# Vision System Service Manual

v1.7.4

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# 2. Guidelines for Maintenance Engineers

## 2.1. Troubleshooting Procedure

This topic introduces the troubleshooting procedure and the general principles.

Before troubleshooting, maintenance engineers should read carefully and follow these requirements:

- Strictly conform to operation rules and safety requirements to ensure human and device safety.
- Record the original information about any problem/issue that occurs in detail during troubleshooting, such as the logs, screenshots, and .dmp files.

In troubleshooting, the engineers should follow the general procedure of analyzing fault symptoms, locating fault causes, and rectifying the fault.

The following figure displays the troubleshooting procedure.

```
        ┌─────────────────┐
        │      Start       │
        └─────────────────┘
                 │
                 ▼
        ┌─────────────────┐
        │ Analyse the issue's
        │     symptom      │
        └─────────────────┘
                 │
                 ▼
        ┌─────────────────┐
        │ Identify the cause
        │ and fix the issue │
        └─────────────────┘
                 │
                 ▼
            Issue fixed?  ──── Yes ──┐
                 │                    │
                 No                   │
                 ▼                    │
        ┌─────────────────┐          │
        │ Collect issue    │          │
        │  information     │          │
        └─────────────────┘          │
                 │                    │
                 ▼                    │
        ┌─────────────────┐          │
        │ Contact Technical Support   │
        │ for remote or on-site       │
        │ technical support           │
        └─────────────────┘          │
                 │                    │
                 ▼                    │
        ┌─────────────────┐          │
        │      End         │ ◄────────┘
        └─────────────────┘
```
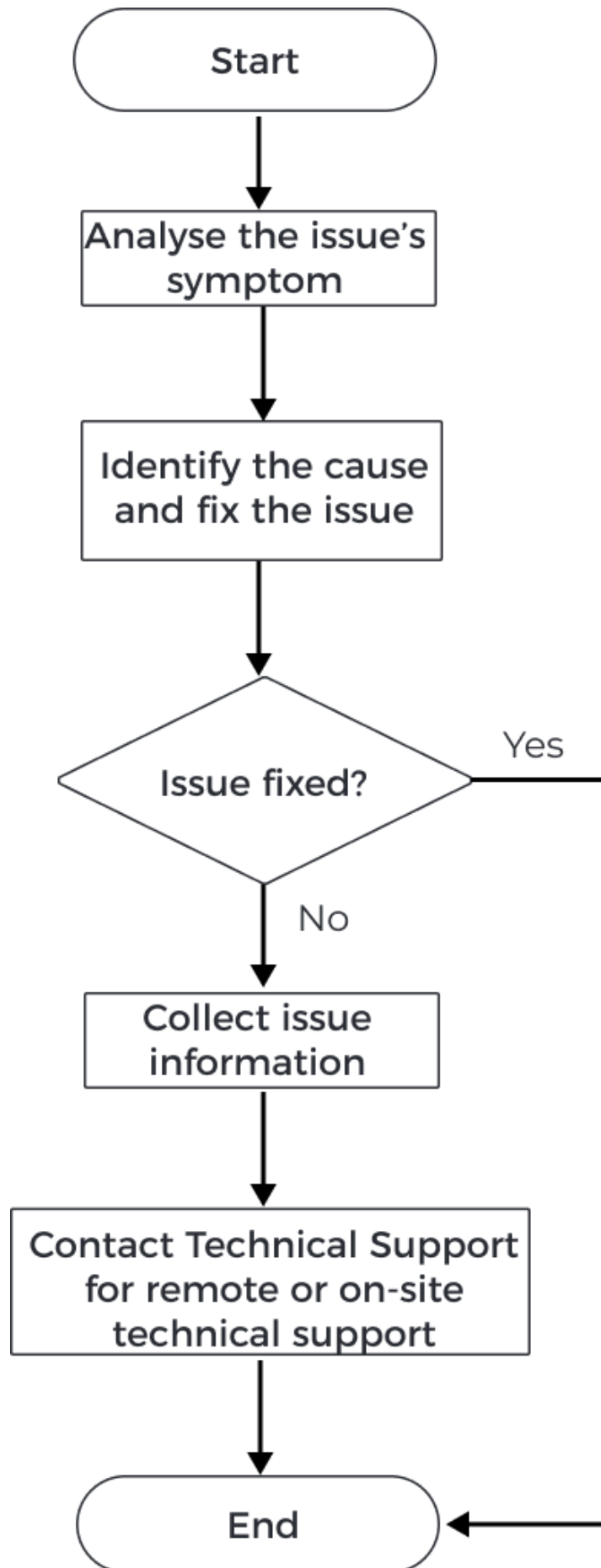
Please refer to *Common Issues* while you identify the causes and correct the issue.

If the issue cannot be identified, please refer to Collect Information about the Issue to collect information about the issue, and contact Mech-Mind Technical Support to identify and fix the issue.

## 2.2. Find Help

### Visit Mech-Mind Online Community

You can ask questions by visiting Mech-Mind Online Community. Online technical experts will answer your questions.

### Contact Technical Support

If you cannot rectify the issue yourself, contact Mech-Mind or your supplier for technical support.

> ℹ️ Before you ask for help, please collect related information about the issue, such as the symptoms, logs, etc., so that the technical support can locate the causes more accurately.

## 2.3. Collect Information about the Issue

If you cannot rectify the issue yourself, please refer to this topic to collect related information about the issue, and then contact Mech-Mind Technical Support to locate and rectify the issue.

