

Making Shakespeare Shine

Maxon Motor U.K. sheds new light in theater application

Matthew Jaster, Senior Editor

New things are invented for theater lighting all the time and they're usually big, expensive technology-driven devices. It's the simple things that make you wonder, "Why didn't I think of that?" according to Ken Billington, lighting designer. The RSC Lightlock is a great example of this.

The RSC Lightlock was developed by Vince Herbert, head of the Royal Shakespeare Company's Lighting Department, to address the nagging problem of controlling heavy, remote-controlled spotlights. In the past, using flexible, lightweight support structures for these lights was out of the question (stopping the lighting system would result in the whole gantry swinging after each motorized movement).

The Lightlock is a device for the entertainment industry that allows lights to be rigged on very lightweight, hanging or flown, structures. Essentially, it's a motion dampening device that can create a multitude of lighting solutions. It has been utilized in the Royal Shakespeare Theater in Stratford as well as concerts for the likes of Bon Jovi and Lady Gaga.

And it came to fruition as most engineering concepts tend to do with the simple question, "What if?"

One of Maxon's customers CSM, a manufacturer of gyro's for the model helicopter industry, approached the motor company with an idea to provide a gyro-stabilized system based on inertial reaction torque.

"We were not certain how well it would work," said Paul Williams, sales engineer, Maxon Motor U.K. "We decided to build a unit to test the concept. CSM provided the gyro and electronics, Maxon provided the motor and RSC built the first lighting prototype."

Noise, dynamic performance and inertia were some of the key challenges in selecting the right motor for the lighting application, according to Williams. "The motor needed to be quiet and the drive needed to be thin. Our EC Flat motors are very compact and can generate high torque which is perfect for this application," he added.

They selected Maxon's EC 90 Flat brushless, multipole motor with an outer rotor design that generates high torques at slow speeds. The flat design is useful when space is limited. This same motor has been utilized in exoskeleton drives to power joints thanks to its low profile, high torque and power to weight ratio.

Before the RSC Lightlock, the only way to use large moving lights was to hang them from heavy-duty mounting infrastructures — which made accessing the lights a lengthy, dangerous and costly process.

When the RSC Lightlock needs to stop moving, a counterweight on an internal disc swings in the opposite direction to its movement, nullifying the momentum. Incredibly, the heavy counterweight necessary is rotated by the Maxon EC 90.

For creative lighting setups, the RSC Lightlock offers plenty of benefits.

"On many of my shows there are flying ladders, and no matter how you hang them, the lights always end up swinging," Billington said. "Lightlock has solved this problem. By putting it on top of the light ladder, it keeps the ladder nice and steady while flying in and out. This prevents the audience from thinking that the show has an earthquake effect every time the scenery changes."

Tim Mitchell, lighting designer for a 2008 production of Hamlet added, "I've worked as a lighting designer for many years. I've always been frustrated by the limitations of traditional lighting solutions and am delighted that the RSC has designed this new product which will open up more flexible creative choices."

Williams is more than happy to be involved in the design phase of a motor application because it builds a closer relationship with his customers. "While we offer a standard product range, 60 percent of our products are modified to meet these unique applications." (www.maxonmotorusa.com) **PTE**



Maxon's EC 90 Flat brushless motor was selected for the RSC Lightlock.



The RSC Lightlock has been utilized in the Royal Shakespeare Theater in Stratford.