



SYMPHONY OF SOUND

Anna Mitchell discovers a delicate blend of physical artifacts and digital interfaces against a backdrop of immersive audio and atmospheric lighting at the Carl Nielsen Museum.

When Museum Odense in Denmark embarked on creating a museum about composer, conductor and violinist Carl Nielsen, they put music front and centre of the project. Turning away from instructing on the facts and details of the life and works of Denmark's most famous composer, they aimed instead to immerse visitors in Nielsen's music and his world.

To deliver the project Museum Odense assembled a team of specialists spanning experts on Nielsen from Copenhagen University, experiential design company Event Communications, acoustic consultancy Coda to Coda and AV and lighting

integration professionals Stouenborg. It was Stouenborg who also acted as a lead contractor subcontracting to System Standex for showcases and Kurtzweil for graphical works and props.

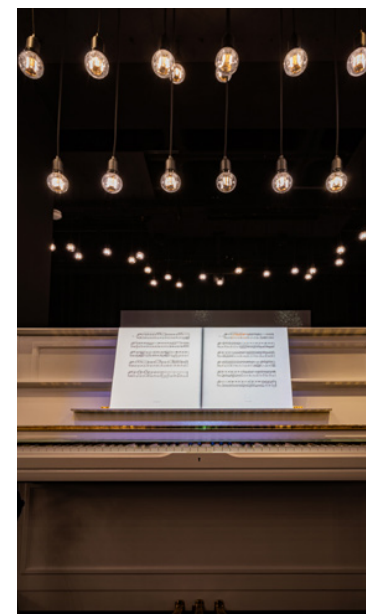
The results speak for themselves. Divided into three movements, the multi-sensory exhibition makes extensive use of light and sound to explore Nielsen's inspirations, music, and the depth of his creative genius. Existing recordings of Nielsen's work are used extensively, combined with pieces recorded specifically for the museum.

Karsten Kjer Michaelsen, museum inspector, Museum Odense said Carl Nielsen was a fascinating but challenging subject to present. While he left a rich body of work, there are

less insights into his life than you might expect from such a prominent figure. Adding to this challenge was the varying levels of knowledge and familiarity with Nielsen. Michaelsen said a key objective was to make the museum appeal equally to adults, school groups, families, Nielsen experts and those discovering him for the first time.

"The most important artefact was the music and presenting that effectively was a big challenge," he says. "The museum is about 400 sq m and split over two levels. To have all these sounds and music playing together in a pretty confined space was hard but, working with the acoustic and technical experts, we succeeded."

Visitors enter the museum in a space called Calibration and



are greeted with a three-sided video projection. Four Epson EB-805F projectors fire onto a scrim that provides a semi-transparent surface. Content features moments from Nielsen's life from childhood and through his career.

"This wasn't meant to explain his life so much as offer moments from his history and show places he's been through his life," explains Kasper Stouenborg, director of Stouenborg. "The content has five chapters which run on a loop in chronological order, but it's designed so visitors can jump in at any point. There's a counter in the corner so you know where you are on the timescale.

"There's no voiceover, the sound is more abstract," adds Stouenborg. That audio is delivered through a Genelec

speaker set up that envelops the audience from the sides and above with immersive, surround sound audio. Twelve 4420A and 4430A Smart IP installation speakers and a 7350 APM subwoofer were installed.

At a point in the loop of projected content light bulbs start to illuminate in front of and behind the screens. These subtly mark a transition between this welcome area and the rest of the museum and lead the way for visitors to go upstairs to the next space. This clever use of lighting, that contributes to an atmosphere but also maps a journey through the spaces, will continue through the museum.

The second upstairs space is a free-flowing room called Exploration, where visitors can explore different parts of

Nielsen's music and life through more than 20 exhibits that Stouenborg describes as "small stories here and there."

While visual technology doesn't dominate the space it was used extensively but subtly with five Epson projectors, eight Iiyama touchscreens and twenty Brightsign players throughout what is quite a small space.

In one station there is a little model of Nielsen's childhood home that rotates while music plays. In another interactive Iiyama screens provides information on how he developed his compositions. Where projection is used in the space, it's generally in a more abstract way with a semi-transparent surface, like a gauze, used to create gentle effects.

Here you only have music and light. It's a place to stand or sit and become immersed in the music of Carl Nielsen.

Kasper Stouenborg, Stouenborg



One of the highlights is a self-playing Yamaha piano that has been modified to look like an old piano. A composition was recorded with the keys programmed to fit exactly with the music. Visitors can listen the piece on molitor headphones while watching the piano keys play the composition.

Audio through the space was delivered with 30 Genelec Smart IP speakers (a mix of 4410A, 4010A and 4420A units) and three 7040A subwoofers. The Genelec system is supported with Panphonics sound showers and K-Array Lizard line arrays used in localised exhibits.

