

Centre for Advanced Laser Applications

📍 Garching, Germany



CALA

MESALOGIC
enterprise software solutions

CALA Headquarters, Photo Credit: Hannieh Fattahi

About the Centre for Advanced Laser Applications **Project Summary**

The Centre for Advanced Laser Applications (CALA) is a research facility located on the Research/High Tech Campus in Garching, Germany. As a location for interdisciplinary top-level research, CALA offers international physicists, physicians, and biologists a unique array of state-of-the-art laser technologies. These scientists and researchers aim to develop sensitive and cost-efficient laser-based methods for the detection and therapy for cancer and other chronic diseases. Their hope is to develop early diagnosis as a key to the successful treatment of these illnesses. They are also focusing on high-intensity X-rays for diagnostic biomedical imaging, laser-generated proton and carbon-ion beams for tumor therapy, and high-resolution laser-based infrared spectroscopy for blood and expired air analysis with the goal of providing risk-free screening procedures. Lastly, CALA research is concerned with maximizing patient health potential and recovery chances.

Two high-tech laser sources, the ATLAS-3000 and the PFS-Pro, are installed in the state-of-the-art cleanrooms. The world's first commercial Munich Compact Light Source (MuCLS) - a combination of a compact electron accelerator and lasers for generating X-rays - is currently in operation at the Munich School of Bioengineering Building (IMETUM) at the Technical University of Munich. While the X-ray source of MuCLS would in CALA be directly connected to its experimental area, the ATLAS and the PFS-Pro are spatially separated from the five experimental stations, the so-called "caves", since ionizing radiation is generated at these locations and thus requires appropriate shielding. The laser beams are directed into the desired cave via a sophisticated evacuated tube system with various vacuum chambers and adjustable mirrors. To ensure that the mirrors can be precisely adjusted and that no accidents occur while handling the lasers, CALA wanted a system to manage and control all aspects of the facility.



*CALA Control Center
Photo Credit: Mesalogic*



*CALA's ATLAS Laser
Photo Credit: Thorsten Naeser*

CALA chose system integrator **MESALOGIC** due to their knowledge of network infrastructure and their knowledge of and experience with **ICONICS GENESIS64**. **MESALOGIC** is a software company that advises its customers on all matters regarding SCADA and remote alarm management. **MESALOGIC**'s customers benefit from the company's team of highly qualified automation, information, and electrical engineers and their extensive knowledge and experience. The company also worked with **HIMA**'s Paul Hildebrandt GmbH to design a smart control and safety system for the joint project between Ludwig Maximilian University (LMU) and the Technical University of Munich (TUM). The **HIMA Group** is one of the world's leading independent providers of smart safety solutions for industry. With more than 35,000 installations of TÜV SÜD-certified safety systems worldwide, **HIMA** is considered a trusted partner to the world's largest companies in the oil and gas, chemical, and power generation industries. **MESALOGIC** then began working to develop HTML5-based visualization and control software tailored to CALA's sophisticated technology demands.

ICONICS Software Deployed

- **GENESIS64™**
- **KPIWorX™**

Realized Real-Time Benefits

The plant is coordinated from the control center via two computers and allows for two project teams to work simultaneously side-by-side without any complications. Once one of the lasers is logged into the system, the second group no longer has access to it; this security measure also applies to the caves. A complete overview dashboard

with status of the entire system is projected onto a large information monitor as well as on five display panels next to the respective doors of the five caves. This display setup prevents unauthorized and possibly accidental entry into an active experiment station and provides a completely transparent overview of all activities.

The **GENESIS64** SCADA system is used to configure all the settings for the experimental station. Every setpoint entered is clearly displayed in modern graphics, and all the information about the user, time, and date is automatically captured for a comprehensive audit trail. With the complete logging of all data, the experiments can be precisely analyzed at any point during the life of the experiment. Moreover, comparative values for follow-up tests to be conducted are available for use at any time. CALA's team also uses **KPIWorX** as their digital signage solution. Industrial PCs, which are mounted by the door of every laser cave, deliver a **KPIWorX** dashboard that provides an overview of the state of the cave and room where the laser mirror is located.

Conclusion

CALA reports that the laser system and test center function as expected and that the researchers are pleased with the reliability and safety the **ICONICS** platform provides in allowing top-notch laser research to be carried out in a safe and efficient manner. In addition, **MESALOGIC** and **HIMA** were able to rejuvenate the extensive technical infrastructure of the high-tech research facility with advanced process measuring and control safety (MSR) technology and smart control and visualization software.



Caves at CALA
Photo Credit: Mesalogic

“The **ICONICS** system has enabled us to create an ergonomic frontend for the control system and with **KPIWorX**, to create a smart digital signage solution for the entry to every experimental laser area.”

Adrian Schmidt
Managing Director
MESALOGIC GmbH