Robotics, Integration, and Automation

CONFIGURING THE IO-LINK DEVICES

Name	Class/Period	Date

1. Overview

In this lab activity, you will add the IO-Link master to your SmartCart LAN.

2. Performance Objectives

After completing this lab activity, you will be able to:

- Set the static IP address of an IO-Link master's EtherNet/IP port.
- Adjust IO-Link master and slave device parameters.
- Monitor device readings using the LR Device cockpit screen.

3. Required Materials

You need the following materials to complete the lab activity:

- SmartCart 4.0
- Computer
- Ethernet cables (including the IO-Link master's M12 Ethernet cable)

4. Required Software

The following software is required for this activity:

- Ethernet Device Configuration (Hischer)
- LR Device

Ensure that the software is installed on your PC and has a valid license. If you are having problems installing or licensing the software, contact your instructor or IT manager.

5. Inventory and Safety

Before beginning the lab activity, review this checklist and mark off each item as you complete it.

- ☐ All hardware components are available for this lab activity.
- ☐ Hands, hair, and clothing are securely away from the work area.
- ☐ The work area is clean and devoid of food or drink.
- ☐ Review the SmartCart safety guidelines.
- ☐ Read through the entirety of this lab activity to familiarize yourself with the requirements.

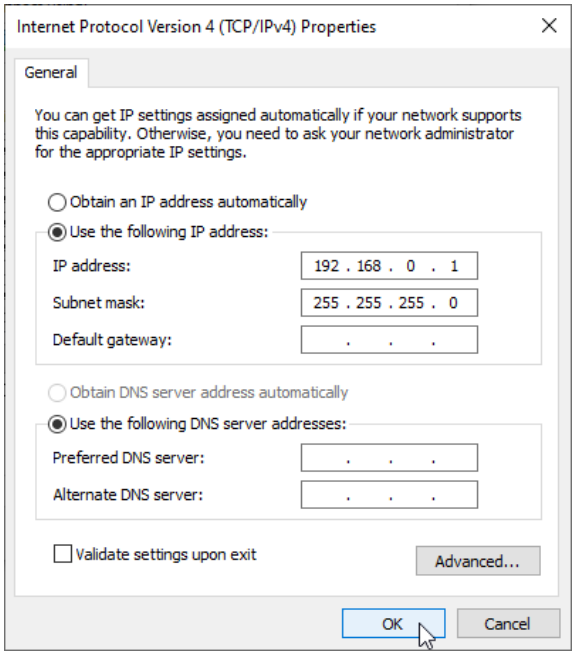
6. Lab Activity

6.1. Configuring the IO-Link Master for Ethernet Communication

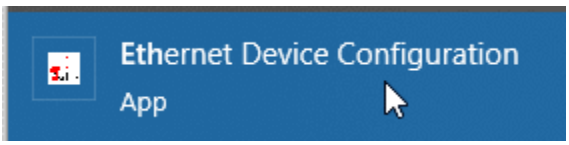
In order for an IO-Link master to communicate with your computer and the CompactLogix controller on an EtherNet/IP network, it must be given an IP address on the same subnet as the other devices. In this task, you will assign a static IP address to one of the SmartCart' IO-Link masters using the Ethernet configuration tool.

Perform the following steps:

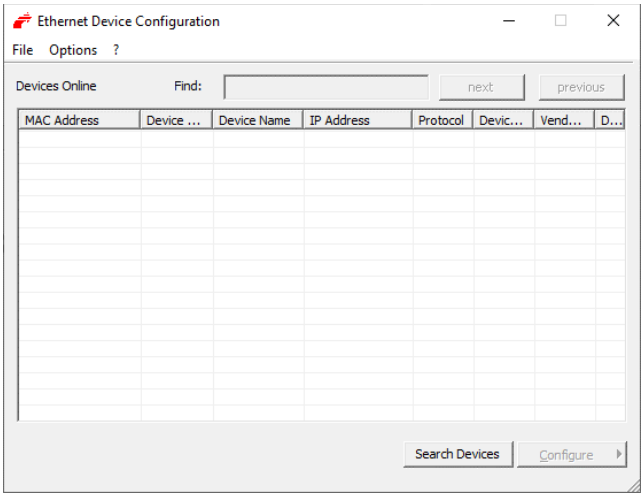
1. Power on the I/O box.
2. Ensure that your workstation is connected to the switch via an Ethernet cable and has a static IP address of **192.168.0.1** with a subnet mask of **255.255.255.0**.



3. Ensure that the 8-port IO-Link master is connected to the switch via an Ethernet cable from the master's left EtherNet/IP port (the port above the Power IN port).
4. On your workstation, run **Ethernet Device Configuration**. You can find this application in the Windows search area.



The application window opens.

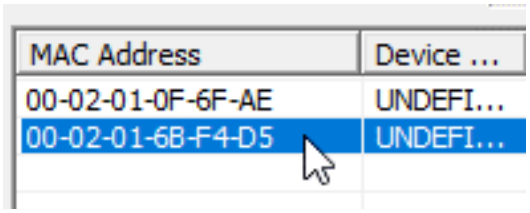


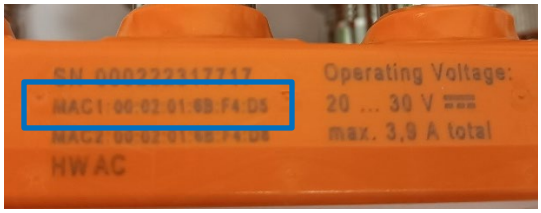
5. Click **Search Devices**.

All IO-Link masters connected to the switch are detected.

