



CONTROL
SOFTWARE SOLUTIONS

Design | Develop | Deploy



**“Innovating Precision:
Your Partner in
Measurement &
Control”**

“Innovative Solutions.
Exceptional Service.”

COMPANY PROFILE

Welcome to Control Software Solutions, your trusted partner in advanced software and hardware solutions. Founded in 2012, we have evolved from a LabVIEW specialist into a comprehensive provider of cutting-edge solutions for measurement, machine automation, and control systems. Our dedication to delivering projects on time and within budget has earned us a solid reputation across various industries.

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WHO WE ARE

At Control Software Solutions, we specialise in delivering innovative automation, measurement, and control systems that empower businesses to streamline processes, enhance performance, and achieve their goals. With deep expertise and a commitment to quality, we are trusted partners in solving complex challenges.

OUR APPROACH

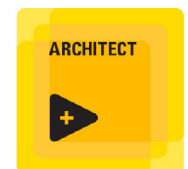
We combine cutting-edge technology with Agile development practices, ensuring flexibility, responsiveness, and exceptional results. By promoting iterative development, continuous feedback, and close collaboration, we deliver projects on time and to the highest standards.

CERTIFICATIONS & EXPERTISE

NI Partner Company



3 Certified LabView Architects



2 LabView Champions



3 Certified Professional Instructors



OUR MISSION

To deliver reliable and innovative automation, measurement, and control systems that drive success for our clients, enhance operational efficiency, and support technological advancements across industries.



CORE VALUES

- **Integrity:** Transparency and honesty in every interaction.
- **Excellence:** Delivering quality solutions that exceed expectations.
- **Innovation:** Leveraging technology to address complex challenges.
- **Customer Focus:** Prioritising tailored solutions through collaboration.
- **Collaboration:** Fostering teamwork and shared success.
- **Responsibility:** Embracing sustainability and social responsibility.



OUR SERVICES

To deliver reliable and innovative automation, measurement, and control systems that drive success for our clients, enhance operational efficiency, and support technological advancements across industries.



Software Design & Development



Project Management



Code Review Services



Support & Maintenance Contract



NI Training



System Integration & Automation

What we offer?

At Control Software Solutions, we provide tailored solutions to meet the unique needs of modern industries:

- **Software Design and Development:** We create bespoke software solutions that optimise automation, measurement, and control processes, ensuring efficiency and precision.
- **NI Training:** Led by Certified LabVIEW Architects and Champions, our training sessions are tailored to empower your team with the skills needed to maximise the potential of LabVIEW, TestStand, and VeriStand.
- **Support and Maintenance Contracts:** Our flexible plans include debugging, architecture planning, and system monitoring, helping you maintain peak performance and minimise downtime.
- **Code Review Services:** We offer in-depth audits of your software to identify potential risks, improve maintainability, and ensure future scalability.
- **Project Management:** With expertise in managing large-scale, intricate systems, we ensure seamless project delivery from concept to completion.
- **System Integration and Automation:** We unify hardware and software into cohesive systems that enhance performance, reduce complexity, and future-proof your operations.

PROJECT CASE STUDY

Since 2012, Control Software Solutions has completed nearly 100 projects in test and measurement, control and automation, and automated testing. We have worked with clients across diverse industries, including medical devices, pharmaceuticals, manufacturing, academia, oil and gas, offshore wind, defence, aerospace, and automotive. Our projects range from consultancy and software development to full system design and build. This section contains a selection of our recent work:

01

Automated Visual Inspection System for a Fast-Moving Production Line

Industry: Manufacturing

Keywords: Vision systems, Automation, Quality control, Barcode printing, CompactRIO, Data Acquisition



Project Overview

Manual inspection on fast-moving production lines often creates bottlenecks, introducing errors and uncertainty into the manufacturing process. Control Software Solutions Ltd was engaged to develop an automated production test system designed to enhance productivity and ensure consistent quality through precise visual inspection.

