READY

FORGE os 5

FANUC R-30iA Startup Guide

The documentation, best practices, and recommendations provided by READY Robotics do NOT constitute safety advice. Products sold through READY Robotics are not by themselves a fully integrated workcell. As required in ISO 10218-2, READY Robotics strongly recommends performing a complete risk assessment of the integrated workcell per ISO 12100. You may wish to use the methodology found in the ANSI/RIA TR R15.306 Task-based Risk Assessment Methodology.

CONTENTS

OVERVIEW

This guide will help you set up a FANUC R-30iA controller (style A cabinet or B cabinet) for use with Forge/OS 5.

By the end, you will control your FANUC robot with Forge/OS on the READY pendant!

You will complete the following steps:

1. Prepare safety hardware.
2. Connect the READY pendant.
3. Connect the your IPC PC.
4. Power on the system.
5. Configure your robot for Forge/OS.
6. Control your robot with Forge/OS!

HARDWARE REQUIREMENTS

Image	Part Name	Description	Vendor	Part Number
 	READY IPC	Hosts Forge/OS. ***Note:*** *READY offers two IPCs:* ***Forge/Hub*** *and* ***Forge/Ctrl (legacy)***	READY Robotics	
	READY pendant	The touch screen interface for Forge/OS.	READY Robotics	112563
	READY pendant Junction Box (**Forge/Ctrl only**)	Connects the READY pendant to the Forge/Ctrl and robot controller.	READY Robotics	R-101257
	12-Pin M12 to Flying Leads Cable	Connects to the READY pendant Junction Box or Forge/Hub to terminals.	READY Robotics	

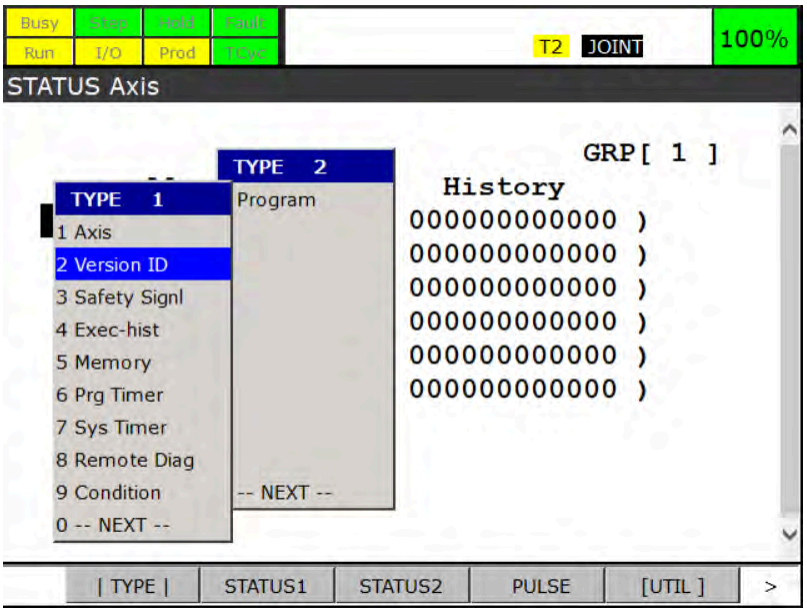
Image	Part Name	Description	Vendor	Part Number
	R-30iA Robot Controller (A or B Cabinet)	Connects the robot arm to power and to other devices.	FANUC	
	OPSFTY Breakout Harness	Required for pendant safety features and other safeguard devices (i.e. safety fence).	FANUC	NE-2020-901-002
	24V/2.5A Power Supply	Powers the READY pendant, safety controller, and more. Min./Max. current: 2.5/5.0 Amps.		e.g., Siemens 6EP1332-5BA00
	Polycarbonate Enclosure or Electrical Cabinet	Protects the electrical parts in an enclosure.		
	Cat5e Shielded Ethernet Cable (x2)	▪ Connects the robot controller to a IPC. ▪ Connects the READY pendant to a IPC.		

SOFTWARE REQUIREMENTS

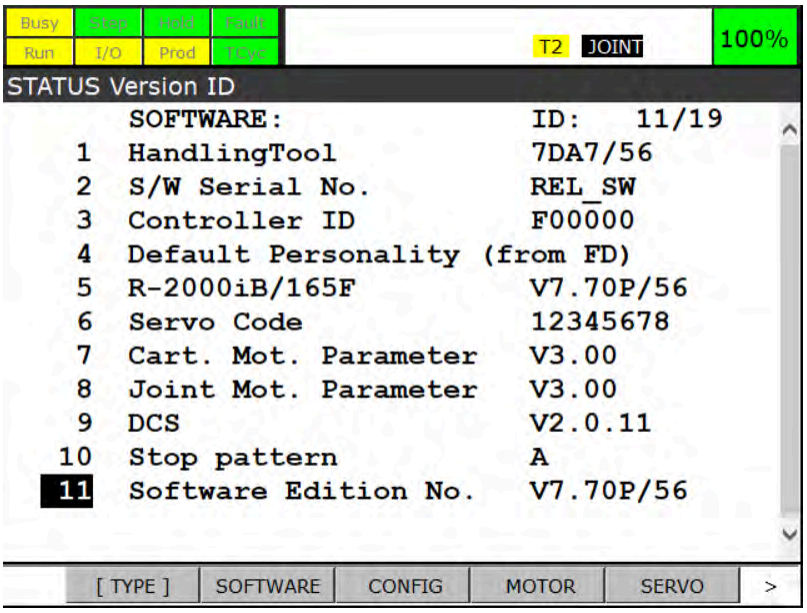
This section explains how to check your FANUC software for these version and option requirements.

Required Option	Description
R-30iA Firmware: V7.70P/56 (04/2021)	Minimum firmware version supported by Forge/OS.
RTL-R632-HT KAREL	Required for Forge programs to run on the robot controller.
RTL-R648-HT User Socket Messaging	
RTL-R735-HT DCS Pos./Speed Pkg	Required to jog the robot with the READY pendant.
RTL-J568-HT DCS Safe I/O connect	

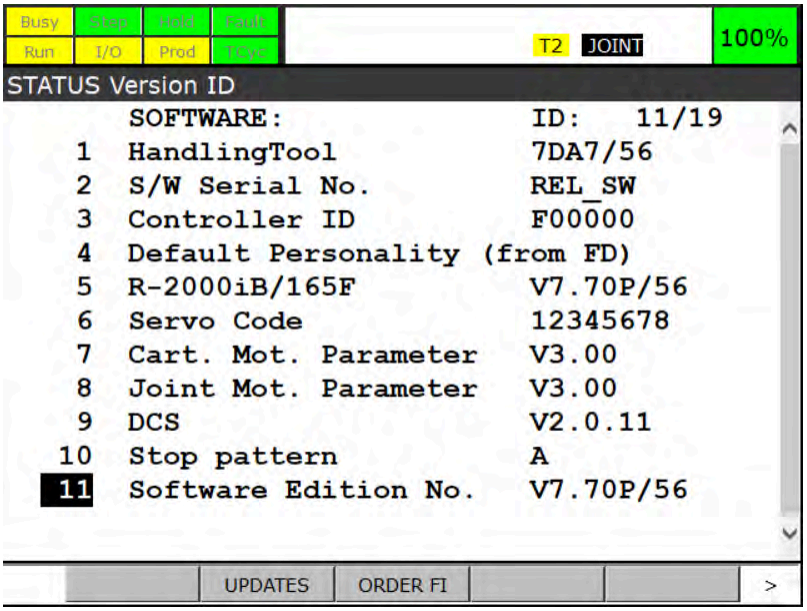
1. Plug the FANUC controller into a power source. Follow FANUC instructions for powering the controller.
2. Turn the power switch on the FANUC controller clockwise to power the controller on. Wait for the controller to boot up.
3. On the FANUC teach pendant, press the **STATUS** button at the bottom of the keypad.
4. In the STATUS menu, press **TYPE (F1)**, then press **Version ID (2)**.



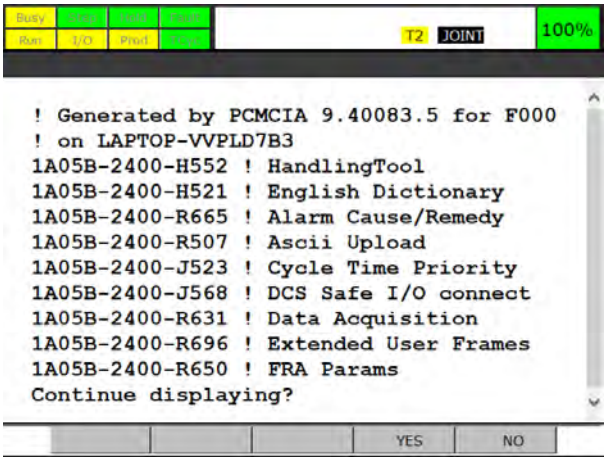
5 Look for **Software Edition No.** and note the version number next to it. If your system version is older than the requirement, contact your FANUC distributor to upgrade.

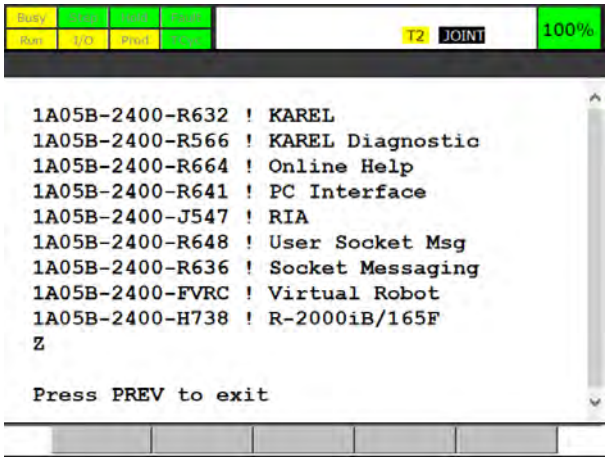


6 Press the right arrow on the touchscreen menu bar, then press **ORDER FI**. The installed options appear with their part numbers.



7 Look for the required options. Under "Continue displaying?", press **YES** to see more of the installed options. If any of your controller's required options are missing, contact your FANUC distributor to upgrade.





INSTALLING FANUC SAFETY HARDWARE

1. Install the FANUC controller and robot according to FANUC installation and safety guidance.

   Note: *This guide assumes that you have installed the FANUC robot and controller, as well as FANUC's robot-specific software.*

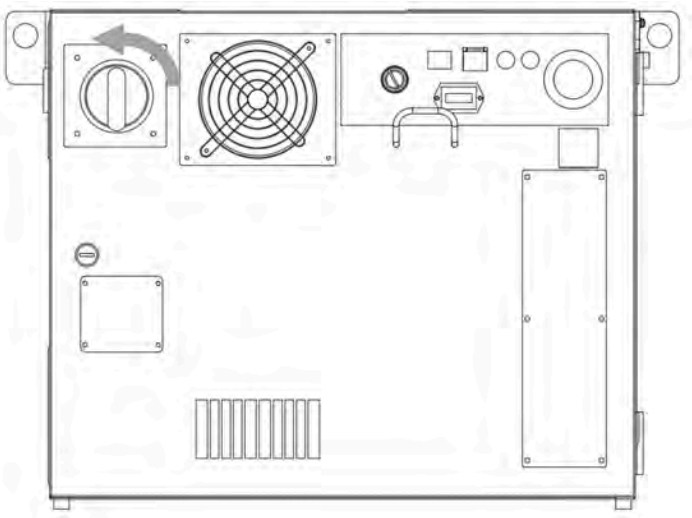
2. Turn off your FANUC Controller. Then disconnect it from its power supply. Follow your facility's lockout/tagout procedure.

   Electric Shock Warning: Disconnect all components from power sources before attempting this installation.

