
Mech-Mind User's Manual

Mech-Mind

Mar 06, 2023

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This section introduces the master-control program for YASKAWA robots and the procedure of setting up the communication with a robot through the program.

YASKAWA SETUP INSTRUCTIONS

This section introduces the process of loading the robot master-control program onto a YASKAWA robot. The process consists of the following steps:

- *Check Controller and Software Compatibility*
- *Setup the Network Connection*
- *Load the Program File*
- *Test Robot Connection*

Please have a flash drive ready at hand.

Note: The flash drive must:

- Have a storage capacity smaller than 32 GB
 - Be formatted to the FAT32 file system
-

1.1 Check Controller and Software Compatibility

- Controller: YRC1000 and DX200

Note: The program is not fully tested on YRC1000 micro controller.

- Controller system software version:
 - YRC1000: no requirement
 - DX200: DN2.25.00A(US/CN)-00 or above
- Option function requirements: must have the MotoPlus and Ethernet functions enabled.

Note: The following instructions are based on YRC1000 controller. Details may differ for DX200 controller.

1.2 Setup the Network Connection

1.2.1 Hardware Connection

Plug the Ethernet cable into:

- An Ethernet port on the IPC
- LAN2 (CN106) port on YRC1000 controller; CN104 port on DX200 controller

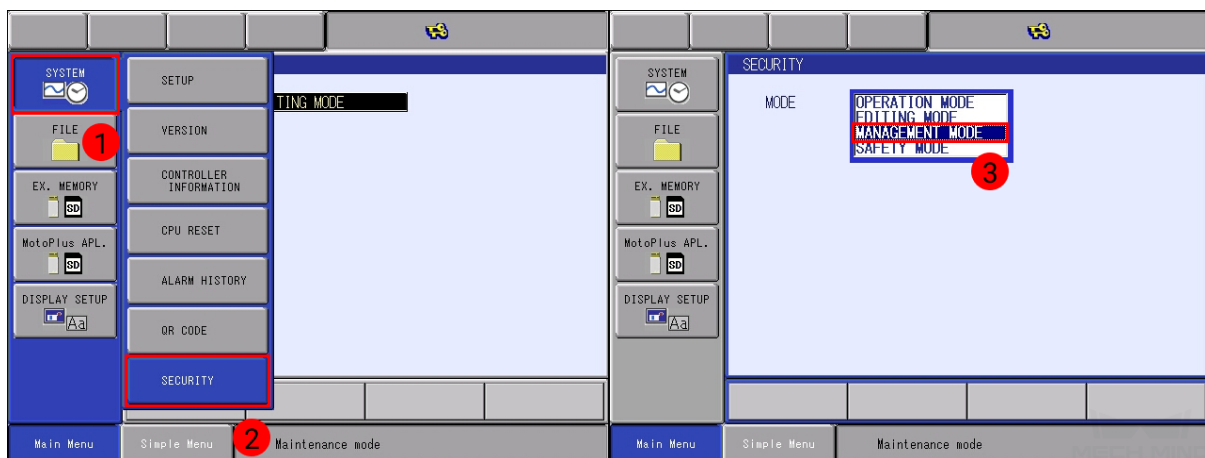
Note:

- LAN1 port on YRC1000 and CN105 port on DX200 are for connecting the teach pendant only.
 - If LAN2 port is occupied, please use LAN3 (CN107) instead.
-

