

Career Profile

Adrian West PhD CEng MIET

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1 Personal Details

Name:	Dr. Adrian Nigel West
Current Address:	9A Clitheroe Road Whalley Lancs BB7 9AA
Telephone:	07973 891860
Residential Status:	House Owner / Occupier
Date of Birth:	October 1957
Nationality:	British
Sex:	Male
Marital Status:	Married
Children:	2
Qualifications:	BSc. (Hon's) PhD.
Professional Status:	Chartered Engineer
Current Position:	Consulting Engineer
Current Employer:	Opus Design Services Ltd

2 List of Skills

- Variable speed drives and power conversion design and application within industrial and renewable energy sectors.
 - Parker AC and DC drives and programming tools.
 - Siemens G120 / S120 drives and programming tools.
- Industrial control system specification and design. Complex multi-motor line drive systems.
- Electrical engineering design and CAD using the industry standard EPlan platform.
- Industrial PLC / HMI program design and implementation
 - Software design using state transition and signal flow diagrams.
 - Advanced PLC programming using object-oriented techniques.
 - Siemens S7-300 / 400 / 1200 / 1500.
 - Siemens Step 7 and TIA Portal.
- Hands on commissioning, service and consulting regarding industrial and renewable energy control and power conversion systems.
- Specialist in industrial web transport systems within all manufacturing sectors including paper, plastic films and metals. Design, commissioning and troubleshooting.
- Computer modelling and simulation of industrial and renewable energy systems. Allows design of complex control algorithms to be easily accomplished.
- Good knowledge of mechanical systems, machining, manufacture and construction methods.
- Good knowledge of EMC measurement and system design techniques.
- Remote telemetry, data collection and reporting systems.
- National Instruments LabVIEW programming for general use and data collection systems.
- Good knowledge of the design and implementation of analog, logic and power conversion electronics at the board level.
- Good knowledge of Microsoft windows desktop, embedded and server operating systems.
- Microsoft office suite use and programming using VBA. Comprehensive knowledge of Microsoft Access database system for developing business and product applications.
- SQL Server commercial database programming including reporting services.
- Industrial process efficiency measurement systems and application within the renewable energy sector.
- Training on variable speed drives, motors and industrial automation.
- Working closely with clients under NDA agreements.

3 Aspirations

- To continue to use my extensive engineering skills to assist companies with power conversion and control systems, operating in the industrial and renewable sectors.
- To nurture links with suppliers and academic institutions in order to develop innovative solutions to challenging problems.
- To remain a “Hands On” Professional Engineer, leading from the front.
- To continue learning within my profession.

4 Education

4.1 Secondary School

Burnley Grammar School. The following table shows my A Level grades.

Subject	Grades Achieved
Mathematics	C
Physics	C
Chemistry	D
General Studies	E

While at school, I worked part time for a precision tool making company and have designed and manufactured small press tools during summer holiday work. I gained practical knowledge on a wide variety of different precision machining techniques.

4.2 University Education

Manchester University: 1976 to 1979.

Subject	Qualification Achieved
Electrical and Electronic Engineering	BSc (Hon's) Grade 2.1

4.3 Final year project

Design and construction of a new type of permanent magnet disk generator. This machine, and its control system were specifically designed for a low power wind generator.

The machine was controlled using a transistor inverter which was also designed and built. Power output, approximately 1kW.

4.4 Post Graduate Research

Manchester University: 1979 to 1982.

Subject	Qualification Achieved
Electrical and Electronic Engineering Mag-Lev Research Project	PhD



Design and control of a new type of linear synchronous homopolar motor for the suspension and propulsion of a passenger carrying rail vehicle.

The project was targeted towards a driver-less vehicle like the Birmingham Airport Maglev project undertaken by British Rail.

Throughout the work, close liaison was maintained with four other Universities, who were also working on similar topics.

The project was partly sponsored by the Science and Engineering Research Council.

The project involved many different activities including test rig mechanical design and build, computer simulation using numerical analysis techniques, electrical machine design, control system design, sensors and power electronics.

To aid testing of the linear motor, a test rig was constructed where the rail was shaped into a large wheel with the motor suspended underneath. This allowed the motor to remain stationary to simplify testing.

At project completion, a mass of 200kg was suspended under the rail using magnetic levitation and the rail “wheel” driven under load to simulate forward motion.

5 Detailed Work Experience

5.1 Eurotherm Drives Ltd (Formerly SSD Ltd).

1982 to 1995

Eurotherm Drives is a large manufacturer of variable speed drives and systems for general industry. The following brief career profile is given below: -

Position	Date
Systems Engineer	1982 to 1984
R & D Engineer	1984 to 1988
Hardware Manager	1988 to 1990
LINK Product Manager	1990 to 1995

During my time at Eurotherm Drives I gained a thorough grounding in wide variety of skills associated with variable speed drive design and application. These skills included: -

- Application and design of systems using variable speed drives and PLC controllers.
- Control characteristics of DC and AC open and closed loop variable speed drives.
- Web transport system fundamental design and application to industrial paper making, metals and plastics industries. I became an authority on web transport systems within the company.
- Hardware design of variable speed drives at the electronics level including switched mode power supplies, analog and microprocessor systems and power electronics. This involved the design of a main power board for the 590 DC variable speed drive. Many thousands of products sold.
- EMC testing at the product level to meet the European generic emissions and immunity standards. I became an authority on designing drive systems to meet EMC requirements.
- Commissioning and service of variable speed drive systems. This included many foreign visits to commission and fault find variable speed line drive systems.



