Energy-optimized Refrigeration with Niagara components from OAS

open automation systems

Located next to the Baden-Baden Festival Theater, the design hotel welcomes its guests with resource-saving building technology. The district has been organized around a large piazza and includes a hotel with 130 rooms and suites, a medical center with 15 specialist practices, a multi-family residential building and an integrated two-story underground parking garage with 200 parking spaces. All rooms and suites of the design hotel have an integrated room management system that interacts intelligently and homogeneously with all building services systems and with the room automation system components.

The entire district was digitalized five years ago with around 40,000 data points across the entire portfolio of building services applications. The digitization, starting with the automation of the primary systems, heating, refrigeration and room air technology, sanitation, through the integrated room automation with lighting, sun protection, to the integration of the hotel booking system OPERA-Fidelio from ORACLE and the web-based PGA WEBvisuBMS, was carried out independently from the manufacturer.

The open building automation system used by system integrator PGA Automation seamlessly integrates all applications via the Niagara OPERA-Fidelio driver. The interaction and communication between room and building automation and the OPERA hotel booking system ensure that guests are greeted with a " welcoming" atmosphere, a preset mix of lighting, audio volume, room air-conditioning and open blinds. After check-out, the room is returned to the energetically optimal "unoccupied" state.

THE CHALLENGE

As part of the current energy optimization measures, the system is being expanded to include Niagara-based demand management for the entire refrigeration system, from chilled water generation through a chilled water distribution network to the different appliances. A wide variety of refrigeration appliances with differing load profiles for the hotel and medical center dynamically change their requirements for demand according to occupancy, internal system requirements, and outdoor temperature.

Refrigeration management is optimized with the open Niagara 4 Framework®. At the heart of the automation is a Tridium Niagara JACE® 8000 controller. The JACE controller collects all data from the refrigeration appliances via BACnet from the room and building automation, different manufacturers, analyzes them and aggregates the optimal load requirement for the chiller management as well as the pump buffer management. Through existing networking and integration, all cooling requirements, such as: AHU's, floor cooling, ceiling cooling sails,

> *"All load requirements of cooling consumers such as air handling units or recirculating air cooling units are digitally networked and routed to the pump buffer management. This means that only as much cooling is produced as is needed."*

Ralf Rostock
Managing Director
OAS Open AutomationSystems GmbH

FAST FACTS

Building type: Medical centre and hotel

Client: Lange Straße 100 GmbH und CO. KG

Project type: Energy optimisation refrigeration with Niagara system integration

Project scope: Collection and analysis of data from all refrigeration consumers, development of corresponding refrigeration requirements for the chillers.
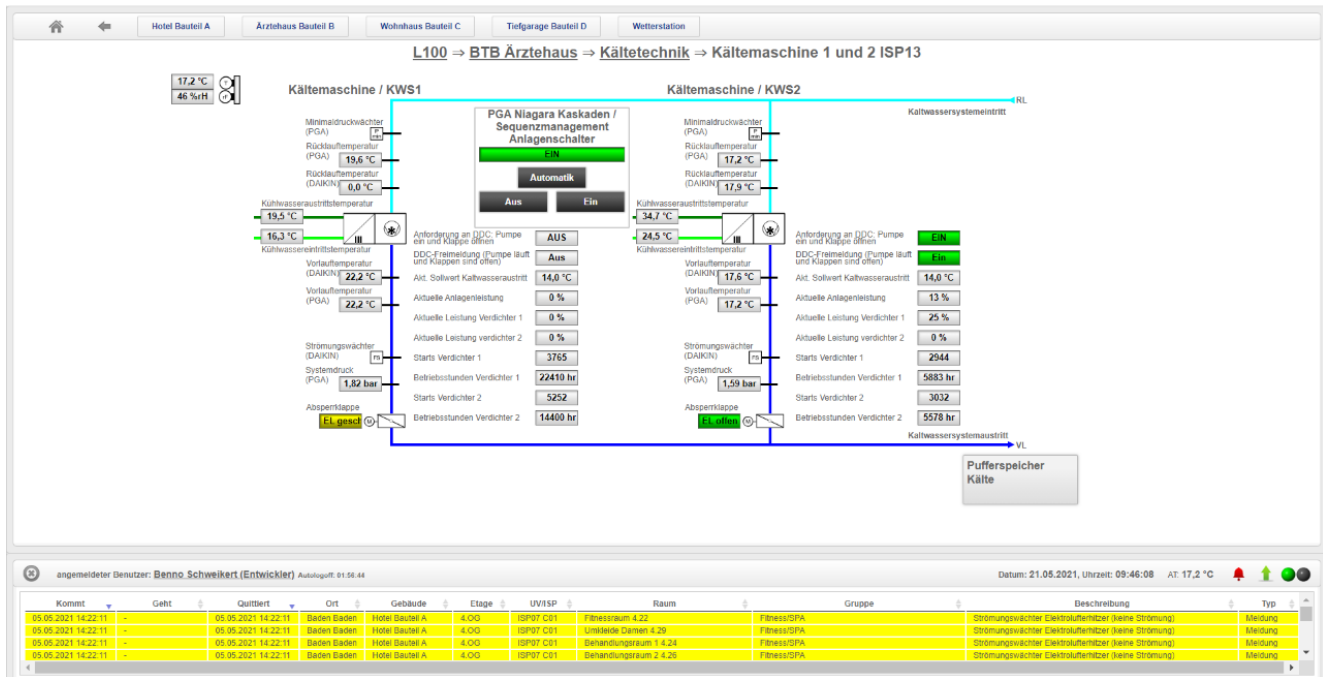
Key technologies:
Niagara Framework, BACnet, cloud-based server hosting, OPC, fallback visualisation system installed on a controller.