MAC Address	Device ...	Device Name	IP Address	Protocol	Devi
00-02-01-0F-6F-AE	UNDEFI...	Undefined ...	0.0.0.0	NetId...	-
00-02-01-6B-F4-D5	UNDEFI...	Undefined ...	192.168.1.250	NetId...	-

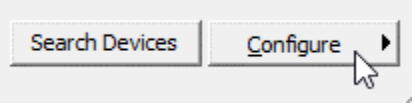
6. Select your *8-port* IO-Link master. If you have multiple masters, you can identify each device by their MAC addresses on the side of the physical device.



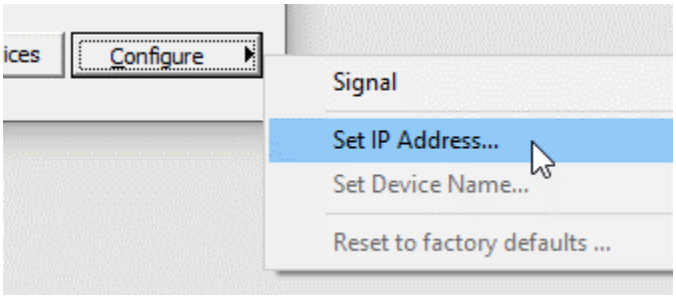


Note: *If you cannot see the MAC address, another way to identify each device is to select a device in the application window and then select* ***Configure > Signal****. The amber LED next to the connected EtherNet/IP port flashes once.*

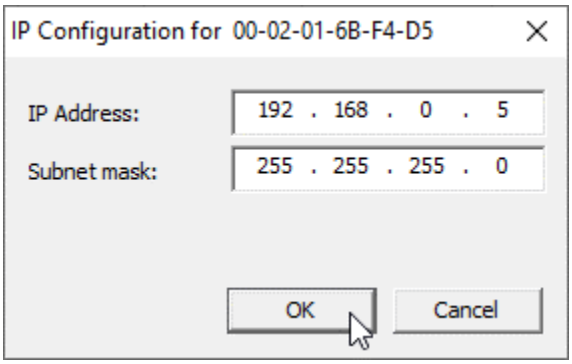
7. Click **Configure**.



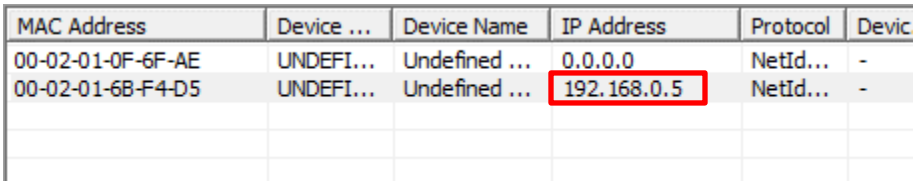
8. Select **Set IP Address**.



9. Set the IP Address to **192.168.0.5** and the subnet mask to **255.255.255.0**. Click **OK** to confirm the changes.



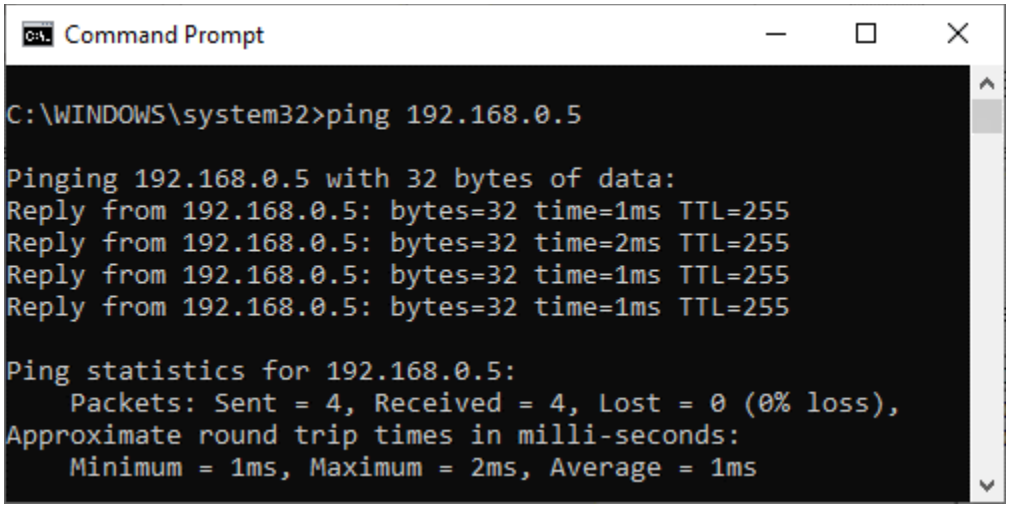
The new (static) IP address is displayed in the application window.



MAC Address	Device ...	Device Name	IP Address	Protocol	Devic
00-02-01-0F-6F-AE	UNDEFI...	Undefined ...	0.0.0.0	NetId...	-
00-02-01-6B-F4-D5	UNDEFI...	Undefined ...	192.168.0.5	NetId...	-

10. Close the Ethernet Configuration Tool window.

11. Using the Windows Command Prompt, ping the IO-Link master to confirm network connectivity.



ⓘ ***Note:*** *If your SmartCart also has a 4-port IO-Link master, you can also configure its IP address at this point. Give it a static IP address of* ***192.168.0.6****. For the rest of the lab activities in this section, we will be using the 8-port IO-Link master in our tasks and examples.*

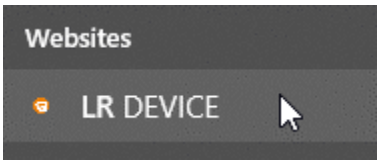
MAC Address	Device ...	Device Name	IP Address	Protocol	Devic...	Vend...	D...
00-02-01-0F-6F-AE	UNDEFI...	Undefined ...	192.168.0.6	NetId...	-	-	-
00-02-01-6B-F4-D5	UNDEFI...	Undefined ...	192.168.0.5	NetId...	-	-	-

