



Diversified Technical Associates, LLC  
215 E. Waterloo Rd  
Suite #7  
Akron, Ohio 44319  
(330) 332-8787  
info@DTechA.com

## **David C. Duff** **Senior Systems Engineer**

### **EDUCATION**

Physics  
Kent State University, Kent, Ohio

Allen Bradley PLC and Operator Interface training  
GE Fanuc PLC and Operator Interface training  
Device Net Interface Seminar  
Westinghouse PLC training  
Compumotor Drive Systems School  
Parker Hannifin Electro hydraulics Controllers school  
Mastering Microsoft Visual Basic 6 Fundamentals

### **GENERAL**

Mr. Duff has spent over twenty years gathering a broad range of experience in control systems for the manufacturing and process environment. With responsibilities including project management, technical leadership and start-up services covering control systems hardware and software development for a variety of customers.

### **PROJECT EXPERIENCE SUMMARY**

#### ***Cooper Tire and Rubber, Texarkana AR:*** **Curing Press Startup Assistance**

Provided startup assistance for the relocation of existing curing presses being moved from the Albany GA plant. Controls included GE 90/30 PLC and GE Proficy View Quick Panels.

#### ***Cooper Tire and Rubber, Texarkana AR:*** **Treadline Startup Assistance**

Provided startup assistance for the relocation of existing triplex treadline being moved from the Albany GA plant. The system was based on GE RX3I control platform and GE Proficy View for HMI, using Ethernet connected distributed I/O and ABB drives.

#### ***Setex, Milton Canada:*** **Seat Assembly Line System**

Project Manager responsible for the relocation and startup of PLC logic and OIT screens for an existing seat assembly line. Systems consisted of PLC controls (Allen-Bradley PLC-5 and Control Logix5000), and Panel View operator interface.

#### ***A. Schulman, Akron OH:*** **Extrusion Line Control System**

Project Manager responsible for hardware review, PLC logic development, HMI screen development, and contractor assistance with complete start-up services for the new extrusion lines. This system included multiple PLC (AB CompactLogix) with Ethernet communication to distributed I/O, KTron Feeders, and multiple GE iFix Scada nodes.

***Cooper Tire and Rubber, Findlay OH:***

**Tuber Line System**

Project Manager responsible for the Recipe System upgrade to the PLC logic, OIT screens, and VB Recipe Application on an existing tuber line. Systems consisted of PLC controls (GE RX3I), GE Proficy View operator interface, and custom VB application using an Access Database.

***Cooper Tire CKT, Kunshan China:***

**Banbury Mixing Line Control, HMI, and Data**

Lead Engineer responsible for hardware review, PLC logic development, HMI screen development, and contractor assistance with complete start-up services for the new mixing lines. This system included multiple PLC (GE RX3I) with Ethernet communication to various sub-system PLCs, ABB drives, and multiple GE Quick View screens for operator interface. System also included Plant web based Scada and view using GE Proficy Portal and Historian. Recipe management and data collection was provided with custom VB applications and Oracle.

***Cooper Tire CKT, Kunshan China:***

**Treadline Control System**

Lead engineer responsible for the design and implementation, and complete startup services of a control system for a triplex extruder treadline and Krupp Head. The system was based on GE RX3I control platform and GE Proficy View for HMI, using Ethernet connected distributed I/O and ABB drives.

***Cooper Tire and Rubber, Athens GA:***

**Treadline Control System**

Lead engineer responsible for the design and implementation, and complete startup services of a control system for a triplex extruder treadline and Krupp Head. The system was based on GE RX3I control platform and GE Proficy View for HMI, using Ethernet connected distributed I/O and ABB drives.

***Cooper Tire, Melksham, England:***

**Treadline Control System**

Lead engineer responsible for the design and implementation of a control system for a dual extruder treadline for high performance tires. The system was based on GE 90-70 control platform and GE CIMplicity Machine Edition for logic development and HMI.

***Electrolux Home Products, Anderson, SC:***

**Trim Shear Line**

Lead controls/software engineer responsible for the design and implementation of controls for a new Trim Shear Machine, including machine builder assistance and complete startup services. The control system for the four (4) stations fully automated pick and place Plastic Cavity Trim Shear consisted of PLC controls (Allen-Bradley SLC-500), multiple Allen Bradley 1305 VFD drives, Ultra 3000 servo drive, and PanelView operator interface.

***Electrolux Home Products, Anderson, SC:***

**Packaging Line System**

Lead engineer responsible for the design and implementation of PLC logic and OIT screens to improve overall system cycle time on an existing packaging line. Systems consisted of PLC controls (Allen-Bradley PLC-5 and Control Logix5000), and PanelView operator interface.

***Gusmer-Admiral – for GE***

**Wet System Human Machine Interface (HMI) System**

Team engineer responsible for the creation of the Active X controls, using Visual Basic 6.0, used in the Wet System Human Machine Interface (HMI) system. The primary purpose for the Wet System Human Machine Interface (HMI) system is to provide operators with a means of monitoring key operations of the Gusmer-Admiral door foaming system. It provides graphical status of Mix-head, Metering valves, and pumps. Systems consisted of Visual Basic 6.0 based HMI interfaced to a GE 9030 PLC.