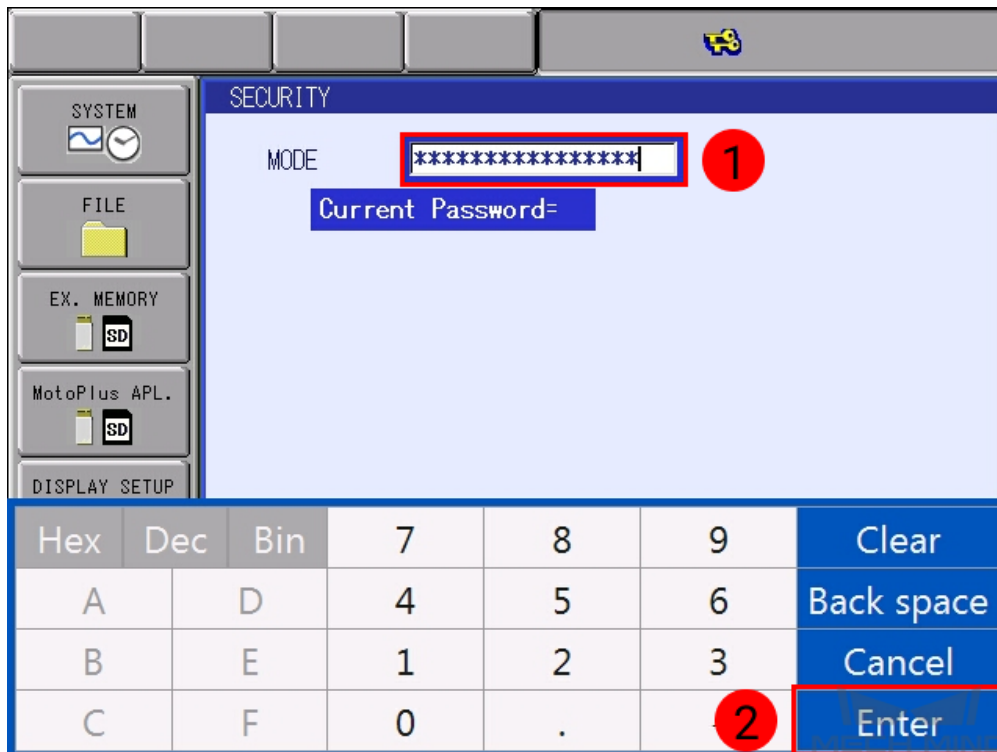
1.2.2 IP Configuration

To allow communication between the IPC and the robot controller, both must have an IP address in the same subnet. This means that the first three numbers of the IP addresses should be the same. For example, 192.168.100.1 and 192.168.100.2 are in the same subnet.

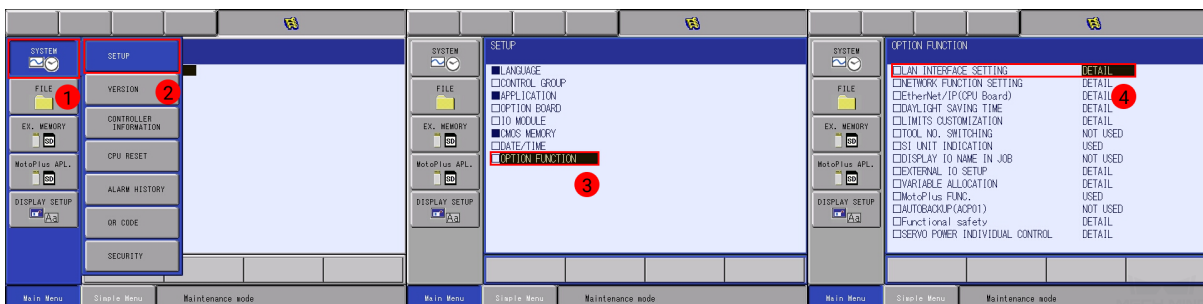
1. Press down **MAIN MENU** when powering on the controller to enter the maintenance mode.
2. Select **SYSTEM** → **SECURITY** → **MANAGEMENT MODE**.



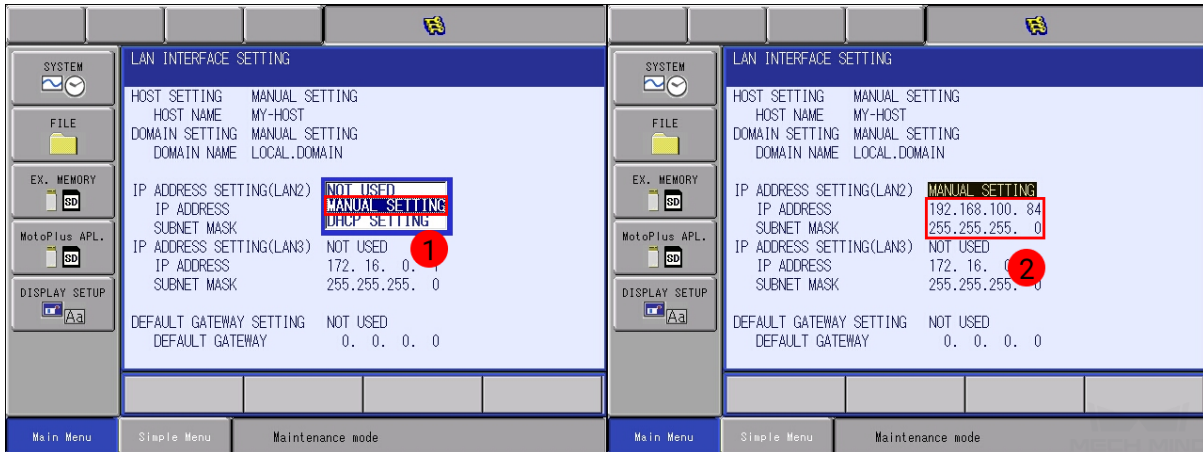
3. Enter the password (the default password is sixteen 9 's), and then press on *Enter*.