6.2. Resetting the Device Settings

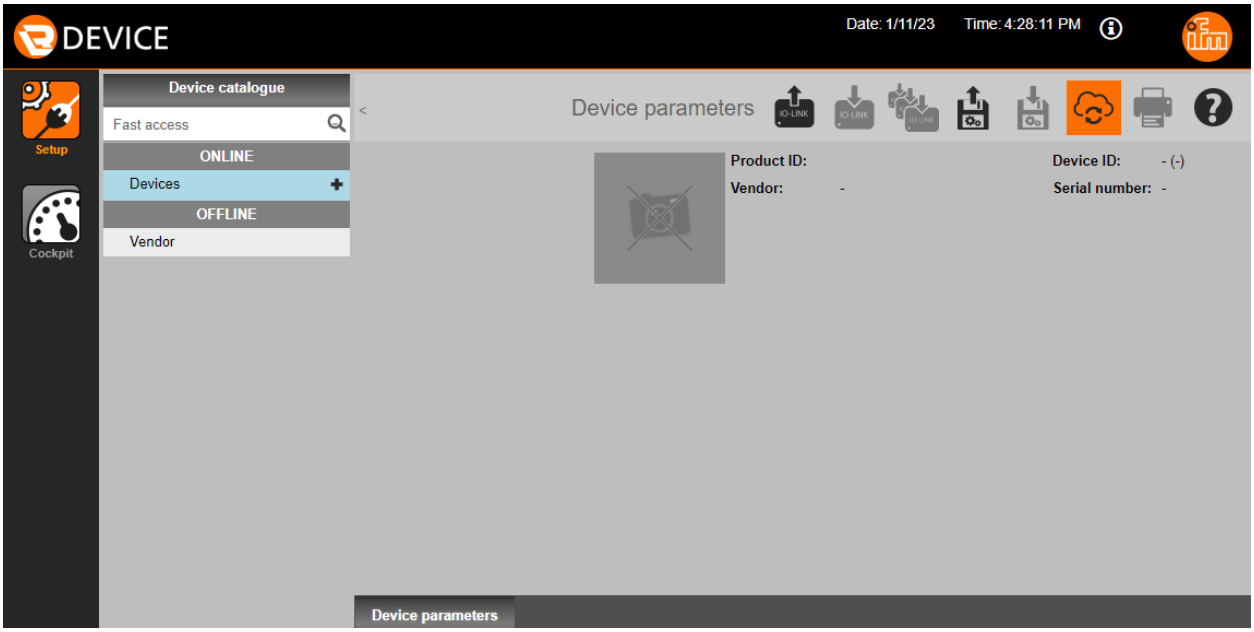
In this task, you will use LR Device to reset the settings of all of the IO-Link slave devices that are connected to the 8-port master. In the next task, you will configure the settings as needed for the project application.

Perform these steps:

1. Open **LR Device**. You can find it in the Windows search area.

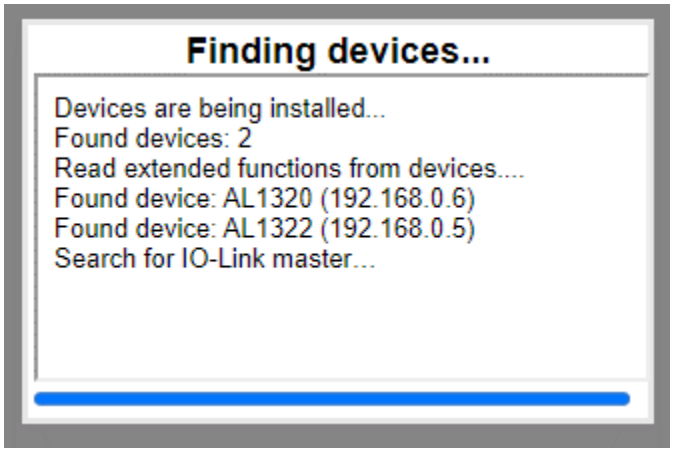


LR Device opens in a browser window. No devices are currently displayed in the Device catalogue.

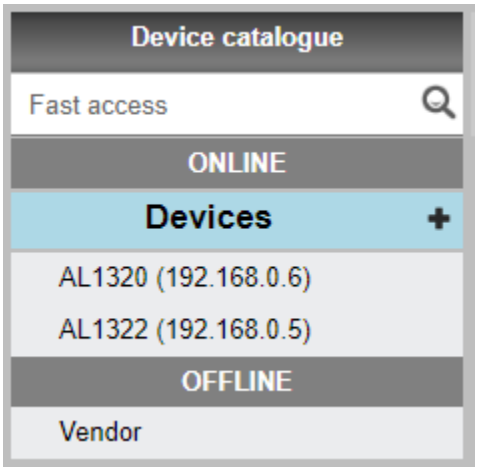


2. At the top-right corner of the window, click the Read from device icon.

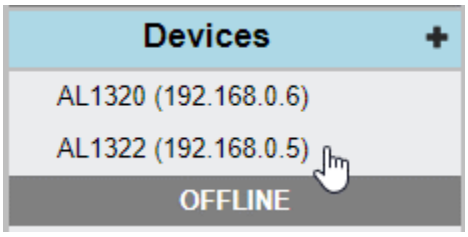
LR Device searches for and finds any IO-Link masters on the network…