### Issue Related Information

Accurate and sufficient information about the issue helps improve the efficiency of issue location and troubleshooting.

### Symptoms

When an issue occurs, please describe its symptoms and the conditions in which it occurs, and provide screenshots of warnings or exceptions.

### Software Running Environment and Configuration

You should provide information about the running environment and configuration of the software when the issue occurs:

- **Software name and version**: Provide the name and version of the software with issues. Find the version number by selecting **Help > About**.
- **Camera model, camera ID, firmware version, and mounting mode**: Provide information about the model, ID, firmware version, and mounting mode of the camera related to the fault.
- **IPC specifications**: If the issue is related to the IPC, provide information about the IPC's hardware configuration.
- **IPC language and region setting**: If the issue is related to the IPC, provide the operating system version of the IPC. For issues related to multi-lingual display, provide information about the IPC's current language and region settings.
- **Software language**: For issues related to multi-lingual display, provide information about the software's language setting.

- **Project**: If the project cannot run normally or as expected, please provide the project that can be used for simulation (including project data and deep learning data).

## Logs

Mech-Mind Software Suite monitors the operation status of software and projects in real time, and records detailed logs. Please collect software logswhen issues occur.

If Mech-Mind Vision System or the robot has problems communicating with the peripheral devices, or the robot does not operate as expected, you need to collect the robot logs in addition to software logs.

## Dump File (.dmp)

A .dmp file is a file that contains data "dumped" from a program's memory space. It is often created when a software program crashes or a memory error occurs. Thus, it helps locate the causes of the issue and find solutions.

Mech-Mind Software Suite creates .dmp files in the following conditions:

- Software crashes.
- The user clicks **Retry** after the software captures an exception.

In some cases (e.g. serious memory errors), when the software cannot capture the exception, the IPC's operating system will capture it and create .dmp files.

You can create a .dmp file manually when the software hangs or does not respond.

For details on how to collect .dmp files, please refer to Collect .dmp Files.

## Collect Information about the Issue

This topic introduces common ways to collect information about the issue.

### Collect Software Logs

### Collect Mech-Vision Logs

Method I: Start Mech-Vision, click **Open folder** in the **Log** panel, and find the log file (.log) of the date when the issue occurs.

Method II: Open the `\logs` folder under the Mech-Vision installation directory in File Explorer, and find the log file (.log) of the date when the issue occurs.

### Collect Mech-Viz Logs

Method I: Start Mech-Viz, click **Open folder** in the **Log** functional panel, and find the log file (.log) of the date when the issue occurs.

Method II: Open the `\logs` folder under the Mech-Viz installation directory in File Explorer, and find the log file (.log) of the date when the issue occurs.

## Collect Mech-Center Logs

Method I: Start Mech-Center, click **Open folder** in the **Log** panel, and find the log file (.html) of the date when the issue occurs.

Method II: Open the `\logs` folder under the Mech-Center installation directory in File Explorer, and find the log file (.html) of the date when the issue occurs.

## Collect Deep Learning Logs

When Mech-Vision runs a deep learning model package of .dlkpack or .dlkpackC files, and only Mech-Vision is started, you can collect deep learning logs as instructed below:

Open the `\dl_sdk_log` folder under the Mech-Vision installation directory in File Explorer, and find the log file (.log) of the date when the issue occurs.

When Mech-Vision runs a deep learning model package of .dlkpack or .dlkpackC files and Mech-Vision is started through Mech-Center, you can collect deep learning logs as instructed below:

Open the `\src\dl_sdk_log` folder under the Mech-Center installation directory in File Explorer, and find the log file (.log) of the date when the issue occurs.

When Mech-Vision runs a deep learning model package of older versions (with .pth or .dlkmp file extension), you can collect deep learning logs as instructed below:

Open the `\resource\deeplearning_server\logs` folder under the Mech-Vision installation directory in File Explorer, and find the log file (.log) of the date when the issue occurs.

## Collect DUMP Files (.dmp)

If the software crashes, or an exception message pops up and the **[ Retry ]** button is clicked, you can collect .dmp files as instructed below:

Open the installation directories of Mech-Vision/Mech-Viz/Mech-Center, and find files with .dmp file extension, such as mmind_vision_76f5af345b_202xxxxx_145339.dmp.

If the software hangs, you can collect .dmp files as instructed below:

1. Open Task Manager on the IPC and find the software.

   > The names of Mech-Vision, Mech-Viz, and Mech-Center in Task Manager are mmind_vision.exe, mmind_viz.exe, and Python respectively.

2. Right-click the software and click **Create dump file** in the pop-up menu.

3. Wait until the .dmp file is created.

4. When the .dmp file is successfully created, click **[ Open file location ]** in the pop-up dialog box and find the created .dmp file.

If an exception occurs in the software and only the IPC operating system has detected it, you can collect .dmp files as instructed below:

1. Click **Start** on your IPC, type "event viewer" in the search bar, and click the first search result.

2. Select **Windows Logs > Application**, and select events related to the exception in the event list.

3. Find the .dmp files in the attachment region in the tab **General** below.

## Collect Information on Robot Errors

If errors occur during communication between the robot and Mech-Mind Vision System, you should collect the robot's communication programs (or their copies) and logs in addition to the logs of Mech-Mind Software Suite. Please refer to the robot's User Manual to collect the information mentioned above.