3. Open the FANUC controller.

   a. Use a flat head screwdriver to turn the lock below the power switch counterclockwise.

   b. Turn the power switch counterclockwise to release the door.



4. Install the Safety Breakout Harness.

   a. Find the panel board on the inside surface of the cabinet door. For the A-cabinet, the panel board is in the Operation Box.

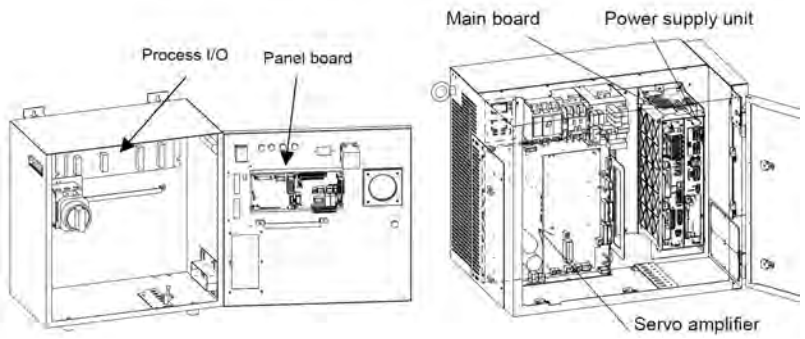
   b. Connect the harness connector to connector **CRMA8** on the panel board.

CONNECTING THE READY PENDANT

The READY pendant includes these safety outputs:

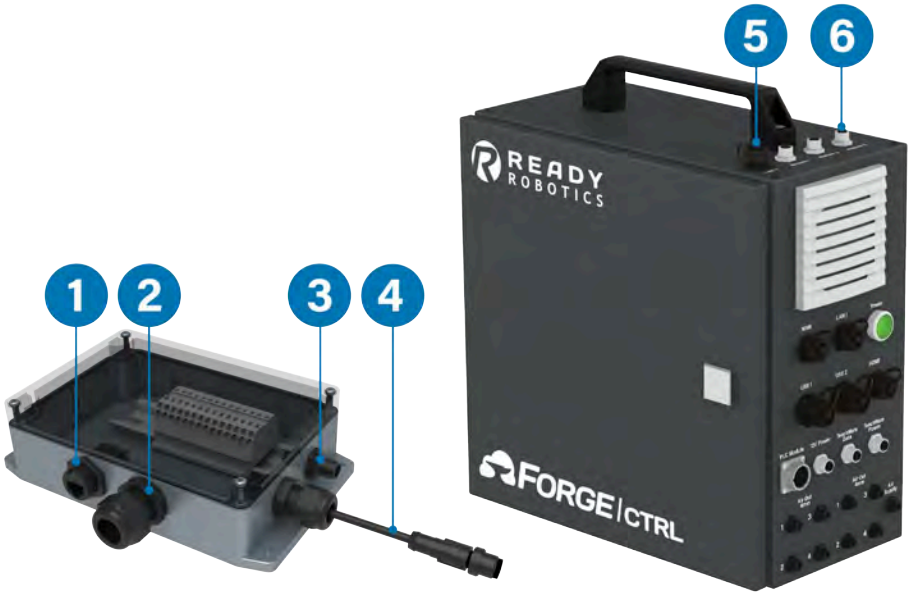
1. Key Switch (Robot Operation Mode)
2. Three-Position Enabling Switch
3. Emergency Stop Button

Electric Shock Warning: Disconnect all components from power sources before attempting this installation.



Interior diagrams for reference, A-cabinet

1 If you are using a Forge/Ctrl, prepare the READY pendant Junction Box:



a Connect a Cat5e STP Ethernet cable from the junction box Ethernet port (1) into a **LAN** port (5) on the Forge/Ctrl.

b Connect the 8-Pin power cable (4) from the junction box into one of the **Module** ports (6) on the Forge/Ctrl.

c Connect the 12-Pin flying leads cable to the safety port (3) on the junction box.

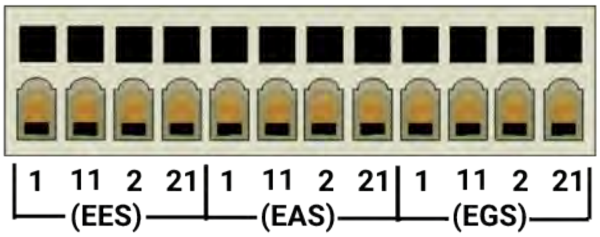
2 If you are using a Forge/Hub, connect the 12-Pin flying leads cable to the **Safety** port on the Forge/Hub.

3 Feed the flying leads through a controller cable entrance. Refer to FANUC documentation for cable entrance and sealing.

4 Wire the flying leads to the Panel Board according to the table below.

Junction Box Wire	Terminal Block TBOP4	CRMA8 OPSFTY Harness	Function
Pink	EES1		Emergency Stop circuit 1
Yellow	EES11		Emergency Stop circuit 1
Black	EES2		Emergency Stop circuit 2
Grey	EES21		Emergency Stop circuit 2
Brown		A7 + 24E	Enabling Switch Circuit 1
Blue		A1 OPSFTY11	Enabling Switch Circuit 1
White		B7 OV	Enabling Switch Circuit 1
Green		B1 OPSFTY12	Enabling Switch Circuit 1
Red		A8 +24E	Key switch circuit 1
Violet		A2 OPSFTY21	Key switch circuit 1
Grey/Pink		B8 0V	Key switch circuit 2
Red/Blue		B2 OPSFTY22	Key switch circuit 2

TBOP4



5 Wire the external safety fencing or another safeguarding device.

a **If you are using safety fencing or another safeguard device**, connect it to the OPSFTY harness: On the terminal block **TBOP4**, use jumpers to bridge **EAS1** and **EAS11**. Then bridge **EAS2** and **EAS21**. Wire the fencing as shown in the table below.

Function	CRMA8 OPSFTY Harness
Fence Contact 11 (Circuit 1)	A8 +24E
Fence Contact 12 (Circuit 1)	A3 OPSFTY 31
Fence Contact 21 (Circuit 2)	B8 0V
Fence Contact 22 (Circuit 2)	B3 OPSFTY 31

b **If you choose to NOT use a safeguard device**, jumper the safety fencing circuits: On the terminal block **TBOP4**, use jumpers to bridge **EAS1** and **EAS11**. Then bridge **EAS2** and **EAS21**. On the OPSFTY harness, use jumpers to connect **A8 (+24E)** and **A3 (OPSFTY 31)**, and connect **B8 (0V)** and **B3 (OPSFTY 31)**.

CONNECTING THE R-30IA AND PC

Forge/OS must be able to communicate with the FANUC controller. This section will help you connect the IPC device and R-30iA using a Cat5e STP Ethernet cable.

1. Find a Cat5e STP Ethernet cable long enough to reach from the IPC to inside the FANUC controller.
2. Plug one end of the Ethernet cable into a **LAN** port on the IPC device.
3. Inside the FANUC controller, remove one of the knockouts on the foam cable panel. Feed the Ethernet cable through it.
4. Plug the cable into port **CD38** on the Main Board.
5. Manage the cables.
   a. Use zip ties to bind cables at the top and bottom of the controller enclosure.

      Important: *Ensure that there is enough slack for the door to open and close without creating tension.*

   b. Cut the zip ties so that the cut-ends are flush with the connectors.
6. Close the controller door. Lock it using a flat head screwdriver.

POWERING ON

In this section, you will power on all the system and prepare the controller on the FANUC teach pendant.

1. Power on your FANUC controller and IPC.
   a. Reconnect the FANUC controller to power and turn it on. Consult your Manufacturer's manual for instructions on powering the FANUC controller.
   b. Power on your IPC device and other devices.

      ***Note:** If you are using a Forge/Ctrl, turn the Power Disconnect Switch to **ON**. Then press the green power button on the other side.*

   c. If there are issues, power off each device, disconnect from power supplies, and check your wiring.
   d. Turn the switch on the front panel of the FANUC controller to **T1** mode.
   e. Turn the switch on the FANUC teach pendant to **ON**.
2. Initialize the FANUC Safety I/O Board.
   a. On the FANUC Teach Pendant, go to the DCS screen by pressing the **MENU** button, **NEXT (0)**, **SYSTEM (6)**, then **DCS**.
   b. Press **PREV** to ensure you are on the main DCS screen. There should be items named Safe I/O Status, Safe I/O connect, etc.
   c. Use the arrow keys to select the **Safe I/O device** setting. Press **Enter**.
   d. Press **INIT (F2)**, then **YES (F4)**. Do this process twice.
   e. The **Safe I/O Board** appears under one of the device headings. Scroll down with the arrow keys and make sure it's there. A new FANUC warning related to new DCS parameters may appear at the top of the FANUC Teach Pendant.
   f. If the device does not appear, turn the FANUC controller off and check the wiring to the Safety I/O Board and the Conversion Unit. Then reboot the controller and try again.

3 Set the robot's IP address.

a On the FANUC teach pendant, go to the Host Communication screen: Press the **MENU** button, then scroll down to **SETUP (6).** Then scroll right to **Host Comm (8)**. Press **ENTER.**

b On the list of Protocols, select **TCP/IP** and press **ENTER**.

c For Port 1, select the line that reads **Port#1 IP addr...** and press **ENTER**.

d Set the IP Address and Subnet Mask according to the READY IPC you have:

- *Forge/Ctrl:* set the **IP Address** to **172.16.255.251** and set the **Subnet Mask** to **255.255.255.0**.
- *Forge/Hub:* set the **IP Address** to **192.168.1.20** and set the **Subnet Mask** to **255.255.255.0**.

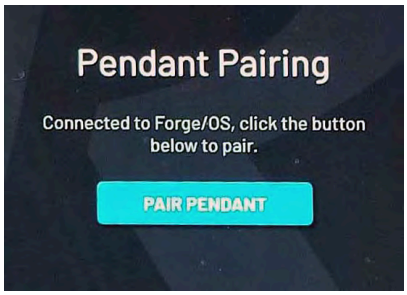
SIGNING IN TO FORGE/OS

Follow these steps to pair the READY pendant with the IPC and sign in to Forge/OS 5.

1. If you need to install Forge/OS 5 on your IPC, stop here and follow all the steps in Appendix A, then come back to these steps.

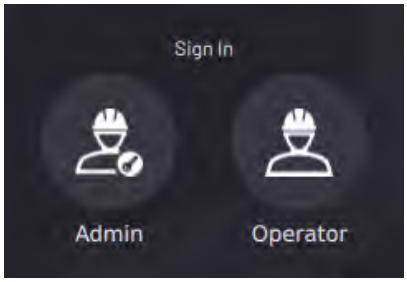
   Tip: *Forge/OS 5 is installed on all Forge/Ctrls and Forge/Hubs shipped after June 1, 2021.*

2. When you power on your READY pendant and IPC, the Pendant Pairing screen appears on the READY pendant. Tap the blue **PAIR PENDANT** button when it appears. It may take up to one minute to appear.

