GTAFE Virtual Industrial Robot Mechanic

V1.4

User and Customer Support Guide

Shenzhen GTA Education Tech Ltd.

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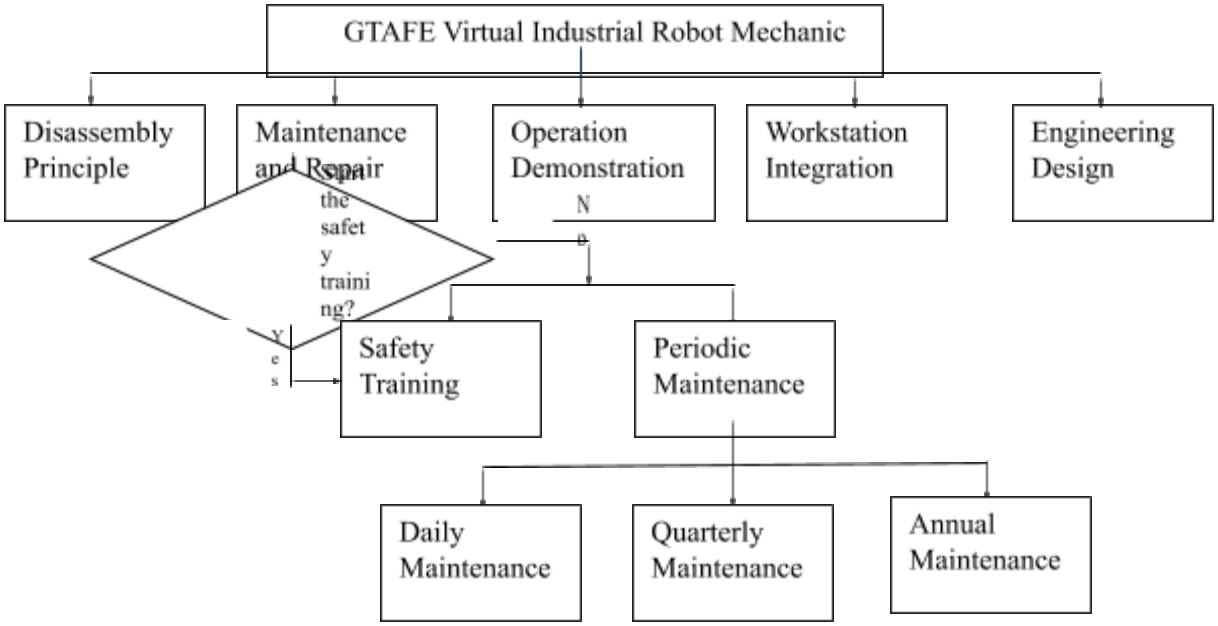
1. Introduction

1.1. Objective

This manual is the user and customer support guide, intended to providing installation and operating guidance for users of GTAFE Virtual Industrial Robot Mechanic V1.3.

1.2. Functional Structure Diagram



1.3. Definition

Term	Definition or description
GTAFE	Shenzhen GTA Education Tech Ltd.
GTAFE Virtual Industrial Robot Mechanic	Using material related to FANUC robot based on VR hardware, the software simulates robot maintenance and repair training. It vividly simulates industrial applications, offers indefinitely repeated practical operations without damage to components, and provides a new teaching model for academic majors related to industrial robots.
3D	Digital three dimensional / stereoscopic technology based on computer / internet, i.e. three-dimensional digitalization
VR	Virtual reality, a computer simulation system which can create and experience virtual world. The simulation environment generated integrates multiple

	resources and offers interactive dynamic views in 3D and systematic simulation of real world behaviors, which giving users immersive experiences.
zSpace 300	Interactive zSpace Table-based VR product based on 3D virtual display, launched by zSpace in 2015.
C/S architecture	Client-server architecture

1.4. References

None

2. Operating Environment

2.1. Hardware Environment

VR terminal (zSpace 300)

Parameter	Description		Specifications
Hardware Configuration	CPU	Intel(R) Core(TM) i3-4370 CPU @ 3.80GHz 3.80GHz	
	Hard Disk	500GB	
	Memory	8.00GB	
	Monitor	24-inch, resolution: 1920 x 1080; supporting 2D and 3D Brightness: 2D ≥ 250cd / m2 ; 3D ≥ 150cd / m2, Horizontal visual angle ≥ 170°, Vertical visual angle ≥ 160° Contrast: 800 : 1 or above; Color ≥ 16700000 Pixel defect: ≤ 7.	
	Capture Locator	Equipped in the monitor, the locator can achieve a 3D effect and localization by means of 3D glasses. Available capture range: 1.2m in length, 1.5m in width, and 1m in height based on the center of the motor	
	Tracking 3D Glasses	The 3D glasses can be used to view the 3D scenario. There are five tracking points, so that the capture locator can accurately achieve a 3D effect and localization. A set of tracking 3D glasses includes complete	

		tracking glasses and legless tracking Clip-ons.	
	Stylus	It can move, rotate and split the objects in the 3D scenario. It offers movement and rotation data in 3 degrees of freedom coordinate axes, and the related resolution, accuracy and refresh rate are required as follows: 3D axial resolution: X axis ≤2mm, Y axis ≤2mm, Z axis ≤ 2mm. Accuracy: spacing accuracy ≤ 2deg, swing accuracy ≤2deg, deflection accuracy ≤2deg. 3D axial accuracy: X axis≤+/-3mm, Y axis≤+/-3mm, Z axis≤+/-3mm. 3D axial refresh rate: X axis ≥ 100Hz, Y axis ≥ 100Hz, Z axis ≥ 100 Hz.	
	Model	zSpace300	
	Port	Display Port (1.2): ≥1; DVI port: ≥1; positioning processing unit interface	
Operating System	Windows 10 (64-bit)		
3D Application software System	3D Application software System includes three parts: desktop VR system drive platform, 3D desktop system software platform, and desktop VR interaction system. Desktop VR system drive platform: offering basic application architecture, system parameter adjustment and management for VR. 3D desktop system software platform: offering 3D desktop functions, including addition, deletion, change, and arrangement of desktop icon, as well as lockup and property change. Desktop VR interaction system: 3D display platform, offering real-world virtual 3D environment in combination with Capture Locator; zooming in / out, rotating, and disassembling virtual objects in combination with the stylus; as well as offering various tools for 3D interaction, and multi-view functions such as multi-angle view, and composite view.		

