



Allen Bradley PLC 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.

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# OVERVIEW

**Allen Bradley/ Rockwell Automation Logix PACs** are powerful devices for automating robotic cells.

This guide walks you through how to configure a Logix PAC in Studio 5000, configure the PAC in Forge/OS, and use the PAC in Task Canvas.

Let's get started!



# CONFIGURING THE PAC

In Forge/OS versions prior to 5.3.0, Rockwell Automation Logix PACs connected to the **EtherNet/IP Forge/OS Adapter** network device (see [Appendix A](#)). This provided a generic set of 132 bytes of input/output for you to define. Even though a usable connection was established, it required effort to map all process data and functions.

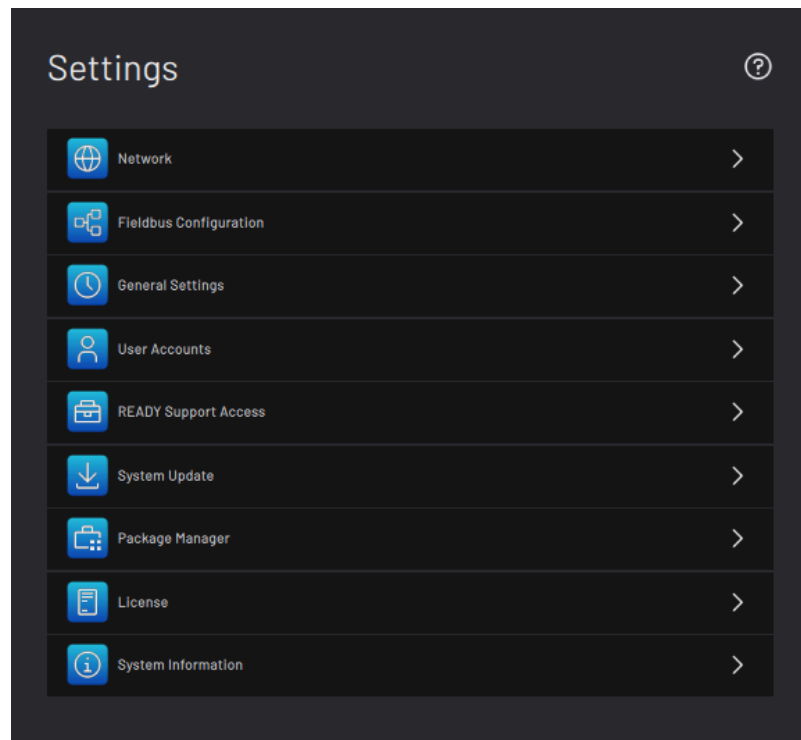
Now, the READY Robotics AOP (Add On Profile) streamlines this process. The AOP establishes a special Ethernet/IP Adapter connection with a defined data map, creating a deeper integration with Logix PACs than was possible with stand-alone EDS files.

After you install the READY Robotics AOP in Studio 5000, follow the steps in this section to connect to Forge/OS and create a **Rockwell Automation Logix PAC** device.

**Note:** The AOP is available for download on the READY Support site.

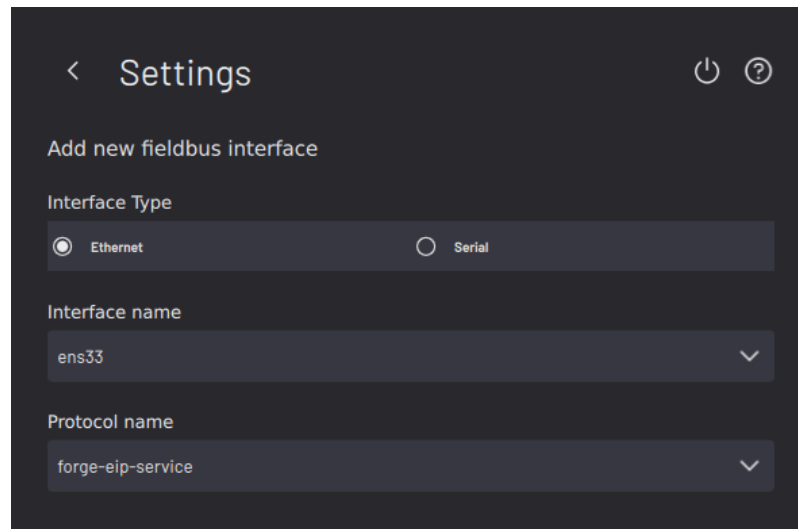
1 Follow these substeps to add an Ethernet/IP fieldbus interface.

a In the **Settings App**, tap **Fieldbus Configuration**.

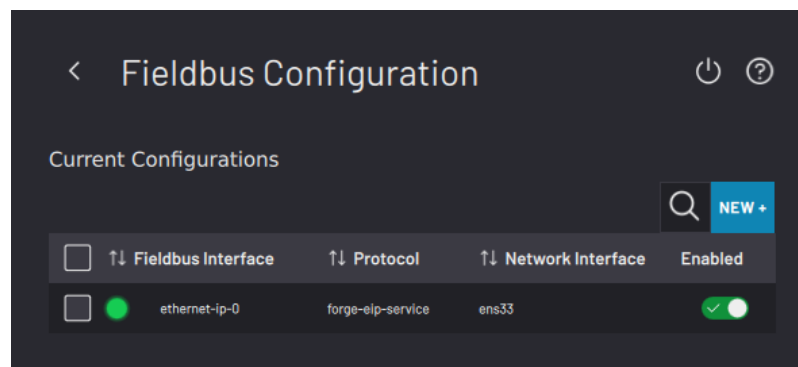


b Tap **NEW +** to create a new fieldbus configuration.

- c** Create an interface with a type of **Ethernet**.



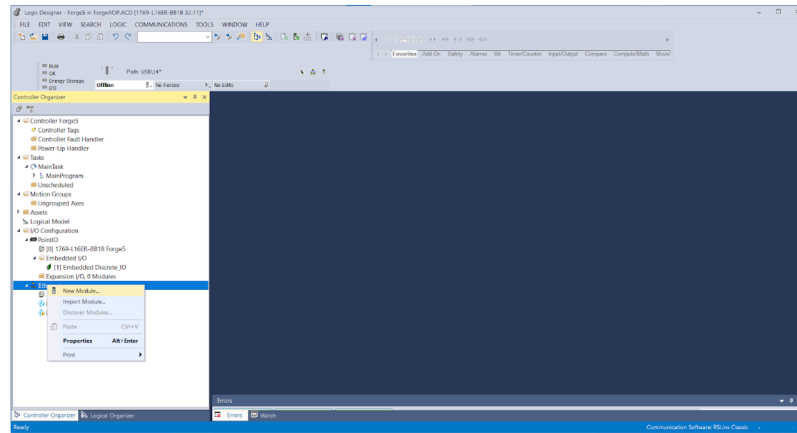
- d** Tap **SAVE**. Make sure that the new Ethernet/IP fieldbus interface appears in the list of current configurations and is enabled.



