



"Sensation 2012" – A mega dance event tours the world

# Beckhoff technology ensures that show flows smoothly

40,000 visitors dressed entirely in white came to the premiere of the "Sensation 2012", which took place on 7<sup>th</sup> July 2012 in the Amsterdam Arena. – Apart from the music it is above all the special lighting and stage effects that make the "Sensation" a mega event of a special kind. Control technology from Beckhoff operating in the background ensures the smooth and safe technical flow of the show, for which the Dutch companies Statecore and Eventions Products are responsible.

The "Sensation" has developed within a decade into the world's largest dance event. The success story began in the year 2000 in Amsterdam; the dance party has been touring the world since 2008 and has in the meantime enthralled fans in 18 countries on four continents. Apart from the DJs there are additional acts and various special effects during the party. A further special feature of the "Sensation" is that the visitors must come in white clothing. This is intended to create a feeling of solidarity and equality in the audience; for the show the effect of this is that white can be optimally illuminated and coloured light is also perfectly reflected.

The sophisticated technology behind the show effects is the work of Eventions Products BV and Statecore BV, who are specialists for innovative entertainment technology. "In 2011 we were commissioned by Eventions Products to develop the show sequence for the 'Sensation 2012' ", says Erik Berends, founder of Statecore, relating how the co-operation began.

## **Beckhoff servo technology ensures a smooth show**

According to Erik Berends, the Beckhoff technology is used mainly for the special effects, such as the six flying dancers, one of the highlights



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Apart from the DJs there are additional acts and various special effects during the party, such as people "floating" through the air.



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of the "Sensation 2012". The women are suspended in harnesses on steel ropes and float through the entire room via a rail attached to the ceiling. The movement takes place with the assistance of six carriages, on each of which a rope hoist with steel ropes is mounted. The carriages and rope hoists are driven by asynchronous motors and the Beckhoff AX5xxx EtherCAT Servo Drives. In order to realise movement in both the horizontal and vertical directions, a motion controller based on TwinCAT was developed. TwinCAT NC PTP runs on the Beckhoff CX5020 Embedded PC. In addition the controller is also used for the movement of props and lighting gear.

### Safety plays a large role

In the "Sensation" there is a large audience to be dealt with, while at the same time the safety of the artists must be guaranteed. "That demands correspondingly sophisticated safety technology", says Erik Berends. The safety-relevant components of the Beckhoff controller employed meet the specifications of the SIL3. The AX5805 safety option card is used in addition

to the safety controller for the Servo Drives. The general safety controller is the EL6900 TwinSAFE PLC from Beckhoff; the safety-relevant signals are read-in and output via the EL1904 and EL2904 safety terminals. "All emergency stops must guarantee safety at several levels", explains the Statecore Managing Director. In the case of the drives the STO function (Safe Torque Off) is triggered via the AX5805; the brakes are activated via the EL2904 safety terminals, independent of the drive.

### Outstanding communication

The complete HMI for the show runs on an iMac. "We have been using Apple for over ten years now, due to its user friendliness and stability", Erik Berends reports. The operating interface was written and designed in Xcode, the development environment for the Mac. Joysticks and pushbuttons are employed for the operation; they are connected to the control PC via Beckhoff terminals using the EtherCAT network. Communication between the Mac and the Beckhoff Industrial PC takes place over Ethernet using a specially written

The premiere of the Sensation dance party 2012 took place on 7<sup>th</sup> July 2012 in the Amsterdam Arena. 40,000 visitors dressed entirely in white participated in this gigantic dance event with special lighting and stage effects.





The complex show control equipment for the "Sensation 2012" was mounted under the roof of the Amsterdam Arena.

network protocol. Communication is handled by the Beckhoff controller on the basis of the TwinCAT Supplement TCP/IP Server.

#### Trouble-free sequence

Statecore is very satisfied with the PC- and EtherCAT-based Control solution. "Due to its openness and universality it is extremely well suited to the tasks that we face with a show like the 'Sensation'. The Beckhoff product range is so versatile – even if you only consider the large number of I/O signals and fieldbus connections – that we can realise the most diverse solutions with it", emphasises Erik Berends. With TwinCAT both the dynamic movement controllers and the safety applications can be developed extremely well. Statecore also attaches great importance to the reliability of the controller. "The expectations of a large show, with expensive artists and a large audience, are very high nowadays and that means a great deal of stress. Malfunctions of the controller are the last thing we need. Therefore, everything that happens in front of and behind the stage must run absolutely smoothly", comments the Statecore Managing Director.

Erik Berends, Managing Director of Statecore, in the Amsterdam Arena during the construction of the "Sensation 2012"

#### Simple, user-friendly operation

Erik Berends names a series of advantages which, in his view, have resulted from the use of the Beckhoff control platform: "The execution of difficult and complex motion sequences is now much simpler for the people who control the show. We control twelve axes at the same time with the Embedded PC. The control console encompasses all important pushbuttons and joysticks for the control of the mobile objects and the lighting. There is also an emergency stop button on the console for triggering a safe stop. The movements visualized on the iMac. However, the biggest advantage is the simplicity and user-friendliness of the solution as a whole: that is extremely important in show business – and in particular for an event that tours the whole world."

Further Information:

[www.statecore.nl](http://www.statecore.nl)

[www.eventions-products.com](http://www.eventions-products.com)

[www.ial.nl](http://www.ial.nl)

The Beckhoff control platform: a CX5020 Embedded PC with TwinSAFE safety terminals and EtherCAT Terminals

