



2018

SCNC

SKILLS CANADA
NATIONAL COMPETITION

OCMT

OLYMPIADES CANADIENNES
DES MÉTIERS ET
DES TECHNOLOGIES


SkillsCompétences
Canada
Edmonton2018

CONTEST DESCRIPTION / DESCRIPTION DE CONCOURS

INDUSTRIAL CONTROL CONTRÔLE INDUSTRIEL

POST- SECONDARY /
NIVEAUX POSTSECONDAIRE



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1 THE ESSENTIAL SKILLS FOR CAREERS IN THE SKILLED TRADES AND TECHNOLOGY

SCC is currently working with Employment and Social Development Canada (ESDC) in order to bring awareness to the importance of Essential Skills that are absolutely crucial for success in the workforce. Part of this ongoing initiative requires the integration and identification of Essential Skills in contest descriptions, projects, and project documents. The next phase and very important aspect of our Essential Skills (ES) initiative is to provide an ES report card to each competitor at the Skills Canada National Competition. The purpose of the ES report card is to inform the competitor about their current level of essential skills based on their competition scores. With this knowledge, the competitor will be made aware which essential skill may require improvement. Full implementation is expected in the next Skills Canada National Competition.

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

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

These essential skills have been identified with in section 2.3 and/or 3.2 of your Contest Description. The top three Essential Skills for your area of competition have been identified on your Project and all other supporting project documents.

2 CONTEST INTRODUCTION

2.1 Description of the associated work role(s) or occupation(s).

<http://skillscompetencescanada.com/en/skills/construction/automation-control/>

2.2 Purpose of the Challenge.

Install and program an industrial control system

2.3 Duration of contest.

12 hours

2.4 Skills and Knowledge to be tested.

Designing, installation and commissioning of a sequential process using a PLC device

3 CONTEST DESCRIPTION

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

DOCUMENT	DATE OF DISTRIBUTION VIA WEBSITE
Test Project	January, 2018
VFD Manual	January, 2018

3.2 Tasks that may be performed during the contest

- Interpreting and using electrical designs, diagrams and a process flow chart to assemble a functional control system.⁸
- Installing various industrial cables and raceways to a wall mounted control panel.
- Programming a programmable logic controller – PLC, to meet project requirements.⁹
- Installing and commissioning terminal components (push buttons, limit switches, pilot devices, etc.)¹
- Wiring a panel using standard trade practices, complying with relevant sections of the Canadian Electrical Code.⁵
- Determining adequate protection for equipment, components and personnel.⁷
- Diagnostic and fault finding on actual project.⁷
- Proper Occupational Health and Safety procedures

Pre-Requisites

- Knowledge of the current Canadian Electrical Code.⁵
- Ability to effectively locate information in technical documents.⁸
- Effective troubleshooting techniques.⁷
- Ability to install various industrial cables and raceways.
- Knowledge of symbols used in an electrical diagram and a control diagram.⁸
- Proper layout, installation practices and techniques for a control panel.
- Knowledge of fail safe designing.
- Knowledge of safety practices in the work environment.
- Knowledge of PLC programming.⁹
- Knowledge of supplied VFD.
- Effective use of allotted time⁷

Essential Skills – ¹Numeracy, ⁵Reading Text, ⁷Thinking (Problem Solving, Job Task Planning and Organization), ⁸Document Use, ⁹Digital

4 EQUIPMENT, MATERIAL, CLOTHING

4.1 Equipment and material provided by Skills/Compétences Canada

- Ladder
- Power bar
- Cordless Drill
- VFD
- DC Power Supply
- 20V MAX* XR Lithium Ion Brushless Compact Hammerdrill & Impact Driver Combo Kit
- 3 Pc. Metal Cut Carbide Holesaw Set
- 35-Pc. Screwdriving Set
- 6" Square #1, #2

COMPETITORS WILL BE REQUIRED TO USE THE MATERIAL AND EQUIPMENT PROVIDED BY SCC. ALL OTHER MATERIAL AND EQUIPMENT WILL BE REMOVED FROM THE SKILL AREA.

