



## CONTEST DESCRIPTION

<b>Competition Date</b>	Thursday, April 4 <sup>th</sup> 2024
<b>Competition location</b>	Holland College Waterfront Campus
<b>Trade Number</b>	04
<b>Trade Name</b>	Mechatronics
<b>Level</b>	Post-Secondary

### 1. INTRODUCTION

#### 1.1 Purpose of the Challenge.

The goal is to provide competitors with the opportunity to demonstrate certain skills and knowledge that every technician must have in the field of Manufacturing, Automation and Technology.

Mechatronics skills will be judged on a practical demonstration of abilities to complete the mechanical, electrical and pneumatic assembly of a manufacturing production system as well as creating and commissioning the controls based on a documented working sequence using Programmable Logic Controllers (PLC). Team of two participants.

Open to Mechatronics, Industrial Automation & Robotics, Instrumentation, Electro-Mechanical or related Technologies sectors.

#### 1.2 Duration of contest.

6 Hours

#### 1.3 Skills and Knowledge to be tested.

- General Electrical and Mechanical knowledge
- Interpret and use electronic, electrical or mechanical schematics
- Render operational and modify sequential mechanisms that have a PLC
- Commissioning electrical, pneumatic and mechanical systems.
- Programming PLCs
- Skillful troubleshooting techniques
- Speed of execution
- Wiring skills
- System Optimization (increasing the system performance)
- Professional workmanship
- Professional practices
- Know-how to look for information efficiently in industrial equipment



## 2. SKILLS FOR SUCCESS

In response to the evolving labour market and changing skill needs, the Government of Canada has launched the new Skills for Success (former Essential Skills) model defining nine key skills needed by Canadians to participate in work, in education and training, and in modern society more broadly. SCC is currently working with Employment and Social Development Canada (ESDC) to bring awareness of the importance of these skills that are crucial for success in Trade and Technology careers.

Part of this ongoing initiative requires the integration and identification of the Skills for Success in contest descriptions, projects, and project documents.

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

Numeracy, Communication, Collaboration, Adaptability, Reading, Writing, Problem Solving, Creativity and Innovation, Digital

## 3. CONTEST DESCRIPTION

### 3.1 Tasks that may be performed during the contest.

- Unpacking and preparation of components including cutting cables to length, stripping of insulation and crimping of ferrules
- Install mechanical modules with proper alignment
- Wire solenoid valves and sensors according to schematics
- Pneumatic tubing for cylinders, valves terminals and service unit according to schematics • Write PLC programs according to instructions
- Conduct maintenance task by replacing various components in the system
- Debug and troubleshoot the assembly to operate according to instructions
- Optimize the system performance

## 4. EQUIPMENT, MATERIAL, CLOTHING

### 4.1 Each competitor is required to bring the following:

- Multimeter (VOM)
- Set of Screwdrivers - recommended:
  - Pozi Drive PZ0, PZ1
  - Philips #0, #1
  - Flat 1.2, 1.6, 2.5, 6 mm
  - Torx T8, T10, T12
- Set of Hex metric keys.
  - Recommended Sizes: 1.5, 2, 2.5, 3, 4, 5, 6, 8, 10 mm



- Set of Open-ended metric wrenches
  - Recommended sizes: 7, 8, 9, 10, 19 mm
- Metric Socket wrenches and/or nut drivers
- Adjustable wrench
- Wire strippers
  - 0.25mm<sup>2</sup> to 1.5mm<sup>2</sup> (AWG 24 – 16)
- Side and flush cutters
- Measuring tape or ruler (metric)
- Ferrule crimping tool

#### **4.2 Equipment and material provided by the competition site**

- Manufacturing Production Stations (MPS<sup>®</sup>): A model of a real production system from Festo Didactic.
- PLC and PLC programming computer
- Pneumatic Tubing
- Wires
- Ferrules
- Tie-wraps
- Compressed Air
- A 120 VAC power bar will be provided to each team complete with electrical power (15 amps).
- Tubing cutter
- Work pieces (Cylinder and Meter Bodies)

#### **4.3 Required clothing (Provided by competitor)**

Competitors are to be dressed in a clean and appropriate manner. The Mechatronics contest recommends that you wear long pants, belt, socks, and must wear close toe shoes

Jewellery such as rings, bracelets and necklaces or any deemed unsafe by competition judges shall be removed

Proper shop attire is to be worn (no loose straps, baggy sleeves etc.). Or any item deemed unsafe by competition judges

## **5. SAFETY REQUIREMENTS**

### **5.1 List of required personal protective equipment(PPE) provided by competitors**

Safety glasses