If the robot does not move or pick workpieces according to the vision result or the planned path, you should collect the robot's communication programs (or their copies), robot logs, screenshots of the programming error's location, on-site photos, and screenshots of data on the register in addition to the logs of Mech-Mind Software Suite. Please refer to the robot's User Manual to collect the information mentioned above.

# 3. Common Issues

This section lists common issues and their solutions.

## Mech-Vision Common Issues

Calibration related issues

- Too Dark 2D Images Captured by LSR L/LSR S/DEEP V4 during Calibration
- Mismatched Image Sizes of Captured Images during Hand-Eye Calibration after Camera Switch

Vision related issues

- Could Not Save Point Cloud Files or Images
- Error Occurred When Reference Direction and Fixed Axis Direction Set the Same in Step "Rotate Axis to Minimize Included Angle to Reference Direction"
- Error Occurred When the Script of Step "Cal Results by Python" Returned Nested Lists
- Camera That Cannot Be Found by Mech-Eye SDK
- Mech-Vision Cannot Capture Images Using the Camera That Can Be Found by Mech-Eye SDK
- Point Cloud Loss
- Axis Z Downward for Poses of Some Objects (Pointing to the Ground)
- Mech-Vision Failed to Output Vision Result After Capturing Images
- Image Data Not Found in Virtual Mode of Step "Capture Images from Camera"

Deep learning related issues

- Mech-Vision Failed to Load Deep Learning Models 1.5.x
- Mech-Vision Failed to Open a Project When Updated to Version 1.6.x

Software related issues

- "bad allocation" Error Log Messages in Case of Memory Insufficiency
- Garbled Characters in Chinese Log Files
- Password Forgotten after Project Locked
- Failure to Connect Hikvision 2D Camera When Connecting Camera in External2D in Step "Capture Images from Camera"
- Failed to Find a Step or a Step Parameter
- Failure to Open OpenGL Windows due to Problematic Graphics Setting
- Changes Ineffective for Parameter "Play Back Mode" of Step "Capture Images from Camera"
- File Loaded in Steps Not Up-to-date
- Message "Graphics Card Driver Version Older Than Required" Appeared When Opening Mech-Vision

- No Data Input for Necessary Input Ports of Steps

# Mech-Viz Common Issues

**Software related issues**

- Garbled Characters in Chinese Log Files
- No Vision Result When Mech-Viz Was Used to Master-Control the Robot
- Failure to Start Mech-Viz due to Problematic Graphics Setting

**Robot Common Issues**

- Network between the Robot and the IPC Not Connected

# IPC Common Issues

- IPC Could Not Be Powered Up

# 3.1. Mech-Vision Common Issues

### 3.1.1. Too Dark 2D Images Captured by LSR L/LSR S/DEEP V4 during Calibration

**Symptom:**

In the hand-eye calibration withLSR L/LSR S/DEEP V4 cameras, the 2D images captured by the cameras were too dark.

**Affected Software Versions:**

Mech-Vision 1.6.1 and later versions

**Possible Cause:**

The LSR/DEEP series consist of a 2D camera (texture) and two 2D cameras (depth source). For 2D images captured by 2D monochrome cameras in Hand-eye calibration, you should increase the value of the **2D Image (Depth Source) Exposure Time** parameter in Mech-Eye Viewer if the environment is relatively dark.

**Solution:**

Follow these steps to fix the issue:

1. Connect to the LSR L/LSR S/DEEP V4 camera through Mech-Eye Viewer.
2. Select "calib" under Parameter group.
3. Increase the 2D Image (Depth Source) Exposure Time or set **Increase the 2D Image (Depth Source) Exposure Time** to **Flash** and re-calibrate the camera.
4. Add light to the environment if the issue persists.

### 3.1.2. Mismatched Image Sizes of Captured Images during Hand-Eye Calibration after Camera Switch

Symptom:

When the camera was switched from a camera with a small FOV to an LSR L/LSR S/DEEP V4 camera and it was used in hand-eye calibration on Mech-Vision 1.5.x, the software prompted the error message "Mismatched image sizes".

Affected Software Versions:

Mech-Vision 1.5.x

Possible Cause:

LSR L/LSR S/DEEP V4 cameras should work with Mech-Vision 1.6.1 or later.

Solution:

Update Mech-Vision to the latest version.

### 3.1.3. Could Not Save Point Cloud Files or Images

#### No Point Cloud File Generated When Saving a Point Cloud Template

Symptom:

In Matching Model and Pick Point Editor, when a point cloud template was made and saved, the save location contained only data files of pick points. No point cloud file was generated under the directory.

Affected Software Versions:

All versions

Possible Cause:

The language of the IPC operating system is a language that uses Latin characters only, such as English, but the file's save path contains non-Latin characters, such as Chinese and other special characters.

Solution:

Change all the non-Latin characters in the file path into Latin characters.

#### Step "Save Results to File" Could Not Save Point Cloud Files or Images

Symptom:

Despite point cloud or image output in the predecessor of Step Save Results to File, the exception message "no data to save" appeared when the Step was executed.

Affected Software Versions:

All versions

Possible Cause:

The language of the IPC operating system is a language that uses Latin characters only, such as English, but the file's save path contains non-Latin characters, such as Chinese and other special characters.

Solution:

Change all the non-Latin characters in the file path into Latin characters.

### Could Not Save Point Cloud Files or Images to USB Flash Drive

Symptom:

Point cloud files or images cannot be saved to a USB flash drive.

Affected Software Versions:

All versions

Possible Cause:

An unstable USB flash drive connection might cause the failure to read, write, and save files to the USB flash drive.

