Robotics, Automation, and Integration

IDENTIFYING SMARTCART COMPONENTS

Name	Class/Period	Date

1. Overview

In this lab activity, you will take a physical tour of the SmartCart 4.0 and identify its components.

2. Performance Objectives

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

- Identify the components of the SmartCart 4.0.
- Describe the basic function of the SmartCart components.

3. Required Materials

You need the following materials to complete the lab activity:

- SmartCart 4.0
- Pen or pencil

4. Required Software

No special software is required for this lab activity.

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, which can be found in the Resources area of this section.
- ☐ Read through the entirety of this lab activity to familiarize yourself with the requirements.

6. Lab Activity

6.1. Identifying Components

In this task, you will identify the main components of the SmartCart 4.0.

Complete the table below:

SmartCart Component	Component Name	Primary Function
		
		
		
	Signal lamps	
		

		
	Smart Sensors	
		
		
		Physically connects SmartCart components and facilitates network communication.
		

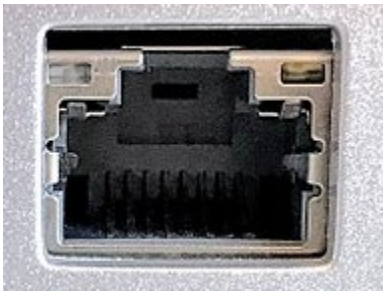
		
		

6.2. Exploring the SmartCart

In this task, you will investigate the SmartCart components while answering the questions below.

Circle all correct answers:

1. Which of the following SmartCart components have standard (RJ45) Ethernet ports such as the one shown in the image below?



a. Robot controller

b. PLC

c. HMI

d. Smart signal lamp

2. Which SmartCart components have *more than one* standard (RJ45) Ethernet port?

a. Robot controller

b. PLC

c. HMI

d. Ethernet Switch

3. Which of the following SmartCart components do not have a standard Ethernet port but are connected to the switch via a custom Ethernet cable?

   a. Programming pendant

   b. IO-Link master(s)

   c. HMI

   d. Vision sensor (camera)

4. What color are the IO-Link masters' EtherNet/IP ports?

   a. White

   b. Black

   c. Green

   d. Orange

5. The rack on the SmartCart table surface has holes for how many pins?

   a. 299

   b. 320

   c. 324

   d. 357

6. Which of the following SmartCart components have servo motors?

   a. Manipulator

   b. Rotary table

   c. Conveyor

   d. Gravity feeder

7. Which of the following components are fixed directly to the SmartCart working surface (tabletop)?

   a. I/O experiment table

   b. Pressure sensor

   c. Rotary table

   d. Digital (optical) proximity sensor

8. The Cognex IS2000 vision sensor has two buttons. How are they labelled?

a. ON & OFF

b. TRIG & TUNE

c. SNAP & FLASH

d. ON & SNAP

9. The robot's gripper tool is powered:

a. Pneumatically

b. Hydraulically

c. Electromechanically

10. How many ports, *in total*, does the IO-Link master AL1322 have?

a. 6

b. 8

c. 10

d. 12

11. Which of the following are NOT part of the I/O experiment table?

a. Microswitches

b. Lamp

c. Buzzer

d. Solenoid

12. Which of the following devices have their own on/off switch and do not power on automatically when the I/O box is turned on?

a. Robot controller

b. PLC

c. Air compressor

d. Vision sensor

e. IO-Link master

7. Authentic Skill Assessment

Show this lab activity sheet to your instructor. 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