2.2. Software Environment

None

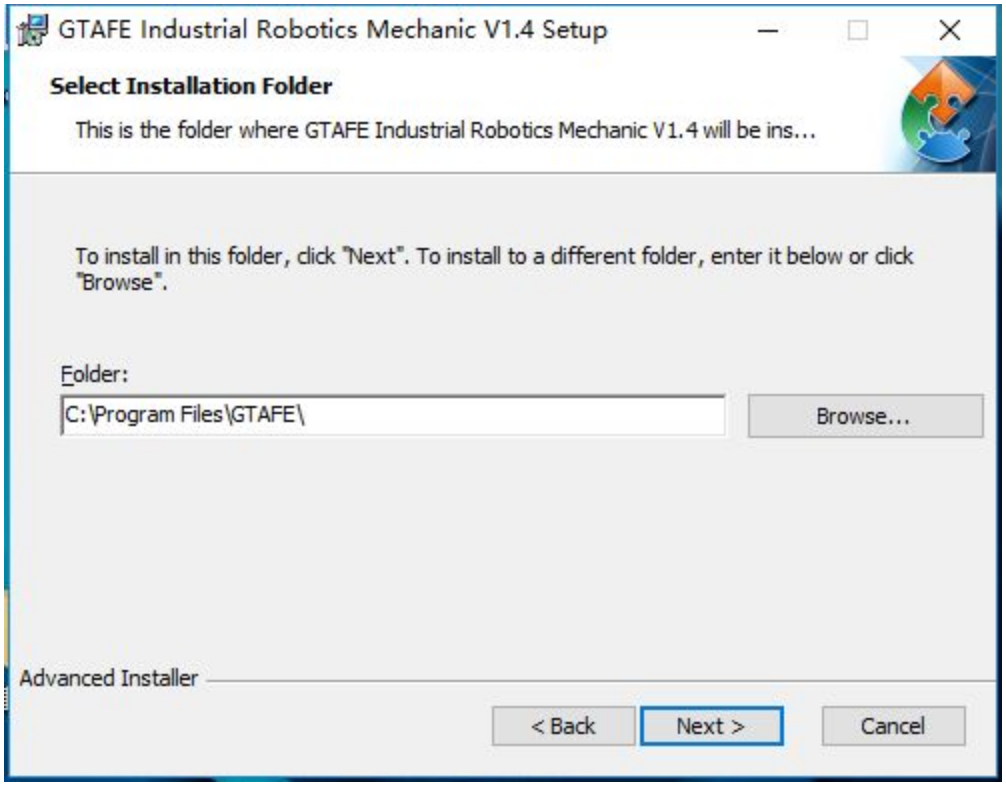
3. Operating Instructions

3.1. Installation and Initialization

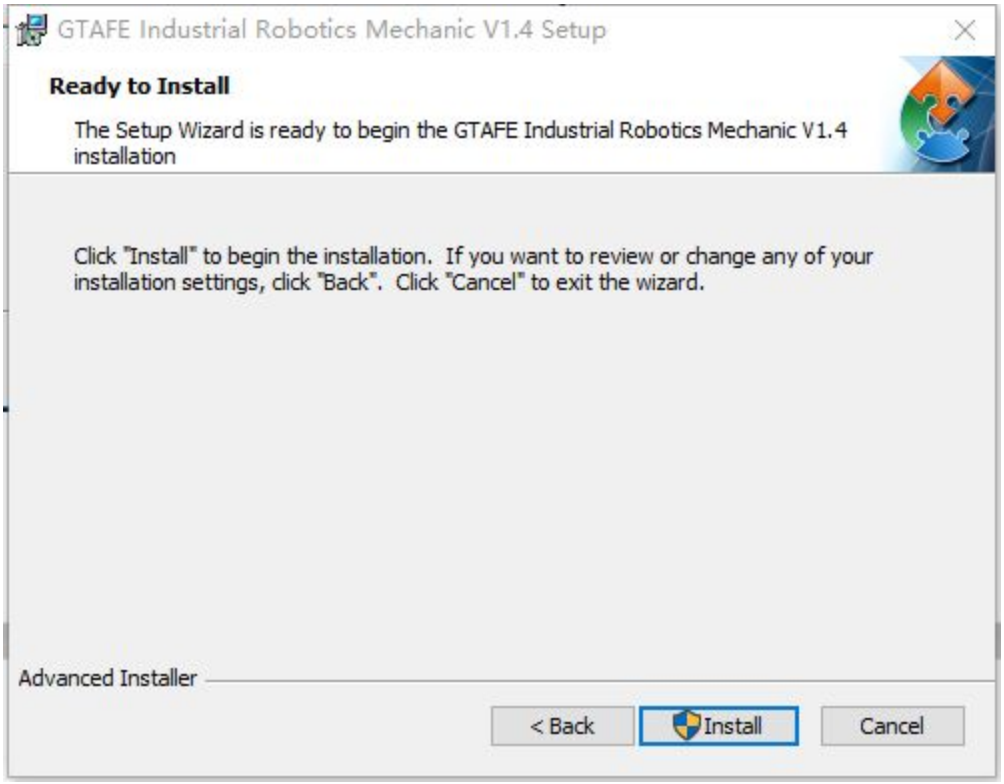
Double click on the setup program 

to start installing the software, as below

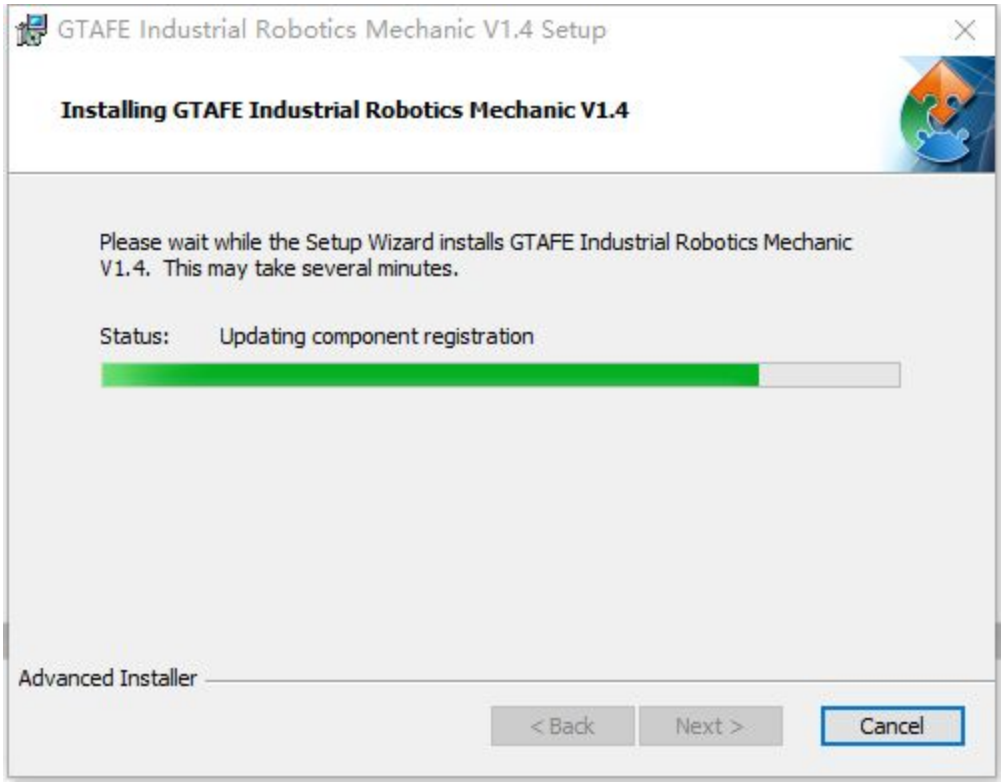
Click on the "Next", and accept the terms. Then select 'Next' to bring up the below interface,