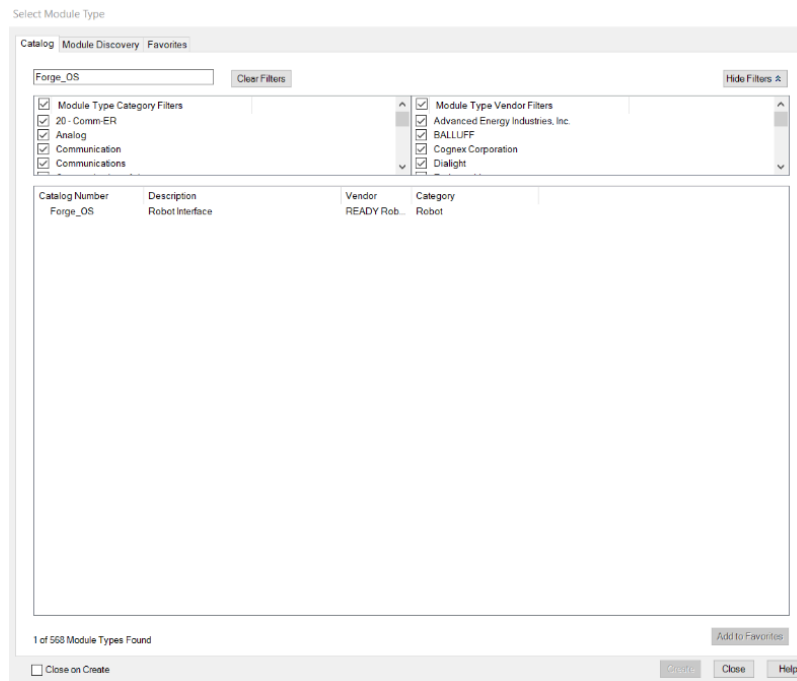
- 2** Follow these substeps to configure the PAC in Studio 5000.

- a** Create a new project.

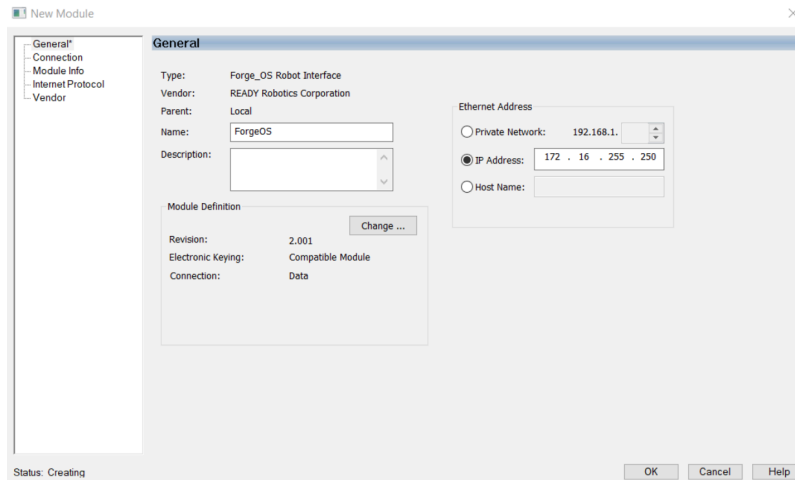
**b** Right-click the **Ethernet** menu and select **New Module**.



**c** Select **Forge\_OS** from the module list.

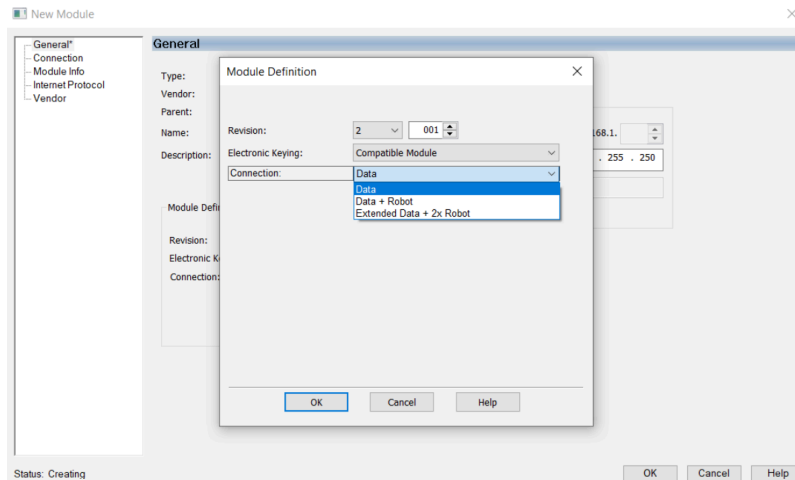


**d** Give the Device a **Name**. Then type in the **IP Address** that Forge/OS is running on.



**e** Click Change under the module definition to select a data model type:

- **Data:** Transfer integer (INT), unsigned integer (UINT), and float task data.
- **Data + Robot:** Do everything that the "Data" type can do, plus transfer robot data (such as robot status, current robot position, TCP translational/ rotational velocities, and joint velocities).
- **Extended Data + 2x Robot:** Do everything that the "Data + Robot" type can do, but for two sets of robot data.



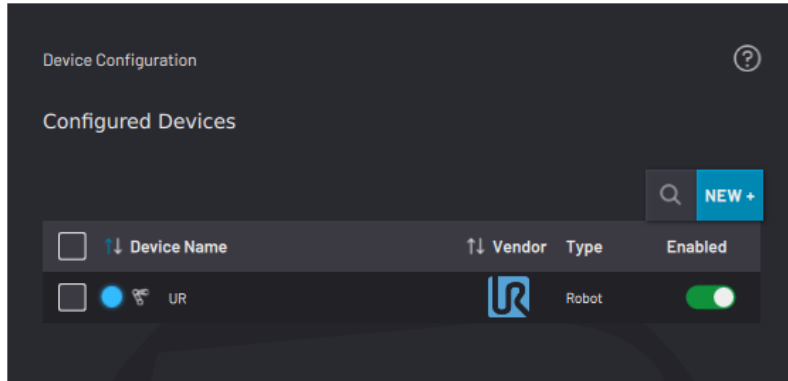
**f** Click **OK** to save your module definition change. Click **OK** again to save the module.