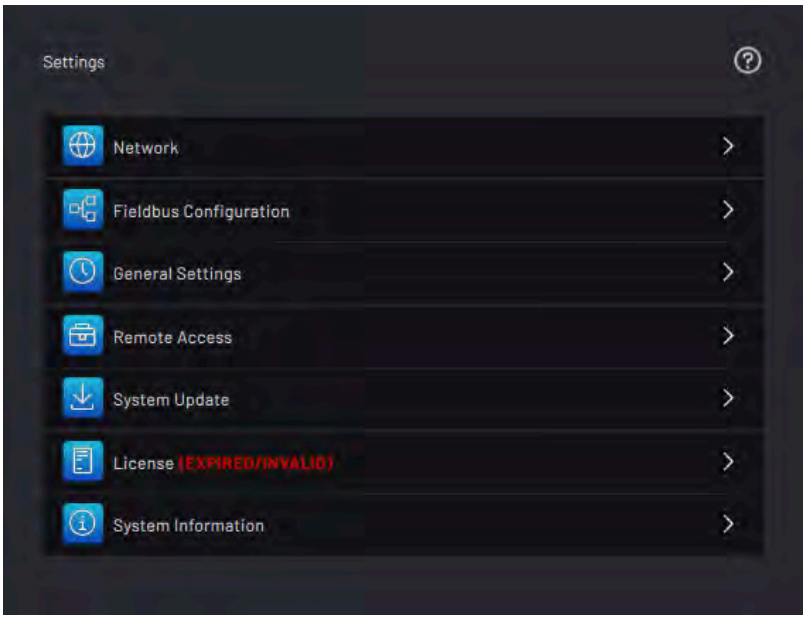


   Note: *If the pendant fails to pair or the **PAIR PENDANT** button is unavailable for longer than two minutes, check the Ethernet connection to the **IPC**.*

3. Tap **Admin** and sign in. The default Admin password is "forgeadmin".



4 If Forge/OS is inactive, it opens the Settings app and prevents you from opening other apps. If you see the screen below, follow Activating Forge/OS with a License Code in Appendix A.



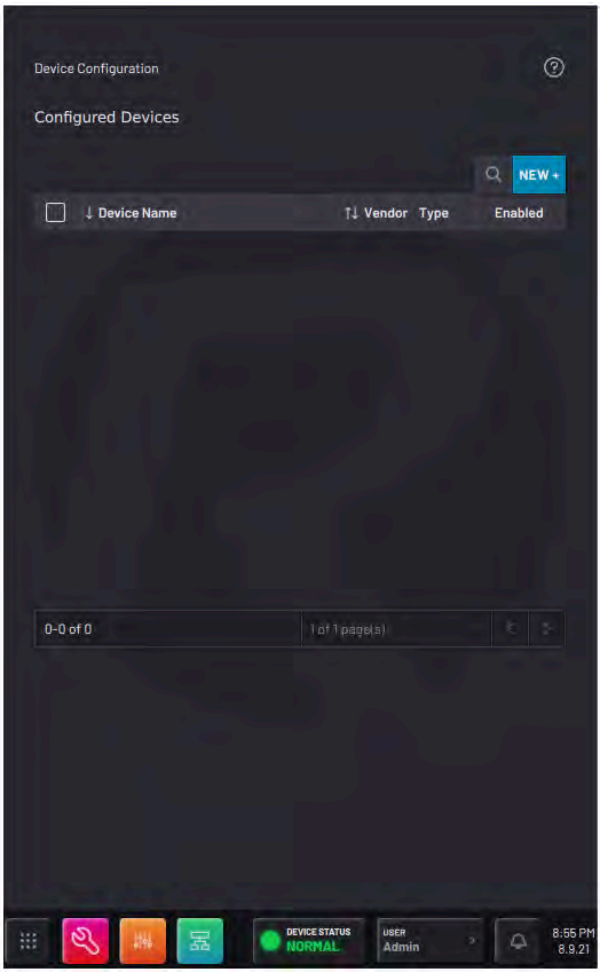
5 With Forge/OS active, move on to the next section.

CONFIGURING THE ROBOT FOR FORGE/OS

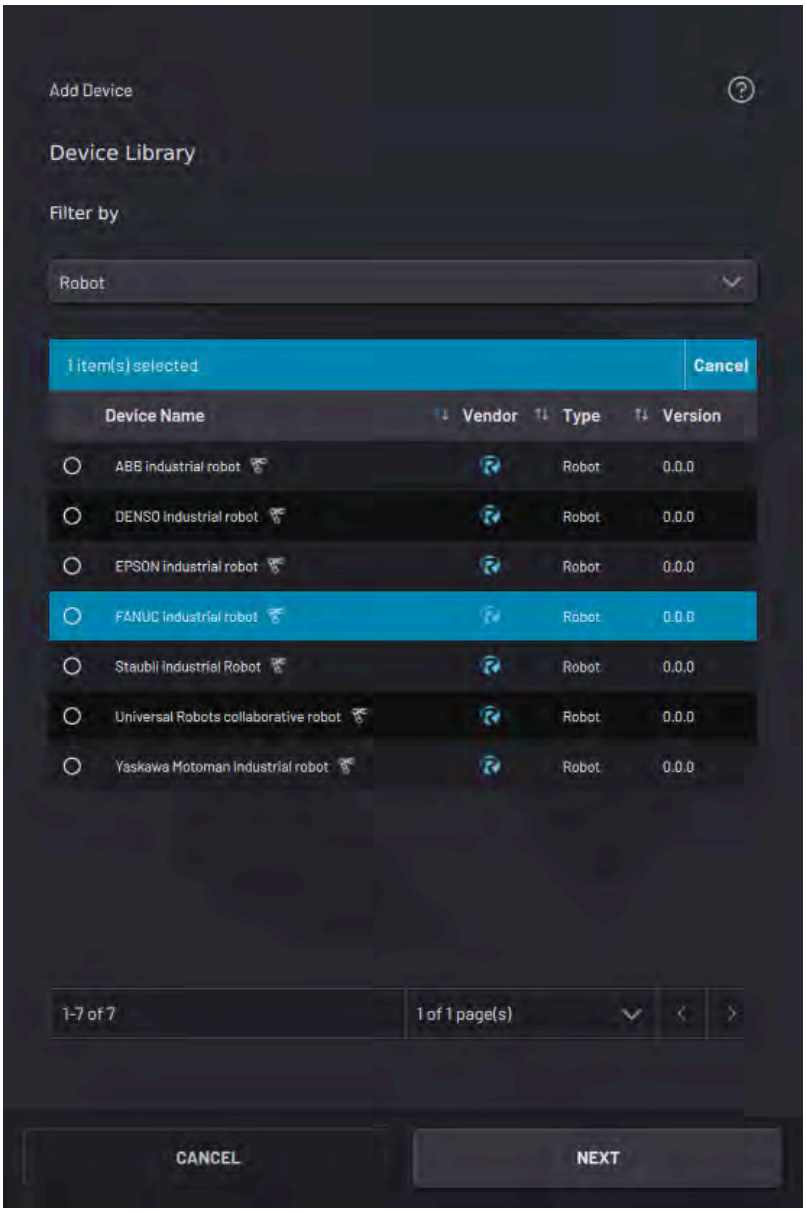
This section shows you how to add a robot in the Forge/OS Device Configuration app and configure the FANUC controller. Make sure the FANUC controller and Forge/OS devices are powered on.

1 In the **Admin** role, open the **Device Configuration** app.

2 Tap **New +** to open the Device Library.

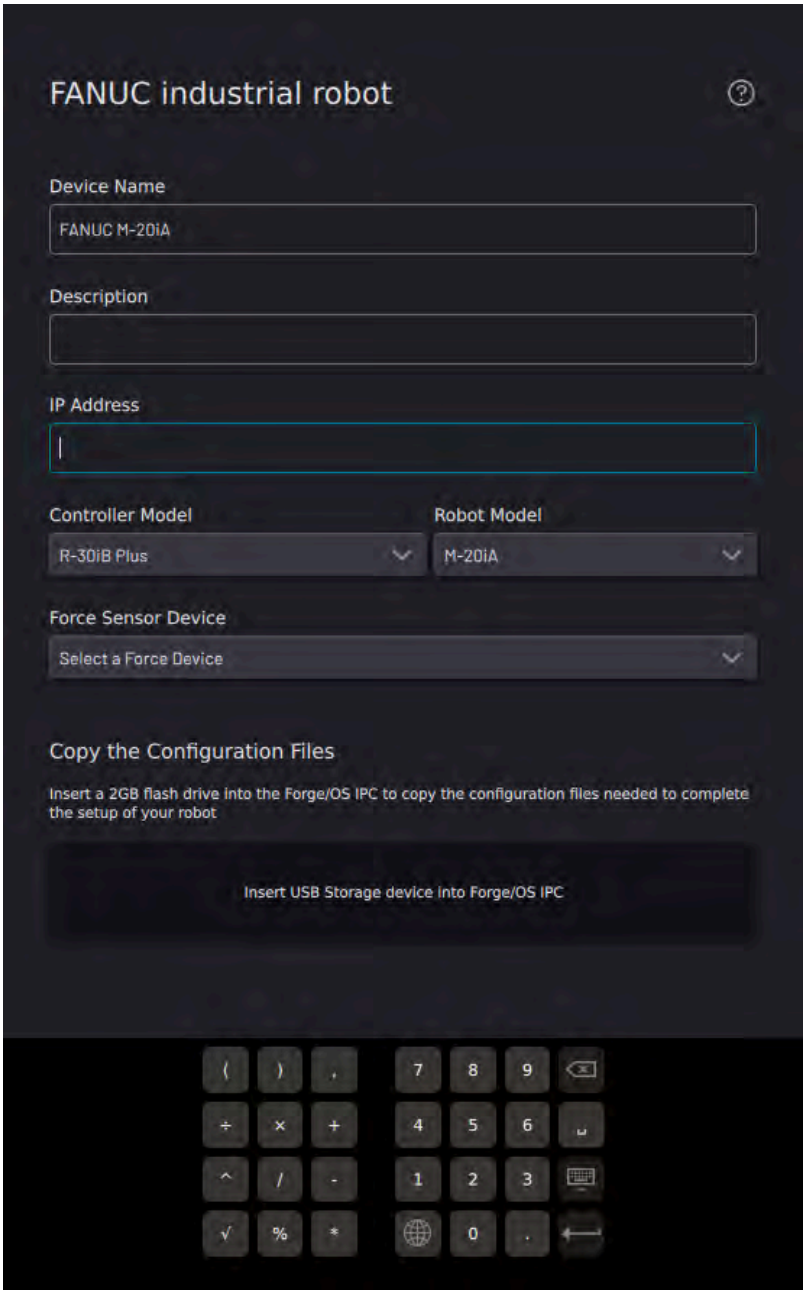


3 Select the **FANUC industrial robot** option. You can use the **Filter by** dropdown to show robot options. Tap **NEXT** to continue.



4 Enter the robot information. Select the robot controller, then select the robot model.

Note: *Enter the same IP address that you set on the FANUC controller.*



5 Insert a USB flash drive into the IPC as instructed on the screen. Use an empty flash drive with at least 2GB of storage.

Tip: *Do not connect the USB flash drive to the* ***READY pendant****.*

6 Tap **Start Transfer** and wait for it to finish.

7. Remove the USB flash drive when prompted.

8. Insert the USB drive into the FANUC teach pendant. Complete these sub-steps to install the configuration files on the FANUC controller:

   a. Set the switch on the front panel of the FANUC controller to **T1** mode. Turn the switch on the FANUC teach pendant to **ON**.

   b. Press the **SELECT** button. A list of programs appears.

   c. Press **MONITOR (F4)** to show the list of running programs. If any programs appear, press the **FCTN** button. Then press **1** to **ABORT (ALL)**. Press **1** and **ABORT (ALL)** at least one more time to make sure that all running programs stop.

      Note: *If you do not abort all running programs, the Forge configuration files might not update properly. This could result in a "Specified program is in use" message during file transfer.*

   d. Press the **MENU** button on the FANUC teach pendant.

   e. Press **FILE (7)**.

   f. Press **UTIL (F5)**, highlight the **Set Device (1)** option, and press the **ENTER** button.

   g. Choose the **USB on TP(UT1:)** option, since the USB drive is in the FANUC teach pendant.