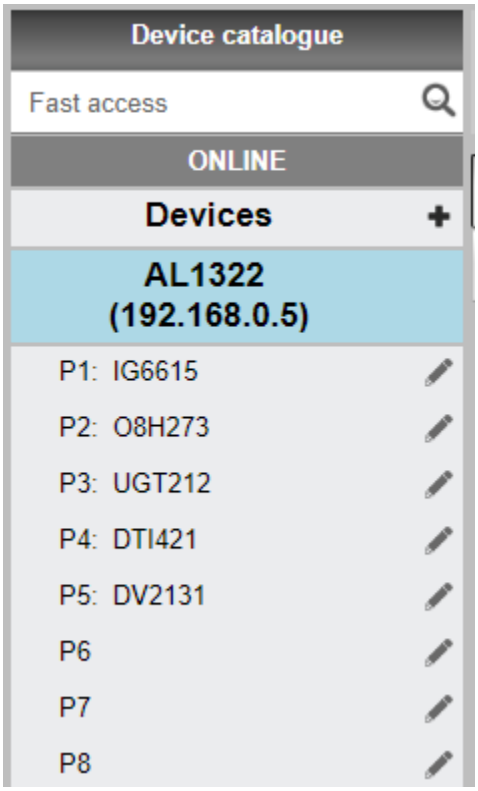
… and displays them in the Device catalogue on the left side of the screen.



3. Select the 8-port master (AL1322).

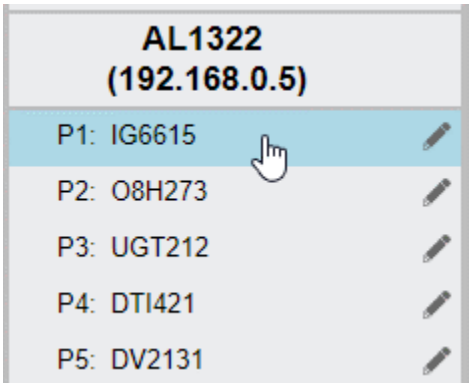


All of the master's connected slave devices are displayed in the catalogue. In this example, there are 5 connected devices: an inductive sensor (IG6615) at port X01, a photoelectric sensor (08H273) at port X02, an ultrasonic sensor (UGT212) at port X03, an RFID read/write head (DTI421) at port X04, and a signal lamp (DV2131) at port X05.

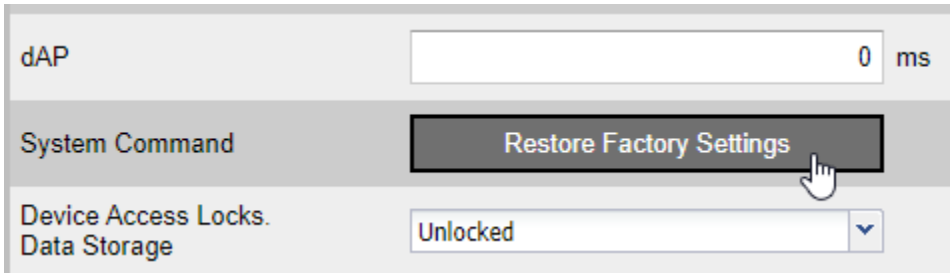


ⓘ ***Note:*** *Your SmartCart may not include an inductive sensor.*

4. Select the first slave device.

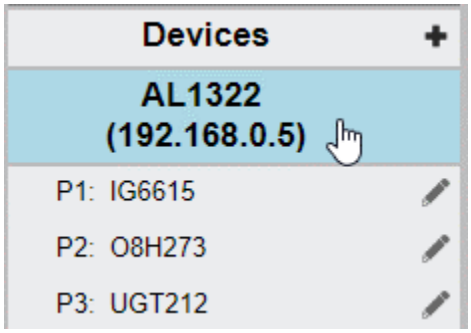


5. The device parameters are displayed on the right side. Scroll down to the System Command line and click **Restore Factory Settings**.



6. Repeat the previous two steps for all of the slave devices that are connected to this master.

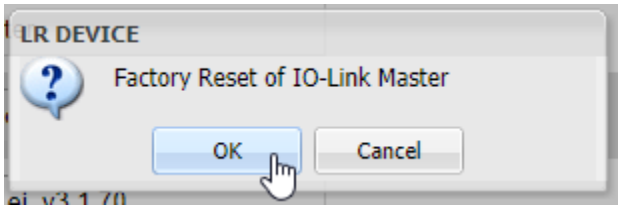
7. In the Device catalogue, select the IO-Link master.



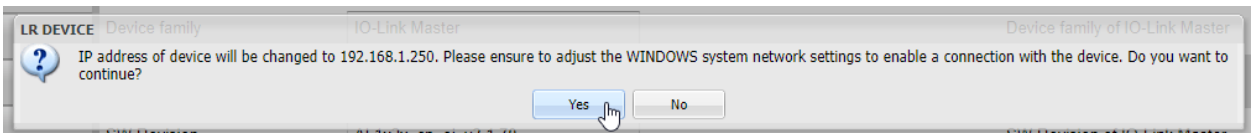
8. The master's parameters are displayed on the right side. Scroll down to the bottom or select the Firmware section.

9. Click **Factory Reset**.

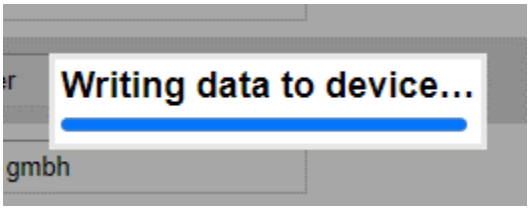
10. In the first popup window, click **OK** to confirm the factory reset.