Authorized Distributor:
OAS Open AutomationSystems GmbH

System Integrator: PGA Automation

Certified Developer: ProSystems GmbH

The refrigeration management is optimised with the help of the open Niagara 4 Framework®.

ceiling and recirculating chillers are collected via BACnet and fed to the Niagara-based load management system. Via Modbus, the data for controlling and monitoring the chillers is communicated directly with the new JACE controller.
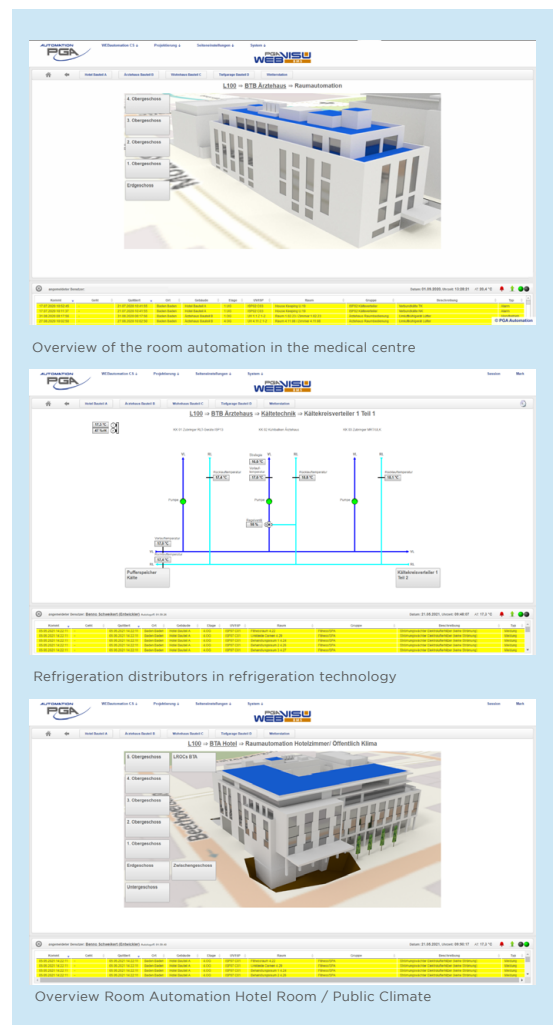
THE OPEN AUTOMATION SOLUTION

