

# Michael Woods, P.Eng.

ELECTRONICS ENGINEER · EMBEDDED PROGRAMMER

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## Skills

<b>Design</b>	PCB Design, ARM Cortex MCU, Motion Control, Functional Safety
<b>Programming</b>	Embedded C/C++, Structured Text (IEC 61131-3), Ladder Logic, JavaScript
<b>Tools/Software</b>	STM32CubeIDE, Platform IO, PCAN-View, Altium Designer, KiCAD, Arch Linux, TI-TINA, GIT/SVN

## Experience

### Director of Electrical R&D

North Vancouver, BC

NOVARC TECHNOLOGIES, INC.

Jun. 2022 - PRESENT

- Created the proof of concept hardware and software required to port our vision system and proprietary AI control to a 3rd party robotic welding apparatus.
  - Developed the CAN 2.0A message handling, motion control functions, SPI accelerometer interface and a finite state machine in C++ using PlatformIO IDE. Embedded software was deployed to an Atmega32U4 based CAN development board to achieve the required motion control functions.
- Established the PCB design capability within the R&D and Engineering groups, including QA/QC and testing procedures.
- Designed a brushed DC motor driver PCB with tachometer circuitry to control a robotic wire feeder.
- Guided the electrical and controls architecture and design requirements of the next generation products.

### Director of Electrical Engineering

North Vancouver, BC

NOVARC TECHNOLOGIES, INC.

Mar. 2021 - Jun. 2022

- Head of the electrical engineering department with a team of two engineers under my direction.
- Planned and executed electrical and controls projects to implement new features on the Spool Welding Robot (SWR).
- Responsible for EU Machinery and EMC Directive compliance. Oversaw safety testing according to IEC 60204-1 and ISO/TS 15066, in addition to EMC testing according to IEC 61000-6-4.
- Obtained ETL marking authority for the production facility.
- Served as tier 2 technical support for customer issues on site.

### Electrical Systems Engineer

Burnaby, BC

BALLARD POWER SYSTEMS

Mar. 2020 - Mar. 2021

- Developed AC&DC design specs, drawings, and calculations, for a 1.5MW stationary fuel cell generator intended for export to European markets.
- Investigated component failures on automotive fuel cell products to determine root cause and develop design solutions.
- Designed and built a test apparatus to validate PCB re-work. Programmed test suite in IEC 61131-3 Structured Text for deployment to STW ESX controllers.
- Led the design of a CAN bus based hydrogen fuel cell voltage measurement device for use in a 1500VDC generation system. Developed schematics, BOM and PCB layout in Altium Designer.

### Electrical Engineer / Project Manager

Vancouver, BC

VARD ELECTRO CANADA

Jul. 2017 - Mar. 2020

- Developed and executed the electrical scope (estimated at \$1.5M) of a project to retrofit a class of medium icebreakers for the Canadian Coast Guard.
- Managed a team of 7 engineers and designers on the fast-tracked detailed design phase of the project.
- Design and review of engineering documentation.
- Effectively communicated project scope, schedule, and budget with lead engineers.
- Reviewed weekly and monthly reports to track key performance metrics.

## Electrical Systems Engineer(Contract)

North Vancouver, BC

SEASPAN VANCOUVER SHIPYARDS

Jun. 2016 - Jul. 2017

### Federal Fleet Renewal Program, Joint Support Ship

- Collaborated with an integrated project team to develop product requirements which met client performance specifications and complied with classification society (DNVGL) regulations.
- Responsible for performing reviews of electrical, electronic and communications systems design products to ensure technical accuracy and adherence to client and company standards.

## Electrical Engineer(Contract)

Vancouver, BC

ALLNORTH CONSULTANTS

Jun. 2015 - Jun. 2016

- Performed AC load and short circuit studies as well as modelled LV and MV systems in EasyPower.
- Analyzed power factor of new and existing plant and provided recommendations for improvement.

## Electrical Engineer

Vancouver, BC

AMEC FOSTER WHEELER

Jun. 2012 - Jun. 2015

### Cape Scott Wind Farm, GDF Suez, Port Hardy, BC

- Telecommunications system engineer tasked with system topography and detailed design including fibre optic communications system, telecommunications hardware, revenue metering and video surveillance system.

### Kokish River Interconnection, BC Hydro, BC

- Designed lighting, AC and DC station service systems, cabling, control room layout, control room fire detection and alarm system, control room security & resource smart system for a 138kV switching station.

## Education

### The University of Calgary

Calgary, Alberta

B.Sc. IN ELECTRICAL ENGINEERING

2006 - 2010

- Senior research project investigating the use of passive multi-band microwave networks in a low power SDR down conversion architecture.
- Conference Paper: Bugo, T., Klippenstein, B., Saizew, M., Woods, M., Helaoui, M. (2010) Dual-Band Receiver Using Passive Six-Port Down-Conversion Technique Suitable for Multi-Standards and SDR Applications. Conference Proceedings of Asia-Pacific Microwave Conference (TH3G-12). Yokohama, Japan. December 7-10, 2010.

## Professional Memberships

### Engineers and Geoscientists BC

British Columbia

PROFESSIONAL ENGINEER (P.ENG.)

2016 - PRESENT