Workaround:

Do not use a USB flash drive to save point cloud files or images.

### 3.1.4. Error Occurred When Reference Direction and Fixed Axis Direction Set the Same in Step "Rotate Axis to Minimize Included Angle to Reference Direction"

Symptom:

In Step "Rotate Axis to Minimize Included Angle to Reference Direction", when the reference direction and the fixed axis direction were set the same, the following error message appeared:
`[error] Illegal parameter!` .

Affected Software Versions:

All versions

Possible Cause:

Step "Rotate Axis to Minimize Included Angle to Reference Direction" does not support reference direction and fixed axis direction being set the same.

Solution:

If the reference direction needs to be set the same as the fixed axis direction when you adjust the pose, please use Step "Rotate Poses to Directions Freely" instead.

### 3.1.5. Error Occurred When the Script of Step "Cal Results by Python" Returned Nested Lists

Symptom:

When the script run by Step "Cal Results by Python" included a RETURN statement of nested lists, the following error message appeared when the Step was executed: `Exception caught when running the script: Unable to cast Python instance to C++ type` ….

Affected Software Versions:

Mech-Vision 1.6.0 and later versions

Possible Cause:

Currently, the Python script returning nested lists is not supported.

Workaround:

Avoid including a RETURN statement that returns nested lists into the Python script called by Step "Cal Results by Python".

### 3.1.6. Camera That Cannot Be Found by Mech-Eye SDK

Symptom:

The camera could not be found by the Mech-Eye SDK software. As a result, Mech-Vision could not use it to capture images.

Affected Software Versions:

All Mech-Eye SDK versions

Possible Cause:

- The cable connection between the camera, IPC, and router/switch was abnormal.
- Firewalls or antivirus software were not shut down.
- IP conflicts might occur.
- Others.

Solution:

If a camera cannot be found by Mech-Eye SDK, please refer to the section Camera Not Found.

### 3.1.7. Mech-Vision Cannot Capture Images Using the Camera That Can Be Found by Mech-Eye SDK

Symptom:

The camera could be found by the Mech-Eye SDK software, but it could be used by Mech-Vision to capture images.

Affected Software Versions:

All Mech-Vision versions

Possible Cause:

- Mech-Vision could not connect to the camera.
- Errors occurred when the Mech-Vision project was running.
- Mech-Vision was shutdown suddenly.

Solution:

Follow these steps to fix the issue:

1. Start Mech-Vision and open the project.
2. Check "Step Capture Images from Camera" by clicking [ Select Camera ] to open the Choose the camera and the parameter group to use window. Select the camera and connect to it.
   - If the camera cannot be connected, proceed to step 3.
   - If the camera can be connected, proceed to step 4.
3. Change the IP address of the camera to an IP address in the same subnet as that of the IPC Ethernet port connecting to the camera and make sure there are no IP conflicts.
   a. Change the IP address of the camera to an IP address in the same subnet as that of the IPC Ethernet port connecting to the camera and make sure there are no IP conflicts.
   b. To change the IP address of the camera or the IPC, refer to the section Set IP address.
4. Click [ Run ] to execute the project to make sure that this issue is fixed.

### 3.1.8. Point Cloud Loss

Symptom:

Point loss occurred in point cloud in real usage scenarios.

Affected Software Versions:

All Mech-Vision versions

Possible Cause:

- There were point losses in the point cloud output by Mech-Eye Viewer.
- There were point losses during the point cloud processing on Mech-Vision.

Solution:

Please fix the issue according to the point cloud processing procedure. The steps are as follows:

1. Check whether the point cloud output from Mech-Eye Viewer is up to standard.
   - If there are point clouds lost, check the parameters ROI and Height Range.
   - If no point cloud is lost, proceed to the next step.
2. Check the processing procedure on Mech-Vision.
   a. Check whether the option Remove Background by Depth is enabled in Step "Capture Images from Camera".

▪ If yes, you should switch on the Debug Output mode, execute the single Step, and check whether the point clouds needed are removed. If they are removed, you should perform [ Select background depth map file ] again or disable **Remove Background by Depth**.

▪ If not, proceed to the next step.

b. Check 3D ROI.

c. Check point clouds with the Step "Show Point Clouds and Poses".

### 3.1.9. Axis Z Downward for Poses of Some Objects (Pointing to the Ground)

Symptom:

The axis Z of some objects' poses pointed downward (to the ground). In actual picking scenarios, the axis Z of all objects should be pointing upward.

Affected Software Versions:

All Mech-Vision versions

Possible Cause:

The direction of axis Z was not corrected before pose output.

Solution:

Follow these steps to fix the issue:

1. Add Step "Flip Poses' Axes" to the project and get its input port and output port properly connected.

2. Select **Positive** for **Direction** in the **Axis Settings** of the Step.

   > **Axis to Flip** defaults to **Z**, and **Reference Axis to Rotate Around** defaults to **X**. No adjustment is needed.

3. Execute the single Step or the entire project, and the issue will be fixed.

### 3.1.10. Mech-Vision Failed to Output Vision Result After Capturing Images

Symptom:

Mech-Vision had obtained the images, but it did not output any vision result.

Affected Software Versions:

All Mech-Vision versions

Possible Cause:

- The project was modified.
- Conditions on site changed.
- Data flow was broken.

Solution:

If the software failed to output the vision result after the project is being modified, follow these steps to fix it:

- Solution I: Revert the project modification.

> ℹ️ If the project cannot be reverted to the previous configuration, check and modify the Mech-Vision project.

