JOHN W. RAYNES, P.E.
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M.C. Dean/CIM Automation, Harrisonburg, VA (2016 - Present)

Automation and Controls Engineer

Project Technical Lead on various Rockwell Logix, FactoryTalk ME/SE and Wonderware contract projects for a regional automation systems integrator. Upgraded PLC and Panelview programs, migrated RSView32 SCADA to FactoryTalk View SE.

Merck, Elkton VA (Embedded Sep. 2016 – Dec. 2017): Provide engineering automation compliance support for a bulk sterile manufacturing process automation system, involving a central DeltaV/Provox DCS with a network of satellite Rockwell SLC-500 and Logix PLC/HMI stations, and PI data historians. Perform major upgrades to Allen-Bradley/PanelView Plus PLC Programs and SLC-500 to Compact Logix migrations.

Raynes Engineering, Inc. Salt Lake, Utah (1996 - 2016)

President and Senior Design Engineer – Consulting Engineering

Founded, and continue to manage, an engineering business specializing in industrial automation, instrumentation, and control systems and electronic design. Projects undertaken have included:

Development of measurement and control systems for manufacturing:

- Complete overhaul/upgrade of the controls on a 100,000 sq. ft. existing warehouse automated conveyor and sorting system, using an array of distributed networked PLCs, device interfaces, and supervisory HMIs. Conversions were planned and executed with no stoppage of regular production. Box throughput increased by close to an order of magnitude
- Network of supervisory Windows PCs, programmed in Visual Basic, for data-driven control and management of a fully automated stamping, milling, and engraving fabrication line
- Controls for a network of 30 workcell-based electrochemical plating stations. Design uses a direct interface from PLCs to programmable power supplies through a custom serial interface
- Network of PLCs with supervisory PCs, for controlling and managing eight warehouse material load/unload stations, coordinated with a network of two-story pallet storage cranes
- Windows PC interface for running a network of individually operated laser engraving stations, obtaining engraving data in real time from a central plant orders database
- Real time Windows PC graphical interface for monitoring motion control systems
- PC-based custom data collection and translation programs, interfacing to Process Control databases and software
- Instrumentation stations, for collection of high speed profile data from PLCs and data acquisition boards, to store in Microsoft Access and SQL Server databases
- PLC-based package dimensional measuring station integrated with plant shipping software
- PLC ladder-logic programming for automated catheter manufacturing machines

Design of pressure transducer interface circuits and systems for numerous biomedical pressure sensor catheter products over a 25 year period. Extensive experience with sensor compensation circuit design and implementation, including passive and active circuit, and digital methods.

Design and programming of a Bluetooth Low Energy micro-power sensor interface to collect pressure, ECG and temperature measurements for critical care applications

Becton Dickinson, Sandy, Utah (1988 - 1996)

Process and Automation Engineer - Medical Products

Developed process measurement and feedback control for high volume catheter manufacturing
Programmed Allen Bradley PLC-based automated catheter manufacturing machines
Developed applications for acquiring critical experimental and production data, to determine the effects of machine performance on product quality

Product Design Engineer - Transducer Systems

Long term R&D development effort to develop a catheter tip micro pressure transducer and interface, for invasive arterial blood pressure measurement:

- Developed a micro-powered transducer interface with simulated Wheatstone bridge response.
- Designed transducer test systems, including and integrated database/report generation system
- Oversight of external silicon microsensor development and fabrication

Catalyst Research Div. of Mine Safety Appliances, Owings Mills, MD (1983 - 1988)

Project manager for the development of an 8086 based CO_2 analyzer and a pulse oximeter

Other design projects:

- Automated battery test consoles, plant instrumentation for production and process control
- Electrochemical gas sensor cell QC test system, for testing O_2, CO, EtO and H_2S sensors
- Automated PC board functional test systems

EMC Controls, Inc., Hunt Valley, MD (1981 - 1983)

Specified and configured system hardware for VAX-based distributed control systems (DCS)

EIL Instruments, Incorporated, Sparks, MD (1977 - 1981)

Design of circuit breaker and protective relay test instruments, up to 60,000 amps test capacity
Field Application Engineer – testing of power distribution systems up to 34KV
Customized, repaired, and calibrated analog and digital panel board meters and power meters

EDUCATION

Virginia Tech, Blacksburg, VA - Bachelor of Science, Electrical Engineering, December, 1979

PROFESSIONAL CERTIFICATIONS AND AFFILIATIONS

Registered Professional Engineer, State of Virginia, License# 0402055870
Automation Direct System Integrator

Institute of Electrical and Electronic Engineers (IEEE) - Present
Instrument Society of America (ISA) - Present
North American Board of Certified Energy Practitioners (NABCEP) - Past
Association for the Advancement of Medical Instrumentation (AAMI) - Past

PATENTS/PUBLICATIONS

U.S. Patent 5,146,788 and 5,866,821, “Apparatus and Method for a Temperature Compensation of a Catheter Tip Pressure Transducer”
U.S. Patent 5,460,183, “Switchable Filter for Re-zeroing an in vivo Pressure Transducer”
U.S. Patent 5,568,815, “Self-Powered Interface Circuit for Use with a Transducer Sensor”