Connected
Efficiency

CAREL

Success Story

where:

Castel Sant'Angelo museum complex

- Rome, Italy.

what

Installation of humisonic Compact, boss supervisor, wireless sensors, IR33

why

Precise temperature-humidity control requirements

- Energy saving
- Low operating and maintenance costs
- Easy to install
- Low visual impact of the field devices

Castel Sant'Angelo museum complex

Monitoring, control and humidification system in the exhibit rooms.

Castel Sant'Angelo (Hadrian's mole or "Castellum Crescentii" in the 10th-12th centuries), also called the Mausoleum of Hadrian, is a monument located on the right bank of the Tiber in Rome, opposite the Pons Aelius (currently called Ponte Sant'Angelo), not far from the Vatican, in the Borgo district; it connects to Vatican City via the fortified corridor known as the "passetto". The castle was radically reconstructed several times in the Middle Ages and during the Renaissance. Owned by MIBACT, in December 2014 the museum became part of the Lazio Museum Complex.

In the period from 24 June to 17 September 2017, the former papal rooms of Castel Sant'Angelo hosted the exhibition entitled "LABYRINTHS OF THE HEART. GIORGIONE AND THE SEASONS OF FEELING BETWEEN VENICE AND ROME". On display were 45 paintings, 27 sculptures, 36 printed books and manuscripts, as well as numerous other objects, prints and drawings, with works by some of the great masters of the sixteenth century, including Titian, Tintoretto, Romanino, Moretto, Ludovico Carracci, Bronzino, Barocci and Bernardino Licinio, all on loan from various Italian and foreign museums.

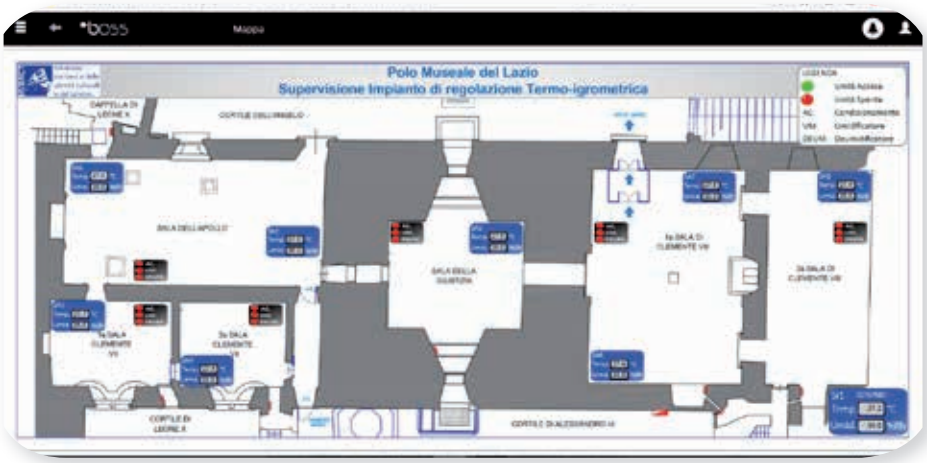
Requirements of the curators and designers

A non-invasive measurement and supervisory system, totally concealed from visitors, and that guaranteed a high degree of reliability, with the possibility of remote alarms, supervision and control, were the priorities for the exhibition. The system also needed to be flexible and reusable, as the exhibition spaces are used for exhibitions with different control requirements, both in terms of the space occupied and the objects on display.
The system needed to be integrated into the exhibit rooms not involved in the initial installation, thus communicating with the existing systems, and also needed to interface with any technology added subsequently, without restrictions in terms of brands or products. Everything had to be done quickly, so as to be ready in time for the planned opening date of the exhibition.

Problems encountered when preparing the exhibition

The fundamental problem for the care and protection of the exhibited works was insufficient temperature and humidity control.

The rooms, due to their structure, had different thermal and humidity loads, and the works on display required different set points, as established by the museum curator.
The CAREL supervisory and control solution allowed interaction with other products installed for air temperature control and dehumidification, as well as with the CAREL ultrasonic precision humidifiers, interacting with these based on active alarm notifications and allowing solutions to be applied remotely. The use of ultrasonic humidifiers fulfilled the pressing demand for precise control of humidity in the different rooms.
The architecture comprises a 4 metre interior and 1.5 metre exterior wall structure, together with metal structures placed on the openings, with consequent potential problems in the transmission of data via the Zig-Bee wireless protocol. However, the use of an external network of bridge routers overcame any communication problems between the probes and the supervisor.
The chosen products were installed in a non-invasive way, in compliance with the organisers' requirements: giving visitors the opportunity to immerse themselves in a sixteenth century environment, without interference by electronic instruments.