The Solution

The automated system was specifically designed to replace manual inspection tasks, improving accuracy, and reducing inspection time.

Key Features

- **Item Counting:** The system accurately counted items on the object of inspection, ensuring proper assembly.
- **LED Inspection:** It verified LED light intensity, colour, and positioning to ensure compliance with stringent product specifications.
- **Barcode Application:** Products that passed verification were automatically labelled with a barcode, streamlining the identification, and tracking process while eliminating manual labelling tasks.

Impact

The implementation of the automated test system delivered significant benefits for the client:

- **Increased Productivity:** By reducing the time required for routine inspections, the system effectively eliminated bottlenecks and improved production flow.
- **Enhanced Accuracy:** Automated visual inspection minimized errors and inconsistencies that are often associated with manual processes.
- **Improved Traceability:** Automated barcode labelling ensured every verified product was accurately identified and easily traceable throughout its lifecycle.

Conclusion

This project highlights Control Software Solutions Ltd.'s expertise in applying advanced automation to solve complex production challenges. The result was a streamlined inspection process, improved quality assurance, and enhanced operational efficiency for the client, solidifying their competitive edge.

02

Automated System for Setup, Calibration, and Verification of Gas Sensors

Industry: Manufacturing

Keywords: Calibration, Gas sensors, Automation, Manufacturing, Process optimisation, Environmental control, Industrial automation.

Project Overview

Control Software Solutions collaborated with a manufacturer of gas detection sensors to design a robust system for the setup, calibration, and verification of their CO2 and hydrocarbon sensor range. The primary objectives were to streamline the manufacturing process, reduce costs, and enhance quality assurance.

By implementing this solution, the manufacturer improved production throughput and achieved cost savings of over £50,000 annually in gas usage alone.

The Solution

The solution centered around a Windows-based desktop application integrated with multiple jigs housed in environmental chambers. Each chamber supported up to 16 jigs, with each jig capable of holding 24 sensors.

Key Features:

- **Sensor Communication:** The software used a custom protocol over RS232 to communicate with the sensors, setting calibration parameters and verifying performance at various temperatures.
- **Environmental Control:** Temperature and humidity within the chambers were regulated via MODBUS TCP-controlled environmental systems, ensuring optimal calibration conditions.
- **Automated Reporting:** Real-time production reports were generated and emailed to the production manager, providing continuous oversight of the process.
- **Alert Mechanisms:** Automatic alerts were sent to technicians for critical issues, such as low gas levels or rig malfunctions, minimising operational disruptions.

Impact

The deployment of this system revolutionised the sensor calibration and verification process:

- **Increased Efficiency:** Automation significantly reduced manual intervention, enhancing manufacturing throughput.
- **Cost Savings:** Optimized gas usage resulted in annual savings exceeding £50,000.
- **Improved Reliability:** Automated alerts and real-time reporting bolstered system reliability, reducing downtime caused by unexpected issues.

Conclusion

This project highlights how Control Software Solutions' expertise in tailored system development can deliver significant operational improvements. The solution not only addressed the client's immediate challenges but also helped them achieve long-term production and cost-efficiency goals.

03

Hydraulic Test System for Aircraft Landing Gear

Industry: Aerospace

Keywords: Aircraft testing, Test systems, Hydraulic control, Sensor calibration, Data acquisition, Military testing, Automation

Project Overview

Control Software Solutions developed a sophisticated software system for controlling a hydraulic machine used to test aircraft landing gear. The software was designed to handle complex control and monitoring tasks, ensuring accurate testing and reliable performance evaluation.

The Solution

The system was responsible for controlling and monitoring various parameters during the landing gear test, including position, load, pressure, and speed of compression/rotation. It also facilitated data acquisition from a range of sensors to evaluate the landing gear's performance against predefined standards.