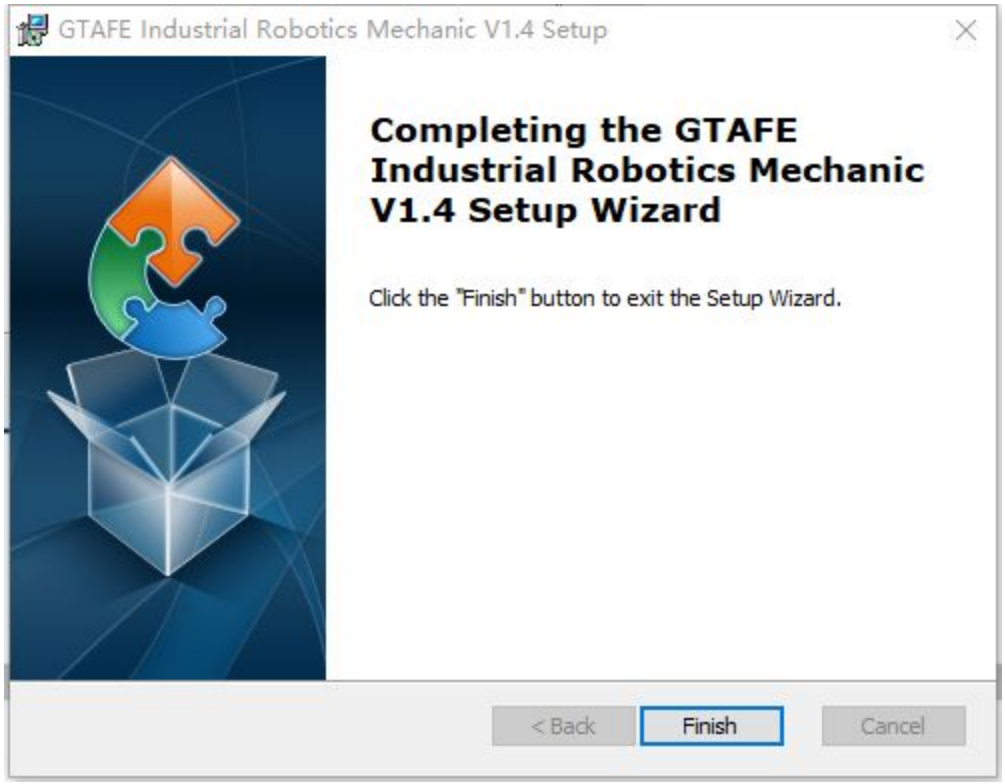
The default installation directory is C:\Program Files\GTAFE\ . Click on the "Browse" to select a new directory, otherwise the default directory will be used. Click on the "Next" to prepare for the installation.



Click on the "Install" to start the installation.



Click on the "Finish" to exit.

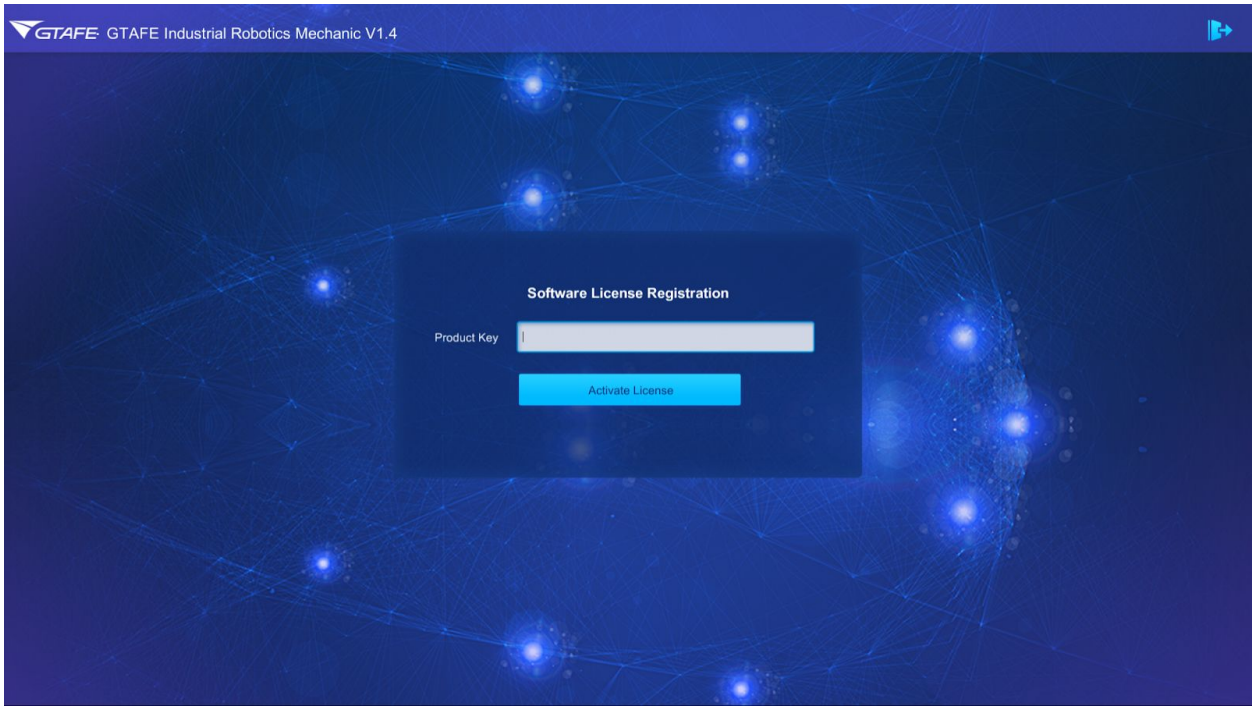


A desktop shortcut will be generated.

