle Direction** either 'Clockwise' or 'Counter Clockwise'.



5. Click **Apply**.
6. After the conveyor width adjusts automatically, click **Production** menu.



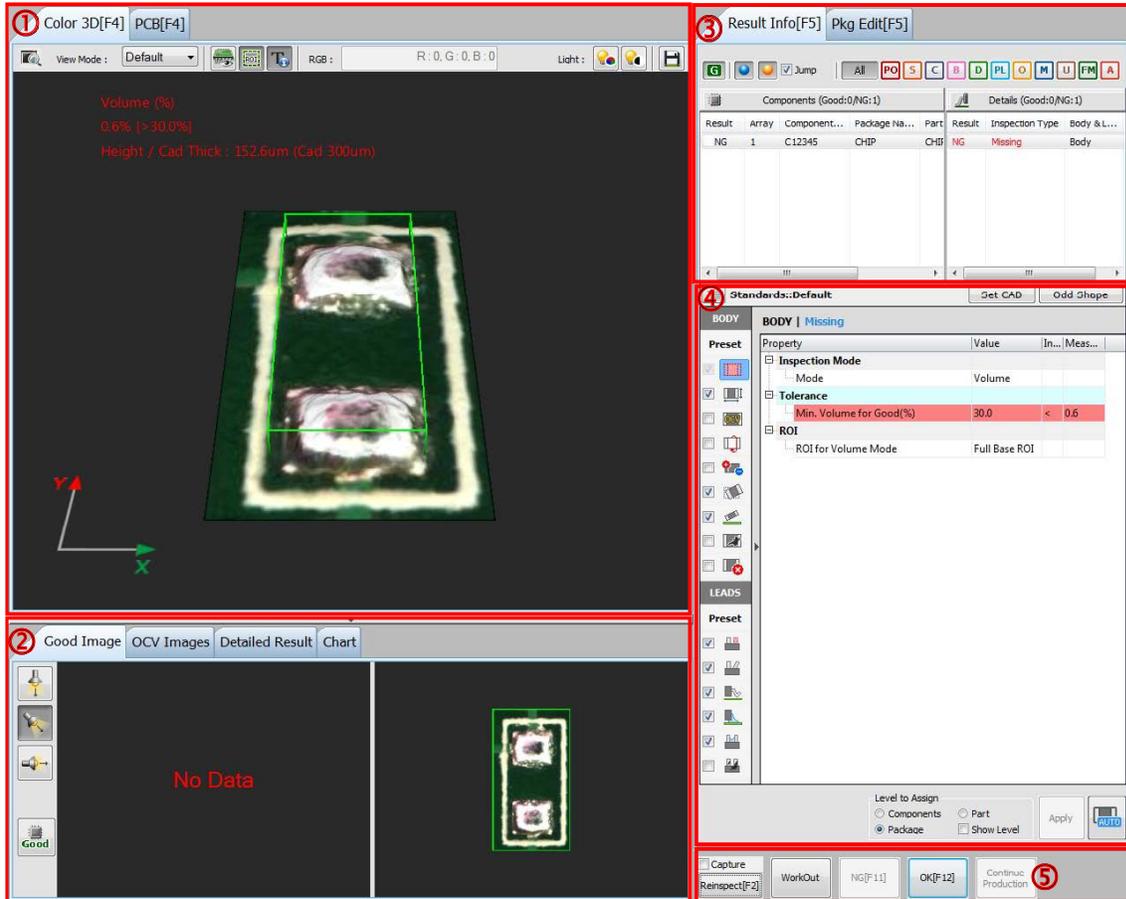
7. Begin inspection by clicking  or by pressing **START** on the switch panel.
8. The Defect Viewer appears after the machine detects defects. After selecting detected defects, displaying either 'NG' or 'OK', the inspected board is extracted from the machine. The machine rests in standby status, ready to inspect the next board.

Determining Defect Results on the Defect Viewer

Judgement

- NG: PCB is determined for defective boards. Operators must eliminate the inspected board.
- OK: PCB is determined for good boards. Proceed with the next PCB inspection.

The Explanation of the Defect Viewer



The screenshot shows the Defect Viewer software interface with five numbered callouts:

- 1 3D Viewer:** Color 3D and PCB tab. The main 3D view shows a PCB with a green bounding box around a component. Text in the top left corner reads: "Volume (%) 0.6% (>30.0%) Height / Cad Thick : 152.6um (Cad 300um)".
- 2 Good Image & OCV Image:** Display good images. Add / delete OCV Images. The bottom left panel shows a "Good" button and a "No Data" message. The bottom right panel shows a small 2D image of the component.
- 3 Result Info:** Display info about inspection results. The top right panel shows a table with columns: Result, Array, Component..., Package Na..., Part, Result, Inspection Type, Body & L... The table contains one row: "NG 1 C12345 CHIP CHIP NG Missing Body".
- 4 Inspection Condition:** Modify Inspection conditions. The bottom right panel shows the "Standards::Default" settings for "BODY | Missing". The "Tolerance" section is expanded, showing "Min. Volume for Good(%)" set to 30.0 and a comparison "< 0.6".
- 5 Inspection Result:** Display inspection results. The bottom right panel shows buttons for "Capture", "WorkOut", "NG[F11]", "OK[F12]", and "Continue Production".

- ① 3D Viewer: Color 3D and PCB tab.
- ② Good Image & OCV Image: Display good images. Add / delete OCV Images.
- ③ Result Info: Display info about inspection results.
- ④ Inspection Condition: Modify Inspection conditions.
- ⑤ Inspection Result: Display inspection results.

Determining Defect Result on the Review Station.

In the Review Station, reconfirm the inspection results(NG or PASS) of PCBs.

Judgment

If Defect Viewer does not judge NG or Pass, judge it in Review Station.