Key Features:

- **Position, Load, and Pressure Control:** The software controlled the hydraulic machine's position, load, pressure, and speed to simulate realistic landing conditions during testing.
- **Sensor Monitoring:** The system monitored numerous sensors, including load, pressure, temperature, and discrete sensors, providing comprehensive data on the machine's operation.
- **Data Acquisition:** The system captured real-time data during testing, tracking key performance metrics and offering a detailed overview of test conditions.
- **Pass-Fail Determination:** Performance was assessed by comparing the collected data against known gas curves and response times, determining whether the landing gear met the required standards for pass or fail.

Impact

The developed control system provided several significant benefits:

- **Accurate Testing:** The software ensured precise control of the hydraulic machine and accurate monitoring of critical parameters, enabling reliable testing of landing gear.
- **Efficient Performance Evaluation:** Automated data acquisition and pass/fail evaluation streamlined the testing process, reducing human intervention and accelerating test cycles.
- **Enhanced Quality Assurance:** The system's ability to track performance against predefined standards ensured that only landing gear meeting all criteria was passed, improving product quality and consistency.

Conclusion

This project demonstrates Control Software Solutions' expertise in delivering customized control systems for complex testing environments. By providing precise control, real-time monitoring, and automated performance evaluation, we enabled the client to enhance the efficiency, reliability, and quality of their aircraft landing gear testing process.

04

Modular Control System for a Robotic Manipulator

Industry: Nuclear Decommissioning

Keywords: Robotics, Automation, Remote handling, Safety systems, Control systems

Project Overview

Control Software Solutions was contracted by a company specialising in remote handling machines for hazardous environments to develop control software for a six-degree-of-freedom robotic manipulator. This project required an innovative and reliable control system to ensure precision and safety during operation.

The Solution

The control system comprised several integrated components, with the software designed to optimise functionality, safety, and user experience.

Key Features:

- **Human-Machine Interface (HMI):** The HMI software was deployed on a Windows-based platform, equipped with dual joysticks for intuitive manipulator operation.
- **CompactRIO Implementation:** The control software was implemented on a CompactRIO, providing real-time axis position control for seamless manipulator movement.
- **Safety System:** A National Instruments 9350 SIL-rated safety card was utilised to implement the manipulator's safety functions, ensuring compliance with strict safety standards.

- **Operating Modes:** The manipulator could be operated in Base, Tool, and World modes, enabling flexibility for various tasks.
- **Replay Functionality:** The system included a replay feature to repeat complex manipulator movements accurately.

Manipulator Configuration

The robotic manipulator combined different drive systems to meet operational demands:

- **A0 Joint:** Powered by an electric motor for precise movement.
- **A1 to A5 Joints:** Controlled hydraulically, providing robust and reliable motion in demanding environments.
- **Hydraulic Jaws:** Designed for secure gripping and manipulation of objects in hazardous conditions.

Impact

The modular control system delivered significant operational benefits:

- **Enhanced Control and Flexibility:** Multiple operating modes and the replay feature allowed for precise and repeatable manipulator operations.
- **Improved Safety:** The integration of a SIL-rated safety card ensured high safety standards were maintained.
- **Reliability in Harsh Environments:** The combination of electric and hydraulic components provided robust performance, even in challenging conditions.

Conclusion

This project underscores Control Software Solutions' ability to develop advanced control systems tailored to the unique requirements of complex robotic applications. The result was a highly capable and safe manipulator system that met the client's needs for hazardous environment operations.

05

Automated Test System for SMETS2 Smart Gas Meters

Industry: Energy

Keywords: Test automation, Smart meters, Regression testing, Firmware testing, LabVIEW, IBM RQM

Zigbee, Utilities, IoT

Project Date: 2015

Project Length: 52 weeks

Services: Project Management, Software Design and Development, System Integration, Code Review Service, Training

Project Overview

Control Software Solutions developed an automated test system for a manufacturer of SMETS2 smart gas meters. The meters were being developed as part of the SMETS2 project, with the embedded software team releasing new firmware updates every three weeks as part of an Agile development process. However, manual testing was a bottleneck, limiting the number of features that could be tested and causing full testing cycles to take up to six months.