      Note: *If you inserted the USB drive into the controller front panel, choose the **UD1:** option.*

   h. Highlight the **All Files** option by using the arrow keys and press **ENTER**.

   i. The contents of the USB drive will appear. Use the arrow keys and the **ENTER** key to find and highlight **FORGE-OS** > **READY-FANUC-DRIVER** > **FORGE_INSTALL,** then press **ENTER.**

   j. Press **Yes (F4)** for the prompt asking if you want to execute the file.

   k. The FANUC Controller first displays **# Backing Up Controller Config #**. Wait for the FANUC Controller to say **Execution is completed successfully**. At a later time, you may copy the backup files in the FANUC Backup folder off of the USB drive.

      Note: *If you get a "Specified program is in use" message instead of "Execution is completed successfully", try aborting all programs again. Press **FCTN** then **1** for **ABORT (ALL)**.*

   l. Press **OK (F4)** and remove the USB drive from the FANUC pendant.

m. Confirm the changes for the safety check system: Go to the DCS screen by pressing the **MENU** button, **NEXT (0)**, **SYSTEM (6)**, and then **DCS**.

n. Press **PREV** to make sure you are on the main DCS screen. You will see items named *Safe I/O Status*, *Safe I/O connect*, etc.

o. Press **APPLY** (F2) to confirm the settings. If you installed Forge/OS files onto the FANUC controller before, there may not be changes to apply.

p. Enter the password (default: **1111**). Confirm the settings by pressing **OK (F4)**.

q. Restart the FANUC controller to apply the settings. Power the controller off, then power it on.

r. While the controller is restarting, set the switch on the front panel of the FANUC controller to **AUTO** mode. Turn the switch on the FANUC pendant to **OFF**.

s. Wait until the FANUC controller restarts before moving on to the next step.

9. If you are using a **CR-series (collaborative)** robot, follow these sub-steps to confirm the payload each time the controller boots up and each time a READY pendant notification tells you to.

   a. Go to the Collaborative Robot DCS screen by pressing the **MENU** button, **NEXT (0)**, **System (6)**, then **DCS**.

   b. Press **PREV**, highlight the **Collaborative Robot** option, and press **ENTER**.

   c. Press **CONFIRM (F2)**. Enter the password (default **1111**) and follow the prompts by answering **YES (F4)**.

   Note: *Each time a FANUC collaborative robot is turned off and then on again, the payload must be confirmed. If possible, wait for 30 minutes after booting. It can take up to 30 minutes for the Force Sensor to calibrate.*

10. Confirm that the Forge/OS programs are running on the FANUC teach pendant. Press the **SELECT** button. A list of programs appears.

11. Press **MONITOR (F4)** to show the list of running programs. There should be three "forge" programs running. If nothing happens when you press **MONITOR (F4)** or you see fewer than three "forge" programs on the monitor, follow these sub-steps.

    a. Turn the switch on the FANUC teach pendant back to **ON**.

    b. On the FANUC teach pendant, press the **PREV** button to return to the list of saved programs.

c Use the arrow keys to highlight the program labeled **Forge_OS.**

d Hold down one of the three-position enabling switches on the back of the FANUC pendant to the middle position.

e While holding down the enabling switch, press and hold the **SHIFT** button and then press the **FWD** button once. Then release **SHIFT** and the enabling switch.

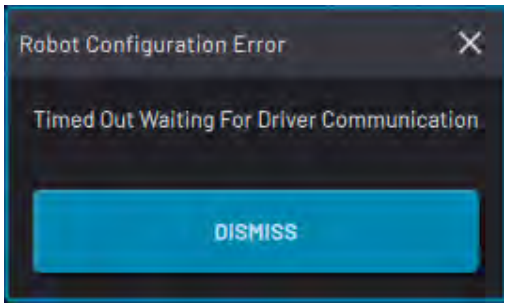
f Check the monitor again. Press **MONITOR (F4)**. There should be three programs listed.

g Set the switch on the front panel of the FANUC controller to **AUTO** mode. Switch the FANUC teach pendant to **OFF**.

12 In Forge/OS, confirm your device settings and tap **SAVE**. Forge/OS attempts to connect with the robot controller for up to 20 seconds.

Note: *When you first connect to a robot, it's normal to see some robot errors and/or warnings on the* ***READY pendant****. Ignore these for now. You will clear them after you finish adding the robot to Forge/OS.*

a If the robot controller fails to connect, you see this pop-up. .

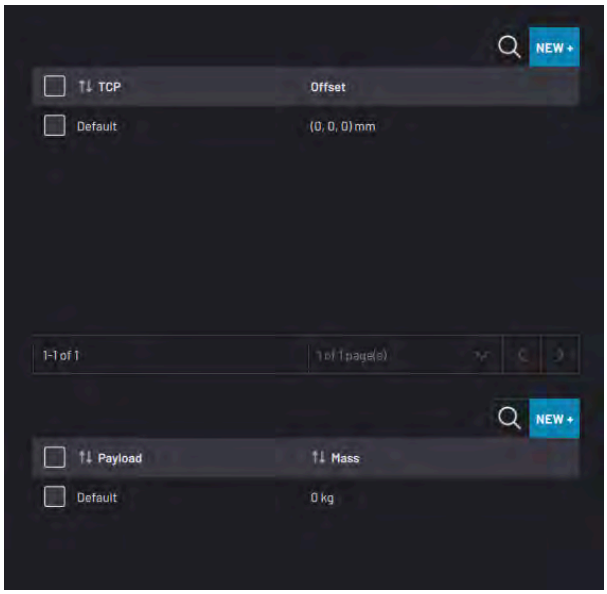


Click **DISMISS**, do the following, then try to tap **SAVE** again:

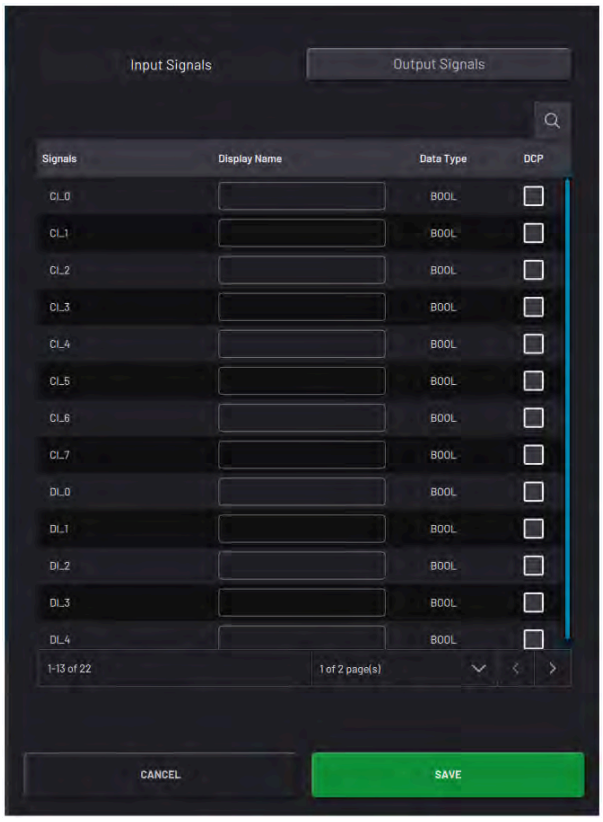
- Check the Ethernet connection between the robot controller and IPC.
- Check the network settings on the robot controller.
- Check if the robot controller is on and in the correct operating mode (in auto or remote mode).
- Select the correct robot controller and robot models in Device Configuration.

13 When the robot connects, you can add Tool Center Points (TCPs) or Payloads for the robot. You can come back to this later by editing the device's configuration. Tap **SAVE** to continue.

Note: *The default TCP is at the robot's tool flange. The default Payload is zero.*



14 *(Optional):* Set up the robot controller's Input/Output (IO) signals for use in the Device Control Panel and Task Canvas.



a Enter a **Display Name** (i.e. "Open Machine Door", "Open Pneumatic Vise", or "Start Machining Cycle") to show what each signal does in other apps.

b. If you want a signal to appear in the Device Control Panel, check the **DCP** box next to that signal.

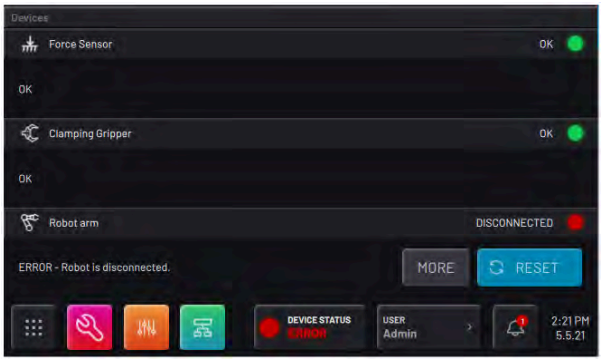
> ***Note:*** *To use these I/O signals, integrate your I/O devices with the robot controller.*

c. Tap **SAVE**. Forge/OS returns to the Configured Devices list, which shows the new robot as **enabled**.

> ***Note:*** *A device is **enabled** when its switch is green and toggled to the right.*

15. Follow these steps to clear robot errors:

a. Tap the **Device Status** button on the Toolbar to expand the Device Status Panel. The robot is listed with two buttons: **MORE** and **RESET**.



b. Tap **RESET** to try to recover from the errors. If you can't **RESET** an error, tap **MORE** to get more details and instructions.

16. If you added TCPs/payloads in step 13, follow the FANUC Tool Loading Steps in Appendix B. You need to perform the Tool Loading Steps each time you add TCPs and/or payloads.

Congratulations! You are ready to control your robot in the Device Control Panel and Task Canvas apps.

APPENDIX A: SETTING UP FORGE/OS

INSTALLING FORGE/OS

Follow these steps to install Forge/OS and sign in to the Admin role. Installation takes about 30 minutes, depending on the resources of the IPC.

1 To install Forge/OS, follow these substeps. You need a Forge/OS installation USB flash drive. Contact your READY Robotics distributor for an installation USB drive.

Important: *Installing Forge/OS will erase all data on the target hard drive.*

a Connect a monitor, keyboard, and mouse to the IPC where you want to install Forge/OS.

b Plug the Forge/OS installation USB flash drive into the IPC.

Tip: *If you need more USB ports, use a USB 3.0 hub.*

c Restart the IPC. While the IPC is powering on, press the keyboard hotkey that takes you to the Boot Menu.

