



Reference name: Reconstruction of theater equipment in the Silesian Theater in Opava

Supplier: ELVAC a.s.

Customer: OCHI - INŽENÝRING spol. s r.o.

Market segment: Electrical industry

Year of implementation: 2011

Introductory text:

In cooperation with the company OCHI-INŽENÝRING spol. s r.o., we implemented the order "Reconstruction of theatre equipment in the Silesian Theatre Opava" - electrical part.

Application description:

The goal of the reconstruction of theater technology in the Silesian Theater in Opava was the complete modernization of the control of electromechanical and linear hydraulic movements used for performances. The entire technology for stage technology is displayed on the MP377 multipanel with a 19" touch screen. The multipanel offers users the opportunity to archive individual performances thanks to an additional compact flash memory card, on which all created performances are recorded in the form of csv files. This allows operators to return to saved performances or create new ones, archive already created performances to a USB flash drive or even load performances back and save them to the mobile panel's memory from a USB flash drive. One saved performance can have up to 300 scenes. The user has the option of both separate runs with individual moves and runs with selected moves in synchronization. The control requirements resulted in the most advantageous use of the SIMOTION D control system.

All move control in the Silesian Theatre Opava is provided by two groups of SIMOTION D445-1 control systems with an extension for the PROFINET - IRT bus. The SIMOTION D series control system controls both electric and hydraulic pulls in a total of 48 controlled pulls, where each pull is equipped with a pair of measuring devices.

To ensure functional safety, a safety control system from the SIMATIC S7-300 CPU319F-3PN/DP series was used. The entire system is designed as distributed, consisting of ET200M decentralized peripheral units with safety modules. SINAMICS S120 frequency converters with integrated safety in SS1 drives and TM54F terminal module were used to control the electric drives. The PROFISafe layer for PROFIBUS-DP was used to ensure safe communication between the SIMATIC S7-300 control system and the drives. Siemens control systems were selected for the purpose of a comprehensive and unified control system concept for controlling theater technology. We managed to create a modern theater technology control of electromechanical and linear hydraulic pulls using the latest control elements based on Siemens control systems in a non-standard application - theater technology control.



Products and technologies used:

Siemens:

- safety control systems from the S7-300 series and SIMATIC CPU319F-3PN/DP
- application of safety functions in SINAMICS S120 inverters via PROFISafe and TM54F
- SINAMICS S120 frequency inverters
- SIMOTION D445-1 control system
- isochronous PROFIBUS-DP, PROFINET-IRT buses
- 1LA7 asynchronous motors
- visualization touch panel MP377 19", TP177B PN/DP

Bernecker Rainer - mobile panel MP50

Schneider Electric CZ, s.r.o. - switching technology

LAPP kabel s.r.o. - cable supply

Rittal Czech, s.r.o. - distribution boards

Weidmüller s.r.o. - terminal blocks

With the ELVAC a.s. solution, the customer gained the following benefits:

Repeatability of the performance with precise and synchronous movements to the desired position in the desired time.

Possibility of creating, editing and archiving the performance.

Increased functional safety of all newly delivered equipment – SIL 2.



