



**Project Name:**  
YAS Hotel  
**Location:**  
Abu Dhabi, UAE  
**Client:**  
Aldar Properties PJSC  
**Lighting Designer:**  
Arup Lighting  
**Local Partner:**  
RDK International  
**Date of Completion:**  
October 1<sup>st</sup> 2009  
**Project Website:**  
[www.theyashotel.com](http://www.theyashotel.com)

## Introduction

YAS Hotel in Abu Dhabi, United Arab Emirates is the first hotel in the world to have a Formula 1 race circuit built around it. At the time when the Hotel was built, it was the world's biggest LED project, to date, controlled through RDM (Remote Device Management) protocol by an advanced lighting control solution provided by e:cue lighting control. The main design attraction of this 5-star, 500-room, 85,000-square-meter complex, is the curvilinear grid-shell covered with over 5,300 diamond-shaped steel panels, containing nearly 5000 RGBW LED fixtures.

Featuring programmed lighting and media sequences that fuse the two sections that span both the circuit and marina. A bridge stretches between the main building and the Marina Tower, enclosing a bar and a restaurant with executive level bridge that will house a rotating exhibition of contemporary artwork. This architectural marvel embodies inspirations ranging from the aesthetics and forms associated with speed, movement and spectacle to the artistry and geometries forming the basis of ancient Islamic art and craft traditions.

## Project Requirements

The project required a reliable control system capable of controlling 5000RGBW LED fixtures. Further critical requirements included the capability of the control system to monitor the status and various parameters of LED fixtures (i.e. temperature) through the RDM (Remote Device Management) protocol that provides bidirectional communication between the lighting fixtures and the control system. The desert climate of Abu Dhabi can reach 60°C in the summertime which creates a big challenge for any type of lighting source, thus, real-time adjustment of LEDs intensity based on the status and temperature of LED fixtures was crucial for the success of the project. The curvilinear shape of the grid-shell also was a challenge to play three-dimensional low resolution video content and to pixel map the video properly on each LED.

Lighting show on the grid-shell can be controlled directly from the control room through a touch-screen monitor, while videos can be uploaded via Internet. LED temperature is monitored through a special heat sensor that sends this data to the control system via RDM, which in turn needs to adjust the intensity to avoid damages of LEDs, fixtures or their drivers.

## Project Solution

Thirty two e:cue Butler XTs, RDM capable, and two Control Servers are the core of the lighting control system of grid-shell lighting. LAS 5.1 (Lighting Application Suite) software package was used by Arup Lighting to create stunning lighting effects such as color-changing lighting sequences and to play customized three-dimensional low-resolution video content on the grid-shell.

Two Control Servers, running the LAS 5.1, control all 32 Butler XTs via Ethernet, which in turn are outputting RDM/DMX signal to LED fixtures and at the same time receiving back data (temperature and status) from the LED drivers and fixtures.

Butler XTs provide bidirectional communication between the LED lighting on the grid-shell, and e:cue's CONTROL SERVER for status monitoring of LEDs.

The system sends status reports to building management and automatically adjusts the intensity of LEDs to prevent overheating.

LAS 5.1 software package also provided the tools for the complex video pixel mapping on the curvilinear shape of the grid-shell, and software visualization for offsite programming of the complete lighting design for this 20,000 DMX-RDM channel installation. Additionally, the project specific lighting sequences and media files can be uploaded remotely through the Internet, and the content is triggered by programmed automation based on a matrix of settings triggered through the astronomical clock, daylight sensors, and a touch-screen user interface.

Outdoor light sensors are also integrated in the control system using a RS232 Port Server. These light sensors trigger the start and end of the show based on lighting conditions outside via the Media Engines 2, which are specified to handle the automation and triggering functions in the control system.



