

# Logical Automation Solutions

- Automate
- Connect
- Retrofit

## Motion Control for Stator Winding

a case study

# Motion Control for Stator Winding - A Case study

**Logical Solutions** India operates in the USA as **Logical Automation Solutions, Inc.** Logical Solutions is an Authorised System Integrator of Siemens since 1993.

We have in the past, used Servo Motors and Drives along with S7 300 PLCs for non-metal cutting production machines. The salient points of one such application are listed below.

The Project involved Automation of a complete line manufacturing Stator of a Compressor Motor. The line includes Stacking - Cleating, Winding, Forming and Lacing operations.

## Control System Components

- 11 PLCs (S7 200 and S7 300) with 2000 Digital Inputs and 2000 Digital Outputs
- 40 AC Servo Motors used with 6 Simodrive 611U Systems
- 05 HMI Panels (OP 170 B) Communicating over Profibus
- Profibus used for Motion Control

## Scope of Work

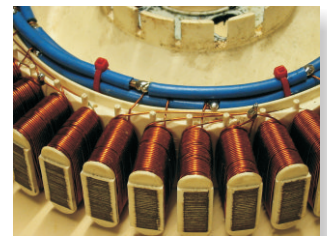
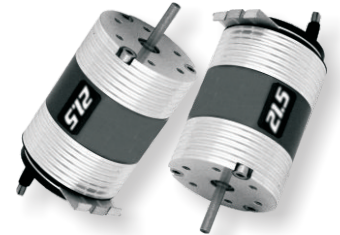
- To provide modern PLC system for 20 year old PLC Control systems
- To provide new positioning scheme for existing electrical control module
- To automate a complete line with 10 machines
- To design and wire up electrical control cabinets
- To develop PLC, HMI software & drive Parameters
- On site commissioning for all the machines

## Challenges

- Adaption of new hardware to existing system & inertia matching
- To make the new system as user friendly as possible, with minimal training on new system
- Tuning of 40 servomotors in speed, current and position loop
- Synchronization of form forward and winding motor so as to get exact no. of turns
- Accurate positioning of Pole Divisor motor & paper feed motor
- Synchronization of paper feed motor and Insulation motor
- Synchronization of 4 winding heads, with central arm on winding machine
- Synchronization of Lacing motor and Indexing motor in Lacing Machine
- Accurate positioning of Indexing motor, with skip programmable sequences

## Achievements

- Smooth transformation from old systems to new systems in a predefined schedule
- Production rate increased by five times with new system
- Winding accuracy and quality has improved
- With new HMI system, diagnosis and operation has become easier
- Downtime has reduced.



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