- Solution II: Use the latest project backup to restore.

### 3.1.11. Image Data Not Found in Virtual Mode of Step "Capture Images from Camera"

Symptom:

In the virtual mode of Step "Capture Images from Camera", the error message "No color images" was displayed when selecting the image data.

Affected Software Versions:

All Mech-Vision versions.

Possible Cause:

Image files are not named properly.

Solution:

When images are read in the virtual mode of Step "Capture Images from Camera", the naming conventions below for the images should be followed. The serial number of the color image should be the same as its depth map counterpart.

- Color images: rgb_image_xxxx.jpg;
- Depth maps: depth_image_xxxx.png.

### 3.1.12. Mech-Vision Failed to Load Deep Learning Models 1.5.x

Symptom:

When a project involved the old deep learning Step Deep Learning Inference (Mech-DLK 2.1.0/2.0.0), the project failed to load deep learning models (file extension: .dlkpack) and displayed the error message: `class std::system_error: No mapping for the Unicode character exists in the target multi-byte code page.`

Affected Software Versions:

Mech-Vision 1.6.0 and later versions

Possible Cause:

The file path of the deep learning model package involves non-Latin characters, such as Chinese and other special characters.

Solution:

1. Change all the non-Latin characters in the file path of the deep learning model package into

Latin characters.

2. Re-open the project and set **Model Package Path** parameter for Step Deep Learning Inference (Mech-DLK 2.1.0/2.0.0).

> **ℹ** Step "Deep Learning Inference (Mech-DLK 2.1.0/2.0.0)" is already out of maintenance. It is recommended to update the deep learning model to the latest version and use the latest deep learning inference step.

### 3.1.13. Mech-Vision Failed to Open a Project When Updated to Version 1.6.x

Symptom:

Mech-Vision 1.5.x ran projects that involved the old deep learning Step Deep Learning Inference (Mech-DLK 2.1.0/2.0.0), with the check box **Autoload Project** selected. When Mech-Vision 1.5.x was uninstalled and Mech-Vision 1.6.x was installed, Mech-Vision projects failed to be opened.

Affected Software Versions:

Mech-Vision 1.5.x

Possible Cause:

The file path of the deep learning model package that is used in the step :ref:`Deep Learning Inference (Mech-DLK 2.1.0/2.0.0) involves non-Latin characters, such as Chinese special and other special characters.

Solution:

Follow these steps to fix the issue:

1. Change all the non-Latin characters in the file path of the deep learning model package into Latin characters.
2. Re-set **Model Package Path** parameter for Step Deep Learning Inference (Mech-DLK 2.1.0/2.0.0).

> **ℹ** Step "Deep Learning Inference (Mech-DLK 2.1.0/2.0.0)" is already out of maintenance. It is recommended to update the deep learning model to the latest version and use the latest deep learning inference step.

### 3.1.14. "bad allocation" Error Log Messages in Case of Memory Insufficiency

Symptom:

Error messages `bad allocation` were recorded in the log when the IPC did not have enough memory space.

Affected Software Versions:

All versions

Possible Cause:

The IPC memory is insufficient.

Solution:

The issue can be solved in any of the following ways:

1. Restart the IPC and close unnecessary software programs.
2. Add virtual memory for the IPC.
3. Use another IPC with a larger memory space.

If the solutions above do not help, please contact Mech-Mind Technical Support.

### 3.1.15. Garbled Characters in Chinese Log Files

Symptom:

The messages of Mech-Vision log files contained garbled characters (???) when the following conditions were met:

- Chinese simplified was set as software language. (Select Settings › Option › Option › language)
- On the IPC, the **Current system locale** was not set as Chinese (Simplified, PRC), but as others (e.g. English, United States). (Select Control panel › Clock and Region › Region › Administrative › Change system locale)

Affected Software Versions:

All versions

Possible Cause:

Current system locale setting and software language setting did not match.

Solution:

- Upgrade Mech-Vision to version 1.7.0 or later.
- If Mech-Vision cannot be upgraded to version 1.7.0 or later currently, follow these steps to workaround this issue:
  - Go to Control panel › Clock and Region › Region › Administrative › Change system locale and change the **Current system locale** to Chinese (Simplified, PRC).
  - Restart the IPC for this change to take effect.

    After the restart, the newly generated logs will display normally in the log files.

    > After the restart, garbled characters will remain in the logs that are generated before the setting change.

### 3.1.16. Password Forgotten after Project Locked

Symptom:

A project cannot be opened, because the user forgot the password after locking the project.

Affected Software Versions:

All versions

Solution:

Contact Mech-Mind Technical Support.

### 3.1.17. Failure to Connect Hikvision 2D Camera When Connecting Camera in External2D in Step "Capture Images from Camera"

**Symptom:**

For Mech-Vision 1.6.1 and older versions, connection to the Hikvision 2D camera in the External2D camera list was not available when you used Step "Capture Images from Camera" to connect to a real 2D camera.

**Affected Software Versions:**

Mech-Vision 1.6.1 and earlier versions

**Solution:**

Since the camera is used mainly for image capturing, intrinsic parameter check, and hand-eye calibration, you can choose the way to fix the issue according to the function that you need the camera to perform.

- If the Hikvision 2D camera is used to capture images only, you can replace "Step Capture Images from Camera" with Step "Camera 2D".
- If the Hikvision 2D camera is used both for image capturing and intrinsic parameter check (or hand-eye calibration), you can follow the steps below to fix the issue:
  - Replace Step "Capture Images from Camera" with Step "Camera 2D" and connect to a Hikvision 2D camera to capture images.
  - When using Step "Capture Images from Camera", turn on **Virtual mode**, and read data in **data path**. **Camera Calibration Parameters** will read calibration parameters of the camera automatically.

