

Entertainment and energy efficiency

Electrical energy management systems in Mexico's CINEMARK cinema complexes



BACKGROUND

Cinemark is an international company, leader in the reproduction of moving images, with 431 complexes and almost 5,000 screens in 15 countries. In Mexico, it has 31 complexes and is ranked third in terms of the most impor-

tant motion picture exhibitors.

The continuous striving of **Cinemark** and its energy savings leader, Eng. **Adrián Limón**, for **Energy Efficiency solutions** in complexes, led to the proposal to install electrical energy monitoring and management systems

to help monitor the electrical energy of all the company's domestic installations from a central office. This system would provide necessary information for taking measurements and the right decisions for making the installations more efficient, without sacrificing the

comfort and quality of visitor services. All Cinemark complexes receive medium voltage electric supply and almost all have 2 transformers, one at 220 VAC, for the cinema's general services, and another at 440 VAC, which supplies energy for the whole air conditioning system. As a result, a monitor was introduced in each transformer for each complex, enabling separate readings of the consumption of cooling loads (highest consumer in cinemas) for the rest of the electrical system.

supplier, helping to change energy costs on a monthly basis.

- Expandable, easy to implement and use.

THE SYSTEM

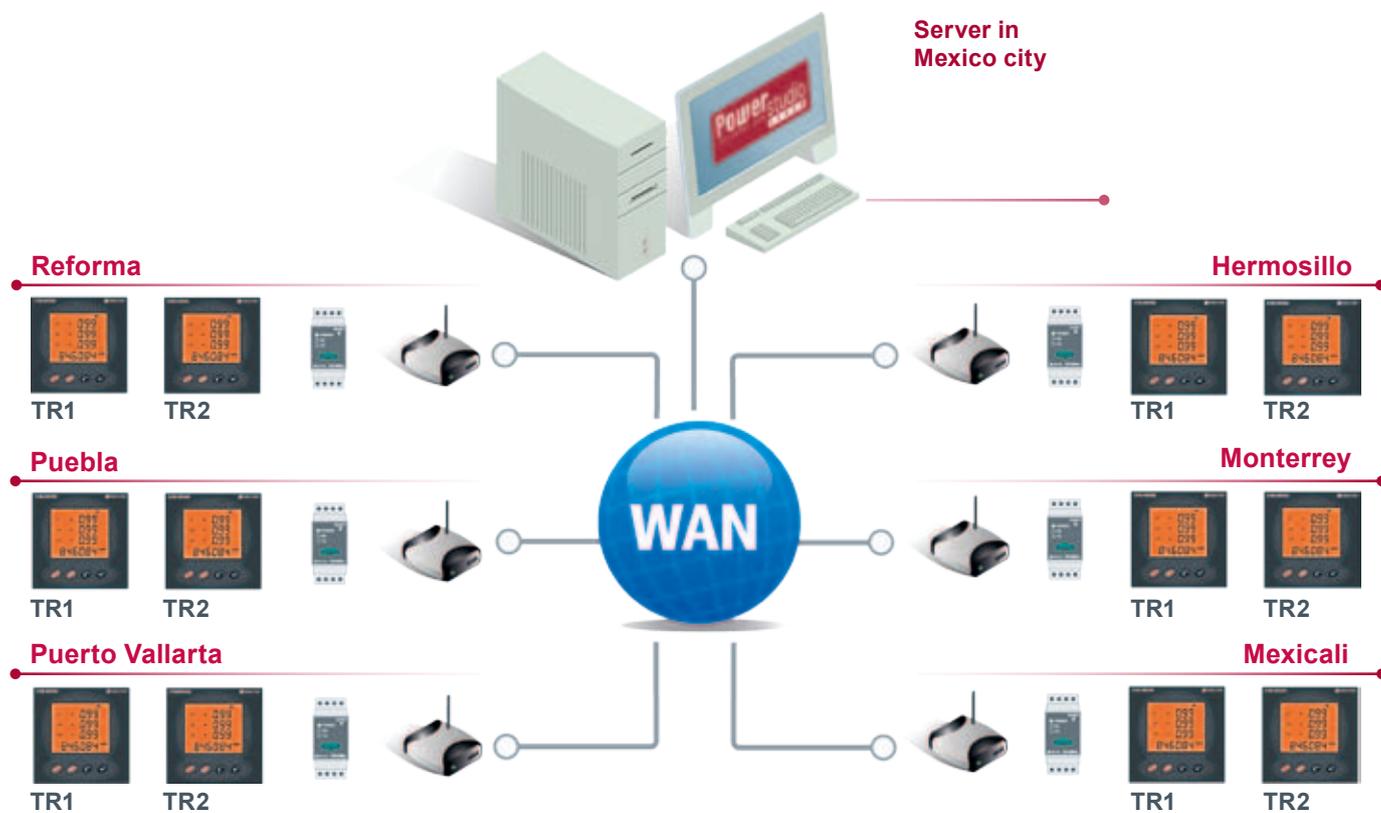
At the date of publication of this article, it consisted of the following equipment, covering practically the whole of Mexico:

- 14 TCP2RS transducers
- 3 TCP2RS+ transducers
- 5 CVM-k2 analyzers with SD memory card and Ethernet port

THE APPLICATION

To simplify data management, a series of screens and reports are programmed for information management purposes. The screens to date are as follows:

- **Home**
Provides the welcome to the system and shows the buttons for changing screen.
- **Graphics**
Makes it possible to display graphics in real-time to compare the immediate performance of



OBJECTIVES

To have a system that enables the following, from the Energy Saving Coordination located in one of the complexes:

- Monitor the main electrical parameters (Voltage, Current, Power, Power factor, Distortions, Energy).
- Show real-time graphics on performance between complexes.
- Monthly reporting on energy consumption in each complex in the form of a bill, similar to that of a power

- 32 CVM-NRG96 analyzers
- 1 CVM-96
- 1 PowerStudio Scada

It should be pointed out that all **Cinemark** complexes are connected via WAN (Wide Area Network), simplifying the communication of devices through TCP2RS transducers to the central server. The general infrastructure is as the above image.

the various complexes. It includes buttons that display the same comparative, but historical, graphics.

