

Project Case Study

SIX FLAGS QIDDIYA CITY – CENTRALIZED LIGHTING CONTROL SYSTEM

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The Project

Six Flags Qiddiya City represents a landmark development within Saudi Arabia's Vision 2030 initiative, positioned as a flagship entertainment destination near Riyadh. The theme park spans multiple themed zones across a mountainous terrain and incorporates 28 major attractions, including record-breaking rides such as Falcon's Flight.

The lighting infrastructure plays a critical role not only in functional illumination but also in enhancing guest experience, safety, and thematic storytelling. The requirement for a centralized lighting control system was therefore significant, enabling coordinated operation of architectural, area development, and show/ride lighting.

The project involved the design, integration, and commissioning of a scalable, lighting control network capable of supporting dynamic programming, real-time monitoring, and future expansion. The system was engineered to align with international theme park standards and ensure operational continuity under varying environmental and usage conditions.



Scope of Work

The scope comprised the engineering and implementation of a park-wide lighting control system, integrating multiple subsystems into a unified operational platform.

1. Lighting Control Architecture

A distributed yet centrally managed lighting control architecture was implemented using industry-standard protocols, primarily DMX512-A, sACN (Streaming ACN), and RDM (Remote Device Management).

- Deployment of ETC-based control processors and network gateways to manage lighting zones across the park
- Segmentation of the park into logical control zones (rides, pathways, facades, area development, retail, and F&B areas)
- Redundant network topology utilizing fiber-optic backbone infrastructure to ensure low-latency communication and fault tolerance
- Integration with time servers and astronomical clocks for automated scheduling

2. Power Distribution and Control

The system included distributed power controls integrated with the lighting control network:

- Installation of intelligent power controls
- Load balancing across circuits to optimize energy consumption and prevent overload
- Monitoring of voltage, current, and system health parameters in real time
- Compliance with IEC electrical standards and local Saudi regulations

Scope of Work

3. Dynamic and Architectural Lighting Integration

The solution incorporated control of both static architectural lighting and dynamic show lighting.

- Programming of dynamic lighting sequences synchronized with park events and ride operations
- Support for pixel-controlled fixtures for immersive lighting effects

4. Central Control Room and User Interface

A centralized control room was established to provide full operational oversight:

- Deployment of central control interface through ETC Paradigm.
- Real-time reporting of system status.
- Integration with Building Management System.

5. System Integration, Programming, and Commissioning

- Termination and testing of control racks and power controls.
- Development of customized lighting scenes and operational schedules
- Full system commissioning, including stress testing and failover validation

6. Training and Handover

- Comprehensive training sessions for client operational staff
- Provision of as-built documentation, network diagrams, and maintenance manuals
- Post-handover technical support during initial operational phase

Client Requirements



The client's requirements were translated into the following technical deliverables:

- **Centralized Monitoring and Control:** A single-point control capable of managing all lighting systems across the park
- **Scalability:** Infrastructure designed to accommodate future expansion, additional attractions, and technology upgrades
- **Reliability and Uptime:** High system reliability with redundancy to minimize operational disruptions
- **Dynamic Scheduling:** Automated control aligned with park operating hours, seasonal variations, and special events
- **Energy Efficiency:** Optimization of power consumption through intelligent power controls
- **Ease of Operation:** User-friendly interface enabling non-technical staff to manage daily operations
- **Standards Compliance:** Adherence to international lighting control standards and local regulatory requirements

Project Challenges

1. Integration of Multi-Vendor Lighting fixtures

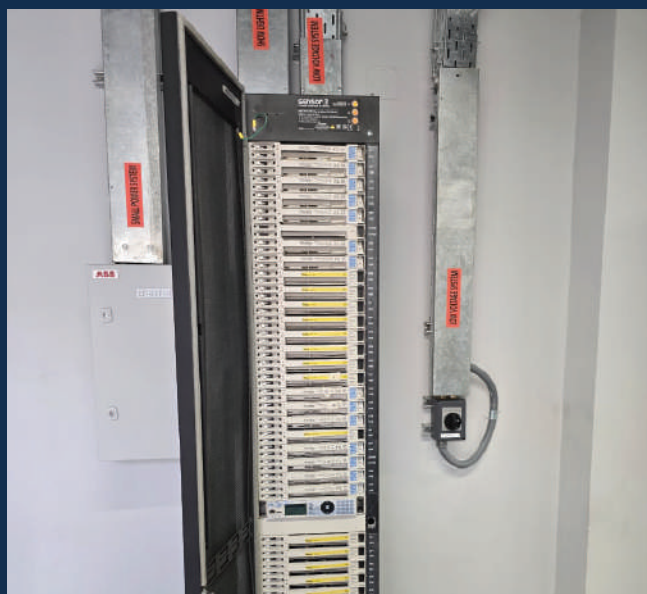
Lighting fixtures were sourced from multiple vendors:

- Use of open protocols (DMX, sACN) to standardize communication
- Extensive compatibility testing during FAT (Factory Acceptance Testing) and SAT (Site Acceptance Testing)

2. Operational Scheduling

The requirement to support both daily operations and large-scale events introduced complexity in programming and control:

- Development of layered control logic to allow simultaneous operation of multiple zones
- Implementation of override hierarchies to prioritize safety and emergency functions
- Synchronization with astronomical data for accurate dusk/dawn transitions





Project Outcomes

The completed system delivered a fully integrated, high-performance lighting control solution with the following measurable outcomes:

- Centralized Control 100% of park lighting systems managed from a single control room, reducing operational complexity
- System Reliability: high reliability of industry tested products ensuring minimal downtime
- Energy Optimization: Improved energy efficiency through automated scheduling
- Operational Flexibility: Ability to override and execute zone-specific or park-wide lighting scenes without service interruption
- Enhanced Guest Experience: Dynamic and synchronized lighting contributing to immersive themed environments

Installed Items/BOQ

Kit List:

- Paradigm Sever: 1
- Paradigm Processors: 44
- Moasic controllers: 23
- Touch Screens 18": 2
- Touch Screens 7": 38
- Buttom Stations: 174
- Response DMX gateways: 116
- ETC DMX Splitter: 251



Client Testimonial

"LightTouch LTE commends the Oasis commissioning team for their exceptional leadership on the Six Flags Qiddiya Theme Park lighting project. Faced with a complex park wide lighting system that required significant stabilization, Oasis approached the onsite challenges with rigorous technical diligence. Their expertise in DMX based control systems and show control programming enabled them to identify and resolve signal integrity, addressing, and interoperability issues across multiple vendors and control platforms. Oasis achieved seamless integration of the park wide lighting network, delivering a reliable, scalable system that fully supports both creative intent and long term operational demands. My thanks go to Jojit Jaromay and Bharath Raj for their professionalism and commitment under challenging conditions, and to Richard Burton for his quick and responsive remote support."

— Dan Reed
Associate Lighting Designer
LightTouch LTE

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