### 3.1.18. Failed to Find a Step or a Step Parameter

**Symptom:**

A Step could not be found when the user searched for it in **Step Library**; or a parameter could not be found when the user searched for it in **Step Parameters**.

**Affected Software Versions:**

All Mech-Vision versions

**Solution:**

- By default, the Step Library displays only the frequently used Steps. Some Steps are hidden. Please follow the steps below to search for hidden Steps:
  1. Click the icon ⊞ beside the search box in **Step Library**. When the icon is like ▤, you check all the Steps in the library.
  2. Type the Step name in the search box and you will find the Step.
- The **Step Parameter** displays frequently used parameters only. Some parameters are hidden. Please follow the steps below to find the hidden parameters:

  Right-click anywhere in the **Step Parameters** panel and select **Show all parameters**. Then you

will find all the parameters of the Steps.

## 3.1.19. Failure to Open OpenGL Windows due to Problematic Graphics Setting

Symptom:

OpenGL and related windows could not be opened successfully. The possible scenario and error messages are described as follows:

- When the user opened **Matching Model and Pick Point Editor** in Mech-Vision, a white screen appeared, with an error message `Fail to load libEGL` in the log panel.
- Mech-Vision could not start the calibration program normally and displayed error messages about OpenGL.
- When the user set 3D ROI on Mech-Vision, the setting interface crashed or the white screen of death appeared.

Affected Software Versions:

All Mech-Vision versions

Possible Cause:

- Setting for the graphics card driver were incorrect.
- Configurations were not up to standard when the IPC has two graphics cards.

Solution:

Confirm whether the graphics card driver is properly installed. If the IPC has two graphics cards, you need to set up OpenGL rendering GPU and Power management mode.

Ways to check the graphics card driver are as follows:

1. Right-click **This PC** on the desktop of the IPC and select **Manage** to enter the computer management page.
2. Select Manage › Device Manager › Display adapters to check the installed graphics card driver.
   - If there is only **NVIDIA GeForce xxxx** under the Display adapters, that means the graphics card driver is installed successfully.
   - If there is **Microsoft Basic Display Adapter** under the Display adapters, that means the graphics card driver has not been installed or needs to be installed again. The driver can be updated automatically on Windows or through a third-party driver.

GPU setup for IPC with two graphics cards:

1. Click ▨ in the tray of the IPC to open the NVIDIA panel.
2. Click the **Program Settings** tab on the **3D settings** panel on the right.
3. Click the **Program Settings** tab on the **3D settings** panel on the right.
4. In the drop-down 1. **Select a program to customize** menu, find and select Mech-Vision. Follow these steps:
   a. Click [ Add ] to open the *Add* page.
   b. Click the [ View ] button at the bottom right on the page and select the installation path of

Mech-Vision.

c. Select **mmind_vision.exe** and click **[ Open ]**. The customized program adding will be completed successfully.

5. Set related parameters in **2. Specify the settings for this program**.
   ○ Set **OpenGL rendering GPU** to **Use global setting (Auto select)**.
   ○ Set **Power management mode** to **Prefer maximum performance**.

6. When the parameter setup is completed, click **[ Apply ]** to save the changes.

### 3.1.20. Changes Ineffective for Parameter "Play Back Mode" of Step "Capture Images from Camera"

Symptom:

On Mech-Vision 1.6.1 or older versions, when the user changed the setting for the parameter **Play Back Mode** of Step Capture Images from Camera, the changes failed to take effect.

Affected Software Versions:

Mech-Vision 1.6.1 and earlier versions

Solution:

Upgrade Mech-Vision to version 1.6.2 or later.

> 🛈 If Mech-Vision is not updated to 1.6.2 or a later version,you need to change the **Play Back Mode** manually each time you open a Mech-Vision project.

### 3.1.21. File Loaded in Steps Not Up-to-date

Symptom:

When the content of a file loaded in a Step was changed without file name modification, the changes in the file were not synced to the Step.

Affected Software Versions:

All Mech-Vision versions

Solution:

Solve the issue in any of the following ways:

- Solution I:
  ○ Click the **Execution Flags** of the Step and select the **Reload File** checkbox.
  ○ Execute the single Step or the entire project, and the file will be reloaded.
- Solution II:
  ○ Rename the file and reload it.
  ○ Execute the single Step or the entire project, and the file will be reloaded.

## 3.1.22. Message "Graphics Card Driver Version Older Than Required" Appeared When Opening Mech-Vision

Symptom:

The message "Graphics card driver version older than required" appeared when you opened Mech-Vision 1.6.1 or a later version.