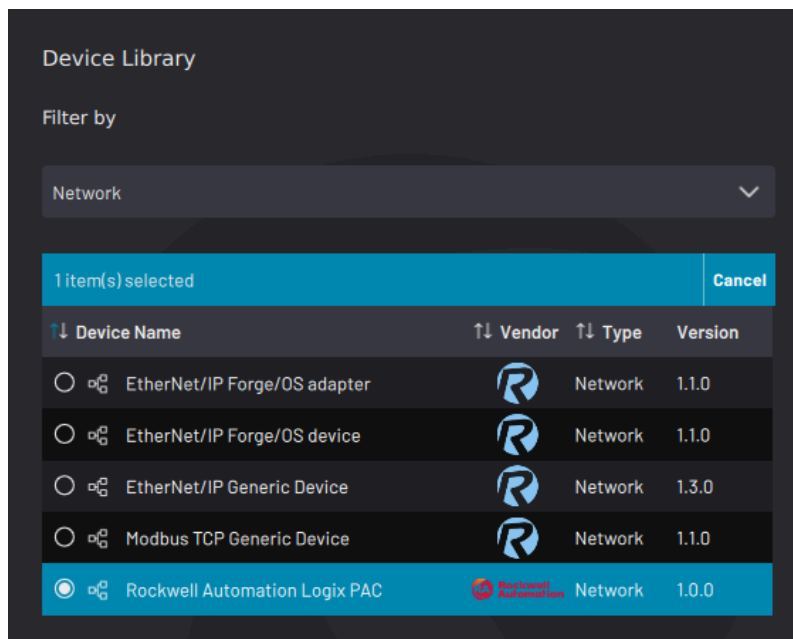
3 Open the **Device Configuration** app.



4 Tap **NEW+**.



5 Select **Rockwell Automation Logix PAC** (Network device type). Then tap **NEXT**.



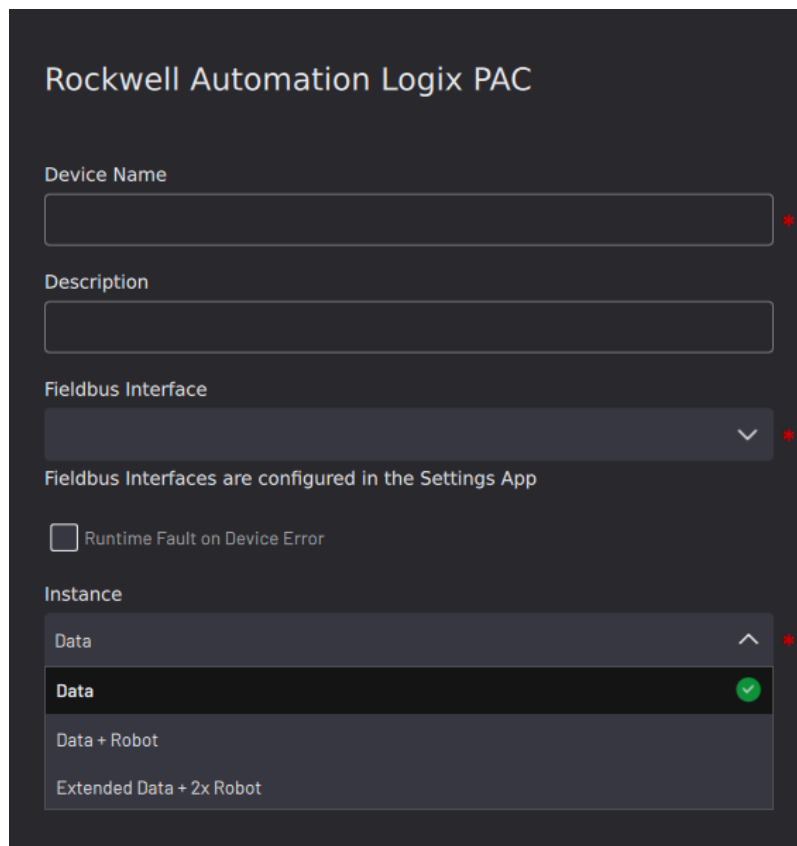
6 Type in a **Device Name**. A **Description** is optional. Then follow the below substeps before tapping **NEXT**.

a In the **Fieldbus Interface** dropdown, select a configured fieldbus interface.

**b** Select (or leave de-selected) the checkbox labeled "**Runtime error on device disconnection**". This checkbox allows you to configure system behavior if the device disconnects. When this checkbox is active and the PAC is not connected, the device enters a "Device is Disconnected" error state. This error state stops the task if it is running or prevents a task from starting. Currently, as long as the fieldbus driver is functioning properly, the device will never go into an error state.

**c** In the **Instance** dropdown, select the data model type that you chose in Studio 5000.

**Note:** Depending on which data model type you choose, you may need to fill in an optional **Robot** dropdown(s). This dropdown includes all robot devices on the system. Selecting a robot here automatically pulls data from that device and maps it to the specified Ethernet/IP registers. The units specified in the Settings app will be used when sending this data.