3.2. Operation Description

1.1.1. Client login

Login interface



Instruction:

1. The application code will pop up after the installation of the software. Fill in the registration code and authorization code obtained through the application code, and then click "Activate License";
2. Click on the  button in the top right corner of the interface to exit the software license registration.

1.1.2. Operator interface

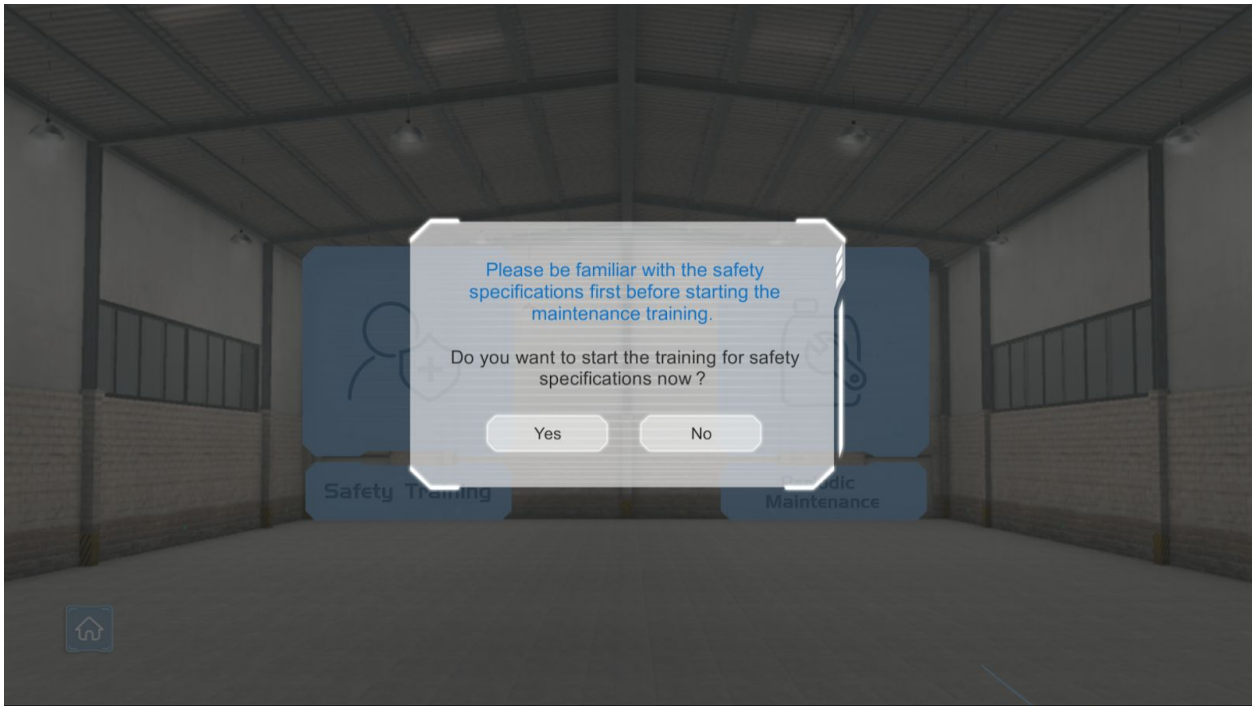
The main interface is as below,

The Maintenance and Repair interface is as below,

Exit the software.

Instruction:

