The International Iberian Nanotechnology Laboratory (INL), Braga, Portugal

Customer Success Story

International Iberian Nanotechnology Laboratory (INL)
Braga, Portugal

Clean Room Floor Monitoring/Control

> *"So far we have been working with GENESIS32 for five years. Our experience during this time has been excellent. That is the main reason why ICONICS is always our first choice when selecting which SCADA to install."*
>
> **José Granero Nueda**
> Project Manager
> Cofely GDF Suez (España)

About International Iberian Nanotechnology Laboratory (INL)

The International Iberian Nanotechnology Laboratory (INL) (http://inl.int), located in Braga, Portugal, is an intergovernmental organization created to foster interdisciplinary research in nanotechnology and nanoscience. Aiming to become a vital part of Europe's scientific area, INL provides a high-tech research environment addressing major challenges in nanomedicine, nanotechnology applied to environmental and food control nanoelectronics, as well as nanomachines and molecular manipulation at nanoscale.

With a total area of 28,000 square meters, the INL will house more than 200 top level scientists and about 100 PhD students, besides the laboratory support and administrative personnel.

Main outstanding spaces of the building included:

- A clean room space with a total area of 1,050 sq. meters, which is divided into 7 big labs that house 19 different spaces, six of them classified at ISO5 and the rest at ISO 6.
- 11 high accuracy rooms; three of them fully shielded to attenuate the electromagnetic interferences with an attenuation of up to 120 dB, with a total area of 700 sq. meters (m^2).
- 23 wet laboratories with a total area of 1,000 m^2.
- 23 dry laboratories with a total area of 1,000 m^2.
- 6 biology laboratories with a total area of 170 m^2.

ICONICS Software Deployed

The INL, working with Cofely GDF Suez (España), selected the ICONICS GENESIS32™ HMI/SCADA software suite for their new Building Management System integration project.

Project Summary

In 2009, a consortium where Cofely was involved was awarded a €42 million contract for the construction of all the installations of the INL in Braga, Portugal. The complex is divided into a hotel for resident researchers and the main building, where clean rooms, laboratories, high accuracy areas and administrative offices are located. The application involved deploying an ICONICS-integrated Building Management System, paying special attention to the clean room and high accuracy and laboratory areas, as well as to the critical process systems.

The Building Management System was designed to control and monitor the following systems: HVAC, Hot Water Production, Chilled Water Production, Low Temperature Chilled Water Production, Process Chilled Water, Ultrapure Water, Vacuum, Compressed Air, Acid Waste Neutralization, Flammable/Toxic Gas Detection, Fire Detection and Smoke Exhaust, Electrical Transformer Substations, Natural Gas Detection, and Liquid Leak Detection. There are over 14,000 total I/O points in the facility.

Critical areas such and clean rooms and high accuracy labs don't allow any downtime for the HVAC system, because most of the experiments carried out in these zones are expensive and take a long time. Should any failure occur while an experiment is being carried out, it would have to be started from the beginning, implying additional and unacceptable costs. On the other hand, the HVAC system for these areas was designed to work 24 hours a day and 365 days a year. In addition to the temperature, humidity and pressure data monitoring and collection for the certification of the clean rooms, it was an additional challenge to control the temperature in the high accuracy rooms with a required accuracy of ±0.1ºC.

The control system is based on B&R's X20 series. The main control tasks are handled by over 100 control cabinets with their respective B&R controllers. Besides the main controllers, over 60 Beckhoff compact PLCs, acting as Modbus TCP slaves, are utilized to control the variable volume boxes located in the conventional areas. B&R (communicating via B&R OPC Server) and Siemens and Omron PLCs (communicating via Kepware OPC Server) were provided by third-party special equipment manufacturers together with their systems and communicate with each other and with the OPC Servers. These are hosted in the same server as the GENESIS32 server via a dedicated Ethernet LAN.

The whole system is synchronized with a SNTP server, also hosted in the GENESIS32 server. The Fire Detection System was also integrated, via Modbus TCP OPC Server, within GENESIS32.