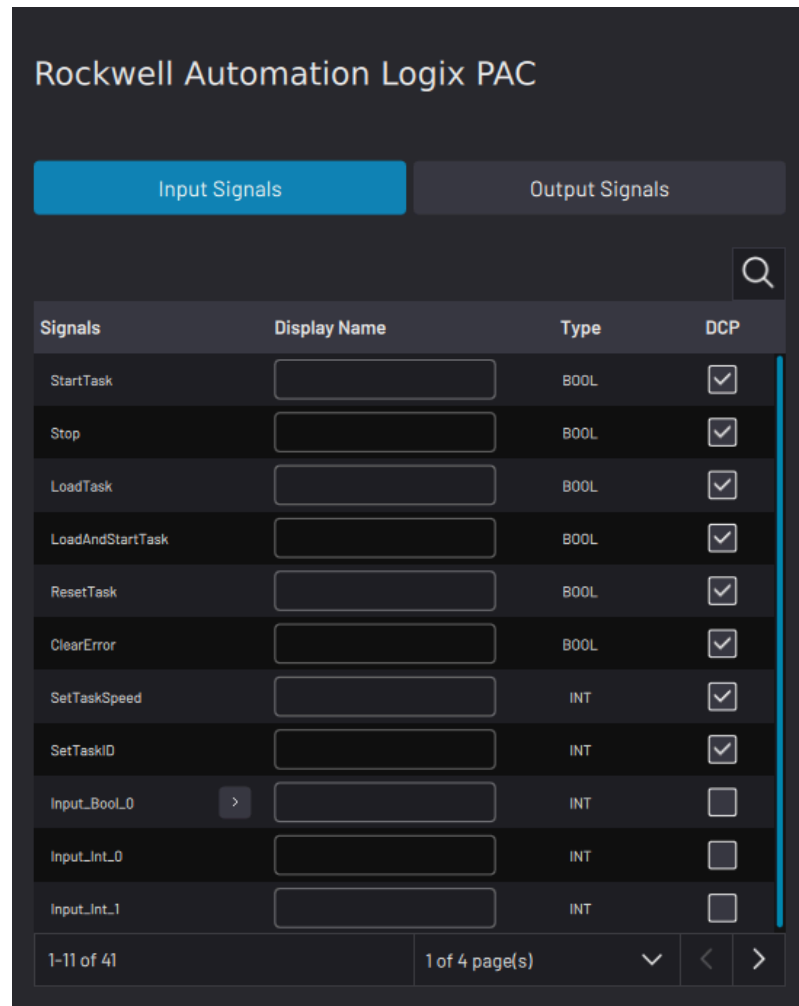


**7** Configure any **Input/Output (I/O)** signals that you want to view in the Device Control app.

**a** Tap the tabs at the top of the screen to toggle between **Input Signals** and **Output Signals**.

**b** (Optional): Enter a **Display Name** to signify what each configured signal does.

- c** If you want a signal to appear in the device's Device Control page, tap the **DCP** checkbox next to that signal.

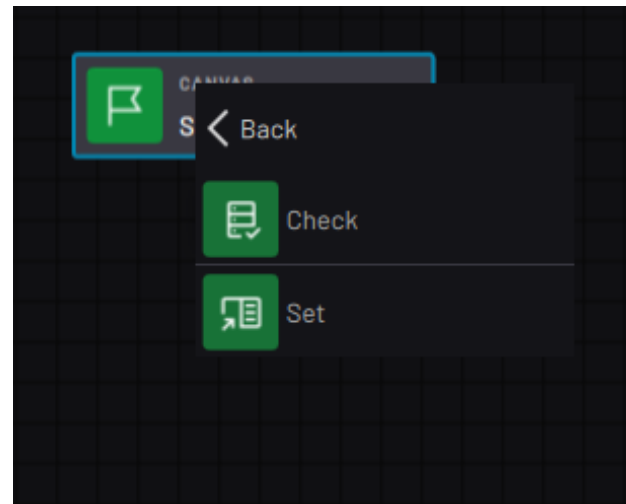
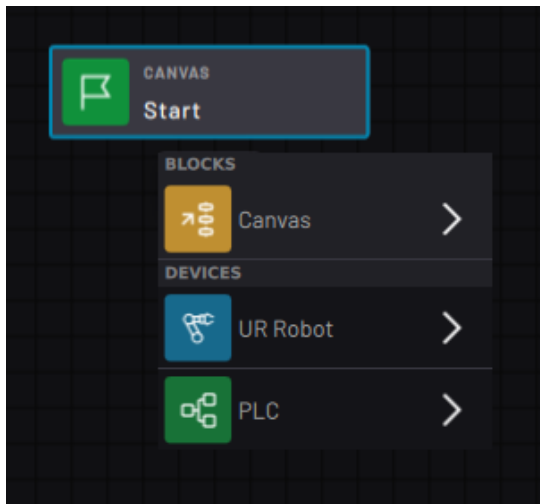


- 8** Tap **SAVE** to return to the Device Configuration home screen. Make sure the PAC appears on the configured devices list and that it is **enabled**.

# USING THE PAC IN TASK CANVAS

Once you create the device, you can send and receive data to and from the Logix PAC.

In a Task Canvas task (that has the PAC listed in Task Settings), the PAC is included in the block menu. Tap it to create **Check** and **Set** blocks.



# USING THE PAC FOR REMOTE CONTROL

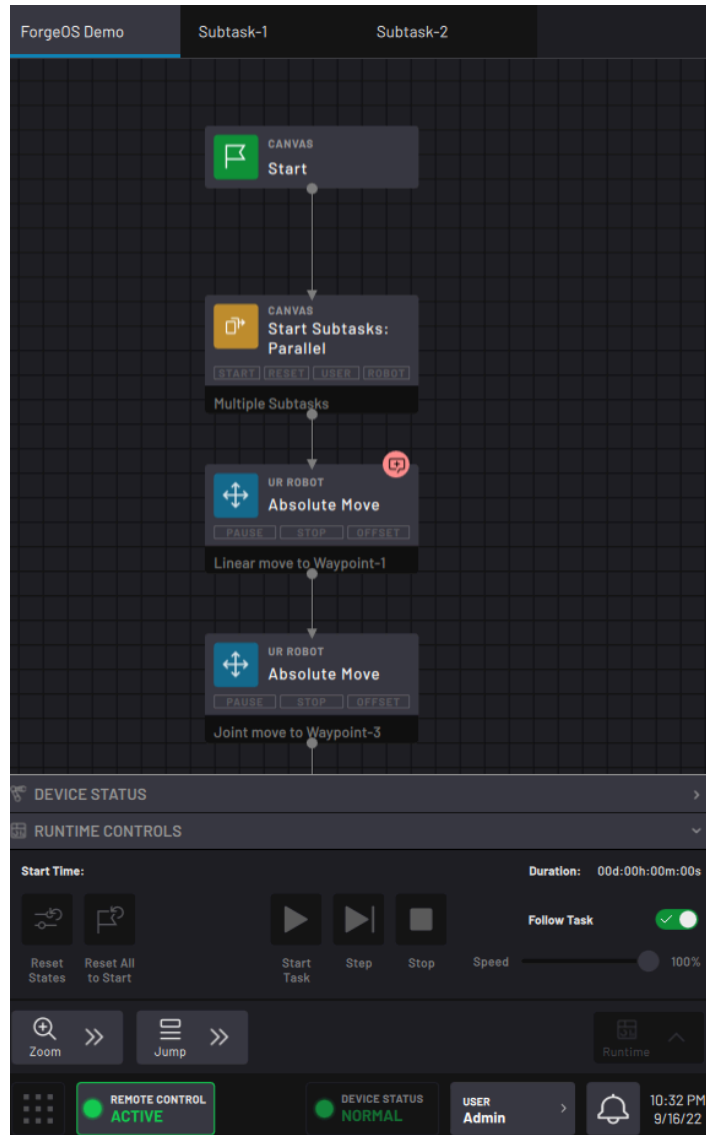
Configuring the PAC through the READY Robotics AOP in Studio 5000 and the **Rockwell Automation Logix PAC** device in Forge/OS comes with pre-defined signal mapping. This pre-defined signal mapping eases the setup for remote control.

What is Remote Control? **Remote Control** mode allows you to communicate with Forge/OS from an external HMI (such as a Logix PAC).