***Cooper Tire and Rubber Company, Findlay, OH:***

**Fischer Wire Belt Cutter System Upgrade**

Lead engineer responsible for the design and implementation including panel layout, wiring and PLC logic for a system upgrade to an existing wire belt cutting line. Upgrade involved replacement of all existing DC Servo drives with Variable Frequency Drives. Systems consisted of PLC controls (TI 545), and VFD's (AB PowerFlex 70).

***Electrolux Home Products, Anderson, SC:***

**Part Conveying System**

Team engineer responsible for the design and implementation of PLC logic and OIT screens for a complete system upgrade and functionality overhaul to an existing large conveyor control system projects. Project involved control system design and implementation for Webb-Stiles inverted power-and-free and monorail conveyors. Systems consisted of PLC controls (Allen-Bradley PLC-5 and Control Logix5000), PanelView operator interface and RFID systems.

***A. Schulman, Bellevue, OH:***

**Mixing/Extrusion/Pelletizing/Packaging Control System**

Lead controls/software engineer responsible for the design and implementation of the replacement to an existing proprietary HMI system with Citect HMI software, Microsoft Access, and Visual Basic. The project also included the addition of oil weigh and injection to the mixer controls, recipe, and data collection. System was comprised of Allen-Bradley Flex I/O hardware added to an existing Allen Bradley PLC5 control system, Citect HMI software, Microsoft Access, and Visual Basic. The control system automatically weighed up to 3 different oils and included up to 4 different injections, per a predefined recipe. Citect HMI system provided supervisory control, a configurable historical trending interface, alarming, and statistical analysis. Recipe management, data collection, and reporting are accomplished using Microsoft Access and Visual Basic.

***AGA Gas, Independence, OH:***

**Furnace HMI Conversion**

Lead software engineer responsible for the conversion of a Wonderware Intouch HMI system to Intellution FIX32 for a developmental gas furnace. System was based on Allen Bradley control hardware and utilized MS Excel for enhanced process analysis and reporting.

***Lectrotherm, Canton, OH:***

**Furnace Control System**

Lead controls engineer responsible for the design and implementation of a control system for a channel induction furnace. System was comprised of Siemens control hardware, Allen Bradley power monitoring equipment and Citect HMI software. Control system automatically controlled capacitance loads for automatic power factor correction, as well as, automatic transformer tap adjustments to follow pre-configured melt and sinter recipes. Citect HMI system provided supervisory control, recipe management, and a configurable historical trending interface.

***Cooper Tire and Rubber Company, Albany, GA:***

**Curing Press Data Collection and Reporting Systems Upgrade**

Team engineer responsible for the design and implementation of data collection PLC logic and OIT screens for a complete system upgrade and functionality overhaul to an existing data collection and reporting system. System functionality was modified to provide “push” scheduling capabilities, control system time synchronization, enhanced cycle data collection, and calibration and maintenance tracking. This system provides real-time communications with over 200 machine PLCs through Ethernet communications. System utilized Windows NT, Intellution FIX32, Visual Basic and Oracle RDBMS.

***Nordson Corporation, Amherst, OH:***

**Low Solvent Paint Spray Line - HON, Inc.**

Modified and supplemented one of Nordson’s paint spray programs for specific customer needs. Paint spray system used two oscillating three-gun sprayers and two fixed guns. The paint line sprayed four and five drawer filing cabinets. Wrote PLC code for filling, flushing and color change of the system. Used color change flag to detect a new color and change the color spray on this continuous paint line. Assisted in the installation and debug of the system on-site.

***Smith Glass, New Stanton, PA:***

**Glass Furnace Control System**

Lead controls engineer responsible for the design and implementation of a control system for a gas-oxy glass furnace. Control system monitored incoming oxygen level from internal oxygen source and automatically corrected gas and oxygen ratios for the precise control of furnace temperature and internal pressure. System was based on Siemens control hardware and utilized a Wonderware HMI system for supervisory control and historical trending.

***Nordson Corporation, Amherst, OH:***

**Low Solvent Paint Spray Line - Eagle Window Corporation**

Modified and supplemented one of Nordson’s paint spray programs for specific customer needs. Paint spray system used two oscillating three-gun sprayers and two fixed guns. The paint line sprayed extruded window components. Wrote PLC code for filling, flushing and color change of the system. Used color change flag to detect a new color and change the color spray on this continuous paint line. Assisted in the installation and debug of the system on-site.

***Cooper Tire and Rubber Company, Findlay, OH:***

**Curing Press Data Collection and Reporting Systems Upgrade**

Team engineer responsible for the design and implementation of data collection PLC logic and OIT screens for a complete system upgrade and functionality overhaul to an existing data collection and reporting system. System functionality was modified to provide “push” scheduling capabilities, control system time synchronization, enhanced cycle data collection, and calibration and maintenance tracking. This system provides real-time communications with over 200 machine PLCs through RS-485 and Ethernet communications. System utilized Windows NT, Intellution FIX32, Visual Basic and Oracle RDBMS.