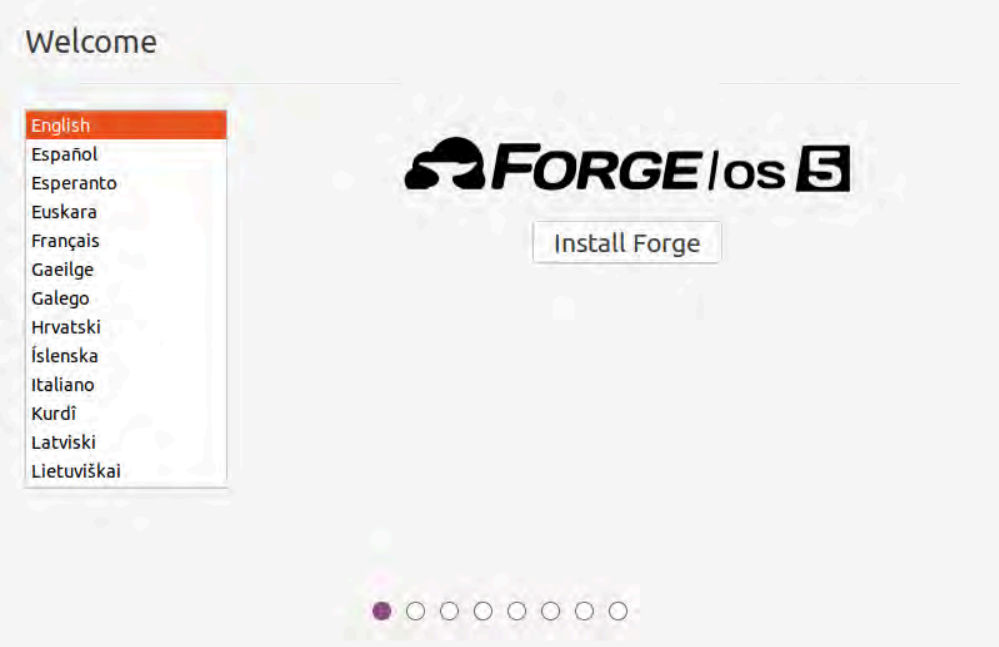
Tip: *The key that opens the Boot Menu depends on the* ***IPC*** *model. The most common keys that do this are ESC, F10, F11, or F12. Refer to your computer's documentation for boot options.*

Note: *If you're installing Forge/OS on a* ***Forge/Ctrl****, press F11. You may need to enter the* ***BIOS Admin password****. Contact READY Support if you run into this issue.*

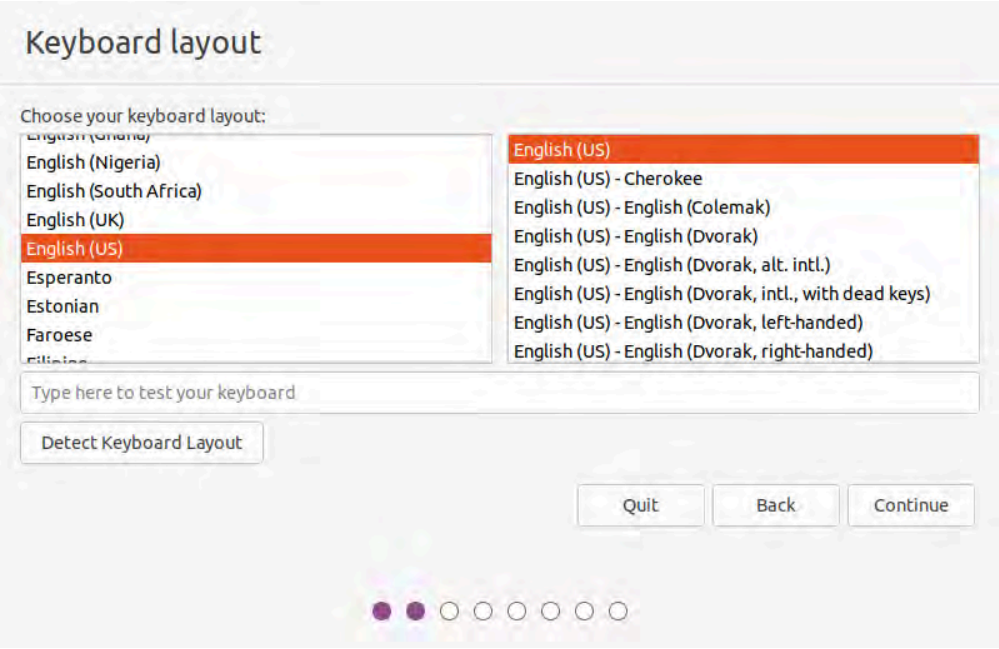
d From the boot options, select **Install Forge/OS** to boot from the installation USB flash drive.

e The installer may take several minutes to load. Wait until the installation wizard opens.

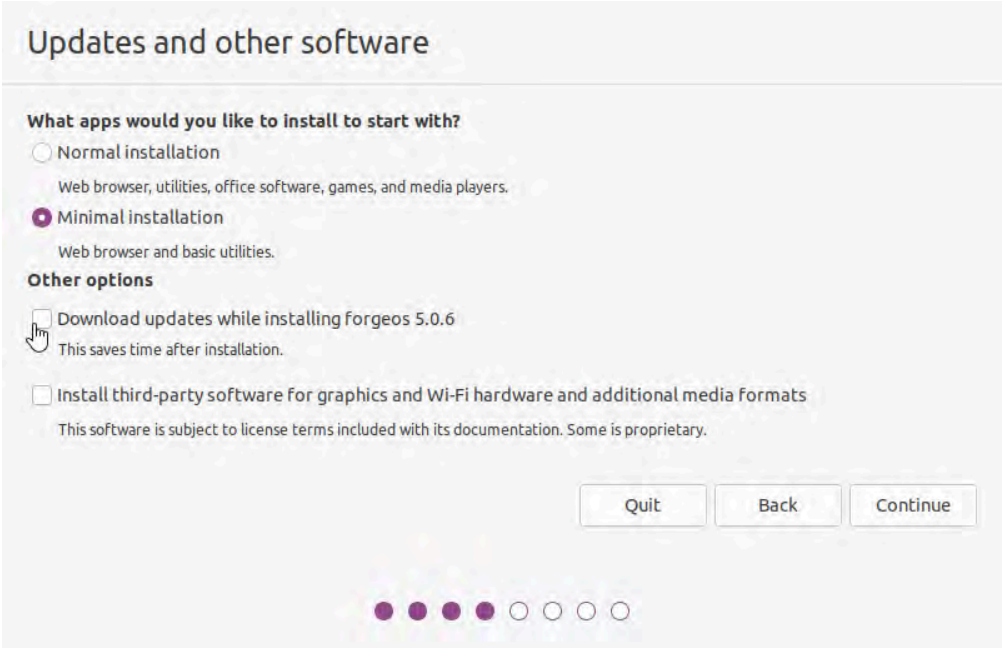
f Select your language. Then click **Install Forge**.



g Choose a keyboard layout. Then click **Continue**.

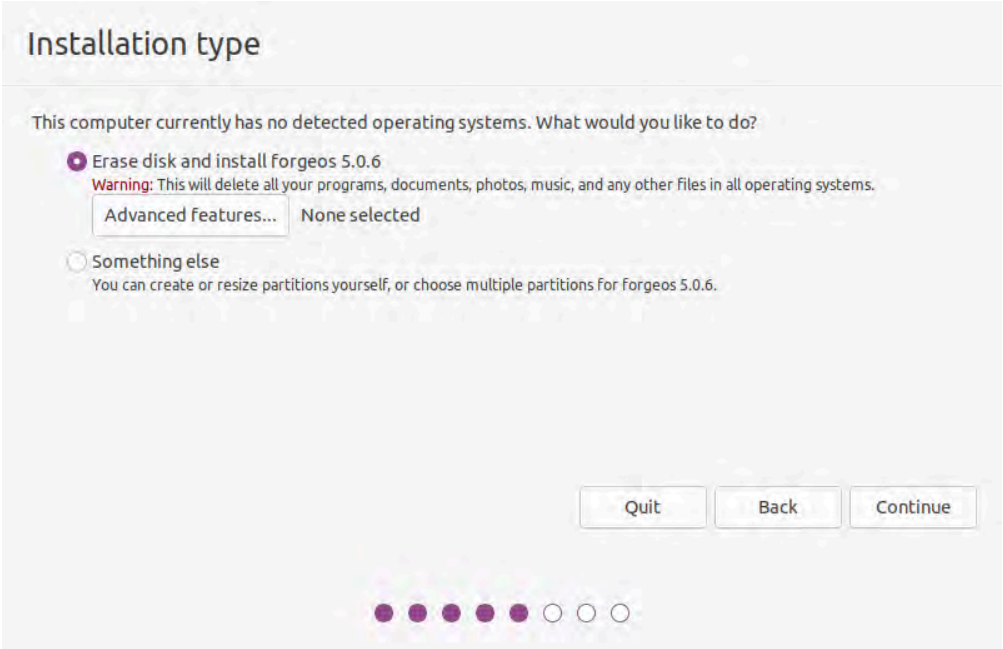


h Select **Minimal installation**. Uncheck **Download updates while installing forgeos**. Then click **Continue**.

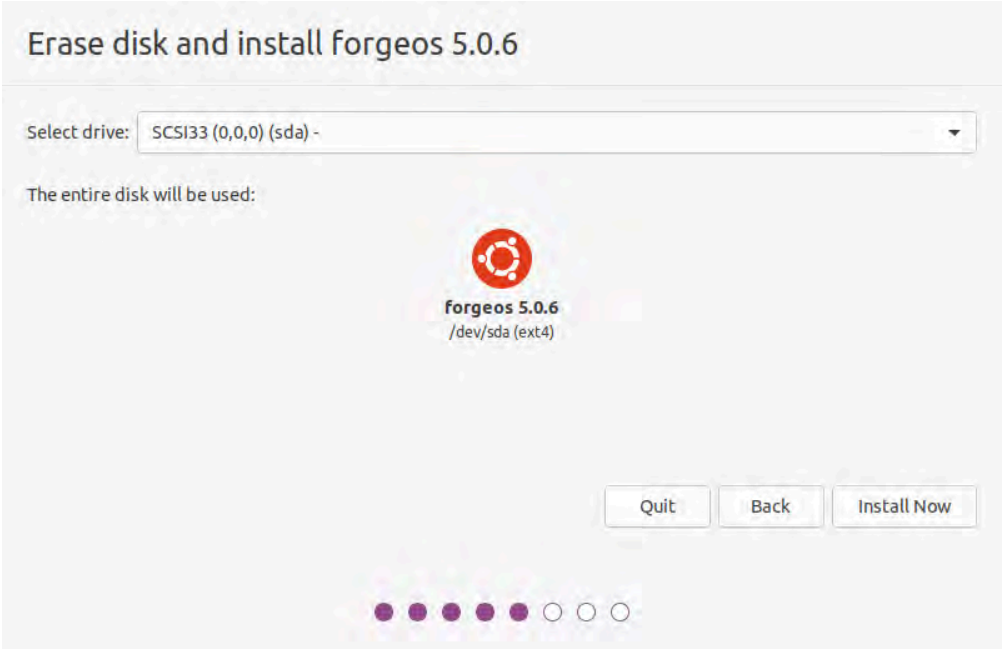


i Select **Erase disk and install forgeos**. Then click **Continue**.

Note: *If Forge/OS is already installed, the installation wizard will show additional options. The goal is to erase the entire disk for a brand new installation.*

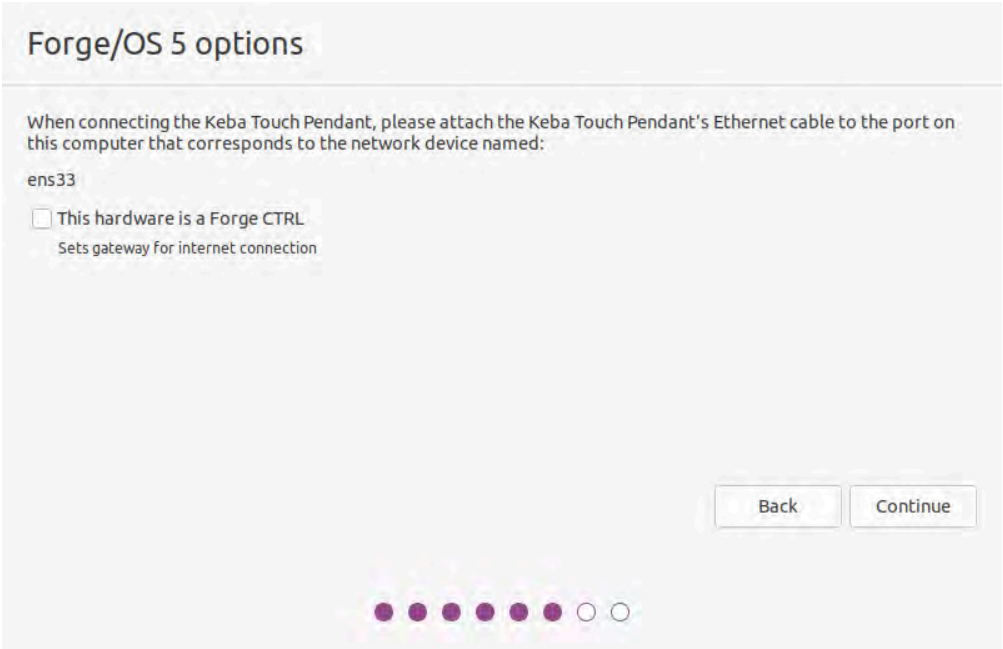


j Select the IPC hard drive for Forge/OS and click **Install Now**.