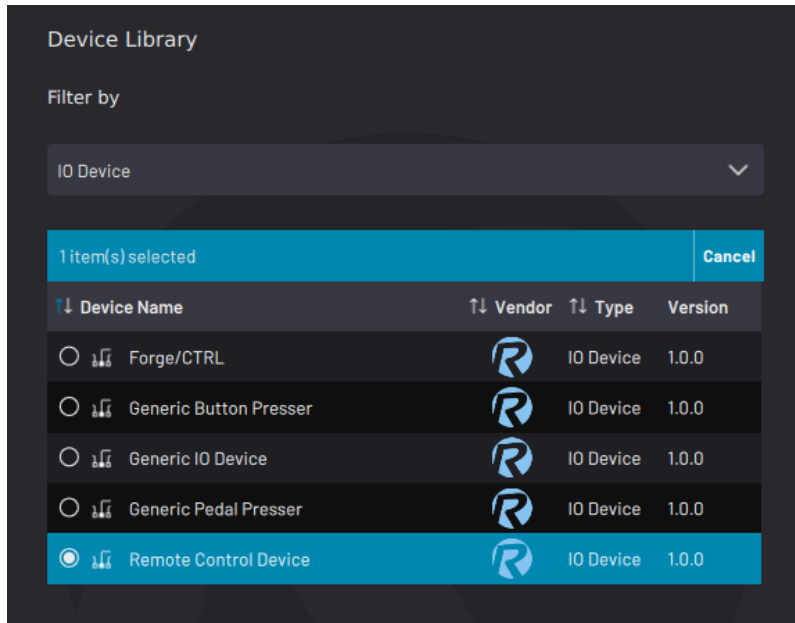
After you follow the steps in this section to configure and enable the PAC as a **Remote Control Device** in Device Configuration, you can use it in Task Canvas.

Enter and exit Remote Control mode in the Toolbar's **USER** button flyout. When you are in Remote Control mode, the **Remote Control Status** button replaces the Toolbar's app icons.

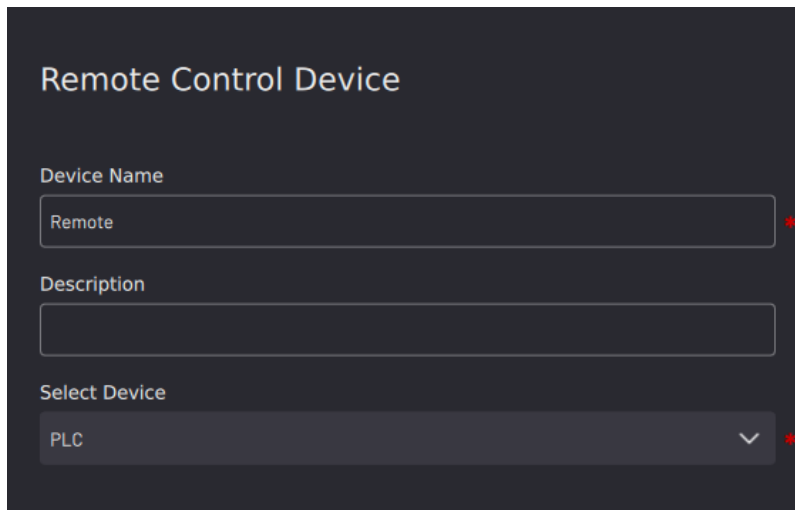
While in Remote Control mode, there is limited on-screen interaction with the READY pendant. The Remote Control device sends and receives data, based on what signals you configured for its inputs and outputs.



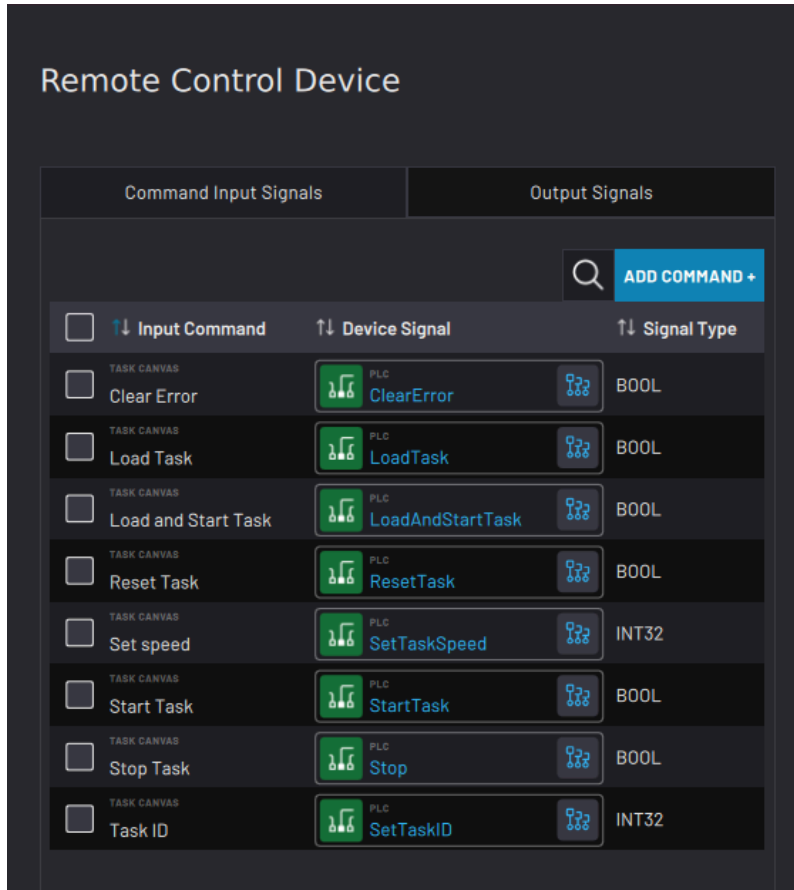
1 Select **Remote Control Device**, then tap **NEXT**.



2 Type in a **Device Name**. A **Description** is optional. In the **Select Device** dropdown, choose a device to use for remote control. Then tap **NEXT**.



- In the **Command Input Signals** tab, tap **ADD COMMAND +** to add an input command. To remove one or more input commands, select the checkbox(es) and tap **Remove**. For the input commands in the table, add device signals by tapping the variable selector to the right of the 'Select a value' field.



