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Lighting Solutions by ***Philips Solid State Lighting Solutions***
Lighting Controls by ***Wireless Solution Sweden AB***

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Lighting Up Asia's new ICON -

SINGAPORE FLYER

The Singapore Flyer, Asia's largest giant observation wheel, has been illuminated with Philips' latest LED technology together with a wireless infrastructure.

Built at an estimated cost of S$200 million, the Singapore Flyer is equipped with the most advanced engineering and design techniques.

The architectural scene in Singapore has reached new heights with the addition of the Singapore Flyer. The 165-metre tall structure exceeds the height of the London Eye by 30 metres, making it the biggest observation wheel in Asia. Built at an estimated cost of S$200 million, the Singapore Flyer is equipped with the most advanced engineering and design techniques.

Opened to the public in March 2008, the Singapore Flyer is as much a treat to spectators as it is to the passengers, bejewelled with an array of coloured lights. The innovative lighting design creates a spectacle to ensure it as an icon not only in the day, but also at night. This would not have been possible without the state-of-the-art **Philips Solid State Lighting Solutions'** LED lighting system, renowned for its environment friendliness, longer lifespan and lower energy consumption.

Said Mr Paul Peeters, Chairman and CEO, Philips Electronics Singapore, "LED technology is the future of energy-efficient lighting and increasingly, we see the trend of LEDs being used in city beautification. As inherently digital devices, LEDs produce light that can be intelligently controlled to dynamically customise environments, making it ideal in lighting up iconic landmarks while at the same time increasing energy efficiency compared to older lighting technologies."

The Singapore Flyer is also the first installation in the world to be controlled by a Wireless DMX infrastructure, which can offer possible lighting scenes for the Flyer to suit themes and occasions.

Lighting Up An Icon

Lighting consultants **Project Lighting Design (PLD)** worked closely with CLA, the Asia Pacific representative for Color Kinetics – now known as Philips Solid-State Lighting Solutions (the new entity formed by Philips' acquisition of Color Kinetics) to create a mesmerising lighting effect for the Singapore Flyer, therefore injecting vibrancy to the Marina Bay area. Lighting designer Douglas Brennan from PLD envisioned a subtle, but dynamic display of light and colour with an eco-friendly solution.

According to Brennan, the Singapore Flyer was one of the more challenging projects he has encountered in his 25 years of lighting design experience; it has less structure and therefore less surface area – compared to the London Eye – which makes it more difficult to illuminate and locate equipment. A major consideration was that the lighting should not interfere with the viewing experience of the passengers during their flight. In addition, the design was developed to ensure that excessive light pollution was minimised.

The lights on each square can be controlled wirelessly to create many gradual subtle effects.

Adding Colours to the Lighting Design

All lighting designs involve a combination of science and art, the technology (science) allowing the visual solution, and experience (art) to be achieved. The use of colour was an important consideration in the design for the Singapore Flyer, not only in highlighting the architecture of the Singapore Flyer, but also promoting its function as a visitor attraction. The lighting design, based on dynamic colour-changing RGB LEDs, comprises of two components, a 'rim wash' and delineation of each of the structural squares on the rim that relate to the 28 capsule locations, both located and illuminating the interior surfaces of the rim to ensure that the views out of the capsule, this being the reason it exists after all, are not compromised.

Design and technology enables dynamic lighting effects with direct view lines that goes around both sides of the wheel.

LED modules were specified for the lighting design as they enable the Singapore Flyer to be illuminated by using up to 16.7 million colours, therefore allowing opportunities for different colour themes for different occasions to be easily provided.

The first observation wheel that was planned to utilise LED lighting, the Singapore Flyer is illuminated using 280 four-foot Color Kinetics iColor Accent Powercore, 112 two-foot Color Kinetics iColor Accent Powercore, 224 Color Kinetics iColor Blast, 12 Powercore, and one Color Kinetics Light System Manager.

The Powercore® is a patented breakthrough in digital power processing technology that increases efficiency, lowers the overall cost, and eases installation of intelligent LED lighting systems by integrating power and data management within the fixture. LEDs have very low wattage, and this is a major benefit as it would not be easy to take

electrical supply onto the wheel.

The Wireless DMX Infrastructure

The Singapore Flyer is also one of the first installations in the world to be controlled by a Wireless DMX infrastructure. This enables information to be sent from the Color Kinetics Light System Manager, located in the main building, to the Flyer through a wireless network. Wireless control is necessary for the Singapore Flyer due to the limitations imposed on maintaining consistent, direct connectivity between the rim as it rotates and the main building. This required some innovative wireless technology.

After careful planning, W-DMX™ by **Wireless Solution Sweden AB** was chosen as the most reliable choice. W-DMX has been a well-known solution in projects like the Pyramids of Giza in Cairo, Times Square in New York, and several major motion pictures out of Hollywood. Four W-DMX BlackBox Transmitters were placed to handle four DMX Universes, together with 28 W-DMX BlackBox Receivers. The W-DMX Generation 3 system includes the world first Wireless Co-Existence tool, allowing the user to choose settings on the W-DMX products, enabling it to work in harmony with all other wireless networks in the area.

Because the wireless system was being installed on a moving object, it required advanced cell planning by a Wireless Solution radio technician. As it involves thousands of DMX channels, it is essential to make sure that all the LED fixtures receives 100 percent signal when the wheel is on the move, and that all wireless systems is working flawlessly without any interference from each other or other public wireless equipment.

With wireless technology, lighting scenes can be selected for the Flyer to suit themes and occasions, e.g. Red and White lights to commemorate Singapore's National Day. There are up to eight special manual settings and eight automatic scenes, which are interchangeable.

Lighting Design and Engineering Support

Working closely with PLD, Creative Lighting Asia, the distributor for Philips Solid-State Lighting Solutions in Asia Pacific and a turnkey service provider specialising in lighting systems, was instrumental in supporting both the lighting design and engineering for the Singapore Flyer.

"Working on a large moving structure made this a very challenging project," says Tony Symms, Project Lighting Manager for Creative Lighting Asia, "All installation, testing and commissioning work had to be organised with the main contractor to get the wheel into the right position when required. We also had a very limited working period, as we could only work from late at night until early morning, in order to prevent delaying other work and the completion of the wheel."

Symms continues, "The Singapore Flyer installation would have been impossible using cable. The W-DMX gave the lighting designer new possibilities, for both indoor and outdoor installations that were simply not possible in the past. We are all extremely pleased."

Flying High With Eco-Friendly Lighting

Through the use of Philips' state-of-the-art LED lighting system, Singapore Flyer is about six times more energy efficient than conventional lighting sources typically used for such projects. A single unit of Philips' ColorBlast consumes just 50 watts compared to the 300 watts required by a normal spotlight. Philips' iColor Accent is also 50 times more energy efficient than neon lights, which are traditionally used in linear lighting.

"The Singapore Flyer is an iconic project with a huge impact on Singapore's city nightscape in Marina Bay. We are thrilled to play a role in distinguishing its presence against the evening skyline and to bring to life the design vision for the Singapore Flyer," states Peeters.

The Singapore Flyer is the latest in a list of iconic landmarks lighted up by Philips' LED solutions, which includes Buckingham Palace, the London Eye, Canada's CN Tower, Eiffel Tower and Ben Franklin Bridge.

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