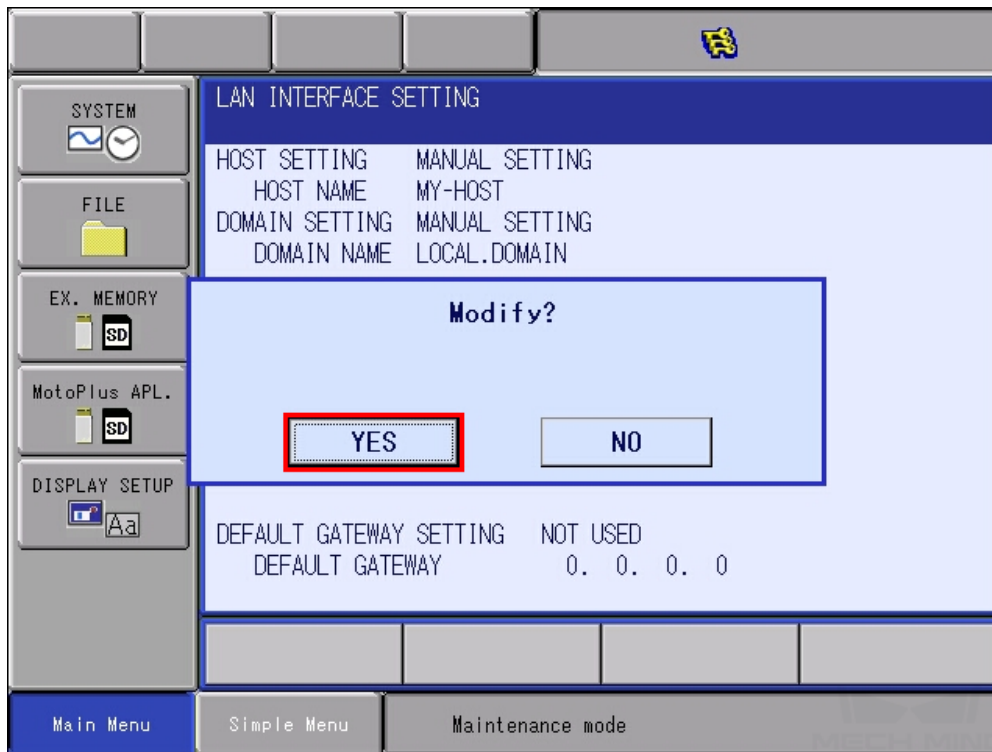
4. Select **SYSTEM** → **SETUP** → **OPTION FUNCTION** → **LAN INTERFACE SETTING**.



5. In **IP ADDRESS SETTING(LAN2)**, select **MANUAL SETTING**, and then set the **IP ADDRESS** to one in the same subnet as the **IPC**, and the **SUBNET MASK** to **255.255.255.0**.



6. Press the ENTER key, and then press on YES in the pop-up message.



1.3 Load the Program File

Attention: Before you start loading the program files to the robot, please perform file backup as needed. For detailed instructions, please refer to the operator's manual of the YASKAWA controller.

1.3.1 Prepare the File

The program files are stored in the installation directory of Mech-Mind Software Suite.