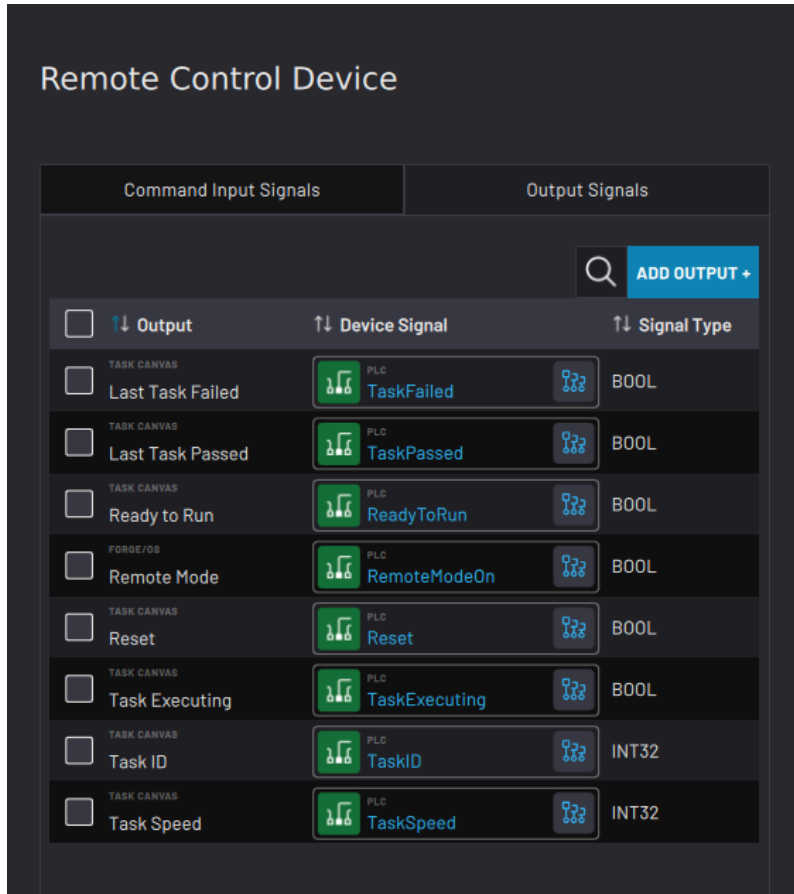
Input signals (that are sent from the PLC to Task Canvas) include:

Input Command	Description
Clear Error	Send a "Clear Error" signal to all devices (as if pressing the Reset button on the READY pendant).  <b>Note:</b> This command is ignored if a task is executing.
Load Task	Load the current Task ID task and select the Start block.

Input Command	Description
Load and Start Task	<p>Load the associated task and immediately start it at 100% speed from the Start block.</p> <p><b>Note:</b> If another task is currently open and executing, it stops the task and loads/starts the called task. If the called task is currently open and NOT executing, it starts the task.</p>
Reset Task	<p>Reset all block states. Place the view and block selection on the Start block of the Main Task.</p> <p><b>Note:</b> This command is ignored if a task is executing.</p>
Set Speed	<p>Set the Task Canvas speed slider speed. This can be received when a task is open regardless of whether it is executing.</p> <p><b>Note:</b> Accepted values are 1-100. Any value outside the accepted range is ignored.</p>
Start Task	<p>Start the loaded task from the selected block.</p> <p><b>Note:</b> This command is ignored if a task is not open or if a task is executing. If a block was stopped mid-execution, it is resumed and not restarted. If there are multiple paused subtasks executing, this command assumes the "Resume Simultaneous Execution" option.</p>
Stop Task	<p>Perform a controlled stop on an executing task (as if pressing the Stop button on the READY pendant).</p> <p><b>Note:</b> This command does NOT execute a reset, but rather leaves blocks in a paused state. This command is ignored if a task is not executing.</p>
Task ID	<p>Specify the task to be loaded on a <b>Load Task</b> or <b>Load and Start Task</b> command. A Task's ID can be set in the Remote Task ID field in Task Settings.</p> <p><b>Note:</b> A change in value does NOT immediately load the specified task, but rather just places that task "on deck" for a Load Task or Load and Start Task command.</p>



- 4 In the **Output Signals** tab, tap **ADD OUTPUT +** to add an output. To remove one or more outputs, select the checkbox(es) and tap **Remove**. For the outputs in the table, add device signals by tapping the variable selector to the right of the "Select a value" field.



Output signals (that are sent from Task Canvas or Forge/OS to the PLC) include:

Output Command	Description
Last Task Failed	The last task failed upon completion. This value is reset when a task is started or resumed.
Last Task Passed	The last task passed upon completion. This value is reset when a task is started or resumed.
Ready to Run	A task is open. All devices needed to execute the task are in RUN or OK mode. There are no safety errors. A block is selected to Start or Resume the task.
Remote Mode	The Remote Control toggle in the Toolbar's User button flyout is enabled (green and toggled to the right).

Output Command	Description
Reset	A task is open and not executing. All blocks are at their initial states. No block has the "Last Executed" icon, and the Start block of the Main Task is selected and visible.
Task Executing	A task is currently running.
Task ID	This is the integer value of the current task (as defined by the Remote Task ID field in Task Settings). This field is 0 when no task is loaded (even if the command "Task ID" has been set).
Task Speed	This is the current value of the Task Canvas speed slider. The range of possible values is 1-100. This field is null when a task is not open.

- 5 Tap **SAVE** to return to the Device Configuration home screen. Make sure the Remote Control Device appears on the configured devices list and that it is **enabled**.

**Note:** The SAVE button is only available when all Device Signal fields are filled in.

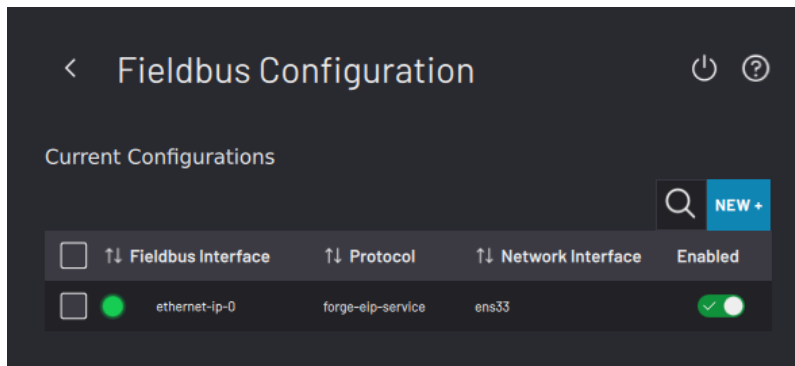
**Note:** A device is **enabled** when its switch is green and toggled to the right.

# APPENDIX A: CONFIGURING THE PAC AS AN ETHERNET/IP FORGE/OS ADAPTER DEVICE

If you have a Forge/OS version prior to 5.3.0, you can still use your Logix PAC in Forge/OS by following the steps in this section.