5.2 Optima Control Solutions Ltd

1995 to 2017

Optima Control Solutions Ltd is a small company operating in the industrial control equipment marketplace. This section documents my experience within this company.

Position	Date
Director, Optima Control Solutions Ltd	1995 to 2017

During August 1995, I was involved in the start-up of a new company, offering a high-level design and supply service for variable speed drive systems. Together with a colleague I was a Director and co-owner of the company.

During my time at Optima I was involved in the following hands on activities: -

- Company Director responsible for future development and day to day operation of the company. My role concentrated on the technical aspects of the company workflow, ensuring that high quality solutions were produced for clients.
- Developed design procedures in line with the ISO9000 requirements to handle the day to day work flow.
- Set the standard about day to day activities of the design engineering team.
- Designed the company computer business system based on Microsoft Access and SQL server. This handles all project activity, purchasing and invoicing. The business system is still in use and is a fundamental part of the business.
- Hands on design of industrial control systems.

5.3 Opus Design Services Ltd

2017 to Current Date

Late in 2017 I have set up a small consultancy company to focus on providing high level drive and power conversion skills to clients within the industrial and renewable energy sectors.

Please refer to my website for more details of services offered. <https://www.opusds.com/>

5.4 Example projects: Industrial control systems

I held primary design responsibility for the following projects:

Tandem extruder / laminator.

Design and commissioning of a large tandem extruder / laminator drive control system including twin turret spliced unwind and rewind.

- Allen Bradley PLC
- 8 drive SSD LINK system with DeviceNet interface to PLC

Aluminium strip coating line.

Design and commissioning of a line drive system for a 150m long aluminium strip coating machine including manual splice twin unwind and rewind systems

- 10 drive SSD LINK system

Rotary flying shear.

Design from scratch of algorithms for a servo controlled rotary flying shear in the metals sector.

- Allen Bradley 1394 servo system

High speed vacuum metaliser.

R + D project to design software functions for a high-speed vacuum metalliser drive control system.

Specification: 1000mpm, load cell controlled with 150mm to 1000mm centre driven unwind and rewind.

This project included an innovative control system to allow the use of no web nips throughout the machine.

All drive control was implemented within a Siemens PLC including high performance centre wind

functionality to allow closed or open loop tension control over a wide tension range. The main aim of the development was to give the OEM client the facility to easily change drive manufacturers since all web tension control is performed in the PLC.

- Siemens S120 drives on Profibus (12Mb/sec)
- Siemens S7-300 PLC

Aluminium plate stacker.

Design and commissioning of a complex aluminium cut plate stacking system which included comprehensive fault tracking and rejection of plates.

- Allen Bradley PLC
- Yaskawa drives on DeviceNet

Jagenberg sheeter upgrade.

Design and commissioning of a high speed Jagenberg rotary shear using Siemens control equipment. This was the first installation of the Siemens T400 rotary shear in the UK. Also provided technical guidance on other aspects of this complex cut to length and stacking machine.

- Siemens 6RA70 DC Masterdrives on Profibus
- Siemens S7-400 PLC

Cerruti gravure press upgrades.

Design, supply and commissioning of a 2.4m Cerruti gravure printing press drive system. This project

included the replacement of the main 300kW press drive and the folder drive equipment. New AC closed loop vector motors were fitted to the broad sheet and folder pulling nips. These were phase locked to the main press line shaft and helped provide a 5-fold increase in fold accuracy over the existing control system.

Line speed up to 750mpm. Subsequent to this contract, 2 other presses were upgraded with similar successful results.

- Siemens S7-300PLC
- 6 drive SSD LINK system with Profibus interface to PLC

Beloit coating line control system refit.

Design and technical responsibility of a complex multi-drive control system re-fit for a large Beloit paper coating machine. This machine had 90 variable speed drives controlling the paper board web. Designed a flying splice unwind control system to allow automatic splice of the incoming 20 tonne paper rolls with the machine running at high speed.