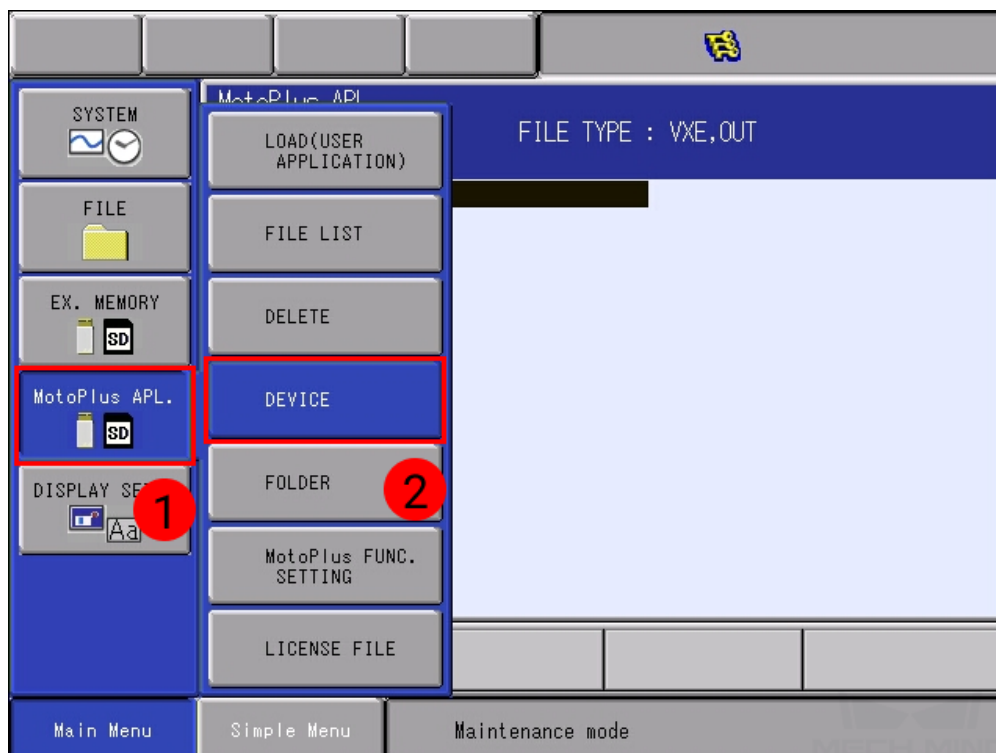
Navigate to `xxx\Mech-Mind Software Suite-x.x.x\Mech-Center\Robot_Server\Robot_FullControl\yaskawa`, and copy the master-control program to your flash drive:

- If you are using a YRC1000 controller, copy `ycrc1000.out`.
- If you are using a DX200 controller, copy `dx200.out`.

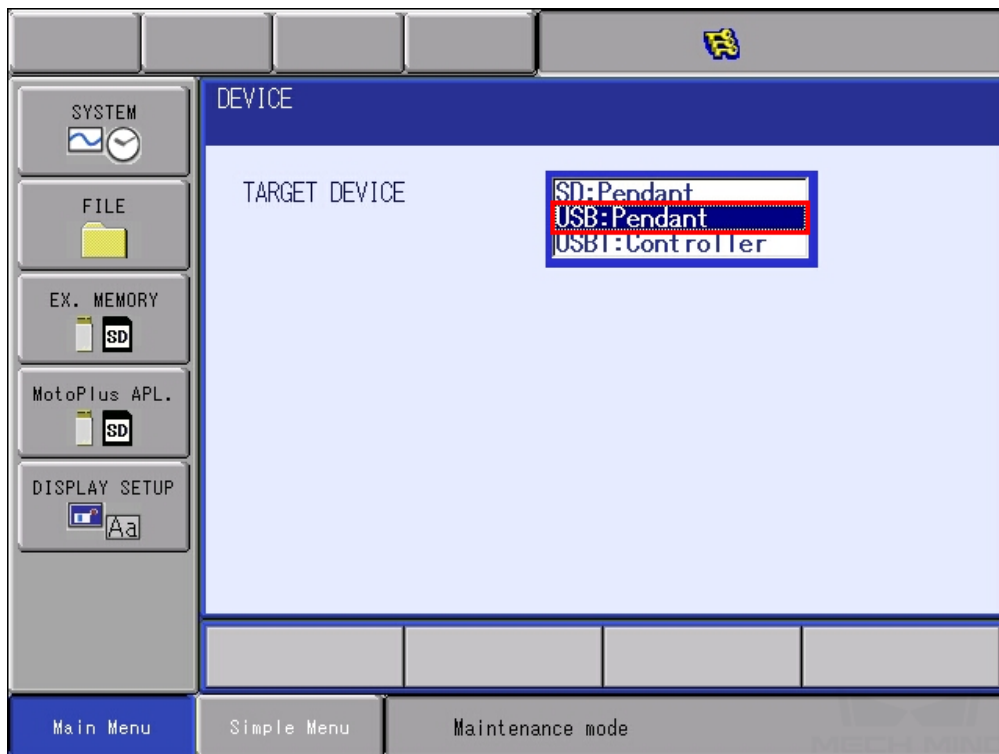
Note: Copy the file to the root directory of the flash drive. Do not put it in another folder or rename it.