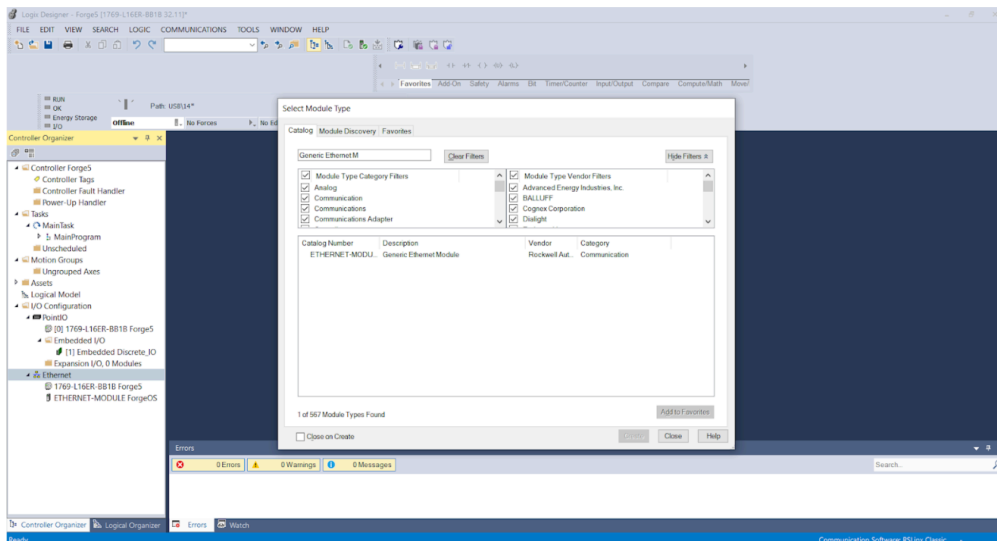
Because these instructions do not use the READY Robotics AOP, you will be required to manually map all process data and functions.

- 1 In the Forge/OS **Settings** app, go to **Fieldbus Configuration**. Create and enable an **Ethernet/IP** fieldbus interface.

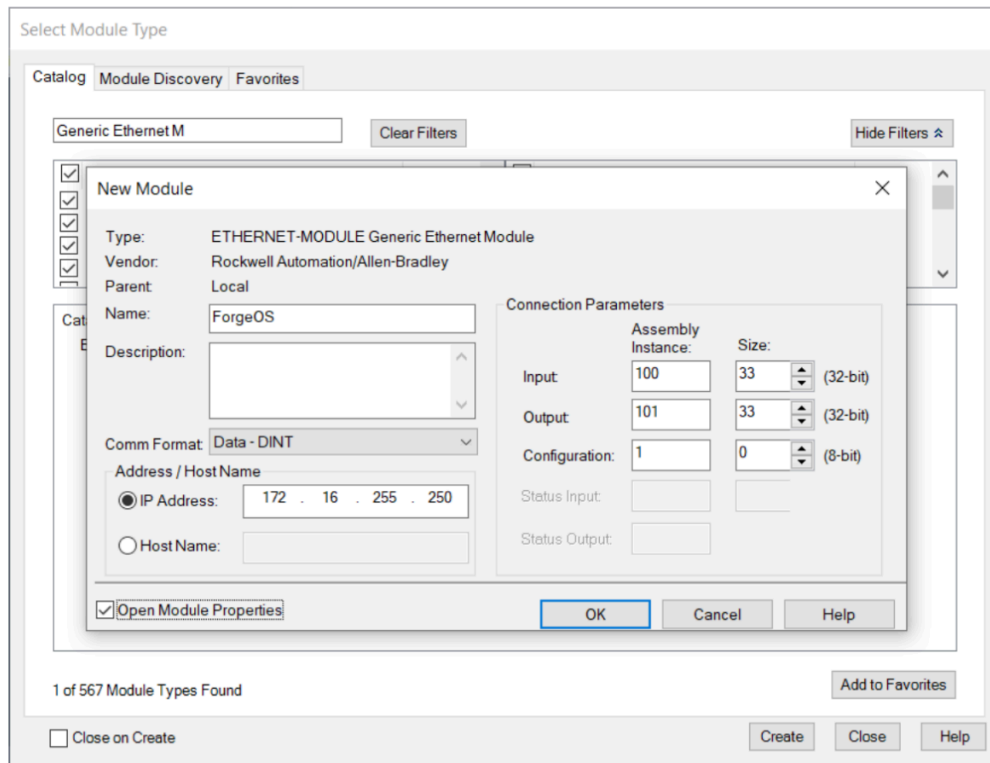


- 2 In Studio 5000, follow these substeps:

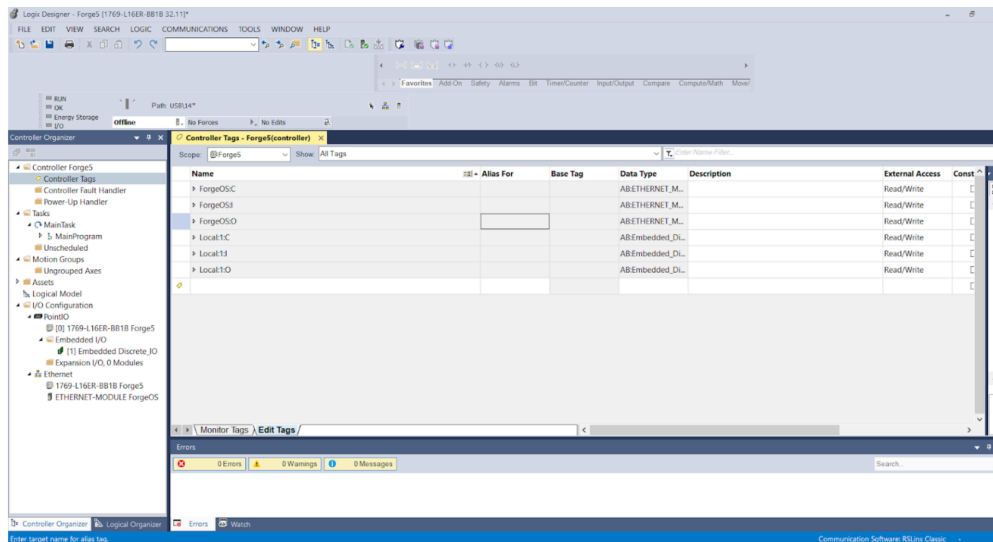
- a Create or open a PLC project.
- b Add a new **Generic Ethernet Module**.