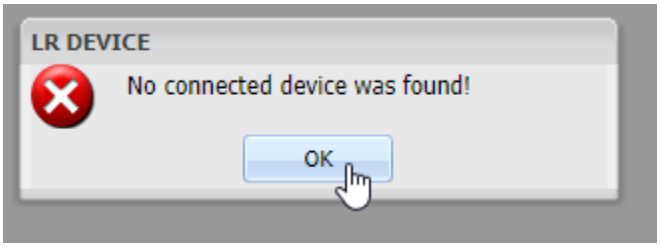
11. In the second popup window, read the warning and then click **Yes**.



12. Wait patiently while the device is reset.

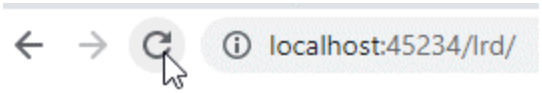


13. In the popup, click **OK**.

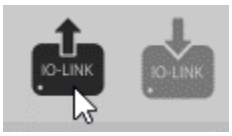


14. Open the Ethernet Device Configuration (Hilscher) application and set the IO-Link master's IP address back to **192.168.0.5**.

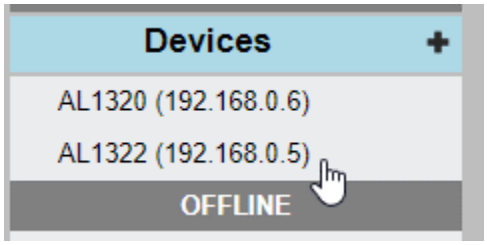
15. Reload the LR Device browser window.



16. Click the Read from device button to display the 8-port master in the Device catalogue.

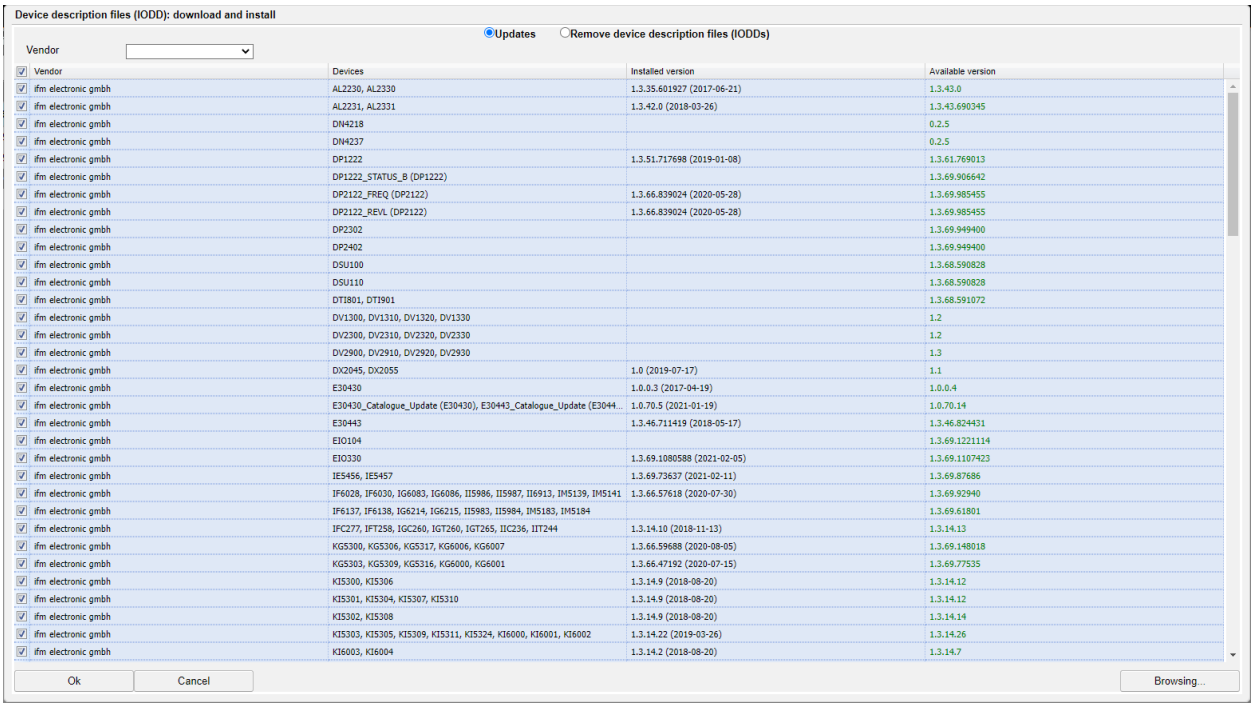


17. Select the device from the catalog.



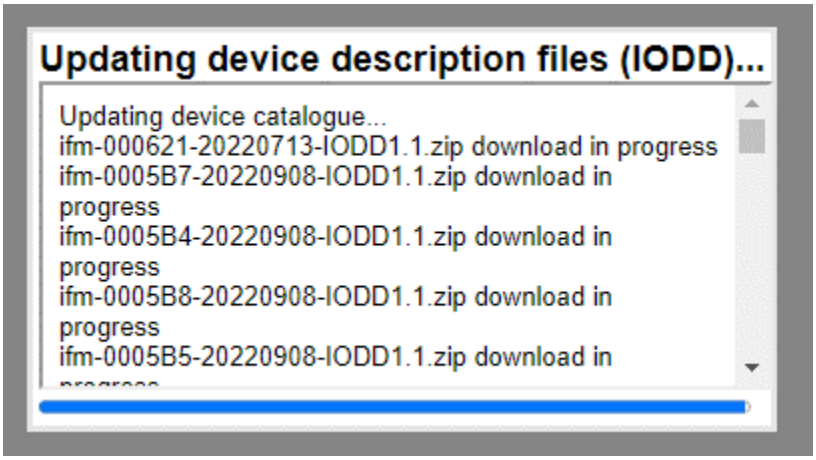
18. Click the Searching for updates button.