1.3.2 Load the File to the Robot

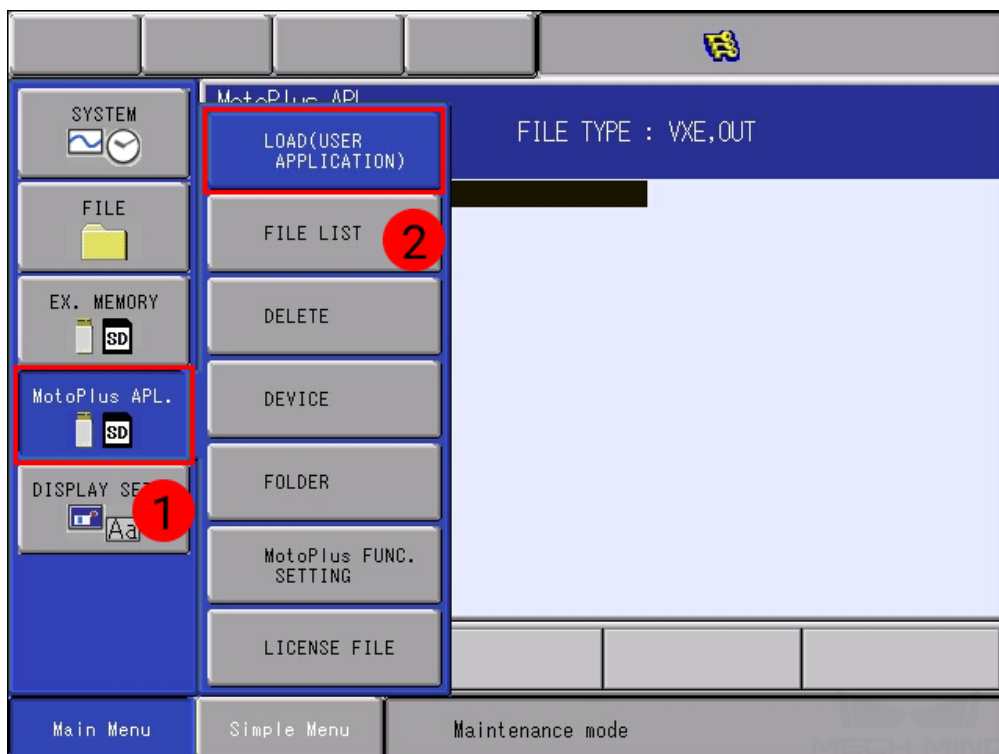
1. Insert the flash drive into the USB port on the back of the teach pendant.
2. Under maintenance mode, select *MotoPlus APL.* → *DEVICE*.



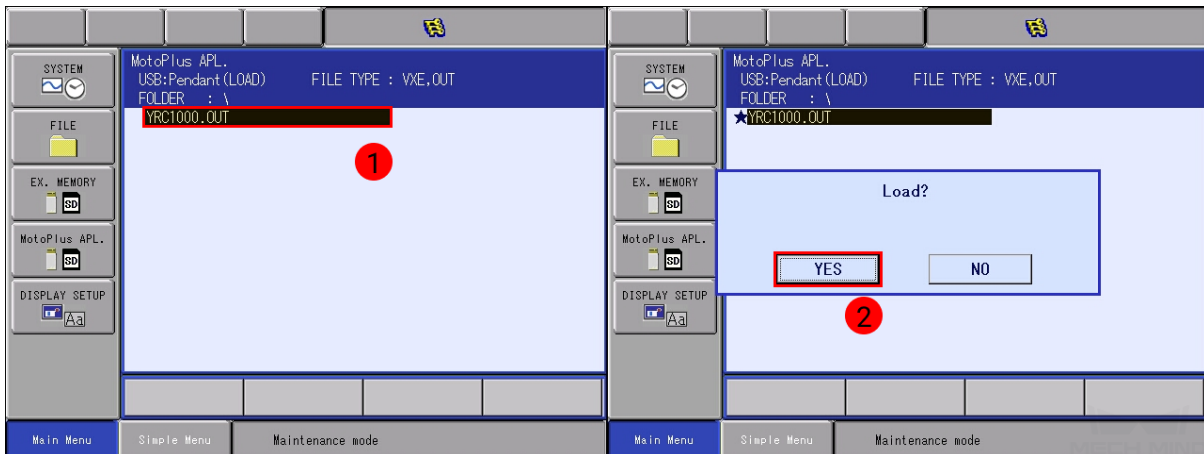
3. Select USB:Pendant for TARGET DEVICE.