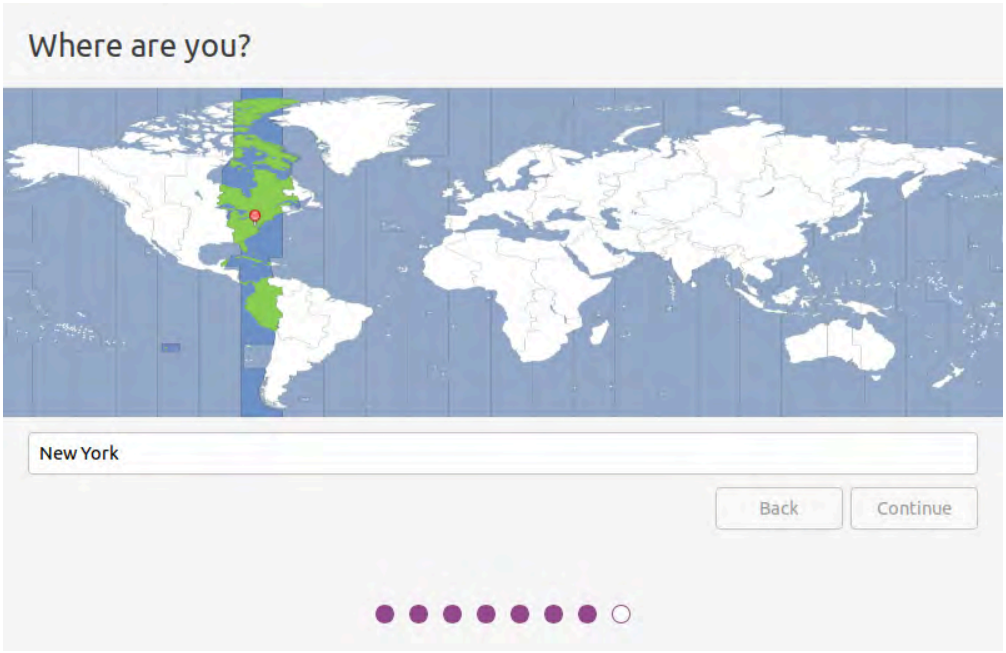


k Confirm that you want to erase the entire disk by clicking **Continue**.

l Make a note of the pendant instructions. If you're using a Forge/Ctrl, select the checkbox next to **This hardware is a Forge CTRL**.

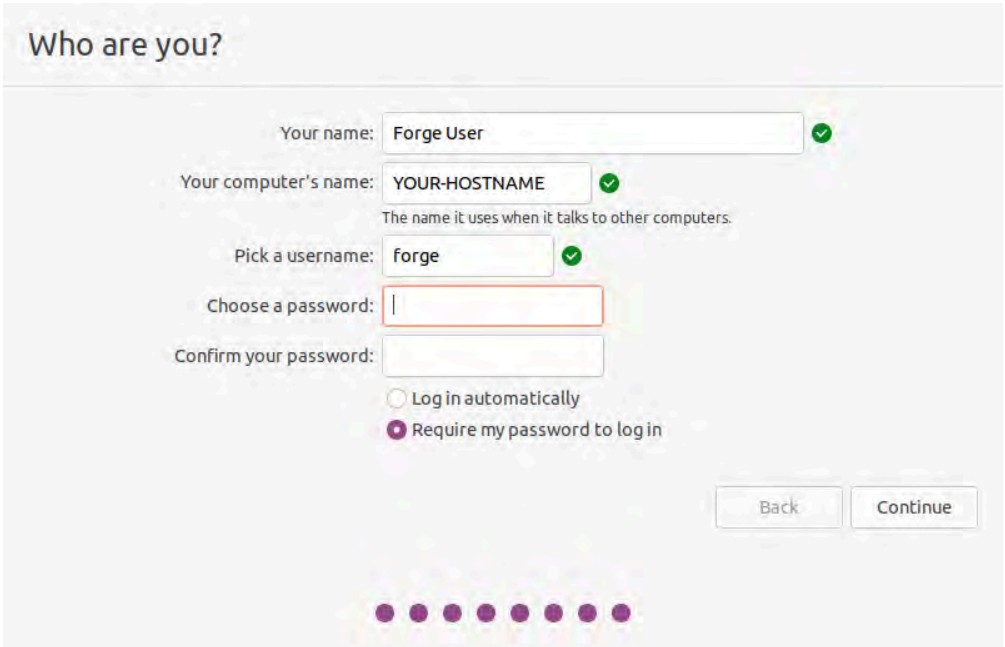


m Choose your timezone. Then click **Continue**.

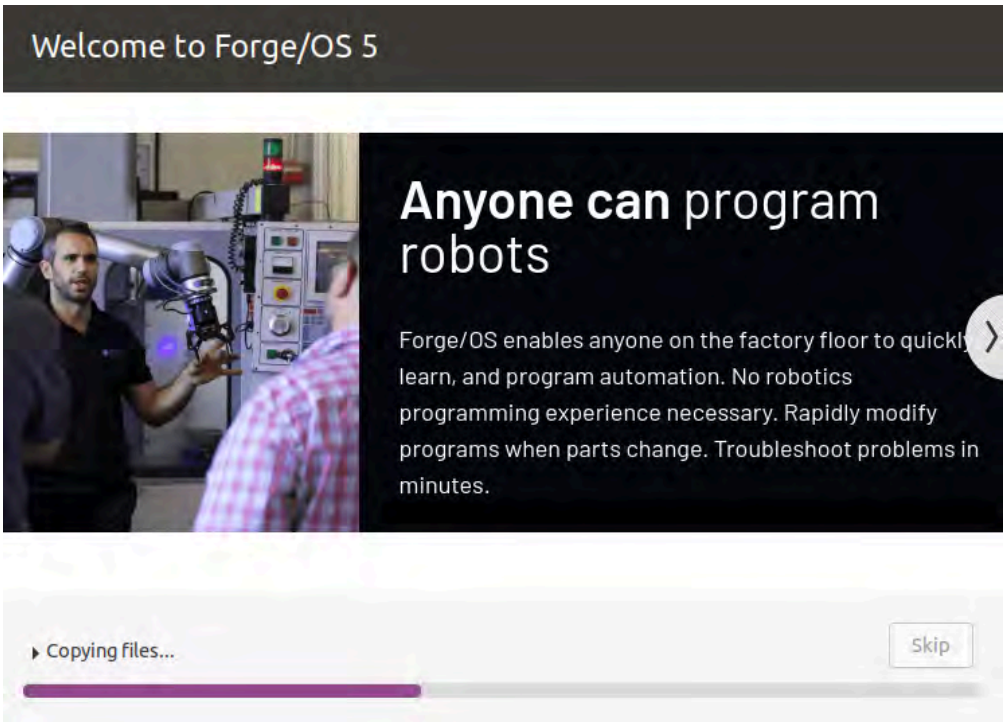


n Choose your IPC's host name. The host name identifies the IPC on the network. Pick a username and password. Then click **Continue.**

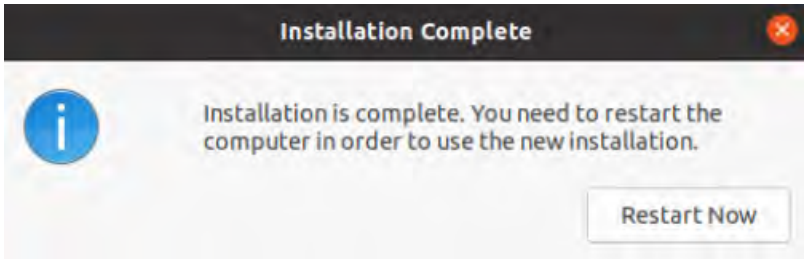
> ***Note:*** *The username and password that you create here are for accessing the IPC desktop. They are NOT for signing into Forge/OS on the* ***READY pendant****.*



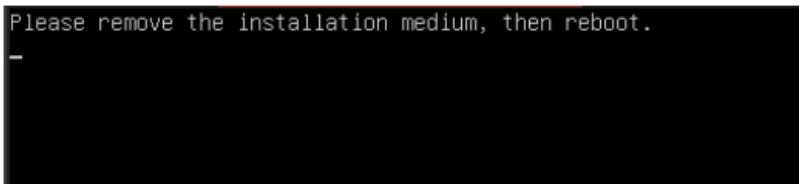
o Wait for the installer to copy and install Forge/OS.



p Once the installation completes, click **Restart Now**.

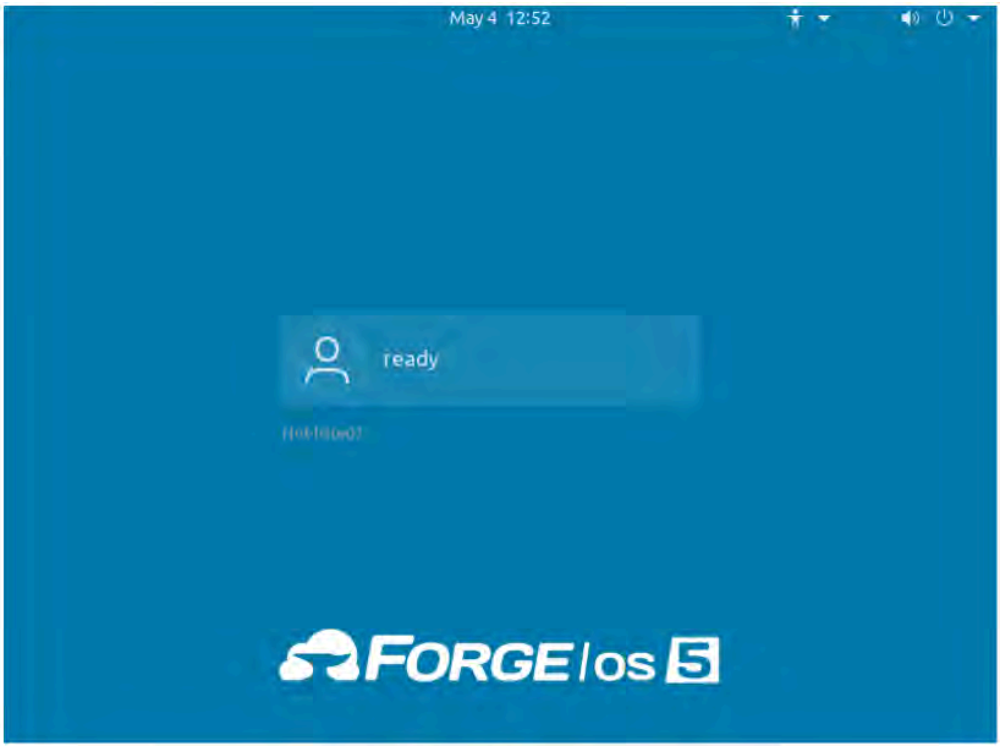


q When prompted, remove the installation flash drive. Then reboot.