In addition, Cofely plans to install ICONICS WebHMI™ and AlarmWorX™32 Multimedia, as the functionalities provided by these tools have been required by the client. Main historical data, alarms and events are logged into SQL databases due to the need for compliance with the FDA 21 CFR Part 11 regulation. Data consistency is a must.

A Laboratory at the INL

Air Handler Operations for the Connected Hotel

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Benefits of the System

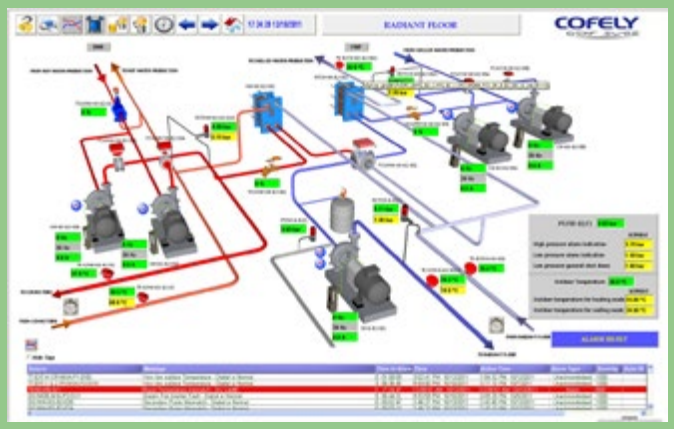
The system allows operators to control and monitor the entire complex, following a Web-based look that makes navigation straightforward and provides users with a low technical profile and with instant visualization of the parameters of any equipment or space. More than 700 screens are deployed on the project. In order to provide a friendly designed environment, 3D graphics with animations were developed, making navigation even easier. An audit trail allows recording of the dates and times of all the operator entries and operator actions that create, modify, or delete any parameters or variables. Another important feature is the possibility of customizing reports, presenting either historical data, alarms or events.

Unlike other SCADA packages, with GENESIS32, openness is not merely a word, as the integration of any controller or system based on OPC can be done on the spot. The system is expected to grow in the next years and based on Cofely's experience with GENESIS32, they know that it won't be a problem.

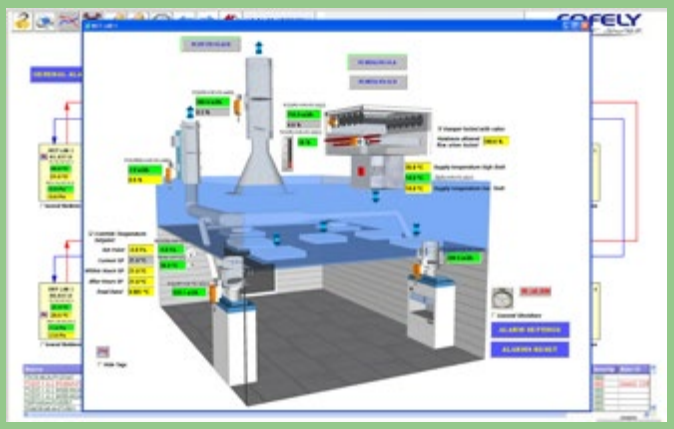
Because of the seamless integration via OPC of the different and heterogenous systems and the user of the Global Aliasing tool, it could be said that, compared to other well-known SCADA manufacturers, GENESIS32 allowed Cofely to reduce development time and therefore the costs by 50 percent.

Among the reasons why Cofely and the INL selected ICONICS GENESIS32 are:

- Past Success Stories and Background with GENESIS32 in Other Building Management Systems for the Pharmaceutical Industry
- Seamless Integration of Any PLC or Controller via OPC.
- Compliance with FDA 21 CFR Part 11
- Free Modbus OPC Server and SQL Server
- Real scalability of the System



A Laboratory at the INL



Air Handler Operations for the Connected Hotel

Conclusion

Cofely GDF Suez (España) required a comprehensive, state-of-the-art HMI/SCADA system to handle the International Iberian Nanotechnology Laboratory's building management. ICONICS GENESIS32, with its wide data source integration, emphatically passed the test.