The Solution

Control Software Solutions created an automated testing solution that streamlined the testing process, enabling rapid verification of features and significantly reducing the testing cycle time. The system was designed to integrate seamlessly with existing development tools, providing comprehensive test coverage and fast results.

Key Features:

- **Automated Testing:** The system could complete 90% of all tests within 24 hours of a firmware update, dramatically reducing testing time from months to days.

- **System Integration:** The solution was integrated with IBM Rational Quality Manager, TestStand, and NI LabVIEW, creating a unified environment for test execution, management, and reporting.

- **Agile Development Support:** The automated test system was designed to keep pace with the Agile development cycle, allowing the embedded software team to continuously test and verify new firmware updates.

Impact

The implementation of the automated test system resulted in several key benefits:

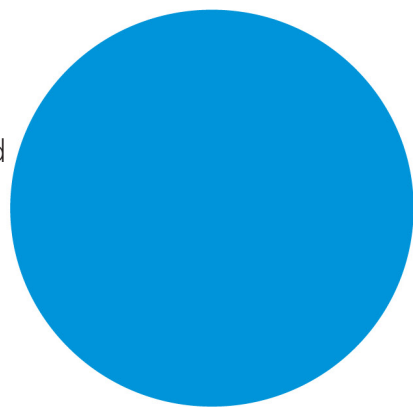
- **Faster Testing Cycles:** The system reduced the time required for testing from several months to just 24 hours, significantly improving the efficiency of the development process.

- **Increased Test Coverage:** The automated system enabled comprehensive testing of features, ensuring more extensive test coverage compared to manual methods.

- **Support for Agile Development:** The system's rapid testing capability allowed the team to keep up with the frequent firmware updates in the Agile development process, ensuring that each release was properly validated.

The Solution

This project demonstrates how Control Software Solutions leverages automation to overcome challenges in complex development environments. By developing a tailored test system, we helped our client significantly reduce testing time, increase test coverage, and improve overall product quality, all while supporting their Agile development process.



06

Test Systems for Electro-Pneumatic Valve Manufacturer

Industry: Manufacturing

Keywords: Valve testing, Automation, Control systems, Pressure testing, R&D, Adaptive Control, Software Design and Development, System Integration, Service and Support Contract

Project Overview

Over the past 12 years, Control Software Solutions has successfully completed more than a dozen projects for a manufacturer specializing in electro-pneumatic valve systems. These projects have spanned various stages of product development, including end-of-line test systems, verification systems for new product development, and proof-of-concept test systems for

The Solution

The systems developed by Control Software Solutions incorporated a range of control and measurement capabilities tailored to meet the client's specific needs. Key aspects of these systems included:

Key Features

- **End-of-Line Test Systems:** These systems were used to verify the functionality and performance of finished products as part of the quality assurance process. They ranged from basic valve sequencing (on/off control) to more complex measurements, such as pressure and temperature monitoring from connected instruments.

- **New Product Development Verification:** Test systems designed to ensure that new products met specifications and performance requirements during development.

- **Proof-of-Concept Test Systems:** Early-stage R&D systems that allowed for the testing and validation of new concepts before moving to full-scale production. For example, the systems provided low-level control of valve currents for proportional valves.

Impact

These custom test systems provided significant benefits to the client:

- **Enhanced Product Testing:** Reliable verification and testing systems ensured consistent product quality and performance.

- **Accelerated Development:** Early-stage testing and proof-of-concept systems enabled faster iteration and refinement of new products.

- **Precision Control:** Advanced control and measurement capabilities contributed to improved performance and accuracy in valve operation.