A list of device description files is displayed.



19. Click **Ok**.

The files download.

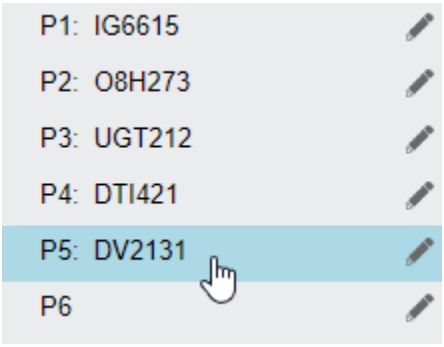


6.3. Device Parameters

In this section, you will change the device names and several device settings.

Perform the following:

1. In the Device catalogue, select your signal lamp (**DV2131**).

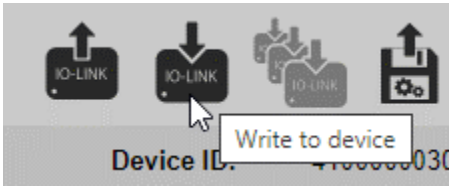


2. In the device parameters, change the Application-specific Tag (the device's name) to **Signal Lamp**.

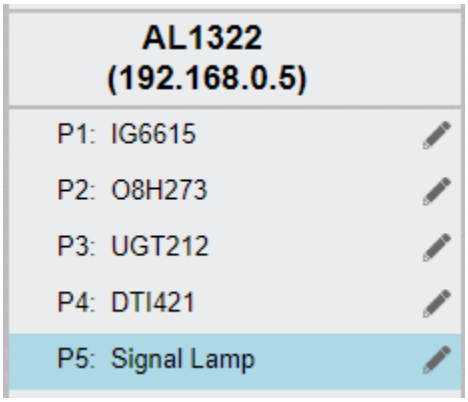
ⓘ ***Note:*** *A pencil icon signifies that a parameter has been edited but has not yet been written to the device.*

3. Scroll down to Buzzer Intensity and change the value to **1**.

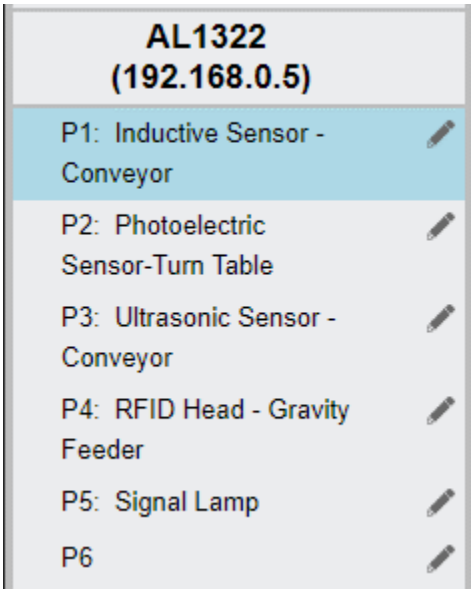
4. Click the Write to device button.



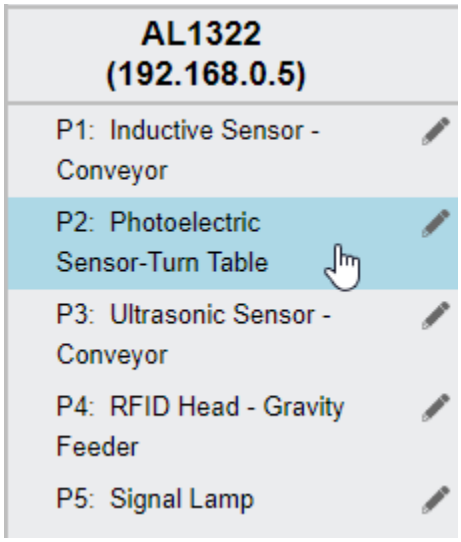
The settings are saved to the device. The device's name is changed in the Device catalog.



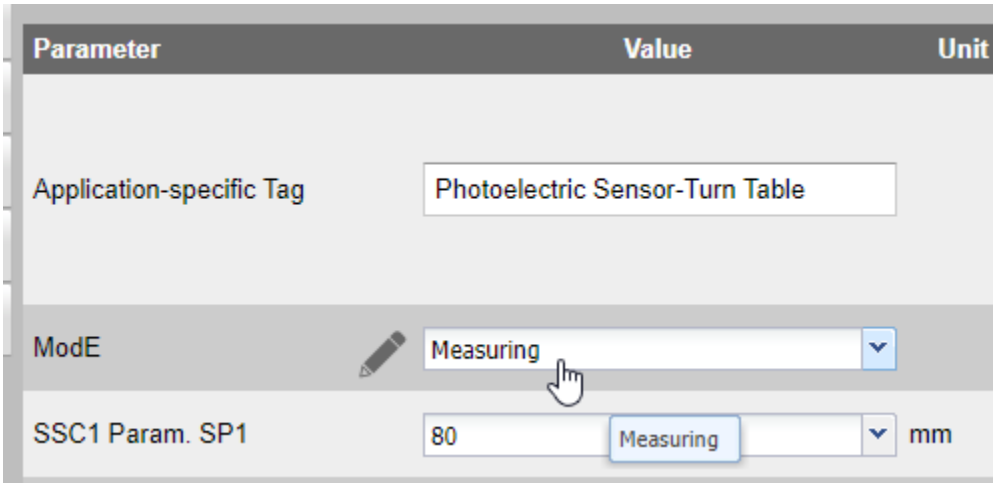
5. Change the names (Application-specific Tags) of all of the connected slave devices so that they are more easily identifiable. Don't forget to write to the device after you have made a change. An example of name changes is shown here:



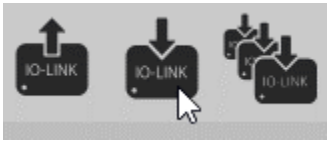
6. In the catalogue, select the photoelectric sensor.