1. After entering the homepage, click on the Maintenance and Repair to pop up the blow interface;

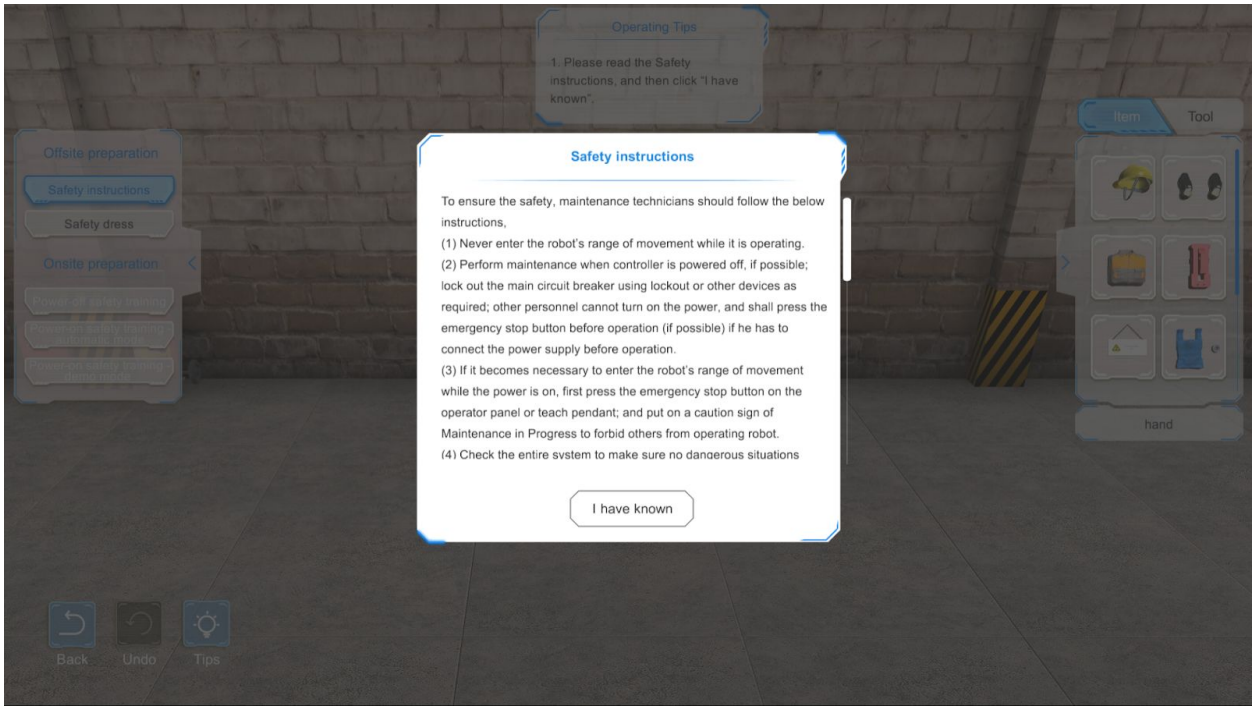


2. Click on the  to exit the software;

3. Click on the  to go back to the main interface;

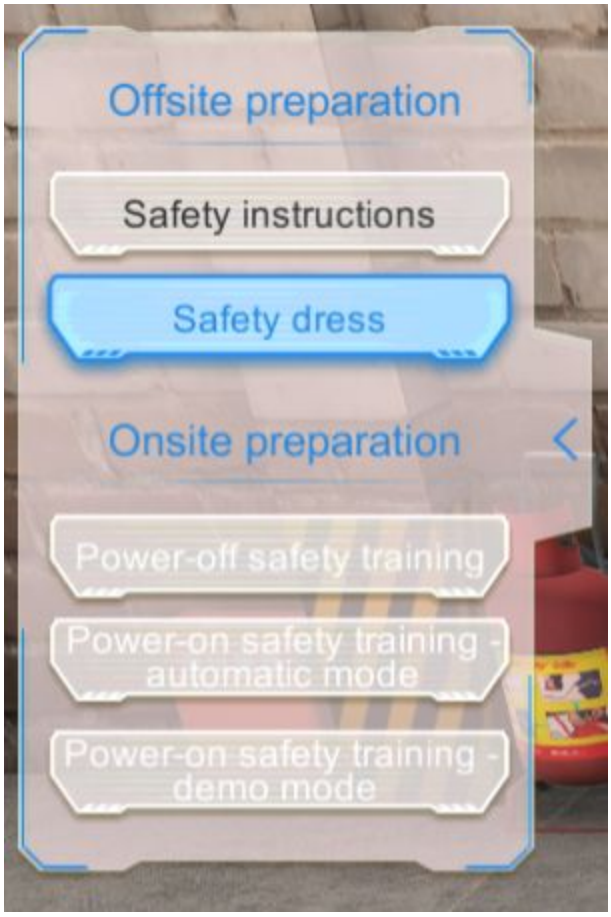
4. Click on the  to go back to the previous menu.

1.1.3. Safety Training interface

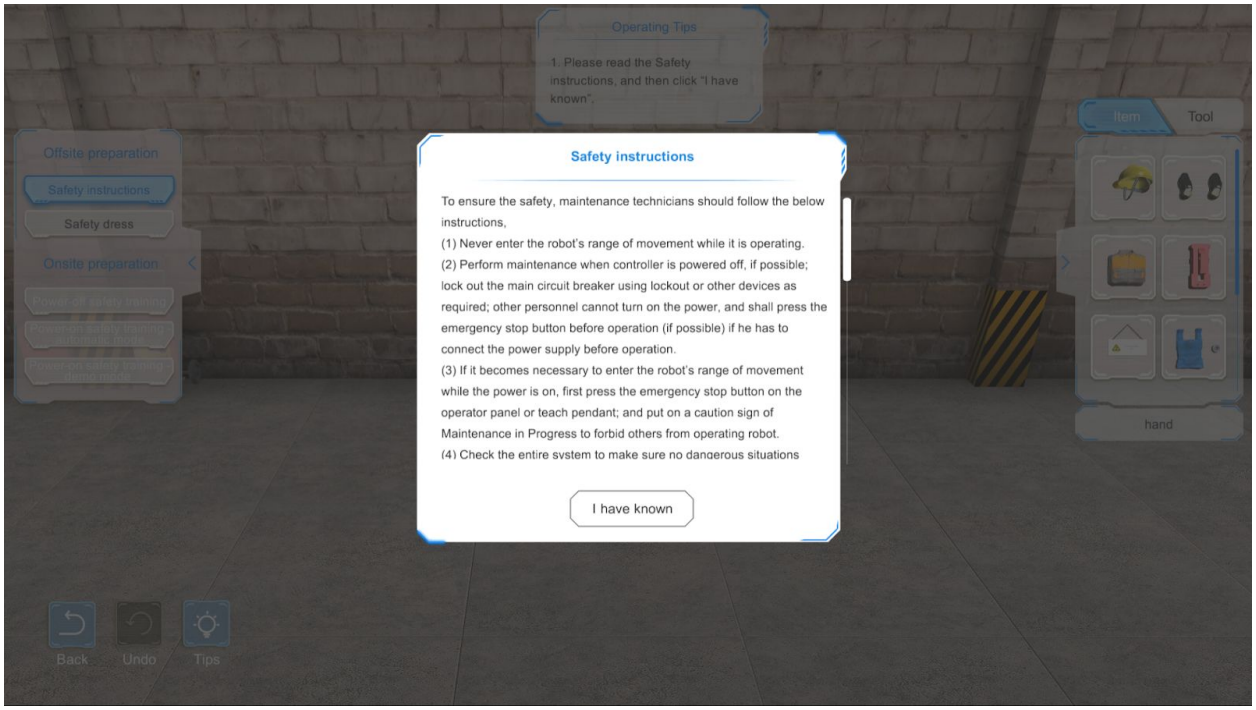


Click on the 

to enter the Safety Training interface. There are five modules: Safety instructions, Safety dress, Power-off safety training, Power-on safety training - automatic mode, and Power-on safety training - demo mode. The default interface is Safety dress.



Click on the "Safety instructions" in the navigation bar to bring up the below interface,



Click on the "Safety dress" in the navigation bar to bring up the below interface,

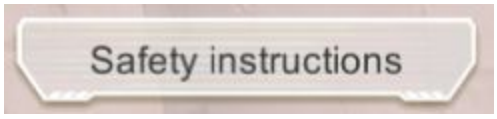
Click on the "Power-off safety training" in the navigation bar to bring up the below interface,

Click on the "Power-on safety training - automatic mode" in the navigation bar to bring up the below interface,

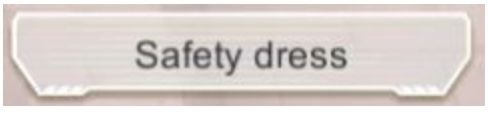
Click on the "Power-on safety training - demo mode" in the navigation bar to bring up the below interface,

Before the disassembly operation, the Undo button is grayed out as  in default. Upon the disassembly operation, the button becomes clickable as  . Click on this button to go back to the previous step.

