

Cable Armouring Machine Upgrade at Prysmian Cables, Wrexham



£100K D.C Drive control system upgrade replaces an outdated and obsolete control system at the Prysmian Cables site in Wrexham, North Wales.

Prysmian Group is the World leader in the industry of high-technology cables and systems for energy and telecommunications, with sales of some €8 billion in 2012, the Prysmian Group is a truly global company with subsidiaries in 50 countries, 91 plants, 17 research & development centres and about 20,000 employees.

Prysmian recently merged with the Draka Cables Group and re-located a number of machines from the Derby plant to the Wrexham plant. The existing Pourtier D.C drive control system was increasingly unreliable and the drives and PLC equipment obsolete; the decision was taken by plant engineers at Wrexham to upgrade the control system at the time of the machine re-location.

Drive and Automation were awarded the contract at approx £100K to replace the obsolete Drive,

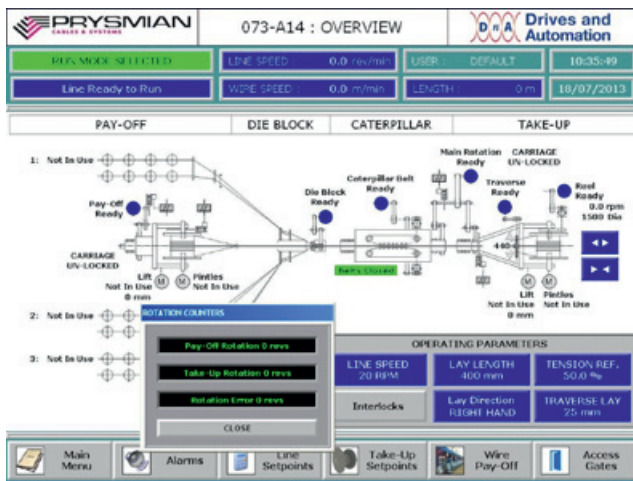
PLC / SCADA control system. The control system solution included panel manufacture, PLC, D.C and A.C drive controllers, HMI / SCADA works, software, site installation supervision and commissioning.

The replacement control system featured an Allen Bradley CompactLogix PLC system, PanelViewPlus with RSView Studio ME HMI, Omron Safety controller, Control Techniques Mentor MP D.C Converters and Control Techniques Unidrive SP / Commander SK inverters.

Technical Details

- Allen Bradley CompactLogix PLC System
- Allen Bradley PanelView Plus HMI
- Omron Programmable Safety Relay
- Control Techniques Mentor MP D.C Drives
- Control Techniques Unidrive / Commander SK Inverters





Machine Description

The Pourtier machine is used in the manufacture of low and medium voltage cables to apply steel galvanised armouring wires onto previously insulated or taped cables.

The machine is built up from the following basic components:

Wire pay off system: Wire is de-coiled from pre wound formers through a wire handling and transfer system to be applied onto the cable at the armouring block.

Pay off carriage: The carriage carries the drum with the cable to be “armoured”, the drum is carried on free running pintles, the cable is pulled off the drum under tension control from a pneumatic drag brake. The carriage rotation is ‘digitally locked’ to the rotating take up and caterpillar unit using the functionality within the Mentor MP D.C controller.

Armouring block: The armouring block serves to transfer the wires from a linear direction, standardise wire tensions and apply them helically onto the cable. The wires are formed and closed onto the cable in a die, this can be adjusted linearly to trim the wire “cone” and is rotated using a geared motor.

Take- up carriage: The take up comprises a belt type caterpillar and a take up rotor mechanically locked together, both rotating as one assembly. The rotor carries the drum onto which the armoured cable is wound, the drum is carried on pintles, driven from a D.C motor / gearbox system, set at a rate to take up the cable leaving the caterpillar. The cable pull is provided by the caterpillar, the desired wire lay length in mm is entered via the HMI which interfaces to the Mentor MP DC drive controller.

The cable winding on the drum is controlled by the traversing mechanism, this is driven by a separate D.C motor / gearbox and software control the traverse mechanism to provide one cable pitch per revolution of the take-up drum.

DnA supplied a complete design package including electrical design, software and commissioning service including the supply of a main drive / PLC control panel, an operator desk with HMI and a number of remote operator

pushbutton stations. A managed Ethernet hub was provided and PLC, HMI, safety relay and drives were networked together to provide a secure network to transfer machine data, menus and drive critical information.

Drives and Automation scope also included the preparation of the functional design specification, software, risk assessments, quality documentation, safety requirements and electrical installation supervision.

Tim Stockton, Maintenance Manager at the Wrexham works was keen to replace the existing control system as the drives, PLC and HMI equipment were obsolete and would have been difficult to support in the future. Tim was looking for a system integrator that had skills in D.C and A.C Drive and PLC applications and importantly experienced in the use of motor ‘digital locking’ techniques. It was vital to maintain the exact position of the rotating pay off, caterpillar and take up machinery sections relative to one another during production to prevent cable damage and Tim turned to DnA to provide such a solution having working with the DnA engineers on similar projects in the past.

Tim stated ‘*We are very pleased with the machine installation, the machine is now producing well after initial mechanical teething problems; Drives and Automation provided us with a thoroughly professional service throughout the project, from the initial specification and design stage, control system manufacture, installation period and final commissioning. We would be very happy to work with them again on future projects*’

Drives and Automation (DnA), based near Sheffield, provides a comprehensive system design and build or retrofit service for control systems, encompassing drives, PLC systems and complete projects working alongside machine builders or end users.

Problem Solved

- Existing Control System Obsolete
- Limited Spares available
- Fault Finding difficult
- Extended Downtime
- Expensive to Maintain

Solution

- New Control System
- New D.C Drives and Inverters
- Modern PLC Control
- SCADA Diagnostics
- Comprehensive Documentation Provided

Benefits

- Downtime Reduced
- Production Increased
- Easy To Maintain and Fault Find
- Energy Savings Maximised
- Easy to Support

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