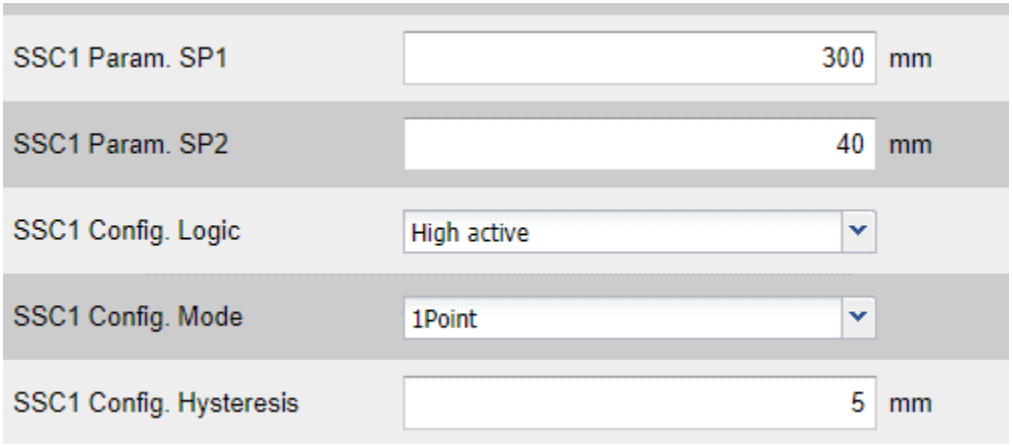
7. Ensure that the ModE field is set to **Measuring**.



8. Write the changed data to the device.

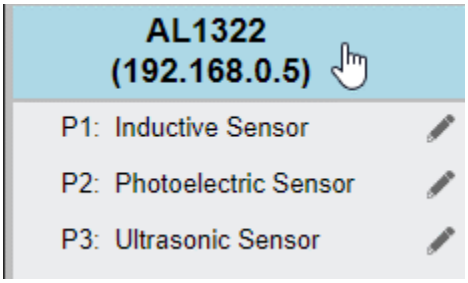


9. *Optionally*, change the ranges and configuration logic of the three proximity sensors' switching (on/off) signals.



ⓘ ***Note:*** *You can always return to LR Device to modify these parameters when you work on your project application.*

10. Select the IO-Link master.

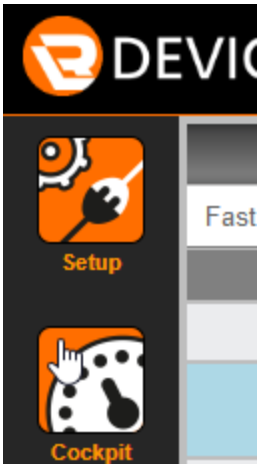


6.4. Testing the Slave Devices

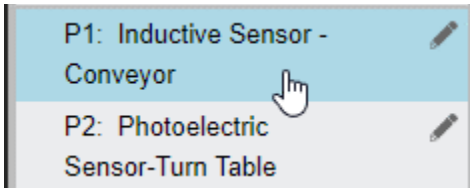
In this task, you will test the connected slave devices using the LR Device cockpit.

Perform these steps:

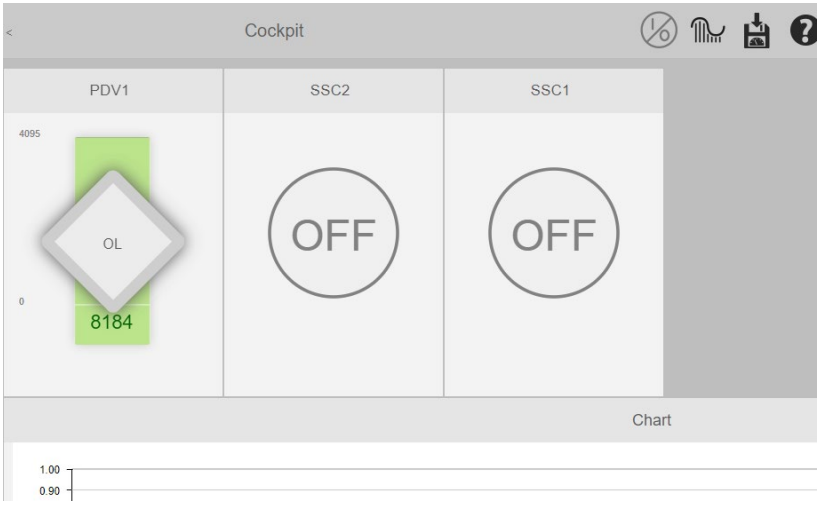
1. On the left side of the LR Device window, click the **Cockpit** icon.



2. From the Device catalogue, select one of the proximity sensors.

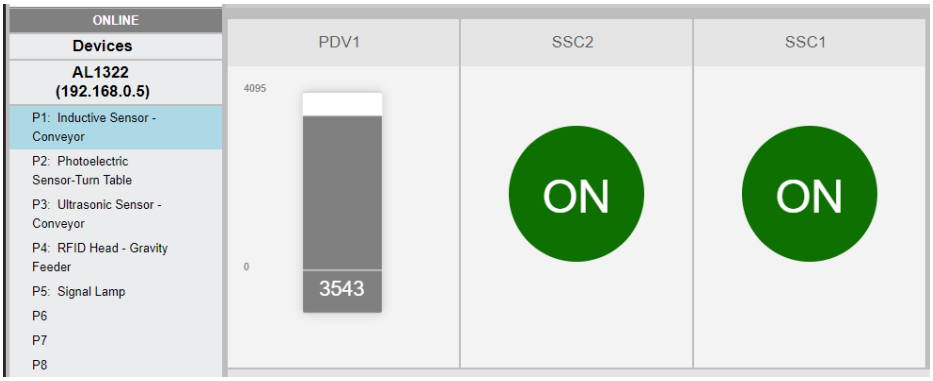


The device's cockpit is displayed.



