



Case study

Rainforest in Leipzig – courtesy of special climate control technology

Zoo Leipzig, Germany



Building automation from Johnson Controls creates ideal climate conditions

Established in 1878, Leipzig Zoo is one of the oldest in the world and home to around 9000 animals. Since it opened in 2011, *Gondwanaland* has been offering visitors a very special kind of tropical experience. The name itself reinforces the notion of the primeval continent as a unique habitat. On a covered area larger than two football fields, more than 17.000 plants and around 300 animals, including exotic species, invite visitors to embark on an unforgettable adventure of discovery through the tropical rainforests of Africa, Asia and South America.

Specific challenges for creation of natural habitat

The unique design of the gigantic new tropical hall at Leipzig Zoo meant that the building's air conditioning and ventilation had to meet very specific requirements. Moreover, the species require different climatic environments, which need to be created within the hall. Johnson Controls, long-standing partner to Leipzig Zoo, was engaged to optimize the hall's technical systems and to offer a habitat to animals and plants that is as close to nature as possible.

Using a building automation system in the animal enclosures and visitor areas of the huge tropical hall ensures optimum control of the indoor climate and real-time monitoring of the technical systems installed. To optimize the systems, it is important to record beforehand those factors which influence the climate in day-to-day operations and key building parameters. Examples of those factors include air temperature and humidity, air flow conditions and brightness. Once the key data is recorded, it can be used to identify weak points in the building's indoor climate where optimization is possible.

Metasys® as flexible and user-friendly solution

At the Leipzig Zoo, all replaced technical systems are integrated into the METASYS® building automation system. In the zoo's gigantic tropical hall, communication is channeled via fifteen key automation stations, installed at various locations and linked between each other. They ensure appropriate plant and effect lighting, and also create the necessary hall climate by means of heating, cooling, ventilation and humidification – depending on the time of year. All relevant system conditions are monitored and modified from one location in the building control system. However, the system can also be operated and observed locally using a laptop and operator interfaces.

There are strict guidelines governing the configuration of the hall's indoor climate using automated systems to keep the temperature between 20°C and 42°C, maintaining multiple temperatures in a closed environment, while the relative humidity is maintained between 65% and 80% throughout the entire year. One way to achieve these conditions is through temperature stratification that allows up to 200.000 m³ of air to be conditioned per hour. To create a comfortable atmosphere, care is taken, particularly in the cooler months, to prevent drafts that could affect special plants and areas where there are animals and people.

The roof of the tropical hall is a glass paneling that has been specially designed to generate heat throughout the zoo as means to reduce its operating costs. Depending on the amount of heat that is generated, the zoo makes use of a natural ventilation system to help regulate ideal temperatures to different parts of the zoo. The METASYS® system integrates this technology and complements the zoos efforts to generate its climate needs naturally.

Due to the large number of field instruments, and the sensitive reactions of plants and animals to changes in climate, the zoo staff depends on a flexible and reliable system. The analysis of error messages, or the highly differentiated temperature, water flow or time switch settings facilitated by METASYS® make an effective contribution to improving climate, costs and ultimately, security, in a system that is very easy to use.

Benefits to zoo, animals, plants and visitors

Using METASYS® building automation provides an indispensable benefit in creating the optimum conditions for animals and plants, particularly in the self-contained, lifelike environment of the giant tropical hall. But for visitors too, the systematic control of hall climate, watering and lighting offers a natural representation of the environment and a unique experience of nature.

In addition, optimized irrigation flows, recycling and systematic control of the circulating air and time switches on lighting equipment help to minimize running costs and thus ensure that the tropical hall is successfully managed from an economic perspective too.