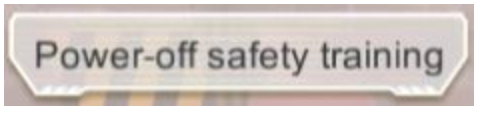
Instruction:

1. Click on the 

to show the scenario of Safety instructions;

2. Click on the 

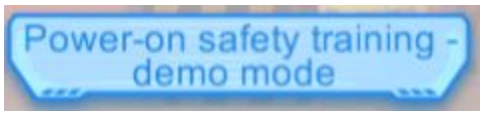
to show the scenario of Safety dress;

3. Click on the 

to show the scenario of Power-off safety training;

4. Click on the 

to show the scenario of Power-on safety training - automatic mode;

5. Click on the 

to show the scenario of Power-on safety training - demo mode;

6. Click on the  button, then the disassembled model rotates to the best angle, and the tool and position that need to be operated are highlighted;

7. Before the disassembly operation, the Undo button is grayed out as  in default. Upon the disassembly operation, the button becomes clickable as  . Click on this button to go back to the previous step;

8. Click on the Back button  to go back to the disassembly principle interface;

9. Click on the  to hide the task navigation bar, as below

10. Click on the  to hide the item / tool bar, as below

11. Press the left button of the stylus to reset all models to their original positions;
12. After selecting the model, press the right button of the stylus and move it forward and backward vertically to the screen, to zoom in or out the model.

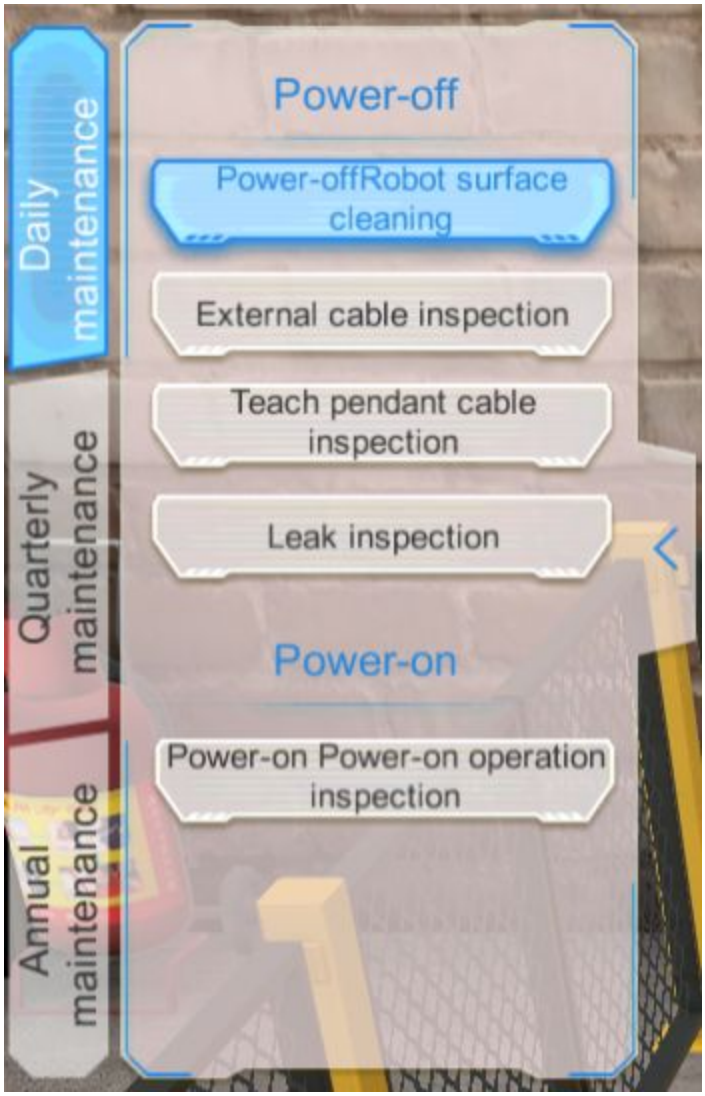
1.1.4. Periodic maintenance - Daily maintenance

The default interface of the Periodic Maintenance is Daily Maintenance.

3.2.4.1 Daily maintenance

The Daily Maintenance interface is as below,

There are five modules in the navigation bar: Robot surface cleaning, External cable inspection, Teach pendant cable inspection, Leak inspection, and Power-on operation inspection. Select one module to show the corresponding scenario.



Click on the "Robot surface cleaning" in the navigation bar to show the corresponding scenario.

Click on the "External cable inspection" in the navigation bar to show the corresponding scenario.

Click on the "Teach pendant cable inspection" in the navigation bar to show the corresponding scenario.

Click on the "Leak inspection" in the navigation bar to show the corresponding scenario.

Click on the "Power-on operation inspection" in the navigation bar to show the corresponding scenario.

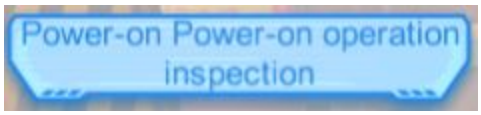
Click on the  button, then the model rotates to the best angle, and the tool / item and position that need to be operated are highlighted.

Before the disassembly operation, the Undo button is grayed out as  in default. Upon the disassembly operation, the button becomes clickable as  . Click on this button to go back to the previous step.

Instruction:

1. Click on the  to show the scenario of Robot surface cleaning;
2. Click on the  to show the scenario of External cable inspection;
3. Click on the  to show the scenario of Teach pendant cable inspection;

4. Click on the 

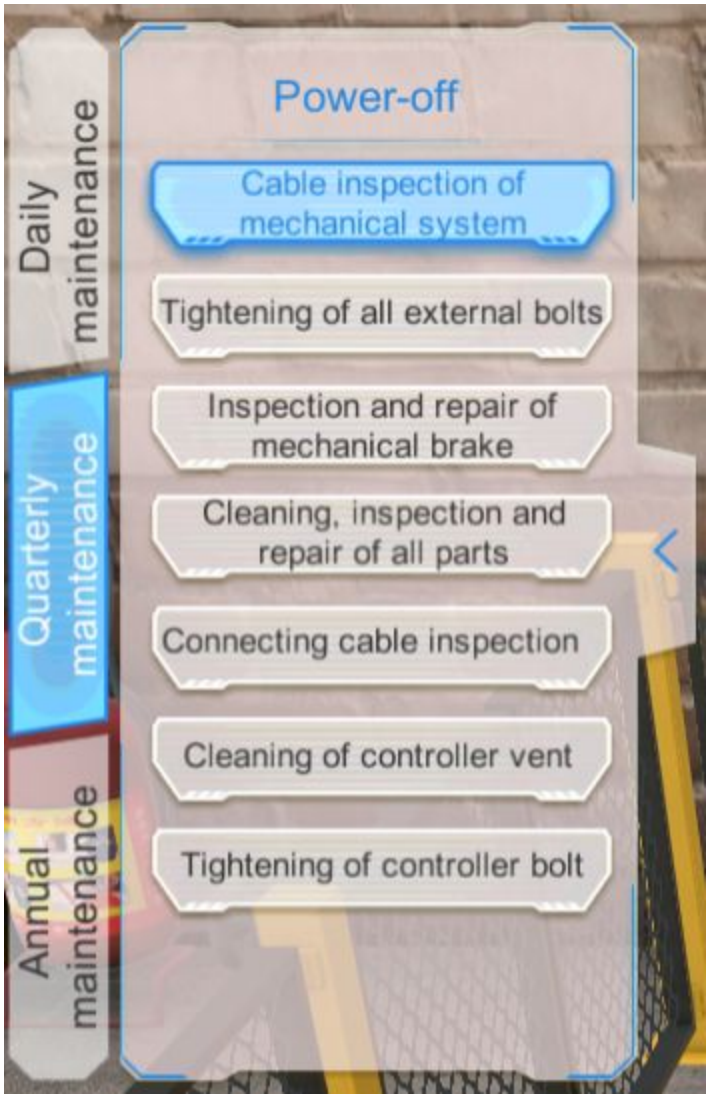
to show the scenario of Leak inspection;
5. Click on the 

