Contest Description

Edmonton Expo Centre, Edmonton
May 4 & May 5, 2022

EVENT: Mechatronics (Teams of Two)	**LEVEL:** Post-Secondary
WORLDSKILLS TRADE #: 4	**LOCATION:** Hall A, Edmonton Expo Centre, Edmonton
DURATION: 12 Hours (Two Days)	**EQUIPMENT SET UP AND TESTING:** **MAY 3: 7:30PM – 8:30PM**

COMPETITION SCHEDULE:

May 4:

ORIENTATION	8:00AM-8:30AM
COMPETITION	8:30AM-11:30AM
LUNCH	11:30AM-12:00 NOON
COMPETITION	12:00 NOON-4:00PM

May 5:

ORIENTATION	8:00AM-8:10AM
COMPETITION	8:10AM-11:30AM
LUNCH	11:30AM-12:00 NOON
COMPETITION	12:00 NOON-3:00PM

*The times may vary- subject to participant progress.

Please Note: Due to the uncertainty caused by COVID 19, the PSCC could be subject to change at any time based on the public health context. This document is subject to change as competition information is updated. Competitors are responsible for staying up to date with the most recent information. Check the footer for last updated date. Changes will be highlighted in yellow.

IMPORTANT: Competitors are required to bring your own device (BYOD) for the competition.

If competitors are bringing a computer or laptop from their school (instead of their personal computer), please ensure that the computer is unlocked so documents and possibly software can be saved/installed to the hard drive and technology support can be provided onsite. This may require access to CMOS settings.

Please contact Whitney Koop with any questions or concerns: whitneyk@skillsalberta.com

CONTEST INTRODUCTION

The Mechatronics competition involves building of electro-mechanical stations to comply with engineering documentations including operational specifications and schematic diagrams. Competitors should have a sound knowledge in the multidisciplinary areas of mechanics, electronics, and automation controls.

By means of a practical exercise, measure certain skills that every technologist must master in the field of Mechatronics (technology combining electronics and mechanical engineering).

- Project is completed in teams of two
- Open to Mechanical, Electro-Mechanical, Automation and Instrumentation Technology sector

SKILLS AND KNOWLEDGE TO BE TESTED:

- Interpret and use electronic, electrical, pneumatic and mechanical documentation or schematics.
- Install and commission electrical, pneumatic and mechanical systems.
- Configure, program, test and modify a sequential mechanism controlled by a Programmable Logic Controller (PLC).
- Ensure operations conform to specification documents.
- Practice skillful trouble-shooting techniques.
- Execute project tasks with speed.

EQUIPMENT & MATERIALS

Equipment and Materials Competitors Must Supply:

- 2x PLCs with at least 16 Inputs / 16 Outputs **each** and a computer with PLC programming software and other necessary cables and tools. Connections between the PLC's and workstations will be specified in the project.
    - A power supply (120 VAC to 24VDC) 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 0VDC (Ground).
  - The PLC outputs should be at least 400 mA. All I/O must be 24VDC.
  - Each team will be provided with tables. Mounting the PLC on a back-plate is recommended.
- 2x SysLink cable connectors (as specified in the posted test project) will be connected to **each** PLC (4 in total)
  - The wiring details can be provided on request to the Provincial Technical Committee.
  - There are no restrictions on the wiring to the PLC but it is recommended to have the same wiring instruction that comes with the SysLink cables. The only wiring that is checked in the competition are the ones connected on the MPS station terminal.
  - These cables should be connected to the PLC before the competition.
- Multimeter (VOM)
- Recommended set of screwdrivers
  - Pozi Drive PZ0, PZ1
  - Philips #0, #1
  - Flat 1.2, 1.6, 2.5mm
- Recommended set of metric hex keys.
  - 1.5, 2, 2.5, 3, 4, 5, 6, 8, 10 mm
- Recommended open ended metric wrenches
  - 7, 8, 9, 10mm
- Adjustable wrench
- Wire stripper
  - .25mm^2 to 1.5mm^2 (AGW 24 – 16)
- Side and flush cutters
- Weidmueller AM25 AM35 or equivalent
- Tubing cutter
- CSA Approved Safety glasses
- Power bar and Extension Cord

Important Note: The computers used for programming the PLC can have any other software application and can contain any files except previous PLC programs, custom libraries or related importable files. NO Internet connection will be allowed on any computer and NO cell phones or other electronic device are permitted during the competition.