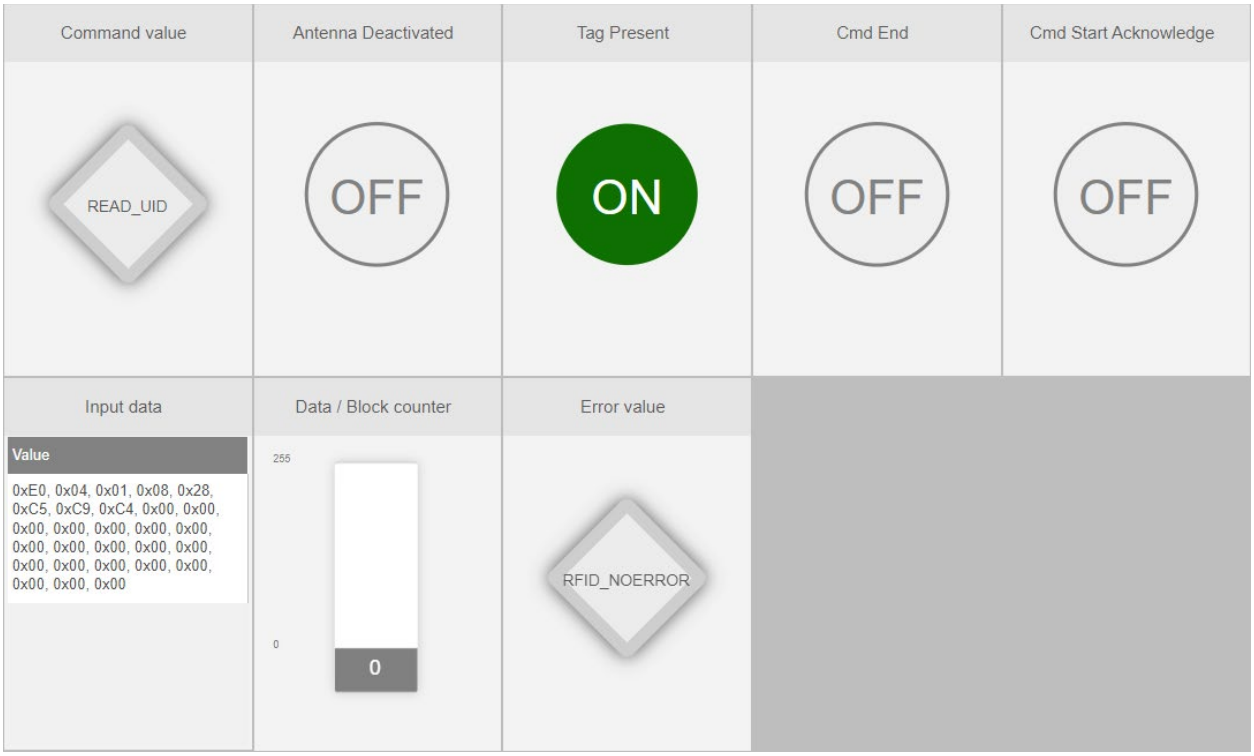
3. Place an object in range of the sensor (if you have chosen the inductive sensor, choose a ferrous, aluminum, copper, or brass object).

4. Monitor the cockpit and ensure that sensor data is displayed.

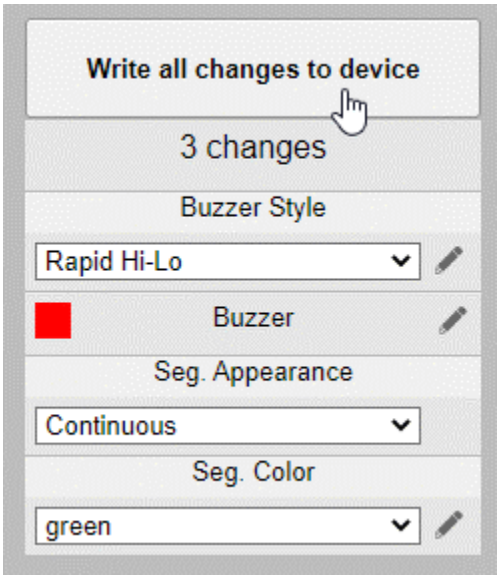


5. Repeat steps 2-4 for the other proximity sensors.

6. Test the RFID head using RFID tags. Read the unique IDs (UIDs) of some of the tags.



7. Test the signal lamp's LED and buzzer. To write to the device, click the **Write all changes to device** button.



8. Turn the lamp's LED and buzzer off.

7. Authentic Skill Assessment

Have your instructor verify that your work meets the requirements in the performance objectives and sign below. Keep this lab activity sheet for future reference.

Instructor Signature	Date

8. Reset Steps

If someone else is going to be performing this lab activity after you, perform the reset steps below. Consult with your instructor before doing so. The procedures for each of these reset actions are listed in section 6.2.

- Reset the IO-Link master to factory default settings.
- Reset the IO-Link slave devices to factory default settings.

9. Shutdown

Unless instructed otherwise by your instructor, review and complete each of the items on the checklist below.

- ☐ Power down the I/O box.
- ☐ Close LR Device.