

Drives Give Great Ball Control at Soccer Circus



AC servo drives from Control Techniques are playing an important role at Soccer Circus – a fully interactive football attraction located at the Xscape Leisure Park at Braehead, near Glasgow.

Soccer Circus, the brainchild of Kevin Keegan, engages visitors in a series of challenging football tasks including ball control, shooting and passing accuracy.

The finale is the Powerplay Super League, where the players work as a team to knock down targets. Designed to test power and accuracy, this game comprises a group of full-size models of footballers, each colour coded to give different scores. Players have to kick ten footballs, aiming to hit the targets to activate a sensor that initiates the retraction of the player below floor level. The balls are automatically delivered to the feet of each player throughout the game.

A total of 28 Unidrive SP drives in servo mode are used for target control and the ball retrieval system.

At the start of the game the 20 targets, mounted on linear actuators with a long stroke length, are raised into their starting position. Each linear actuator is powered by a Unimotor under the control of a 5.5 kW (7 HP) Unidrive SP, each fitted with an onboard Programmable Automation Controller called SM applications. On the back of each target is a Fieldbus I/O module bus coupler which sends

a signal directly back to the drive. Each hit on the target is assessed and, if the impact is sufficient, triggers the drive to retract the target back below the playing surface.

A separate PLC assesses the database, reading all of the team cards, initiating the games, monitoring the scores and communicating with the 20 Unidrive SP servo-drives via Profibus to start and stop the Super League game.

The footballs feed down into two ‘sumps’. At any one time, there are 200 balls in the system. Two conveyors, with a series of cleats, run through the sumps picking up 10 balls at a time. Sensors check that there are 10 balls on each conveyor before indexing around to deliver them to the two transfer positions, where linear actuators load the balls onto the four delivery conveyors. Unidrive SP AC drives in servo mode control each of these eight axes, the six conveyors and the two linear actuators.

Design Engineering Manager, David Birchall has led the work on the control systems at Soccer Circus. Commenting on the solution, he said: “The versatility, communications and programmability of the Unidrive SP has proved to be integral to the final design. We’ve cut out the need for a central drives controller, with intelligence distributed around the drives, delivering a system that provides effective multiple redundancy. Should an error in the automation system occur, the show goes on, in the best tradition of show business!”

KEY BENEFITS

- DISTRIBUTED INTELLIGENCE
- EFFECTIVE MULTIPLE REDUNDANCY
- HIGH LEVEL ON BOARD PROGRAMMING
- HIGH SPEED COMMUNICATION



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