***PPG Industries, Strongsville, OH:***

**Powdered Paint OEM Production Line Control System Upgrades**

Team Engineer responsible for the logic control system upgrade for a powdered paint grinding line. The multi-node HMI system was based on Microsoft NT, utilizing Intellution FIX32 v7.0, and an Allen Bradley SLC5/04 PLC.

***ACC Automation, Akron, OH:***

**Batch Dipping Line Control System**

Developed control system for a batch dipping line. Responsible for the development of the control logic and HMI System. System was based on a GE 90/30 PLC and Intouch Wonderware HMI system.

***Rubatex Inc. Bedford, VA and Conover, NC:***

**Banbury Mixing System**

Responsible for Intellution FIX32 Development, and complete start-up and training services. System consisted of PLC controls (AB PLC5/60), Intellution's FIX DMACS, and Microsoft's Access. The system was set up in a multi-node configuration with four Mixers in Bedford, and two Mixers in Conover, with the SCADA nodes and Access Database running on networked PCs using Microsoft NT. Shared formula management, data collection and retrieval, material traceability through bar coding, and batch consistence where the key features of the system.

***Goodyear Tire and Rubber Mixing Center, Akron, OH:***

**Banbury Power Monitor**

Responsible for hardware and software design for addition of power monitoring to an existing Banbury mixer control system. System included addition of an analog input to an AB (PLC2/30) to read the output from a motor power load cell, modification to the existing PLC program to read and convert the power reading to KWH and to collect this information per batch along with other data. Data collection was achieved using AB Wintellegent Links with DDE links to an Excel spread sheet. The Excel spread sheet running a Visual Basic application stored the collected data on a daily bases.

***Advanced Elastomer Systems, Wadsworth, OH:***

**Polymer Extrusion Line**

Responsible for complete hardware design, and assistance on electrical installation. System consisted of AB SLC 5/03 with AB Flex Remote I/O modules. System interfaced with numerous vendor supplied sub-control systems, including main GE extruder drive and zone temperature controls, Micro Motion metering pumps, granulator controls, conveyor and elevator systems.

***Cooper Tire and Rubber Company, Albany GA:***

**Banbury Mixing Line Control and Data Collection and Material Tracking System**

Responsible for hardware review, TCP screen development, PLC program design, and contractor assistance with complete start-up services for the new mixing lines. This system included multiple PLC (GE 90/70) with Genius Bus communication to various sub-system PLCs, multiple TCP screens for operator interface. System also included latter additions of a PLC based off-line compounding system, and a PLC based weighment and material transfer system. Both of these systems communicated to the main mixing control system via GE Genius Bus. Recipe management and data collection was provided with Intellution's FIX DMACS and Oracle running on a multi-node Novell network.

***PPG Industries, Strongsville, OH:***

**Powdered Paint OEM Production Line Control System**

Responsible for hardware design, PLC program design, and contractor assistance with complete start-up services for the new grinding lines. System consisted of multiple networked AB PLCs (SLC 5/04), with numerous network controlled remote I/O interfaced variable frequency drives, system interfaced with numerous vendor supplied sub-control systems including, Process air units, Matcon Mixing system, main GE extruder drive, and extruder zone temperature controls. Operator Interface was provided with Intellution's FIX DMACS running on a multi-node Novell network.

***Cooper Tire and Rubber Company, Findlay, OH:***

**Tire Curing Press**

Responsible for PLC program and operator interface screen, modifications. System included PLC (GE 90/30) and TCP operator interface screens. Also provided start-up assistance.

***Cooper Tire and Rubber Company, Clarksdale, MI:  
Inner Tube Extrusion Line***

Responsible for operator screen development, and start-up assistance. This control system included GE (90/70) PLC control and TCP Smart screen Operator interface.

***Parker Hannifin Automotive Connectors Division, Johnstown, AK:  
GM Air Conditioners Connector Machining Center***

Responsible for complete specification, design, and integration of hardware and software to control machining center. System included AB PLC (SLC 5/02), TCP Smart Touch Operator interface, Parker Electro hydraulic motion controllers, Compumotor Dynapar DC Servo controllers, and a robotic parts handling system. On-site machine commissioning and operator training were also provided. Completed system allowed, flexible connector development, increased production rate, and greatly reduced machine setup times.

***Parker Hannifin Hydraulic Filter Division, Toledo, OH:  
Hydraulic Recirculation Filter Interface***

Developed Electronic Interface for Hydraulic Recirculation Filter, using Intel's embedded micro controller 87C51 chip. Finished product Parker Hannifin's "Smart Filter" was selected as product of the year by PDN magazine.

***Parker Hannifin Valve Division, Akron OH:  
Allen-Bradley Remote I/O Interface for Valves***

Responsible for hardware and software development for interfacing pneumatic valves to AB PLC remote I/O communications. This product development included board level design work interfacing Allen-Bradley's PLC Remote I/O Node Adapter IC chip to Intel's embedded micro controller 87C51 chip. Responsibilities also included technical assistance and training of the marketing department on this product.