

CASESTUDY

# US Airbase Spangdahlem | Germany

## Optimization of BMS to Deliver Energy Savings



Spangdahlem Air Base is a United States Air Force base located near the small German town of Spangdahlem, Rhineland-Palatinate.

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Spangdahlem | Germany

### Projekt Overview

The base was constructed between 1951 and 1953 and is home to a total of 4,800 military personnel. Approximately 840 German nationals and 200 US contractors also work at the base. Spread across circa 650 hectares the base complex is made up of over 500 Buildings.

ABB Cylon® products have a long history at the US airbase at Spangdahlem and have been providing centralized control to the airbase for almost 20 years. ABB Cylon® have been appointed the preferred BMS supplier to the US airbase. In 2005 the BMS was upgraded by Boley (System Integrator) and HVAC (contractor) to ABB Cylon® UnitronUC32. As such it has each generation of Unitron controllers installed in different applications across the airbase but all available on the same integrated network and control system. This includes hundreds of UC32 and UC2000 range of controllers linked by an Ethernet network.

ABB Cylon® products are installed in circa 40 buildings, representing circa 3,500 data points, across the airbase and include a diverse range of building types: Cinema, Restaurants, Schools, Hospital, Church, Kindergartens, Dorms, residential accommodation for families (Heating and Cooling,

### Project Summary

Applications:	Heating, Air Handling, Cooling, Metering
Number of Points:	Ca. 3500 ABB Cylon® Data Points in Ca. 40 buildings
Number/Type of Building:	40 mixed use buildings: Cinema, Restaurants, Schools, Hospital, Church, Kindergartens, Dorms, Residential, Fitness Center and a Shopping Center
Network:	Ethernet, BACnet IP, BACnet/MSTP
ABB Cylon® Hardware Installed:	UnitronUC32/ UC2000
ABB Cylon® Software Installed:	UEC6, Unitron Command Centre, ABB Cylon® Active Energy Manager
Contractor:	HVAC Spangdahlem

AHU controlled), and more recently in 2012, a newly built fitness center with 1000 data points and a shopping center with 1300 data points (500 BACnet).

“ABB Cylon® provides the US Airbase in Spangdahlem, Germany, with a reliable and user friendly BMS system that has allowed for seamless expansion and retrofit, while providing optimization of current and future systems – Jan Friedrich, HVAC

### **ABB Cylon® Solution**

As energy budgets and costs are increasingly coming under pressure, with the addition of new buildings and upgrades of older buildings, the return on investment in the BMS also comes under scrutiny. HVAC Spangdahlem set out to prove the value of an optimized BMS.

HVAC Spangdahlem identified that while the BMS was effective in maintaining occupancy comfort levels, the potential to reduce energy consumption through effective optimization of the BMS had not been examined. This was apparent in one example where AHU units were running 24 hours irrespective of occupancy levels or comfort requirements.

In February 2013, HVAC Spangdahlem initiated and installed a pilot of ABB Cylon® Active Energy Manager in the new 10,400 m<sup>2</sup> shopping center that opened in November 2012, to demonstrate how controlling and optimizing a BMS could deliver significant savings. The shopping center has 512 ABB Cylon® hardware points and 800 integrated BACnet points from 3rd party systems. Additionally, 19 meters were connected to the ABB Cylon® Active Energy Manager to include water, electricity and heating.

Through optimization of the air handling units (temperature and night control) through ABB Cylon® Active Energy Manager, it was established that the shopping center AHU's were running 24 hours a day. By reducing the runtime of the AHU from 24 hours to 14 hours (switching off the AHU for 8 hours over night) savings of €40,000 to €50,000 could be saved during the year, without affecting occupancy comfort. The AHU units in the center are so powerful that it takes approximately one hour for the space temperature to reach 21 degrees after an 8 hour 'off period'. Thus programming the AHU's to switch on 1 hour before the center is scheduled to open means optimum use of the energy required without compromising occupant comfort. This simple change in one building will deliver real and tangible savings.

### **Solutions Benefits**

With the implementation of ABB Cylon® Active Energy Manager to monitor and analyze energy consumption it would be possible to achieve savings of 15 – 20% in energy costs and consumption via correct scheduling and optimization of the BMS across the remaining buildings. The potential savings on electricity costs alone on a campus the size and scale of the US airbase at Spangdahlem are significant. With an estimated annual spend of approximately €8-9m per year on electricity; this presents a potential saving of between €1.2m and €1.8m.