Affected Software Versions:

Mech-Vision 1.6.1 and later versions

Possible Cause:

The version of the IPC's graphics card driver is too old to support the updated Mech-Vision. The required graphics card driver versions are:

- Version 471.68 and later for Mech-Vision 1.6.1 and 1.6.2
- Version 472.50 and later for Mech-Vision 1.7.0 and later versions

Solution:

Update the IPC's graphics card driver to the latest version. Follow the steps below:

1. Check the GPU model of the IPC in any of the following ways:
   - Method I:
     - Press the `Win`+`R` keys on the keyboard and type **DxDiag** in the **Open** search bar to open the diagnostic tool Direct X.
     - Click **Display** and you will find the GPU model information in the **Chip Type**.
   - Method II:
     - Type **NVIDIA control panel** in the search box of taskbar to open the panel.
     - Check the graphics card type and driver's version on the homepage.
   - Method III:
     - Right-click **This PC** on the desktop of the IPC and select **Manage**.
     - On the computer management page, select **Device Manager** and check the GPU model information in **Display adapters**.
2. Update the graphics card driver:
   a. Go to NVIDIA Website.
   b. Choose the IPC's graphics series in the **Product Series** drop-down menu, and choose the graphics type in the **Product** drop-down menu. Click **[ Search ]** after you confirm the other information.
   c. Click **[ Download ]** on the page NVIDIA Studio Driver.
   d. Click **[ Download ]** again on the new page to start downloading the driver.
   e. When the download is completed, double-click the .exe file to install the driver.

> ℹ️ | After the driver is successfully installed, Mech-Vision needs to be restarted to run normally.

### 3.1.23. No Data Input for Necessary Input Ports of Steps

**Symptom:**

A window popped up with the exception message **Procedure Execution Error**.

**Affected Software Versions:**

All Mech-Vision versions

**Possible Cause:**

The data flow necessary was not established between the Step's input port and another port.

**Solution:**

Connect the input port of the Step to another port as the pop-up window suggests.

# 3.2. Mech-Viz Common Issues

### 3.2.1. Garbled Characters in Chinese Log Files

**Symptom:**

The messages of Mech-Viz log files contained garbled characters (???) when the following conditions were met:

- Chinese simplified was set as software language. (Select Settings › Option › Option › language)
- On the IPC, the **Current system locale** was not set as Chinese (Simplified, PRC), but as others (e.g. English, United States). (Select Control panel › Clock and Region › Region › Administrative › Change system locale)

**Affected Software Versions:**

All versions

**Possible Cause:**

Current system locale setting and software language setting did not match.

**Solution:**

- Upgrade Mech-Viz to version 1.7.0 or later.
- If Mech-Viz cannot be upgraded to version 1.7.0 or later currently, follow these steps to workaround this issue:
  - Go to Control panel › Clock and Region › Region › Administrative › Change system locale and change the **Current system locale** to Chinese (Simplified, PRC).
  - Restart the IPC for this change to take effect.

    After the restart, the newly generated logs will display normally in the log files.

    > After the restart, garbled characters will remain in the logs that are generated before the setting change.

### 3.2.2. No Vision Result When Mech-Viz Was Used to Master-Control the Robot

**Symptom:**

Mech-Vision had output the vision result, but the robot did not receive it.

**Affected Software Versions:**

All Mech-Viz versions

**Possible Cause:**

- Auto-load is not set for the Mech-Vision project.
- Auto-load is not set for the Mech-Viz project.
- Steps "Vision Look" and "Vision Move" did not read the correct Mech-Vision project.
- Mech-Center was not running.
- External signals were abnormal.

**Solution:**

Follow these steps to fix the issue:

1. Start Mech-Vision, right-click the solution to which the project belongs and select the **Autoload Solution** checkbox.
2. Start Mech-Viz, right-click the project and select the **Autoload Project** checkbox.
3. In Steps "Vision Look" and "Vision Move" of the Mech-Viz project, confirm that the **Vision Name** parameter has been set to the correct Mech-Vision project.
4. Start the Mech-Center software.
5. Check external signals.

### 3.2.3. Failure to Start Mech-Viz due to Problematic Graphics Setting

**Symptom:**

Mech-Viz could fail to start if OpenGL and related windows could not be opened.

**Affected Software Versions:**

All Mech-Viz versions

**Possible Cause:**

- Incorrect setting for the graphics card driver.
- Configurations not up to standard when the IPC has two graphics cards.

**Solution:**

Confirm whether the graphics card driver is properly installed. If the IPC has two graphics cards, you need to set up OpenGL rendering GPU and Power management mode.

Ways to check the graphics card driver are as follows:

1. Right-click **This PC** on the desktop of the IPC and select **Manage** to enter the computer management page.

2. Select System Tools › Device Manager › Display adapters to check the installed graphics card driver.

   - If there is only **NVIDIA GeForce xxxx** under the Display adapters, that means the graphics card driver is installed successfully.

   - If there is **Microsoft Basic Display Adapter** under the Display adapters, that means the graphics card driver has not been installed or needs to be installed again. The driver can be updated automatically on Windows or through a third-party driver.

GPU setup for IPC with two graphics cards:

1. Click  in the tray of the IPC to open the NVIDIA panel.

2. Click the **Program Settings** tab on the **3D settings** panel on the right.

3. Click the **Program Settings** tab on the **3D settings** panel on the right.

4. In the drop-down **1. Select a program to customize** menu, find and select Mech-Viz. Follow these steps:

   a. Click [ Add ] to open the *Add* page.

   b. Click the [ View ] button at the bottom right on the page and select the installation path of Mech-Viz.

   c. Select **mmind_viz.exe** and click [ Open ]. The customized program adding will be completed successfully.

5. Set related parameters in **2. Specify the settings for this program**.

   - Set **OpenGL rendering GPU** to **Use global setting (Auto select)**.

   - Set **Power management mode** to **Prefer maximum performance**.

6. When the parameter setup is completed, click [ Apply ] to save the changes.

## 3.3. Robot Common Issues

### 3.3.1. Network between the Robot and the IPC Not Connected

Symptom:

The test using ping to check the network connectivity between the robot and the IPC failed.