- NG: The PCB is determined for a defective board.
- PASS: The PCB is determined for a good board.

Screen Layout



- ① Navigation Map: Displays the location of an item selected in Failure Item List.
- ② 3D Viewer: Display 3D images.
- ③ 2D Viewer: Display 2D images.
- ④ Failure Item List: Display defective items.
- ⑤ Buttons to judge whether the board is defective or not. Select either **Pass** or **NG** based on the **Failure Item List**.

Buttons to reconfirm the defective item selected in the **Failure Item List**. Select **Defect** if it is defective, or **Defect Pass** if it is not defective.

Stopping Inspections

Click  on the **Main Menu** to stop inspection. Or, press **STOP** on the front panel to stop inspections in progress.

Bypass Modes

There might be an occasion when you need to suspend the inspection of a PCB as it is necessary to adjust to the speed of processes or due to other circumstances. In this case, Bypass Modes are recommended.

- SW Bypass: Select the **Inspection** tab and click the  button to stop inspection.
- HW Bypass: Change the HW Bypass Switch to **ON**.

* **When PCB direction is RL.**



* **When PCB direction is LR.**



Minimizing Programs

AOIGUI

Click  to minimize AOIGUI.

Review Station & AOI SPC

Click  to minimize Review Station.

Closing Programs

AOIGUI

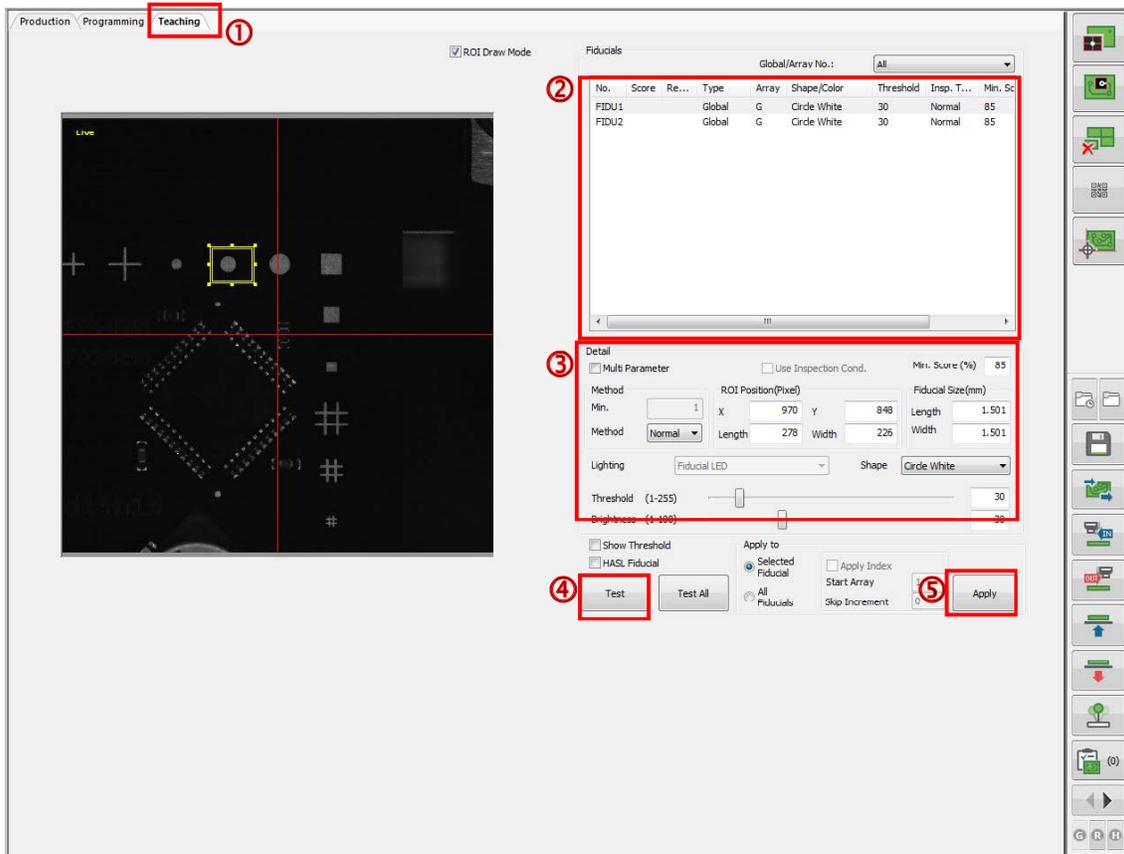
Click  to close SPC.

Review Station & AOI SPC

Click  to close Review Station.

When appearing Fiducial Error window

1. Click **Teaching**.
2. Select one fiducial to modify on the fiducial list.
3. After checking detailed information about the selected fiducial, modify its information if it is necessary.
4. Test the modified fiducial by clicking **Test**.
5. If there is no problem, click **Apply** to save modified information.



When deactivating START button

When deactivating , click .

Shortcut Keys

| Key | Description | Additional Actions |
|----------|--|-----------------------|
| F2 | Re-inspection | |
| F3 | Re-inspection (Single component) | |
| F4 | 'Color 3D' tab & 'PCB' tab Modification Button | |
| F5 | View Mode Modification Button | |
| F6 | 3D & 2D Image Modification Button | |
| F7 | Display Cad information Window | |
| F9 | 'Result Info' tab & 'PkgEdit' tab Modification Button | |
| Ctrl + D | Cad Information Modification Button | A: Apply |
| | | C: Cancel |
| Ctrl + R | Display Rotation Application Window | R: Apply CCW Rotation |
| | | A: Apply |
| | | C: Cancel |
| Tab | 'Result Info' tab & 'Property' tab Modification Button | |

※ Shortcut keys can be modified.