to show the scenario of Power-on operation inspection;
6. Click on the  button, then the disassembled model rotates to the best angle, and the tool and position that need to be operated are highlighted;
7. Before the disassembly operation, the Undo button is grayed out as  in default. Upon the disassembly operation, the button becomes clickable as  . Click on this button to go back to the previous step;
8. Click on the Back button  to go back to the disassembly principle interface;
9. Click on the  to hide the task navigation bar;
10. Click on the  to hide the item / tool bar;
11. Press the left button of the stylus to reset all models to their original positions;
12. After selecting the model, press the right button of the stylus and move it forward and backward vertically to the screen, to zoom in or out the model.

3.2.4.2 Quarterly maintenance

The Quarterly Maintenance interface is as below,

There are seven modules in the navigation bar: Cable inspection of mechanical system, Tightening of all external bolts, Inspection and repair of mechanical brake, Cleaning, inspection and repair of all parts, Connecting cable inspection, Cleaning of controller vent, and Tightening of controller bolt. Select one module to show the corresponding scenario.



Click on the "Cable inspection of mechanical system" in the navigation bar to show the corresponding scenario.

Click on the "Tightening of all external bolts" in the navigation bar to show the corresponding scenario.

Click on the "Inspection and repair of mechanical brake" in the navigation bar to show the corresponding scenario.

Click on the "Cleaning, inspection and repair of all parts" in the navigation bar to show the corresponding scenario.

Click on the "Connecting cable inspection" in the navigation bar to show the corresponding scenario.

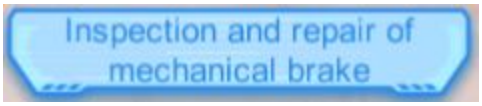
Click on the "Cleaning of controller vent" in the navigation bar to show the corresponding scenario.

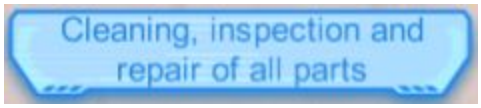
Click on the "Tightening of controller bolt" in the navigation bar to show the corresponding scenario.

Click on the  button, then the model rotates to the best angle, and the tool / item and position that need to be operated are highlighted.

Before the disassembly operation, the Undo button is grayed out as  in default. Upon the disassembly operation, the button becomes clickable as  . Click on this button to go back to the previous step.

Instruction:

1. Click on the  to show the scenario of Cable inspection of mechanical system;
2. Click on the  to show the scenario of Tightening of all external bolts;
3. Click on the  to show the scenario of Inspection and repair of mechanical brake;

4. Click on the 

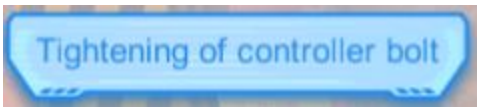
to show the scenario of Cleaning, inspection and repair of all parts;

5. Click on the 

to show the scenario of Connecting cable inspection;

6. Click on the 

to show the scenario of Cleaning of controller vent;

7. Click on the 

to show the scenario of Tightening of controller bolt;

8. Click on the  button, then the disassembled model rotates to the best angle, and the tool and position that need to be operated are highlighted;

9. Before the disassembly operation, the Undo button is grayed out as  in default. Upon the disassembly operation, the button becomes clickable as  . Click on this button to go back to the previous step;

10. Click on the Back button  to go back to the disassembly principle interface;

11. Click on the  to hide the task navigation bar;

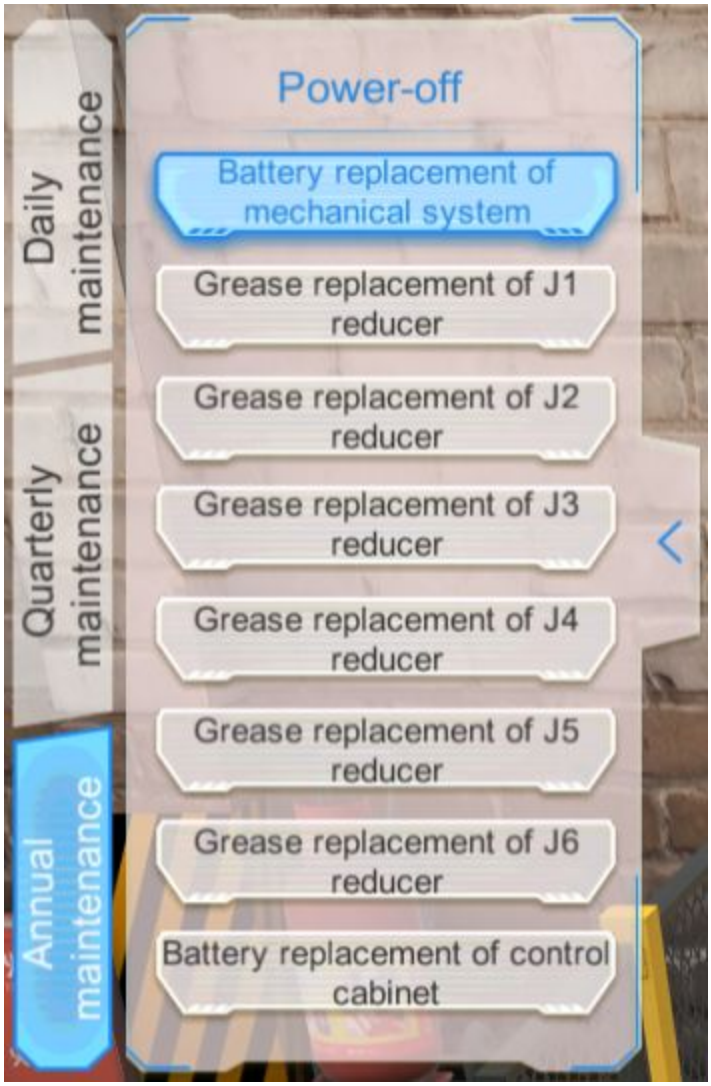
12. Click on the  to hide the item / tool bar;

13. Press the left button of the stylus to reset all models to their original positions;
14. After selecting the model, press the right button of the stylus and move it forward and backward vertically to the screen, to zoom in or out the model.