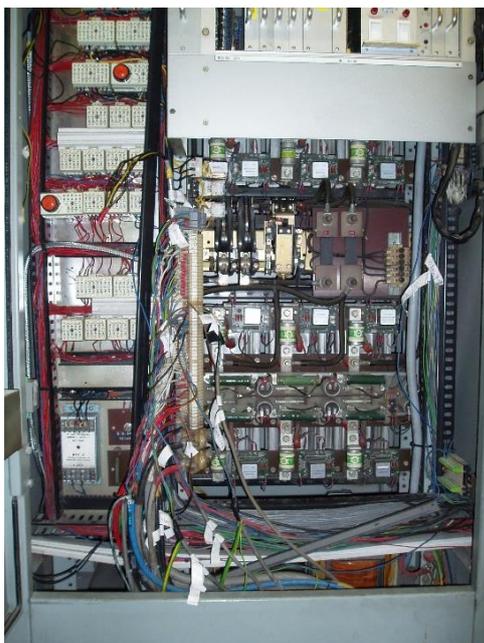
Variable speed drives: Parker 690 AC and 590 DC drives.

PLC: Siemens S7-400 with remote I/O. The existing control system was entirely controlled using relays.

The machine was upgraded over 18 months by replacing the existing drive enclosure back plates according to a tight rolling shutdown program. The machine continued to run in production after the shutdown events.



The following images show typical old and new drive and control system backplates for one section of the machine: -



5.5 Example projects: Renewable energy systems

Design of electrical and control systems for a tidal generator.



This was an 18-month R + D project to design and build the power conversion and control system for a prototype semi-submersible tidal generator. I was responsible for all electrical engineering and control activities which included: -

- Complete project specification for all electrical systems on the semi-submersible hull and shore cabin.
- Specification of the power converters and subsea medium voltage transmission system.
- Electrical design and construction within the tight space constraints of the submerged device hull.
- Computer modelling of the tidal turbine and associated control systems to maximise energy conversion efficiency and explore extreme operating tidal flow and wave activity.
- Control system software within the hull and shore panel in order to implement computer simulated algorithms.
- Specification and construction of a motor dynamometer to test actual control algorithms. The dynamometer was driven using the computer models in order to simulate actual operating conditions including extremes of tidal flow and wave activity.
- Preparation and implementation of dynamometer test plans.
- Presentation of dynamometer results to stakeholders and investors. The dynamometer proved to be an important milestone in the project design and investment cycle.
- Specification and implementation of redundant communication systems between semi-submersible hull and shore equipment.
- Design and implementation of the data collection systems. These included a mass data collection system to provide trending and aggregate data to support reporting and efficiency profiling.
- Testing of all systems prior to deployment off the west coast of Scotland.
- Equipment used: Siemens S120 variable speed drives, PLC and control equipment.

Design of control software for a vertical axis wind turbine.

Project to develop the power conversion and control system for a fixed pitch vertical axis wind turbine.

Building on the experience gained on the tidal turbine project I was responsible for the following activities:

- Working with the turbine and mechanical designers to understand the complex turbine operating point requirements to maximise energy harvesting.
- Computer simulation of the turbine and associated mechanical and electrical systems. This allowed various complex control algorithms to be explored before committing to the target system software.
- Comprehensive control system specification.
- Siemens control PLC and S120 variable speed drive software design and implementation.
- System testing on the actual control hardware using a test motor in order to verify operation according to simulation results. No dynamometer was available in this case.
- Modification of existing electrical systems to provide enhanced functionality for example power metering and temperature measurements.
- Installation and commissioning on a test site turbine. Due to the extensive modelling and testing this resulted in “first time” operation on the actual turbine.
- Design and implementation of the mass data collection systems. The aim being to measure and improve power conversion efficiency of the turbine.



Control software for a community twin-screw river hydro plant.

Complete control software re-design for an existing twin Archimedes screw river hydro plant to solve poor performance problems and reduce staff site attendance. PLC upgrade using Siemens equipment to address obsolescence issues.

- Site surveys and meetings with the client to understand the issues with the plant.
- Comprehensive written specification to define control system functional requirements and specify deliverables.
- Modification of existing electrical drawings to integrate new hardware.
- Software planning using state transition and signal block diagram techniques.
- Complete re-write of Siemens PLC, S120 drive and HMI software to suit requirements. Included design and implementation of closed loop weir level control, inlet trash clearance algorithms and dynamic brake-controlled stop in case of power blackouts.
- Design and implementation of a comprehensive cloud-based data collection system including historical logging and remote-control functionality.
- Commissioning and training.



6 Hobbies and Leisure time

As well as the usual family activities, I include a few activities which take up some of my leisure time.

6.1 Church Bell ringing

My main leisure interest is Church Bellringing. I have been Tower Captain at a local church. There, I was responsible for all aspects of bell ringing. This included teaching of new recruits, organisation of the Sunday and practice ringing and safety in the tower.

6.2 Home Workshop

I have built up a comprehensive home workshop, including a lathe, drilling machine etc. I am well versed in most common workshop techniques.

Being a house owner, I am interested in all forms of DIY.

6.3 Sailing

I am interested in off shore sailing and have crewed for many yachts. I have crossed the Channel many times, while cruising around the Channel Islands and France.

I have competed in the "Round the Isle of Man" race and the "Round the Isle of Wight Race".

Family and work activities have curtailed this activity over the past years.

6.4 Walking

I enjoy the outdoors and walking in the hills with the family and the dog.