**c** Populate the Forge/OS Ethernet/IP Connection Parameters.

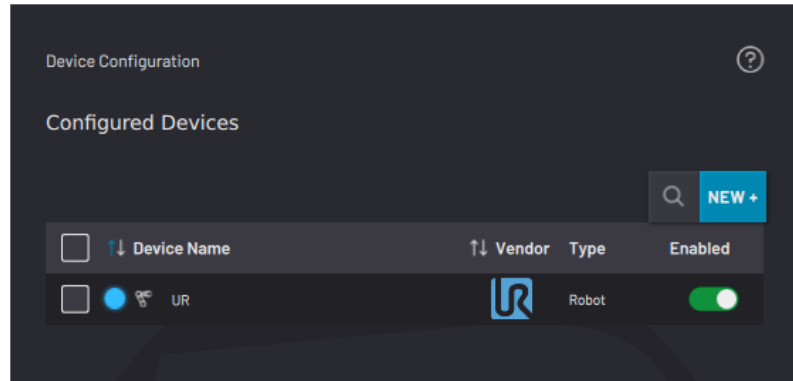


**d** Once created, you can view the data under **Controller Tags**.

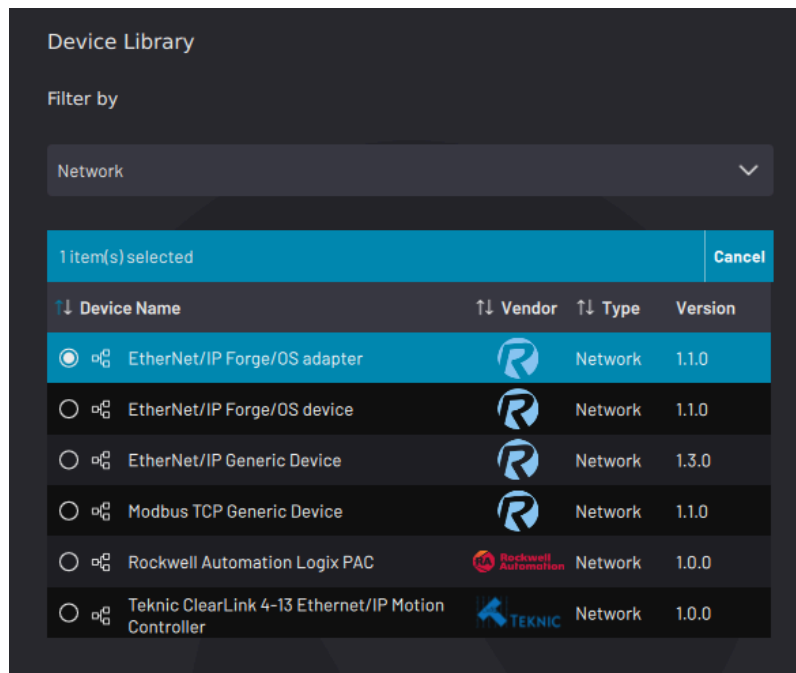


3 In the Forge/OS **Device Configuration** app, follow these substeps:

a Tap **NEW+**.



b Select **EtherNet/IP Forge/OS Adapter** (Network device type).



- c Give the device a name, select the Ethernet/IP fieldbus interface that you created at the beginning of this section, and tap **NEXT**.

## EtherNet/IP Forge/OS adapter ?

Device Name

 \*
 

Description

Fieldbus Interface

ethernet-ip-0
▼

 \*
 

Fieldbus Interfaces are configured in the Settings App

Runtime Fault on Device Error

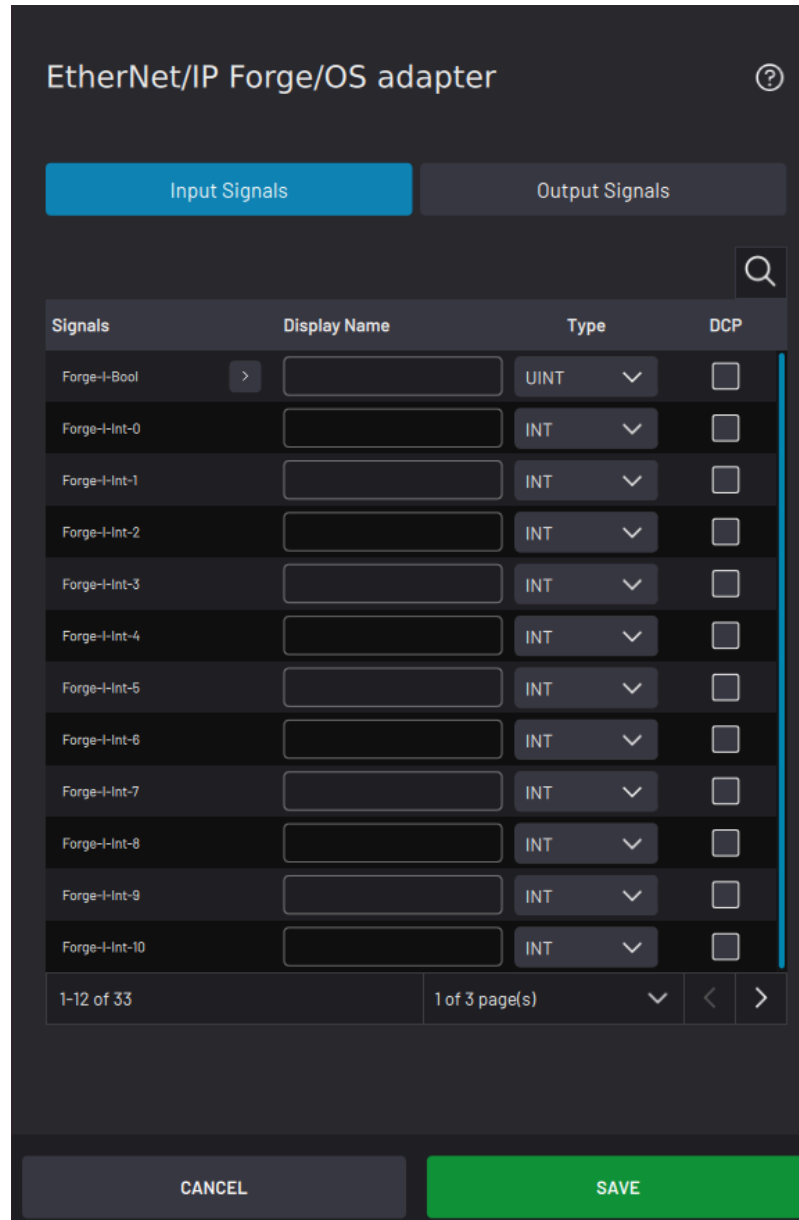
Name	Assembly Instance	Size	Data Type Size
Input	100	33	32-bit
Output	101	33	32-bit
Config	1	0	Unknown

\* Required Field

CANCEL

NEXT

**d** Configure any **Input/Output (I/O)** signals that you want to view in the Device Control app.



**e** Tap **SAVE**.