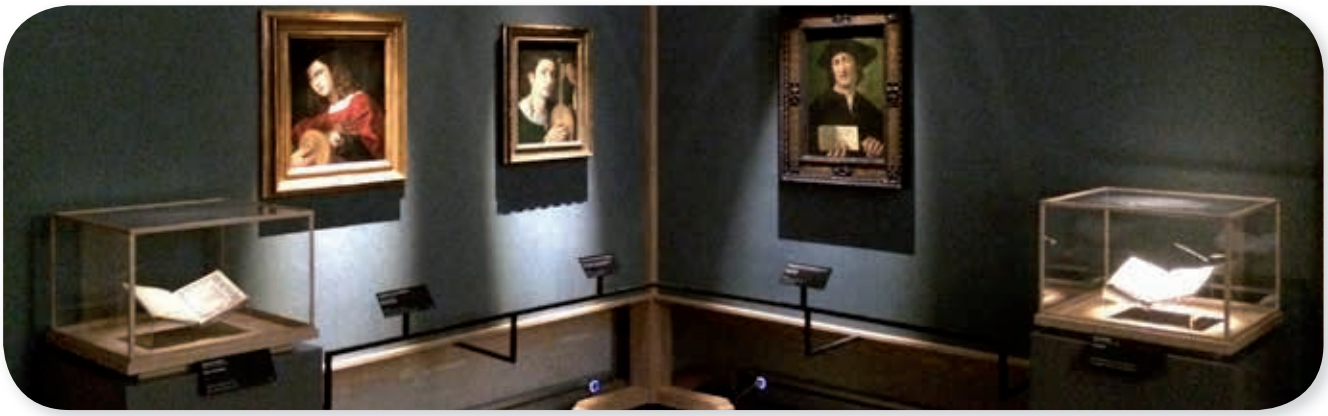


Simplified graphic map of temperature-humidity control in the museum area for use by the site monitoring manager.

Technical map of the devices installed with remote monitoring and management.

Description of the type of installation

The system installed at the museum complex was designed by Rome-based firm "Studio Ingg. Musmeci and Mercuri", who completely relied on CAREL for the electronic control and humidification products. Implementation was supervised by the system integrator Mauro Natalizia from Tecnoclima Italia srl, who in addition to being responsible for programming and supervision of the system, liaised with the other equipment suppliers so as to integrate everything all into one system. The resulting system is highly flexible and easily expandable to all exhibition spaces, with very low integration costs and fast installation, a fundamental requirement due to the very short time available to have all the structures in Castel Sant'Angelo ready for use.



View of a museum room

Details of a typical installation in a museum room of: ultrasonic humidification systems, dehumidifiers and management and control electronics on the air-conditioning systems.

View of the system with cover panelling

Description of the CAREL field devices

Material supplied

6	DN33E9MR20	DN33 UNIV 2 UNIVERSAL INPUTS, 2DO+2AO, BUZ, IR, 24VAC-DC
5	DPPC112000	INDUSTRIAL ENVIR. SENSOR TEMP. -10T60GR. C. (OUT 0-10VDC) / HUMID. RH 10-90% (OUT 0-10VDC)
1	BMHST00XS0	BOSS MONITORING SYSTEM HIGH-END BOX STANDARD CAPACITY (100 DEVICES)
1	WS01AB2M20	RTM SE ACCESS POINT 12...24VAC - MODBUS
18	WS01RB2M20	RTM SE ROUTER-BRIDGE RB 12...24VAC - MODBUS
8	WS01G01M00	RTM SE WIRELESS SENSOR WALL MOUNTING SA TH -10T60G - MODBUS
1	WS01F01M00	RTM SE WIRELESS SENSOR INDUSTRIAL MOUNTING SI THL -20T70G - MODBUS
7	UU01GDA001	1 KG/H ULTRASONIC HUMIDIFIER WITH AUX 230V 50HZ REVIEW CARD

Conclusions

The monitoring system developed was able to guarantee, in a very short time and with reduced installation costs, the very strict temperature-humidity requirements (22 degrees +/- 1.5 degrees - RH 55% +/- 3%). These requirements are fundamental for the correct conservation of the exhibited works, coming from leading museums around the world, and had to be complied with in order for the exhibition to go ahead.
Close collaboration between the designers and installers, supervised and managed by CAREL, together with the system integrator, meant the deadlines required by the customer were able to be met. All of this helped ensure customer satisfaction, an essential reason why this can be considered the perfect system for similar museum applications.

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