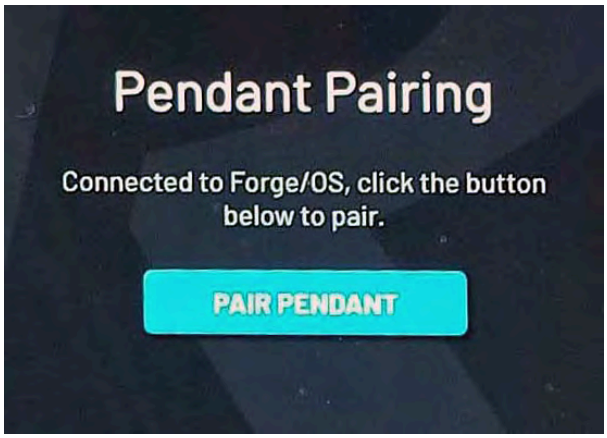


r Wait for Forge/OS to finish booting.

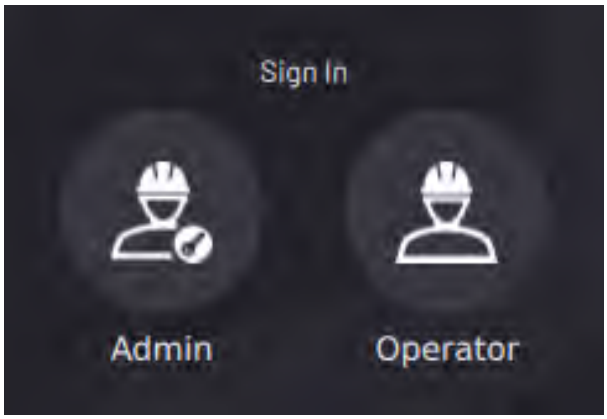
5 When you see the login screen with the Forge/OS 5 logo, Forge/OS is ready to run on the READY pendant! You don't need to sign in to the desktop. Disconnect the monitor, keyboard, and mouse that you used to install Forge/OS.



2 On the READY pendant, the Pendant Pairing screen appears. This is where you connect the pendant to Forge/OS each time you reboot. Tap the blue **PAIR PENDANT** button when it appears. It may take up to two minutes to appear.



3 Tap **Admin** and sign in. The default Admin password is "forgeadmin".



Note: *After installation, you have limited access to Forge/OS until you activate it with a license code. See Activating Forge/OS with a License Code.*

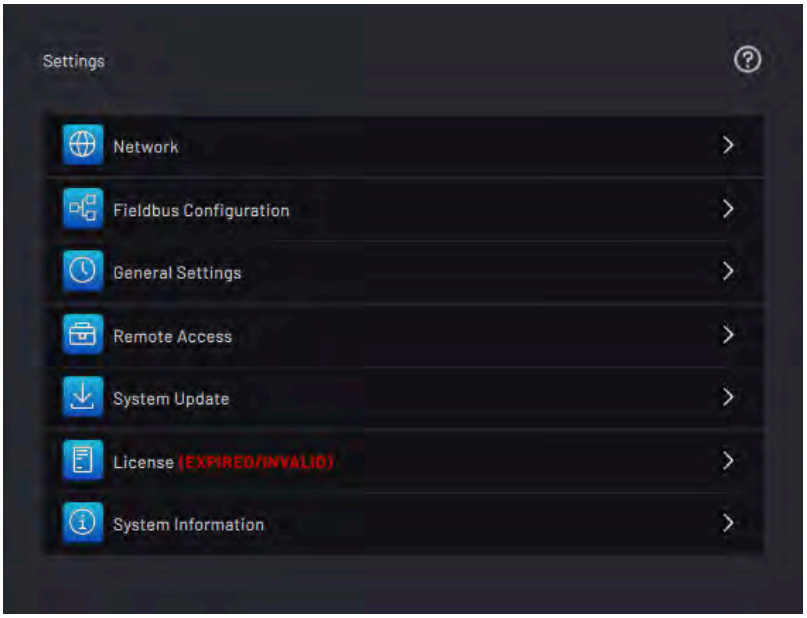
ACTIVATING FORGE/OS WITH A LICENSE CODE

To activate a Forge/OS license, you need:

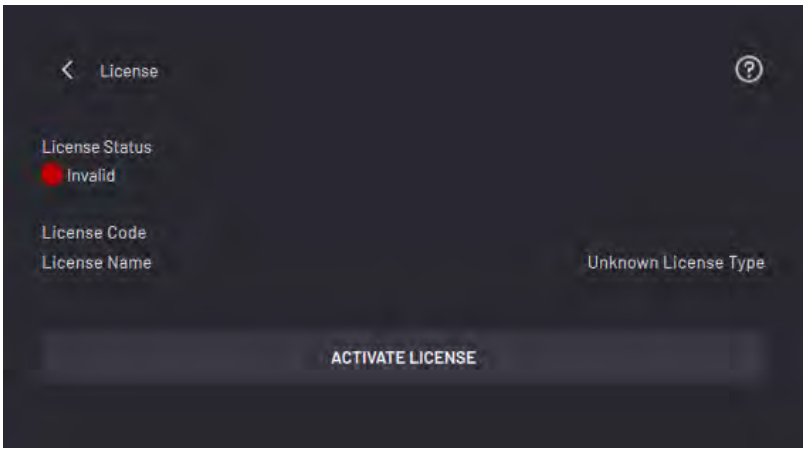
- A USB flash drive (2GB or greater)
- An internet-connected PC
- A valid Forge/OS license code

> ***Tip:*** *Connect a USB keyboard to the port on the bottom of the* ***READY pendant*** *to type in any text field in Forge/OS.*

1 On the Settings app main screen, tap **License Info**.



2 Tap **ACTIVATE CERTIFICATE**.

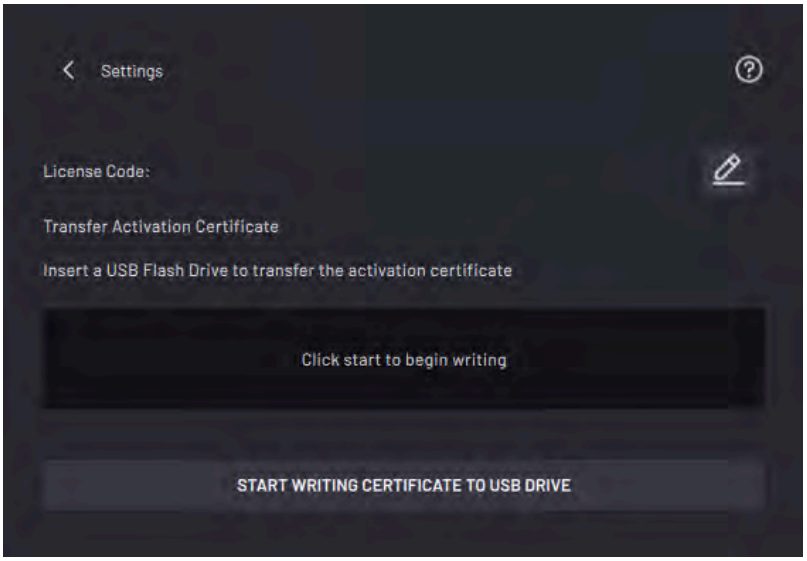


3 Enter your license code. Then tap **ACCEPT**.

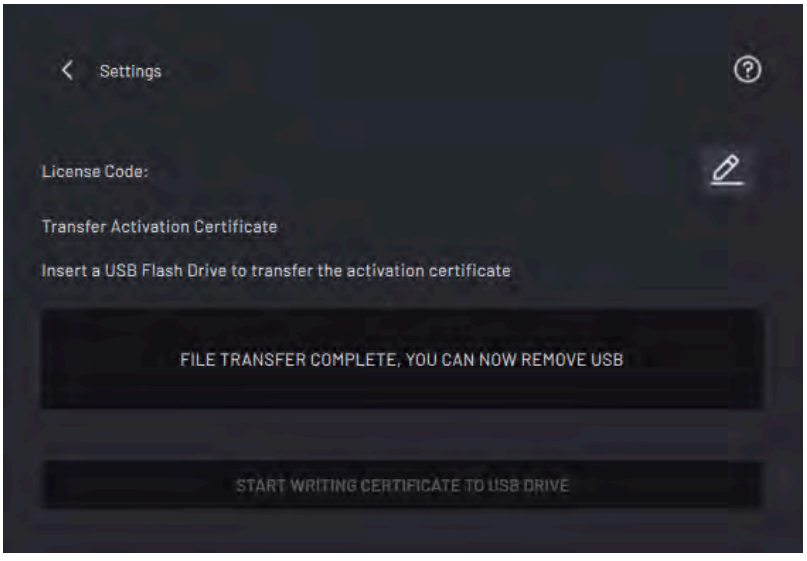
> ***Note:*** *To edit the license code after you've tapped ACCEPT, tap the pencil icon in the top-right corner.*

4 Insert the USB flash drive into your IPC.

5 Insert the USB flash drive into your IPC. Then tap **START WRITING CERTIFICATE TO USB DRIVE**.



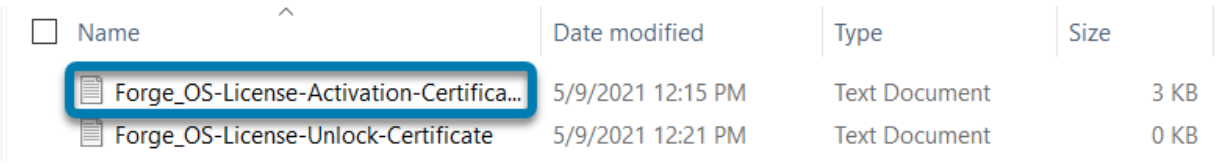
6 Wait for the files to finish transferring. When the file transfer is complete, remove the USB flash drive and tap **NEXT**.



7 Use the activation certificate and create the unlock certificate:

a Insert the USB flash drive into your PC.

b. Find the USB drive in your PC file explorer. Open the new "Forge_OS-License-Activation-Certificate.txt" file from the USB drive and copy all the contents.

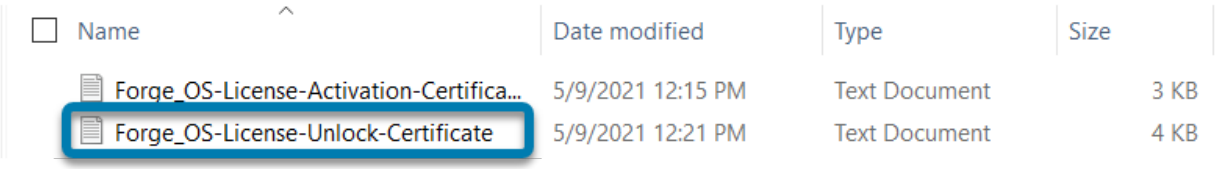


c. Open an internet browser and go to the Forge/OS 5 License Activation Portal.

> ***Note:*** *Access the license activation portal at www.activationportal.me/selfservice/activation.aspx?Type=1&cid=7461&pid=8933&lang=en-US*

d. Paste the contents of the activation certificate file and click **Activate**.

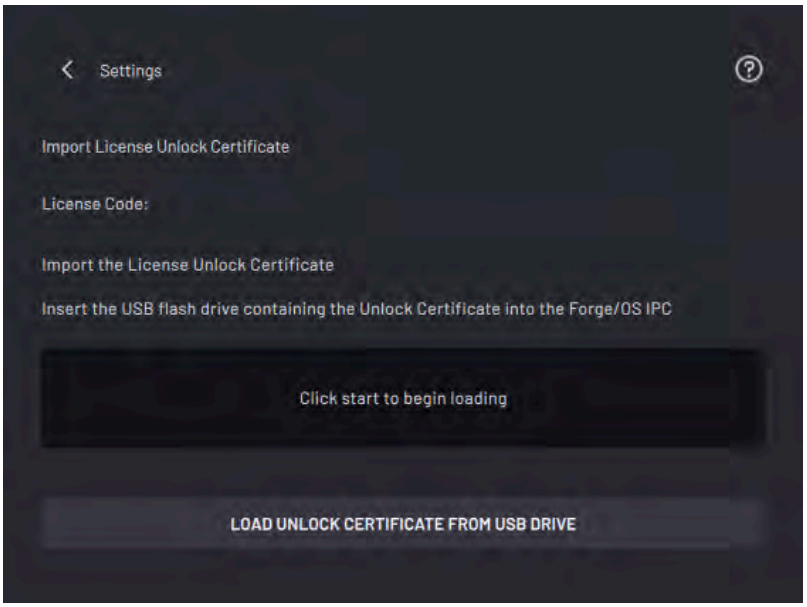
e. The portal generates new text characters. Copy all of the text and paste it in the empty "Forge_OS-License-Unlock-Certificate.txt" file.



