



Museon den Haag

About Museon den Haag

The Museon is a museum for culture and science, examining the relationship between Man, Nature, and Society. Situation in The Hague, the International City of Peace and Justice, it received 230,000 visitors in 2015.

Completed in 1985, the current building was designed by renowned architect Wim Quist to be compatible with the adjacent Municipal Museum, which was itself designed by the famous architect, HP Berlage. Internally, The Museon has an airy feel, with voids around nested squares such that nowhere do visitors have the impression of being enclosed. Every room has a view of a larger part of the exhibition.

In their new permanent exhibition One Planet, the Museon has used the 17 Sustainable Development Goals from the United Nations as the starting point. Themes include: over-fishing, water pollution, energy, refugees, climate change and discrimination. The goals are addressed in 17 displays, using text,

pictures, interactivity and items from the collection. Each theme is a challenge facing the whole world but the display links it to the Netherlands, so that visitors can compare the situation 'here' and 'there'.

In October 2016, Museon opened a new permanent exhibition called "One Planet", an exciting and fun-filled educational exhibition for the whole family with many interactive elements offering visitors an entertaining way to discover how we can work together to ensure a healthy and sustainable future for the planet.

In parallel, the Museon refurbished the lighting of the second floor that housed the exhibition. The goals for this refurbishment were fivefold.

- A better lighting design
- Better and easier lighting control
- Energy savings and reduced environmental impact
- Maintenance savings
- Creating a backbone infrastructure for future IoT connectivity

A better lighting design

The existing installation was one-dimensional, and Jeroen Pijl, responsible for the exhibition lighting at The Museon, felt the 2700K color temperature used throughout had a “soporific” effect on visitors. The new lighting design was carried out by Joost de Beij, whose brief included emphasizing the architecture to a full extent, making navigation easier around the various exhibits, and maximizing a feeling of well-being among visitors. Nearly 400 track spots are mounted in display cabinets and at ceiling level, with ceiling and floor mounted wall-washing around all columns. A suspended band of colour-changing lighting snakes its way around the whole exhibition, providing its own brand of connectivity.

“There have been many positive comments from visitors, mostly highlighting how comfortable the surroundings are.”

- Jeroen Pijl, Exhibition Lighting, The Museon

Museon chose TTX2.50.LV and TTX2.70.LV luminaires from Mike Stoane Lighting, based on both aesthetic appeal and functionality. So far, Museon has installed 380 fixtures on EUTRAC 48V tracks. These fixtures incorporate Xicato XIM Generation 4 (gen4) 3000K Artist modules, which integrate a deep-dimming driver with Bluetooth wireless control and beacons, while providing nearly perfect color rendering (TM30 Rf 96, Rg 103). Using XIM gen4 on DC track, Museon can power multiple fixtures from a single AC-DC power supply, eliminate external driver boxes, separate controllers and control wires, and gain total flexibility in configuring and reconfiguring their lighting. This approach has proven to be simpler, less visually impactful and less expensive than traditional 230V track.

Better and easier lighting control

The XIM gen4 modules contain a wireless Bluetooth Low Energy (BLE) board that can communicate with mobile devices such as smartphones and tablets, or with PCs using the Xicato Control Panel software. The



Control Panel allows The Museon to create multiple, secure networks containing a virtually unlimited number of lights, sensors, or switches, providing simple commissioning of the various lights and lighting groups, scene creation (e.g. for cleaning or service modes), and outputs settings for each fixture and exhibit during normal operating hours. With no extra control components or wiring, the costs involved were negligible. A traditional wired control system would not have been affordable. In fact, the savings on the control system enabled The Museon to purchase higher quality luminaires.

Energy saving and reduced environmental impact reduction

Some of the project funding came from the Klimaatfonds-Duurzaam Den Haag, which offered the Museon a grant as part of "The Foundation for Sustainable The Hague" (<http://duurzaamdenhaag.nl/klimaatfonds>) to meet a CO2 reduction target of 200 tonnes / year. Despite the extra light layers, moving from fluorescent and halogen lighting to high efficiency LED luminaires and dimming control allowed this target to be achieved. There will be further improvements with the addition of sensors and programming, as covered later in this article. Energy consumption fell from 13.7 kW/hr to 4.85 kW/hr.



XIM Gen4 in 19mm and 9mm LES

Maintenance savings

Of course, LED sources have longer lives than traditional sources, but the Xicato XIM gen4 modules also protect themselves, and provide operational data that can be used to monitor conditions that impact lifetime. XIM modules include an Integrated Diagnostics Engine that monitors and acts upon continuous temperature and electrical measurements. If a module gets too hot, it will dim or even shut off to protect its life, giving maintenance personnel time to diagnose and address the underlying issue. Operating data is also advertised by the modules,

and can be collected and presented in real time on a dashboard that is used by Jeroen at Museon to monitor the health of the modules and power supplies, and conduct preventative maintenance.

Looking ahead to provide a backbone for IoT connectivity.

A next step will be to add Bluetooth occupancy and daylight sensors that communicate with the lighting for additional energy savings. Joost de Beij and The Museon will explore ways to enhance the visitor experience with sensor driven interactivity and dynamic lighting. The Museon also plans to use the Bluetooth beacon capability within the XIM modules to make its first venture into personal tour guides, utilizing beacon-based proximity awareness and content. Beacon-based applications will allow for the collection of location data that can be analysed to further improve space usage based on heat maps etc. Finally adding Bluetooth-to-IP gateways will allow remote access and scheduling.

"This lighting upgrade to our One Planet exhibition has more than met our expectations and triggers us to think anew about the possibilities of smart museum lighting. We have every intention to extend this Bluetooth technology throughout The Museon".
- Rob Schouten, Head of the Department of Collections and Production at The Museon

About Xicato

Xicato designs and develops light sources and electronics that enable architects, designers and building managers to create beautiful, smart spaces in which people love to live and work. Xicato's industry-leading LED light sources and advanced Bluetooth lighting control systems are found in thousands of installations around the globe.

In addition to our LED modules and XLT linear tape, Xicato is defining the future of energy efficient, human-centric environments with our GalaXi™ portfolio of intelligent light sources, drivers, sensors, software and connectivity.

Founded in 2007, Xicato is headquartered in Silicon Valley and has offices in China, Europe and the US.

For further information, visit www.xicato.com.