

## *Contest Description*

<b>COMPETITION DATE:</b> March 24 <sup>th</sup> 2023	<b>CONTEST AREA NAME:</b> Mechatronics
<b>CONTEST AREA NUMBER:</b>	<b>LEVEL:</b> Post-Secondary
<b>DURATION OF CONTEST:</b> 6 hours (1 day)	<b>LOCATION:</b> CNA Ridge Road Campus

### CONTEST INTRODUCTION

Purpose of the Challenge.

Typically, the goal is to provide competitors with the opportunity to demonstrate certain skills and knowledge that every technologist must have in the field of Manufacturing, Automation and Technology. These skills will be judged on a practical demonstration of abilities to complete control tasks using a Programmable Logic Controller (PLC).

Team of two participants.

Open to Mechatronics, Industrial Automation & Robotics, Electronics, Electromechanical and Mechanical Technologies sectors.

The following 9 skills have been identified and validated as key essential skills for the workplace in the legend below:

<sup>1</sup>Numeracy, <sup>2</sup>Oral Communication, <sup>3</sup>Working with Others, <sup>4</sup>Continuous Learning, <sup>5</sup>Reading Text, <sup>6</sup>Writing, <sup>7</sup>Thinking, <sup>8</sup>Document Use, <sup>9</sup>Digital.

These essential skills have been identified in “Skills and Knowledge to be tested” section and in your project and supporting documents

Skills and Knowledge to be tested:

- General Electrical and Mechanical knowledge
- Programming a PLC.<sup>9</sup>
- Skillful troubleshooting techniques <sup>7</sup>
- Speed of execution

## CONTEST DESCRIPTION

List of documents produced and timeline for when competitors have access to the documents.

DOCUMENT	DATE OF DISTRIBUTION VIA WEBSITE
Contest description	Morning of competition
professional practice	Morning of competition
I/O and wiring diagrams	Morning of competition

I ask that --- may be performed during the contest.

- Disassembly of Festo Station
- Reassembly of Festo Station
- Program station to contest description specifications

Note: Competitors will not be allowed to compete if the above items are not brought and used.

### EQUIPMENT, MATERIAL, CLOTHING

Equipment and Material supplied by Skills Canada-Newfoundland and Labrador

- Festo Station/stations for competition (supplied by Festo)
- Tubing
- Wrenches/allen keys
- Twist ties
- I/O testing SIM boxes
- Wiring/wire strippers
- Wires
- A 120 V AC Power bar will be provided to each team complete with electrical power (15 amps).
- 1 x PLC with at least 12 inputs / 12 outputs plus computer with the PLC programming software and other necessary cables and tools.
- A power supply (120 VAC to 24 VDC) rated at least 4.5 amps should be used to power each PLC and the MPS station.
- All PLC inputs shall be sinking inputs. The sensors and buttons shall switch (source) +24VDC to each PLC input. Sensors are PNP type and shall source the current and the PLC input module will sink the current.
- All PLC outputs shall be sourcing outputs. The output shall switch (source) +24VDC to turn an individual load on. The load shall sink the current to 0 VDC (Ground).
- The PLC outputs should be at least 400 mA. All I/Os are 24VDC.
- 2 x Syslink cable connectors (IEEE 488) should be connected to the PLC

- Each cable would connect 8 I/Os to the PLC: one cable would connect from the PLC to the MPS station containing sensors and solenoid valves. The other cable would connect from the PLC to the control panel, which contains operator devices such as pushbuttons, switches, and pilot lights.
- See PLC wiring document posted on the Skills/Competences Canada website.

Equipment and Material Competitor must supply:

- Safety glasses

Required clothing (Provided by competitor)

- Long pants
- Short sleeve or tight arm long sleeve shirt
- Close toes shoes/boots

## **SAFETY REQUIREMENTS**

The health, safety and welfare of all individuals involved with Skills Canada NL are of vital importance. Safety is a condition of participation and shall not be sacrificed for the sake of expediency. At the discretion of the judges and technical committees, any competitor can be denied the right to participate should they not have the required proper safety equipment and/or act in an unsafe manner that can cause harm to themselves or others.

List of required personal protective equipment (PPE) supplied by Skills Canada NL:

- N/A

List of required personal protective equipment (PPE) supplied by Competitors:

- Safety glasses

Note: Competitors will not be allowed to compete if the above items are not brought and used

## EVALUATION/JUDGING CRITERIA

### Point Breakdown

POINT BREAKDOWN	/100
Professional Practice	20
Time evaluation	20
I/O check and allocation	20
Expected functionality	40

## ADDITIONAL INFORMATION

Tie (No ties are allowed)

Tiebreaker #1: In the event of a tie, the team with the highest score in “Expected Functionality” will be declared the winner.

- Tiebreaker #2: If a second tie occurs, the team with the highest score in “Time Evaluation” will be declared the winner.

- Tiebreaker #3: If a third tie occurs, the team with highest score in “I/O Check and Allocation” will be declared the winner.

### Competition Rules

Please refer to the competition rules for all general SCPC information.

## PROVINCIAL TECHNICAL COMMITTEE MEMBERS

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