4.2 Equipment and material provided by the competitor

Mandatory

- Programmable Logic Controller, communication cable and software. Laptop computer with appropriate operating system and PLC software. Computer & PLC need to be free of all pre-programmed PLC files. Computer will be inspected by the National Technical Committee (NTC) prior to usage.
- The PLC must have the following minimum requirement:
 - 120 VAC power will be provided to supply the Enclosure
 - 24 Volt inputs/ouputs are preferred
 - Fit into a space 250mm high x 250mm deep x 500 mm wide
 - 16 - Inputs
 - 16 - Relay Outputs
 - Internal Battery (if applicable) PLC technical documents/manuals will be permitted provide they are free of additional notes and writings and contain only original manufacturer information. Note: Additional backup PLC (Recommended)

Required

- Multimeter
- Complete set of pliers (diagonal cutting, needle nose, electrician's, sta-kon crimper, slip-joint gripping)
- Complete set of screwdrivers (Phillips, Robertson, Flat-headed)
- Level(s)
- Wire Strippers
- Electrician's knife
- Metric measuring tape
- Ruler straight edge and/or T-square
- Metal saw (Hack saw) & Mitre Box/Vice
- Flat and round metal file with handle
- Hammer
- Centre punch
- Set of metal drill index
- Knockout Punches and/or carbide hole saw (22) or Unibit
- Full compliment of screwdriver tips for cordless drill (short & long including nut drivers)
- Set of termination screwdrivers (slotted)
- Adjustable wrench
- Allen Keys (metric and imperial)
- Any additional tools are subject to approval from National Technical Committee Chair prior to completion starts.
- No additional Power Tools and no pre-fabricated templates allowed.

4.3 Required clothing provided by the competitor.

- Proper work site clothing (no shorts allowed)

5 SAFETY REQUIREMENTS

5.1 Safety workshop

Upon arrival at the Skill area, Competitors will participate in a Safety workshop and they will be expected to work and maintain a safe working area during the competition. Any Competitor breaking any health, safety and environmental rules, may be required to undertake a second safety workshop, this will not affect the Competitor's competition time.

5.2 List of required personal protective equipment (PPE) provided by competitors.

- Safety Glasses with side shields
- CSA approved Safety Shoes
- Protective Gloves (high dexterity)
- Hearing protection
- Hard Hats
- Lockout Hasp for Main Disconnect

6 ASSESSMENT

6.1 Point breakdown

POINT BREAKDOWN	/100
Measurements	18
Wiring & Components Installation	42
Functionality	30
Safety practices	10

7 ADDITIONAL INFORMATION

7.1 Consecutive translation

If consecutive translation is required on site, the Skills/Compétences Canada Provincial/Territorial offices must advise Skills/Compétences Canada National Secretariat a minimum of 1 month prior to the competition or this service might not be guaranteed.

7.2 Tie (No ties are allowed)

In the event of a tie, the competitor with the highest score in the Wiring & Components Installation will be declared the winner. If a second tie occurs, the competitor with the highest score in the Measurement criteria will be declared the winner.

7.3 Test Project change at the Competition

Where the Test Project has been circulated to Competitors in advance, NTC shall change a maximum of 30% of the work content. Please refer to the Competition Rules.

7.4 Competition rules

Please refer to the [competition rules](#) of the Skills Canada National Competition.

8 NATIONAL TECHNICAL COMMITTEE MEMBERS

Member Organization	Name
British Columbia - Chair	Clarence Burlock
Alberta	Michael Carrick
Saskatchewan	Norm Walker
Ontario	John Sousa
Québec	Éric Beaumier
New Brunswick	Mike McGaw
Prince Edward Island	Scott Zwicker
Nova Scotia	Allison MacRury
Newfoundland & Labrador	John Dalley

Contact the Skills/Compétences Canada national secretariat for any questions or concerns: Marilou Leduc (mariloul@skillscanada.com).