- **Table**
This shows a summary of the main parameters of each of the cinemas, comparing all of them on one screen. Provides direct access to energy reports.
- **Map**
This indicates the geographical



To make data management easier, a series of screens were programmed in PowerStudio Scada which help to manage information such as energy indexes, billing simulation, graphics, etc.

location of each complex in Mexico and the instantaneous power (kW) of each one.

• **Visitors**

Makes it possible to force a calculated variable according to the number of visitors in each complex. This data will be used to calculate the energy index of each complex (kWh/visitor).

• **Energy prices**

This is for the monthly updating of the energy price in each cinema, because the cost of this in Mexico varies monthly and is different for each of the country's separate regions. Costs also vary in the three different time bands with a charge for billable demand (kW).

2 types of report are obtained:

• **Billing simulation**

A report for each cinema, a page for the 220 VAC transformer, one for the 440 VAC transformer and another for the total.

• **Energy indexes**

A general report, with all cinemas measured, indicating total energy,

number of visitors and most importantly electrical energy used per visitor.

Thanks to the **PowerStudio Scada** "calculated variables" function, it is possible to determine the total energy of each complex, adding together the energy of each transformer as a single device. Also generated was the calculated variable for number of visitors which can be forced in order to update the amount of visitors in a given period.

RESULTS

By implementing the **CIRCUTOR** energy management system, **CINEMARK** has managed to:

- Control electrical energy by supervising the performance of each complex, notifying each of them if any abnormal incident has occurred.
- Identify and measure energy indexes which determine the profitability of each complex, making it possible to achieve Electrical Energy Efficiency internally.
- Energy consumption per square metre.
- Energy consumption per visitor.

- Comparison of energy consumption between complexes to propose energy limits for similar complexes and achieve a standard level of consumption for each of them.
- Identification of energy consumption during non-operational times.
- Detection of problems with energy quality, such as harmonic currents, failures in electric supply, low power factor, etc..
- Investment opportunities in energy-saving technologies.
- Checking of energy-saving measurements in real-time.
- Corroboration of energy billing.

CONCLUSIONS

In all energy-saving and efficiency projects it is important to have a system that can immediately assess any decisions to be taken in this respect, because in most cases you need to wait for the energy suppliers bill to check whether investment in efficient lighting, improvement in air-conditioning systems and programmed load disconnection had the desired results

or not. Thanks to **CIRCUTOR** systems, based on the **PowerStudio Scada** platform and measuring equipment, it is possible to instantaneously analyse the performance of points managed, so if any complex implements a measure to achieve more efficient energy consumption, this will be noticed quickly. Likewise, thanks to all the information supplied, appropriate measures can be taken if any problem is detected in the installations, either in terms of energy quality or quantity, so it can be guaranteed that **CIRCUTOR** energy management systems provide companies with all the necessary tools for achieving **Electrical Energy Efficiency**. **Cinemark**, a good example of them.

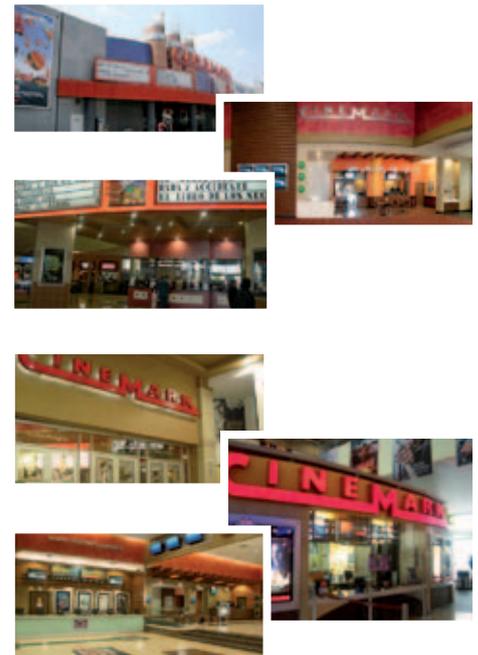
We develop energy saving projects based on Electrical Energy Efficiency, studying the environment using fixed or portable measurement systems, which will enable us to develop projects in Demand Control, Power Factor Correction, Harmonic Current Problem Correction, etc., thus obtaining economic and environmental savings.

Starting from Energy Diagnostics, we can determine the condition of your business and help you make better use of the electrical energy you consume.

Contact us and start saving.▶

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“...In all energy-saving and efficiency projects it is important to have a system that can immediately assess any decisions to be taken in this respect, ...”



ABOUT US



CIR-MEX is a private company that represents, markets and gives technical support for **CIRCUTOR** branded products in Mexican territory.

Our close working relationship spanning 15 years makes **CIR-MEX** the area's **CIRCUTOR EXPERT** in Monitoring and Electrical parameter analysis projects via the Power Studio platform.