Conclusion

This long-standing partnership highlights Control Software Solutions' expertise in providing tailored control and measurement systems that meet the evolving needs of the electro-pneumatic valve industry. By delivering reliable test systems, we have played a key role in supporting our client's product development, R&D, and quality assurance processes, helping them maintain high standards and accelerate innovation.

07

Control Software for Offshore Wind Farm Piling Template

Industry: Offshore wind

Keywords: Automation, Hydraulic control, Piling systems, Offshore installation Control systems, Hydraulic actuators, PID

Project Overview

With expertise in closed-loop control of hydraulic systems, Control Software Solutions was contracted to develop control software for a piling template used in the installation of offshore wind farms. The piling template was designed to ensure precise positioning of piles during the installation process.

The Solution

The piling template consisted of a mud mat positioned on the seabed, with three large hydraulic actuators attached to the mat to support the main frame of the template. Each of the three corners of the main frame featured hydraulic jaws capable of gripping the piles. A control desk on deck, featuring a human-machine interface (HMI), allowed operators to control the piling template via a joystick.

Key Features:

- **Hydraulic Actuators:** The system used three large hydraulic actuators to position and stabilize the piling template.

- **Hydraulic Jaws:** Each corner of the main frame had a set of hydraulic jaws capable of securely gripping the piles during installation.

- **Automatic Levelling:** Once the initial position of the template was set, the system automatically levelled the template, achieving pitch and roll accuracy better than 0.1 degrees.

Impact

The developed control software offered several benefits:

- **Precision Control:** Automatic levelling ensured the piling template maintained an accurate position, enhancing the installation process.
- **Increased Efficiency:** The closed-loop control system improved the speed and accuracy of the installation, reducing manual intervention.
- **Improved Safety:** By automating key processes, the system minimized human error and enhanced operational safety.

Conclusion

This project demonstrates how Control Software Solutions applied its expertise in closed-loop control and hydraulic systems to deliver a robust and efficient solution for offshore wind farm installation. The resulting control software improved the accuracy, efficiency, and safety of the piling template, contributing to the success of the client's offshore projects.

SPECIAL OFFERS

Exclusive Offer for New Clients!

We're offering a special opportunity for new clients to experience our expertise in measurement, control, automation, and automated test solutions. Whether you have a complex challenge or need a reliable partner for your next project, we're here to help.

Choose One of These Special Offers:

10% Off Labour Rates on Your First Project

- Use offer code: **NEW10** when you enquire.

Free, No-Obligation Proposal & Consultation

- Use offer code: **FREEPROPOSAL** when you contact us.

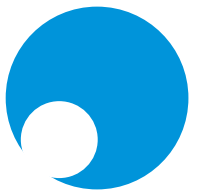
Why Work With Us?

- Industry-leading expertise in automation and control
- Proven track record with successful projects across multiple industries
- Certified and experienced professionals delivering tailored solutions

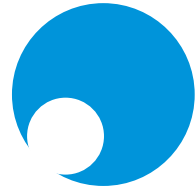
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Contact us on 01457 740025 or email sales@controlsoftwaresolutions.com and mention your chosen offer code to get started.



TESTIMONIALS



“ Working with CSS was the first time we outsourced our software requirements. The project specification, implementation, and commissioning were painless. The work was completed on time and within budget. ”

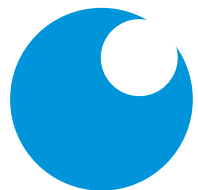
- General Manager, CATRA

“ David truly put the needs of the customer first and delivered for a very complex and changing project. His willingness to resolve issues and support the team made him stand out. ”

- Engineering Manager, Parker Hannifin

“ Having previously worked with several software contractors, I was immediately impressed by the breadth and depth of knowledge demonstrated by Control Software Solutions. Changes in scope were dealt with professionalism and the provided solution matched specification. I would work with Control Software Solutions again and recommend them highly. ”

- Project technical lead



GET IN TOUCH

“ Get in touch today to discuss your project needs! ”

Contact Details-



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Exceptional Service.”**

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