

## **JOHN W. RAYNES**

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### **Raynes Engineering, Inc. (1996 - Present)**

#### **President and Principal Engineer – Consulting Engineering**

Founded, and continue to manage, an engineering consulting business specializing in automated instrumentation and control systems. Projects undertaken have included:

Development of measurement and control systems for manufacturing:

- 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
- Network of PLCs with supervisory PC, for controlling and managing a set of warehouse material load/unload stations, coordinated with a network of four 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
- Seven-oven temperature profiling, control and monitoring station using a single low-cost PLC
- Real time Windows PC graphical interface for monitoring motion control systems
- PC-based customized measurement data collection and translation programs, interfacing to InfinityQS Statistical 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 stations through a serial data link
- PLC ladder-logic programming for automated catheter manufacturing machines

Datalogger-based collection and display systems, for tracking power generation from commercial solar photovoltaic arrays (hardware/sensor assembly, datalogger programming, on-site installation)

Windows PC real time graphical interface software for a commercial data logger product line

Design and production of automated test consoles for medical pressure transducers, incorporating relational databases for full lot traceability

Electronic compensation circuit design, and process consultation, for microsensor pressure catheter products

Design, construction and programming of 500 cell battery test/data collection console

Development and presentation of Visual Basic/database programming courses for shop floor applications

#### **Solar Design, Sales, and Installation (RE Solar)**

From 2000 through 2008, established and ran a secondary business (doing business as RE Solar), specializing in the design, sales and installation of solar photovoltaic, wind, and micro hydro electric power systems for residences and small businesses. This business serviced the South Central Utah area from an office in Torrey, Utah. It is no longer in operation.

## **Becton Dickinson, Sandy, Utah (1988 - 1996)**

### **Process and Automation Engineer - Medical Products**

Developed process measurement and feedback control for high volume catheter manufacturing

Programmed 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 micropowered transducer interface with simulated Wheatstone bridge response.
- Designed transducer test systems, including and integrated database/report generation system
- Oversight of external silicon microsensor development. Developed lot acceptance test regimens

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

Project manager for the development of an 8086 based CO<sub>2</sub> analyzer and a pulse oximeter

Other design projects:

- Automated battery test consoles, general plant instrumentation for production and process control
- Electrochemical gas sensor cell QC test system, for testing O<sub>2</sub>, CO, EtO and H<sub>2</sub>S 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)

Specified site installation requirements for DCS power and signal conditioning

Coordinated manufacturing, hardware integration and acceptance testing

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

Designed and perform testing on circuit breaker test instruments up to 60,000 amps test capacity, and protective relay test instruments

Field tested protective equipment on power distribution systems up to 34KV

Customized, repaired, and calibrated analog and digital panel board meters and power meters

## **EDUCATION**

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

## **PAST PROFESSIONAL AFFILIATIONS**

**Institute of Electrical and Electronic Engineers (IEEE)**

**Association for the Advancement of Medical Instrumentation (AAMI)**

## **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 Rezeroing an in vivo Pressure Transducer"

U.S. Patent 5,568,815, "Self-Powered Interface Circuit for Use with a Transducer Sensor"