3.2.4.2 Annual maintenance

The Annual Maintenance interface is as below,

There are eight modules in the navigation bar: Battery replacement of mechanical system, Grease replacement of J1 reducer, Grease replacement of J2 reducer, Grease replacement of J3 reducer, Grease replacement of J4 reducer, Grease replacement of J5 reducer, Grease replacement of J6 reducer, and Battery replacement of control cabinet. Select one module to show the corresponding scenario.



Click on the "Battery replacement of mechanical system" in the navigation bar to show the corresponding scenario.

Click on the "Grease replacement of J1 reducer" in the navigation bar to show the corresponding scenario.

Click on the "Grease replacement of J2 reducer" in the navigation bar to show the corresponding scenario.

Click on the "Grease replacement of J3 reducer" in the navigation bar to show the corresponding scenario.

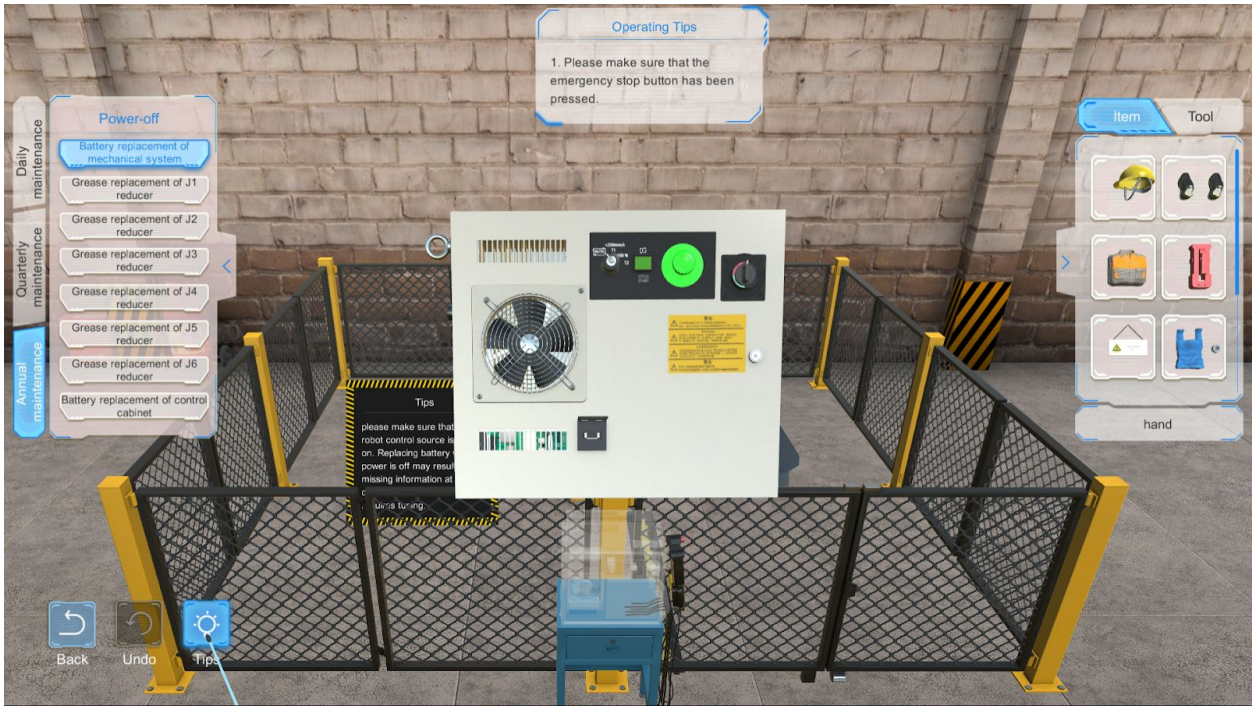
Click on the "Grease replacement of J4 reducer" in the navigation bar to show the corresponding scenario.

Click on the "Grease replacement of J5 reducer" in the navigation bar to show the corresponding scenario.

Click on the "Grease replacement of J6 reducer" in the navigation bar to show the corresponding scenario.

Click on the "Battery replacement of control cabinet" in the navigation bar to show the corresponding scenario.

Click on the  button, then the model rotates to the best angle, and the tool / item and position that need to be operated are highlighted.



Before the disassembly operation, the Undo button is grayed out as  in default. Upon the disassembly operation, the button becomes clickable as  . Click on this button to go back to the previous step.

Instruction:

1. Click on the  to show the scenario of Battery replacement of mechanical system;
2. Click on the  to show the scenario of Grease replacement of

J1 reducer;

3. Click on the 

to show the scenario of Grease replacement of J2 reducer;

4. Click on the 

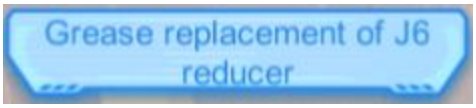
to show the scenario of Grease replacement of J3 reducer;

5. Click on the 

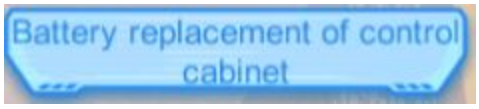
to show the scenario of Grease replacement of J4 reducer;

6. Click on the 

to show the scenario of Grease replacement of J5 reducer;

7. Click on the 

to show the scenario of Grease replacement of J6 reducer;

8. Click on the 

to show the scenario of Battery replacement of control cabinet;

9. Click on the  button, then the disassembled model rotates to the best angle, and the tool and position that need to be operated are highlighted;

10. Before the disassembly operation, the Undo button is grayed out as  in default. Upon the disassembly operation, the button becomes clickable as  . Click on this button to go back to the previous step;

11. Click on the Back button  to go back to the disassembly principle interface;

12. Click on the  to hide the task navigation bar;
13. Click on the  to hide the item / tool bar;
14. Press the left button of the stylus to reset all models to their original positions;
15. After selecting the model, press the right button of the stylus and move it forward and backward vertically to the screen, to zoom in or out the model.

2. Application notes

If license request failed, or other problem happened, please contact GTAFE Service Center.

3. Appendix

None