Experienced in the implementation of energy efficient automation solutions, OAS and ProSystems are enhancing the existing building technology with innovative integration and automation components from the Niagara Framework®. The OAS SBS JACE 8N4 controller is used as IoT integration platform. The AutomationServer kit OAS SBS JACE 8N4 is an integral part of it.
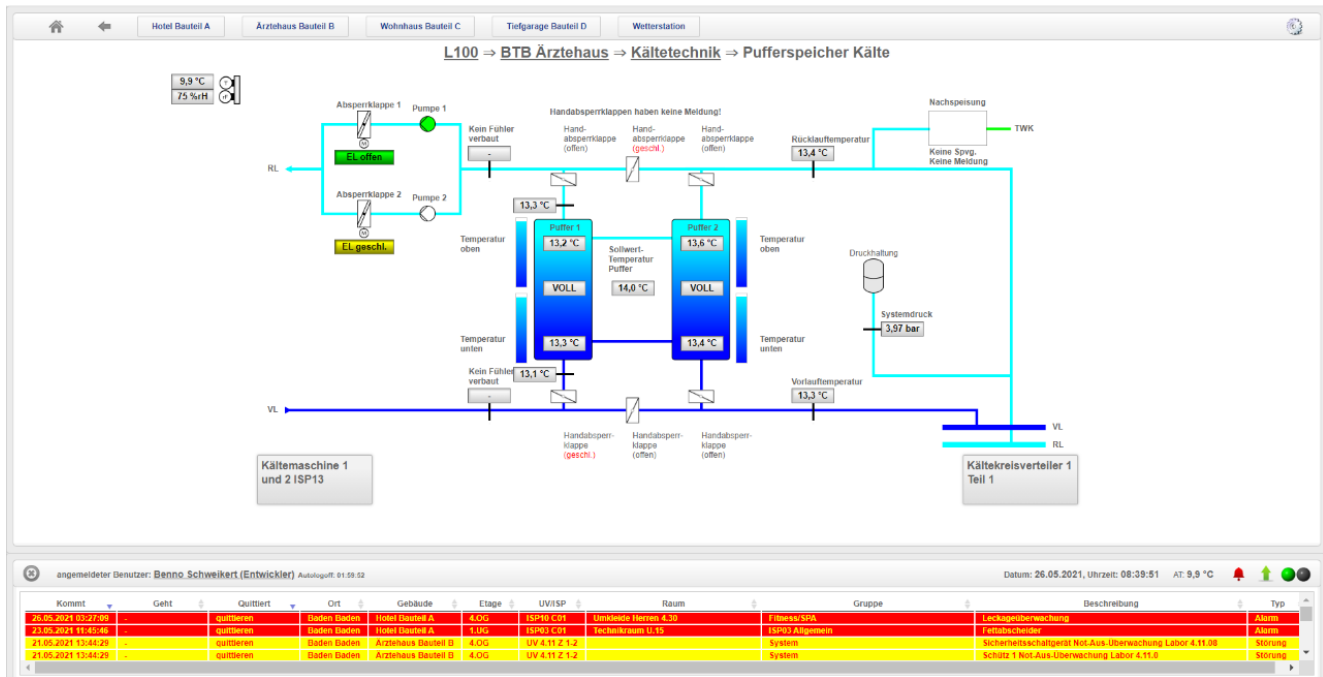
An extension of the web-based control technology with direct access via the web interface of the PGA WEBvisuBMS contributes to the energy optimization of the refrigeration technology. The Niagara® developers also have their own direct remote access. In the OAS control center, they program the appropriately prepared JACE controller via the existing VPN connection, thereby avoiding additional costs for travel. In the backend area they work on the Niagara 4 Workbench and in the frontend, they adapt the PGA WEBvisuBMS.

THE RESULT

This open automation solution enables only as much refrigeration to be generated for the hotel and the adjacent medical center as is needed. This sustainably optimized cooling supply technology not only reduces energy consumption, but also benefits the environment. The operating costs consisting of energy use, wear and tear, and maintenance costs are significantly reduced.

This open automation solution for the end-to-end digitization of building technology enables a direct VPN access for support at the customer's site, both in the front end and in the back end. Especially in times of this pandemic, digitization measures like these ensure continued support for system maintenance, expansion and optimization in the area of service and support.

Overview of the room automation in the medical centre

Refrigeration distributors in refrigeration technology

Overview Room Automation Hotel Room / Public Climate

Optimal load requirement for chiller management and pump buffer management

ABOUT OAS

OAS Open AutomationSystems GmbH is your Tridium Authorised Distributor for open energy management and building automation systems for the continuous digitalisation of technical building equipment. Our cloud-based portal solutions offer a secure, reliable and trouble-free system integration with a high level of ease of use. Our modular Niagara-Framework ® components and OEM product developments communicate with BACnet and other common protocols and offer limitless integration from the field level through automation level up to the cloud.

ABOUT PGA AUTOMATION

With more than 20 years of experience, PGA Automation plans, develops and implements integrated system solutions across the entire range of modern digital automation technology.
As a system integrator and solution provider, PGA Automation offers complete end-to-end solutions for all applications in process and industrial automation, room and building automation, environmental water/wastewater technology, energy management as well as web-based BMS, HMI, SCADA and management solutions.

ABOUT PROSYSTEMS

For more than 30 years, the range of services has included complex software solutions in the field of IT-based automation, from the level of field devices to the level of controllers and control technology to the interfaces for PPS, MES and ERP systems. ProSystems is the development partner of PGA Automatin and OAS. As a Niagara-certified developer, ProSystems forms a powerful alliance with OAS as Niagara Solution Provider.
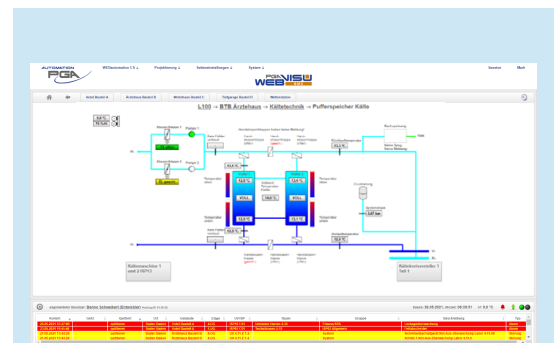
Refrigeration buffer storage in the refrigeration technology in the medical centre

ÜBER TRIDIUM

For over 20 years, Tridium has been a world leader in open-protocol application frameworks for operational data. Our products enable different monitoring, control and automation systems in buildings, data centres, manufacturing systems, smart cities and more to communicate and collaborate. We create smarter, safer and more efficient businesses and communities - bringing intelligence and connectivity to the edge of the network and back.

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