Dante was used for audio and with all signals for the speakers running on a network managed by Netgear switches, the sound can be routed to any zone within the museum. It also gives Stouenborg a high level of remote access. This was one of the reasons for opting for

Genelec as Stouenborg explains: “Genelec has matched network capability with a very high-quality loudspeaker.” A Merging Technologies Ovation system was deployed to play back the audio.

Audio was vital to the success of the project, but its prominence meant a lot of sonic elements within one space. One of the changes that was made after the installation was adding logic to the system that ensured if audio is triggered and plays in one area, the areas close to it will not play at the same time.

The lighting introduced in the first space continues through this area with 650 lightbulbs hanging from the ceiling, all individually controlled by a Pharos system. “That took some time to mount but it’s a striking effect,” notes Stouenborg. “They serve several purposes in this space, contributing to the atmosphere, representing Nielsen’s ideas and from time

to time a wave of light goes through the exhibition. When a piece of music is playing locally somewhere, it combines with a light effect.”

To make the system that supports this and at the same time is stable, rock solid and runs every day without problem was difficult.

Stouenborg had to ensure that light and music was synchronised. As visitors approach different areas PIR sensors trigger audio and lighting playback. “Brightsign players control each visual element locally. They take the signal from the sensor, send it to the network, the sound server reacts and then... the magic happens,” says Stouenborg.

Changes were also made to the original design to help ensure stability. “In many areas, we were able to reduce complexity in the system design and still achieve the desired effect,” says Stouenborg. “One example was

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*Karsten Kjer Michaelsen,
Museum Odense*



Tech Spec

Audio	Thoman the t.amp
Behringer HA400	TA50 amplifiers
headphone amplifier	Yamaha DU1
Bluestream	Disklavier Enspire
DA111ADE Dante	ST Upright Piano
audio analogue decoders	
Lighting	
Genelec 4010A,	Ljusdesign
4410A, 4420A,	Gimmick and Neo
4430A and 8341A	Zoom spotlights
loudspeakers and	Martin VC-Dot
7040A, 7350A	LED lights
and 7370A	Pharos Lighting
subwoofers	Playback LPC-X
Hall Audio Hall	Controller and
Bluetooth	TPS touchscreens
Connector	
Networking	
Interspace	Netgear
Industries PCBB2	M4250-16XF and
balance box	M4250-26G4XF-
K-Array Lizard	POE+ switches
K214 line array	Ubiquiti EdgeRout-
speakers	er X
Video	
Merging	Brightsign LS424,
Technologies	HD1024 and
Ovation audio	HD224 media
server, Pyramix	players
software and	Epson EB-805F
Anubis interface	projectors
Molitor DIO	Iiyama ProLite
headphones	15.6-in and 32-in
Panphonics SSHA	touchscreens
6060 sound	
showers	
Soundtube	
IPD-RS62-EZ-BK	
pendant speakers	



removing the media servers that were planned to deliver edge-blended projections throughout the museum. We did the blend with a media server, exported the output, and then played the video through Brightsign players. Reducing the number of computers and relying more on hardware has made the systems more reliable and easier for maintenance.”

As visitors follow the light path out, they descend stairs to the final area of the museum: Immersion.

“Here you only have music and light,” says Stouenborg. “It’s a place to stand or sit and become immersed in the music of Carl Nielsen through a 12-minute composition.”

“We specified some of the biggest studio monitors Genelec has in their line up and Genelec came on site and supported with calibration,” says Stouenborg. “The results are great, the sound system represents the music very well.”

The Genelec monitors were deliberately used in a very visible way, with a cluster of

seven 8341A monitors and a 7370A sub hanging down from the ceiling in a circle. “It’s really the only object in the room and therefore becomes the visual focal point of this space,” says Stouenborg. Additional Genelec 4430A units were fixed on the walls to deliver a reverb effect around the listener.

Delivering the light installation are a series of large, fabric-covered light boxes housing Martin VC-Dot LED lights. “They act as a large video screen but in very low resolution with 20cm between each pixel,” says Stouenborg. Specially created films that fit with the music are run through the system.

Despite the complexity of the synchronisation of music, light and visuals, Stouenborg programmed the system to deliver easy control for museum staff. They turn the entire system on and off with a touch of a button on a touchscreen linked to the Pharos system. They can also easily mute audio by zone so if there is a group tour and

someone is providing information or instruction they can do so without interference.

When the last room is used for events or to welcome school groups, museum staff can access control functions to play music examples or run a presentation on an Epson EB-805F projector. Other audio sources can be connected to the system using a Hall Audio Bluetooth Connector. Whilst control is kept simple, there’s also a good amount of flexibility built in for various needs and events.

“The main object in the exhibition is the music,” reiterates Stouenborg. “All the other physical objects are second to the music. We wanted the visitors to learn about Carl Nielsen but it had to be the music that they leave the museum with.”

The museum opened this summer and having watched visitors in the space, all parties agree the aims were achieved. “We’ve succeeded in keeping the music the star of the show,” confirms Michaelsen. 🎧