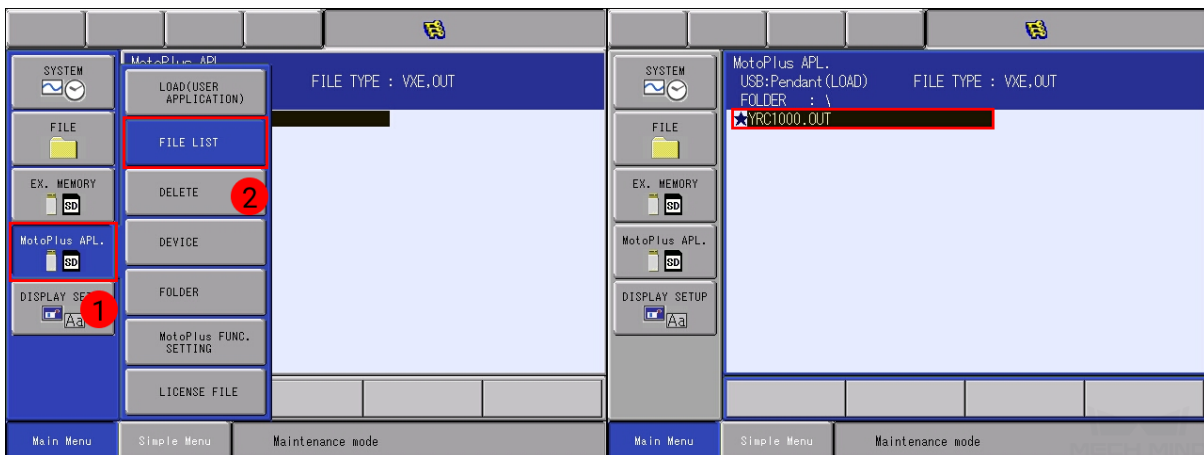
4. Select MotoPlus APL. → LOAD(USER APPLICATION).



5. Select **YRC1000.OUT** (DX200.OUT for DX200 controller), and press **ENTER**. Select **YES** in the pop-up message to start loading the program.



6. After loading completes, go to *MotoPlus APL.* → *FILE LIST*, and you should see **YRC1000.OUT** (DX200.OUT) displayed.



7. Restart the controller without pressing the **MAIN MENU** key; the program is now running automatically in the background. Turn the mode switch key to **PLAY**, and proceed to **Test Robot Connection**.



1.4 Test Robot Connection

1.4.1 Configure Robot in Mech-Viz

1. Open Mech-Viz, click *New project* to create a new project.
2. Select the robot model in use in the next page.
3. Save the project by pressing **Ctrl** + **S**.
4. In the toolbar, change the **Vel.** (velocity) and **Acc.** (acceleration) parameters to **5%**.
5. Right-click the project name in **Resources** and select **Autoload Project**.

1.4.2 Configure Settings in Mech-Center

1. Open Mech-Center and click on *Deployment Settings*.
2. Go to **Robot Server**, and make sure **Use robot server** is checked.
3. Check if the robot model displayed next to **Robot type in Mech-Viz project** matches the one in use.
4. Set the Robot IP address, and click **Save**.

1.4.3 Connect to Robot in Mech-Center

1. Click *Connect Robot* in the Toolbar.
2. The robot is successfully connected if:
 - A message saying **Robot: server connected to the robot** shows up in the **Log** panel, and
 - A robot icon with the robot model shows up in the **Service Status** panel.