Possible Cause:

- The Ethernet cable connection was abnormal.
- The IP address of the robot and that of the IPC Ethernet port connecting to the robot were not in the same subnet.
- The IP address of the robot and that of the IPC Ethernet port connecting to the robot conflicted.

Solution:

Follow these steps to fix the issue:

1. Check the Ethernet cable connection.

   a. Re-plug the Ethernet cable and replace it to check whether the network is connected. If the network is not connected, go to next step.

   b. Insert the Ethernet cable to a normal Ethernet port to re-check whether the network is connected. If the network is not connected, go to next step.

2. Check the IP address of the robot and that of the IPC Ethernet port connecting to the robot and make sure they are in the same subnet.

   ○ To modify the IP address of the robot, refer to the robot's user manual.

   ○ To modify the IP address of the IPC Ethernet port connecting to the robot, refer to the section Set the IP Address of the IPC .

   ❗ Please note that the IP address must be unique. Otherwise, IP conflicts may occur.

# 3.4. IPC Common Issues

### 3.4.1. IPC Could Not Be Powered Up

Symptom:

The IPC could not be powered up.

Solution:

Please contact Mech-Mind Technical Support.

# 4. FAQs

This section lists out some frequently asked questions (FAQs).

## Mech-Vision FAQs

- How to Do When Axis-Z of the Output Pose Points Downward?
- How to Choose the Model Based on 3D Matching Features?

## 4.1. How to Do When Axis-Z of the Output Pose Points Downward?

The axis-Z of a pose output in a project points downward because the pose direction was not checked and corrected beforehand.

Before the pose output, you can add Step "Flip Poses' Axes", and set the parameters **Axis to Flip**, **Direction Type**, and **Reference Axis** to **Z**, **Negative**, and **X** respectively.

## 4.2. How to Choose the Model Based on 3D Matching Features?

There are many types of workpieces that use 3D matching, and it is not easy to choose the right matching model. Before selecting a template, you need to understand the workpiece features.

- Workpiece features:

  The following is an example of a sphere, a cylinder and a diamond-shaped plane. In the following figure, black is the object before moving and orange is the object after moving. When they move the same distance, the degree of overlap from highest to lowest is: diamond plane > cylinder > sphere. Therefore, the constraint strength of these objects from highest to lowest is: sphere > cylinder > diamond plane. It can be concluded that the more faces there are in 3D matching, the stronger the constraint is.
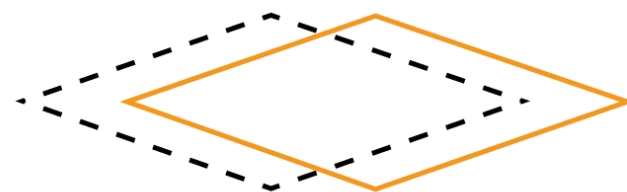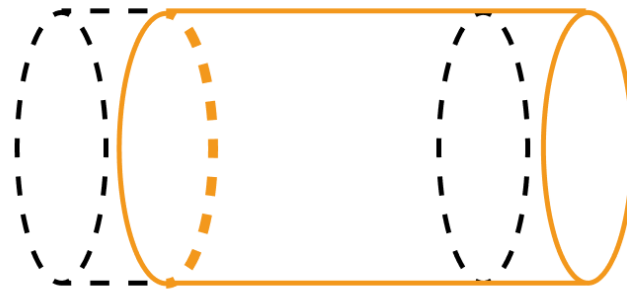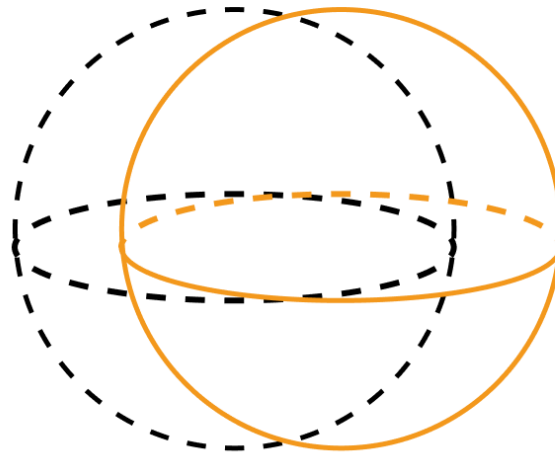
- How to choose the model:

  For any workpiece, move a fixed distance in any direction and determine the model to be used according to the coincidence degree of the workpiece before and after the movement. If the coincidence degree is high, the workpiece is less constrained, and you can choose the **edge model**; if the overlap is low, the workpiece is more constrained, and you need to choose the **surface model**.

## 4.3. Which third-party cameras does Mech-Vision support?

The third-party cameras that can be connected to Mech-Vision are listed in the table below.

| Item | Camera type | Related Step | Note |
|------|-------------|--------------|------|
| Hikvision | 2D camera | Camera 2D | Relative driver and the camera2d_h plugin should be installed. |
| DAHENG | 2D camera | Camera 2D | The camera2d_plugin plugin should be installed. |
| MindVision | 2D camera | Camera 2D | The camera2d_plugin plugin should be installed. |
| Cameras supporting the GenICam standard | 2D camera | Camera 2D | The camera2d_plugin plugin should be installed. |
| LMI | Laser profiler | Capture Images from Camera | The camera3d_plugin plugin should be installed. |
| SSZN | Laser profiler | Laser profiler | The camera3d_plugin plugin should be installed. |