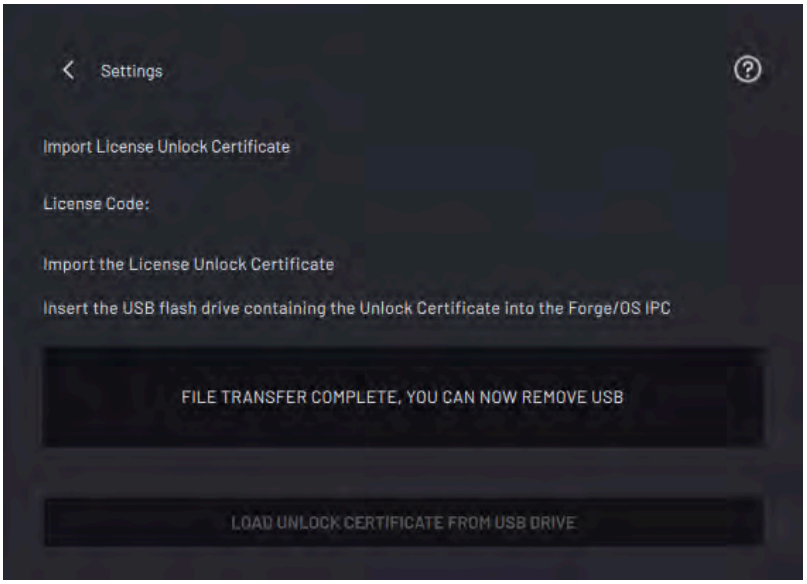
f. Save the unlock certificate file.

8. Remove the USB flash drive from your PC.

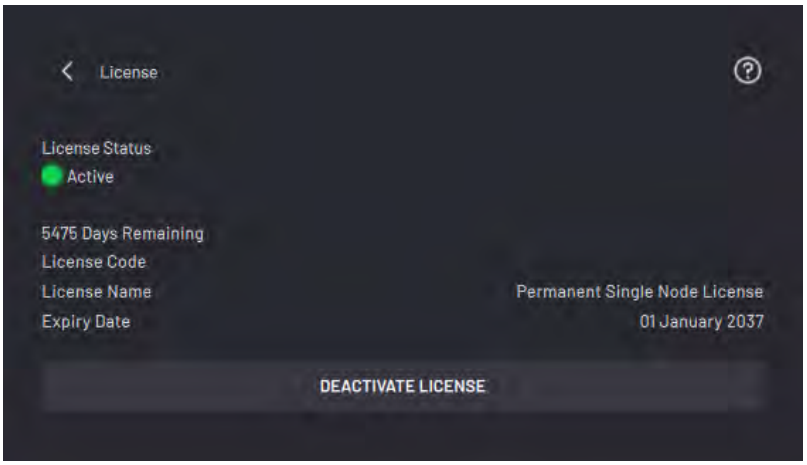
9 Insert the USB flash drive into the IPC again. Tap **LOAD UNLOCK CERTIFICATE FROM USB DRIVE**.



10 Wait for the file to finish transferring. When the file transfer is complete, remove the USB flash drive and tap **SAVE**.



11 Forge/OS returns to the licensing home screen and shows an active license. If the license status isn't active, restart these license activation steps. Double-check your license code.



CHOOSING PREFERENCES

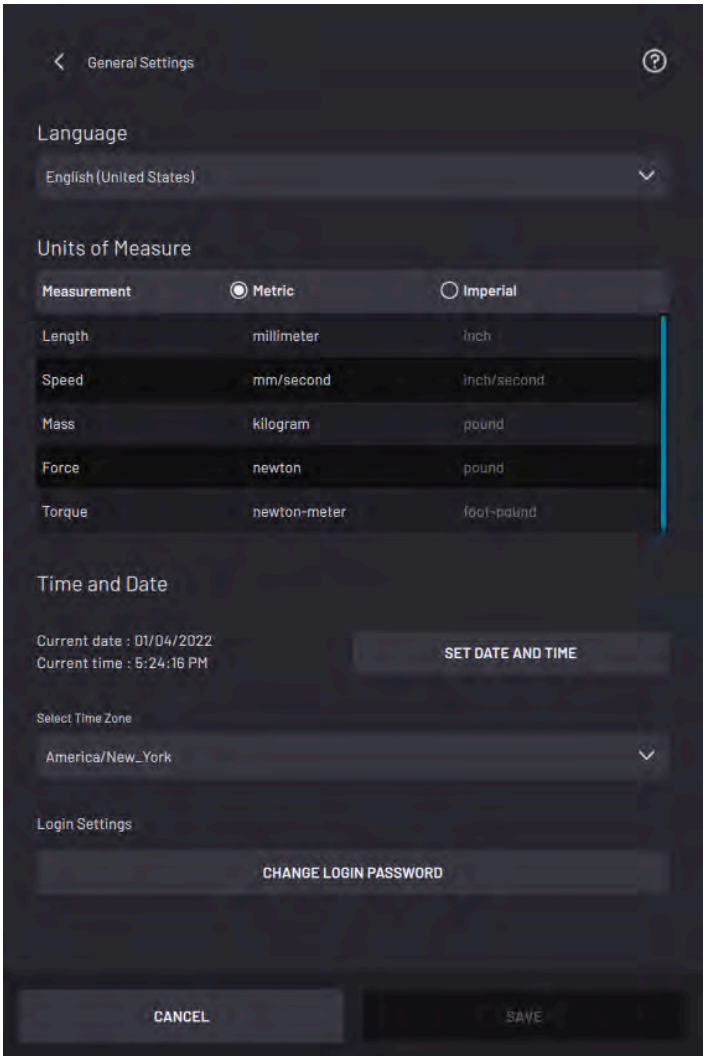
These steps help you choose system preferences, including language, units, time, and network settings.

1. To change preferences for the first time, go to General Settings:

   a. On the Settings app main screen, tap **General Settings**.

   b. Change the Units of Measure, Time and Date settings, or the Admin login password.

   Note: *If you later forget your password, contact READY Robotics to reset it.*



   c. Tap **SAVE** to save changes and exit the General Settings menu.

APPENDIX B: TOOL LOADING STEPS

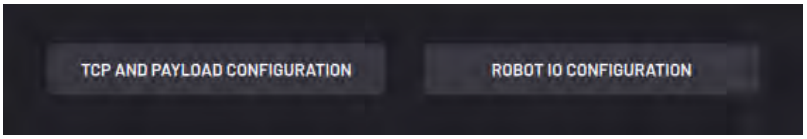
Follow these steps to add new TCPs/Payloads in Forge/OS and update the configuration on the FANUC controller.

Here is an outline of the tool loading process:

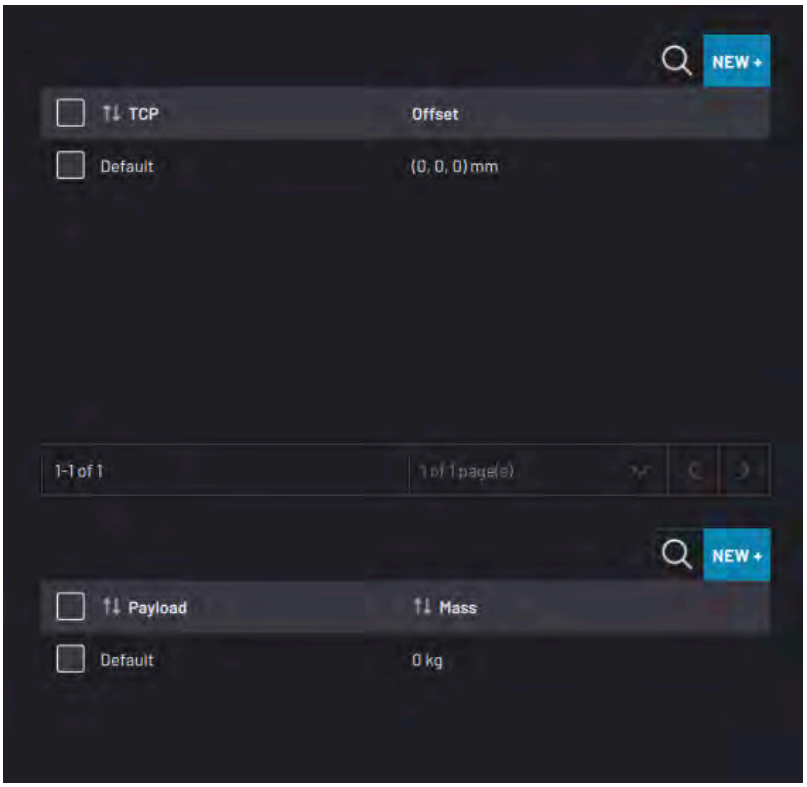
- Add TCPs/Payloads to the robot's configuration in Forge/OS and save.
- Apply DCS parameters.
- Restart the FANUC controller.
- Confirm the Collaborative DCS settings (collaborative only).
- Reset the controller from Forge/OS.

1. In Forge/OS, go to the Device Configuration app and find the FANUC robot under Configured Devices. Select the device and tap **Edit** to open the robot configuration.

2. Tap **TCP AND PAYLOAD CONFIGURATION**.



3. Add all the TCPs and Payloads you need for your workcell and tap **SAVE**.



4. Tap **SAVE** to exit the robot configuration. Forge/OS uploads the tool data to the FANUC controller. Forge/OS shows an error for the robot: *FANUC Error SYST-212: DCS settings not applied*.

5. Install your end of arm tooling on the robot.

6. On the FANUC teach pendant, apply the DCS parameters:

   a. Go to the DCS screen by pressing the **MENU** button, **NEXT (0)**, **SYSTEM (6)**, and then **DCS**.

   b. Press **PREV** to make sure you are on the main DCS screen. You will see items named *Safe I/O Status*, *Safe I/O connect*, etc.

   c. Press **APPLY** (F2) to confirm the settings..

   d. Enter the password (default: **1111**). Confirm the settings by pressing **OK (F4)**.

7. Power off the robot controller and wait 10 seconds.

8. Power on the robot controller. Wait for the FANUC pendant to boot.

9. If you are using a **CR-series (collaborative)** robot, the controller will boot to the DCS **Collaborative robot** screen. Follow these sub-steps to confirm the collaborative DCS settings:
   a. Press **CONFIRM (F2)**.
   b. Enter the password (default: **1111**) and follow the prompts by answering **YES (F4)**.
10. On the READY pendant, tap the **Device Status** button to expand the Device Status Panel, then tap the **RESET** button on the list next to the robot. This clears the faults on the robot and gives you control of it.

RESOURCES

Want to learn more about how Forge/OS can empower you?

Visit **READY.academy** (ready.academy) for *FREE* hands-on courses to help you deploy a robotic system.

Visit **READY.market** (market.ready-robotics.com) for products and services offered by READY and our partners.

Visit our **Support** site (support.ready-robotics.com) for robot startup guides, FAQs, and more.

Visit our **Resources** page (ready-robotics.com/resources) for articles, whitepapers, and other resources.

If you encounter a problem and need to talk to someone, reach out to us.

- Email READY Robotics: support@ready-robotics.com
- Call READY Robotics: +1-833-732-3977