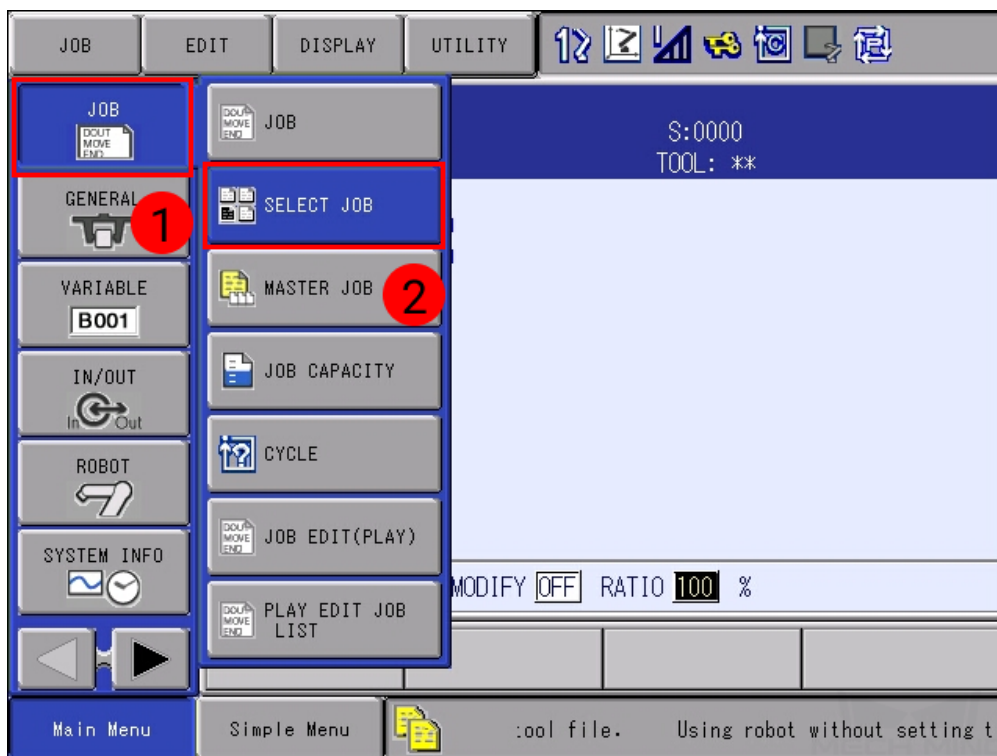
1.4.4 Move the Robot

1. In Mech-Viz, click *Sync Robot* in the toolbar to synchronize the pose of the real robot to the simulated robot. Then, click *Sync Robot* again to disable the synchronization.
2. Click the **Robot** tab in the lower right, and change the joint position of J1 slightly (for example, from 0° to 3°). The simulated robot will move accordingly.
3. Click *Move real robot*, the real robot should move accordingly.

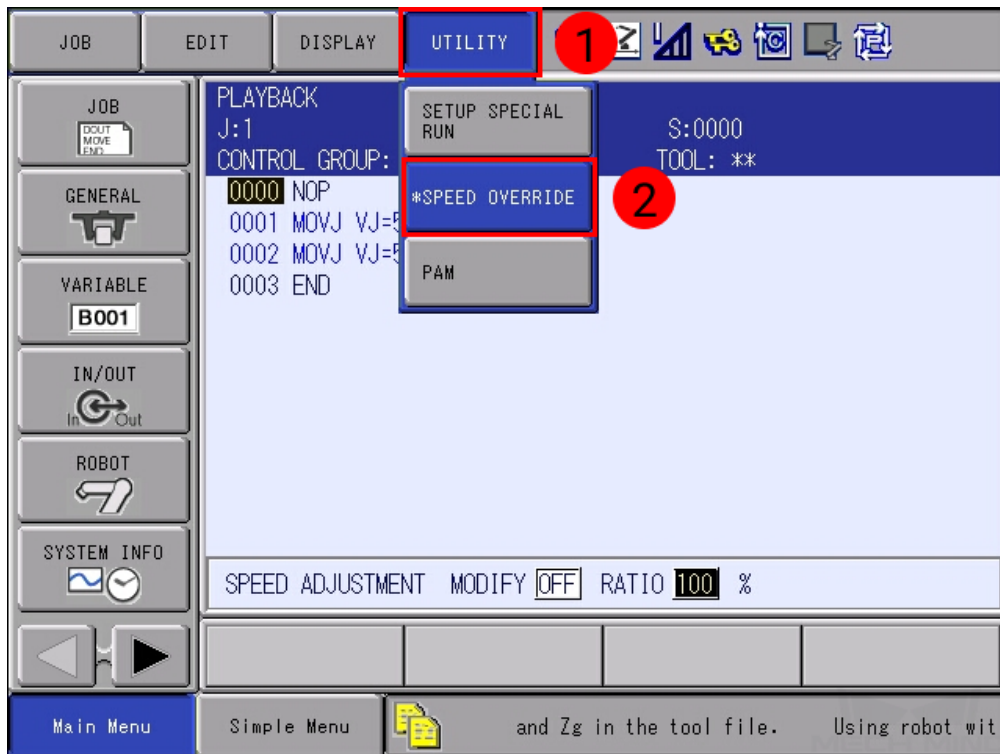
Attention: When moving the robot, please pay attention to safety hazards. In the case of an emergency, press the emergency stop button on the teach pendant!

As the robot will move at 100% velocity by default, it is recommended to adjust its velocity before running the corresponding Mech-Viz project.