Equipment and Materials Supplied by the Committee:

- Modular Processing Stations (MPS®): A model of a real product handling system from Festo Didactic
- Pneumatic Tubing
- Wires

- Tie-wraps
- Compressed Air

JUDGING CRITERIA

Final judging criteria will be made available at the competition time. A sample of similar criteria is available in the test project.

TIE BREAKING PROCESS

In the event of a tie secondary evaluation will be based upon performance in a pre-determined judging sub-category determine gold.

SAFETY

The health, safety and welfare of all individuals involved with Skills Canada Alberta are of vital importance. Safety is a condition of participation with Skills Canada Alberta 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.

Additional Safety Requirements (provided by competitor):

- Competitors are to be dressed in a clean and appropriate manner. The Mechatronics contest requires that you wear long pants, closed toed shoes and safety glasses when required.
- At the discretion of the judges and technical chair any competitor can be removed from the competition site for not having the proper safety equipment and/or not acting in a safe manner
- Jewelry such as rings, bracelets and necklaces or any deemed unsafe by competition judges and shall be removed*
- Only approved shop attire (no loose straps, baggy sleeves or any item deemed unsafe by competition judges) is permitted*

*Competition judges and safety personnel will have final authority on matters of safety.

ADDITIONAL INFORMATION

Bring Your Own Device (BYOD) Additional Information

IMPORTANT: Competitors are required to bring their own device and software for the 2022 competition. Each competitor can choose their own device and software so their workflow and process are what they are familiar with. **Note, computers must remain inside the competition area for the duration of the competition from the time the competition begins on Day 1 to when the competition ends on Day 2 (including overnight). Competitors may supply their own locking cables if they wish.**

Equipment Set-up and Testing (for BYOD competitions)

Competitors who are competing in technology-based competitions that are BYOD, will be given an opportunity to set up and test their equipment to ensure their equipment is fully functional and networked (where required) prior to the start of the competition the following day. Only registered competitors will be permitted into the competition area for set-up and testing. Competitors who miss the equipment and setup testing opportunity will need to set up their equipment after the mandatory competitor orientation time on the day of competition. Any time that is required to set up and test their equipment on the competition day will be part of their overall competition time. The competition time for these competitors will NOT be extended.

Equipment Set-Up and Testing for all event areas that are a BYOD competition will be held on Tuesday May 3, 2022 from 6:00pm-7:00pm.

Skills Canada Alberta Regional and Provincial Rules and Regulations

Regional and Provincial Rules and Regulations

Competitors must be prepared to adhere to all public health measures in place at the time of the PSCC.

Lunch

Lunch for competitors will be provided by Skills Canada Alberta.

Parking & Venue Maps

http://edmontonexpocentre.com/attend/parking/

Competitor Registration

Competitor Registration for the PSCC will take place on Tuesday May 3, 2022 from 9:00am-6:00pm outside Hall B of the Edmonton EXPO Centre.

Virtual Awards Ceremony

The Virtual Awards Ceremony will take place **Friday, May 6th at 6:30pm**. A link will be made available on the website with additional information prior to the ceremonies.

Team Alberta Information

Team Alberta (Post-Secondary) will be selected at the PSCC happening on May 4 - May 5, 2022. Top eligible medalists will compete at the Skills Canada National Competition (SCNC) May 24-28, 2022 in Vancouver, BC. It is recommended that competitors review the SCNC contest description to be familiar with the national contest description and project at http://www.skillscanada.com/.

If a competitor is not able to attend the SCNC, competitors MUST notify Victoria Anderson Victoriaa@skillsalberta.com prior to the start of competition. If a gold medalist is not able to attend the SCNC, the next top-ranking individual will be asked to participate.

Test Project change at the Competition

Where the Test Project has been circulated to Competitors in advance, PTC can change a maximum of 30% of the work content.

Questions?

Please contact Mike Sury Mikes@skillsalberta.com if you have any questions regarding the Contest Description.

COMMITTEE MEMBERS

Daniel Barrett (daniel.barrett@sait.ca) SAIT
Neil Wenger (wenger2@telus.net)
Laine Van Hardeveld (laine.vanhardeveld@gmail.com)
Cash Prediger (cash.prediger@rdpolytech.ca) RDC