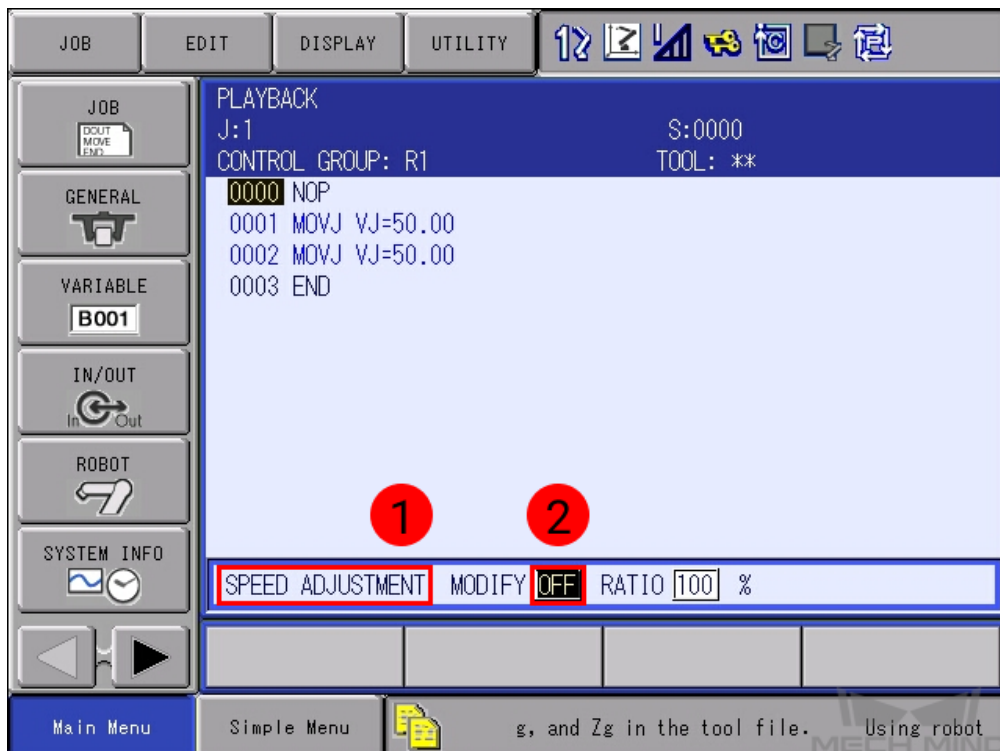
1. Select *JOB* → *SELECT JOB*.



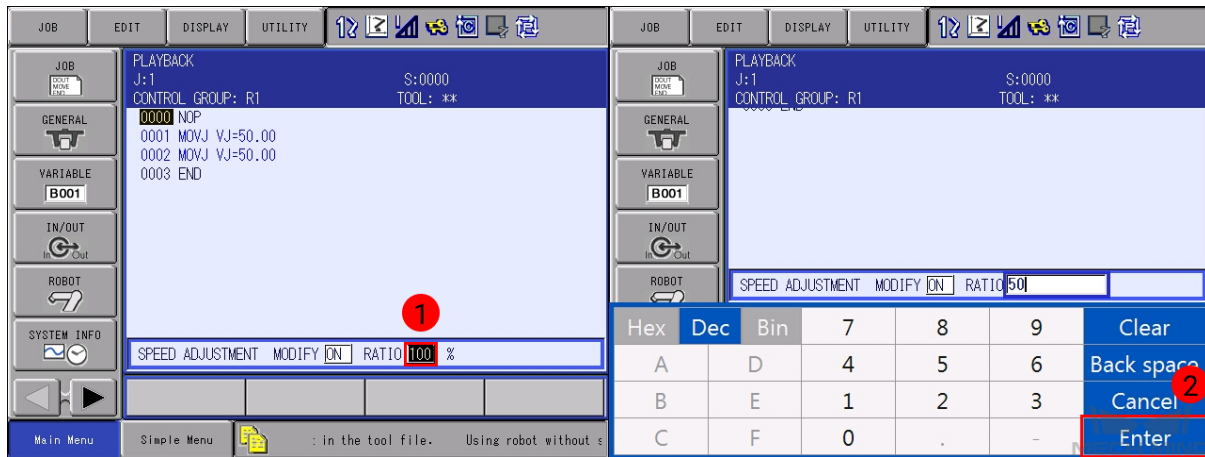
2. Select any job in the **JOB LIST**, and then press the **SELECT** key.
3. Select *UTILITY* → *SPEED OVERRIDE*.



4. Press on SPEED ADJUSTMENT and then OFF, press the SELECT key to switch MODIFY to ON.



- Press on the number after RATIO, and press the **SELECT** key to change the speed ratio. Press on **Enter** to save the change.



YASKAWA PROGRAM DESCRIPTION

2.1 Occupied IO

Occupied IO	Signal
DI (16)	IN1-IN16
DO (16)	OT1-OT16