



POWER HYDRAULICS CONTROL SYSTEMS

ELECTROTECHNICS

project / realization / service





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Table of Contents

Introduction.....	3
1. Power hydraulics control - on land	4
_1.1 Project: Gdańsk Przegalina.....	4
_1.2 Project: Bridges in the city of Elbląg	5
2. Power hydraulics control - at sea	8



Introduction

More than 20 years of experience

Our company boasts more than 20 years of experience in designing and constructing control systems. Design, construction, installation, startup and maintenance - comprehensive „turnkey“ solutions for all projects. Offering high quality and professional service over the years, we have earned a large group of satisfied clients.

In-house production hall and design office

All designs developed by our design office are put into life by our in-house production hall. We are also capable of completing every project based on technical documentation supplied by the client.

For land and offshore industries

Our services are dedicated to the civil engineering and offshore industries. Our hydraulics control system will work perfectly both as part of new projects and within upgraded infrastructure.

Complete projects can be verified by a classification society, e.g. DNV



1. Power hydraulics control - on land

Systems designed to control power hydraulics are a very important element of each offshore and civil engineering structure. Control of a bridge or a boom-type conveyor belt should be entrusted to a company which provides comprehensive services - including design, construction, implementation, through to installation and startup.

1.1 Project: Gdańsk Przegalina

PLC supplied by ABB used in conjunction with a HMI and a distributed input/output module. Control of the bridge's power hydraulics (two primary pumps and one secondary pump for emergencies).

The hydraulics system consists of fixed-capacity pumps, and the speed of lowering the bridge is controlled by proportional valves (controlled by a REXHROTH card and a PLC) and a hydraulic pump activation sequence - our proprietary algorithm embedded in the PLC. We provide ongoing monitoring of pressure in the hydraulic system to make sure the differences between the actuators are the smallest possible to prevent damage to the bridge structure or an overload of the hydraulic system.





more information about the project: <https://an-elec.com/realizations/bridge-przegalina>

1.2 Project: Bridges in the city of Elbląg

This project posed an even bigger challenge than the previous one. First of all, each of the two bridges had two spans, and control of the bridges was performed from a single point (tower). Each bridge is autonomously controlled while exchanging a part of the information - e.g. weather data. The distance between the control room (HMI) and the PLC (placed in the supports) was 350 m, and the distance between the PLC and the remote input/output module was also 350 m (tunnel under the river). Each operation is recorded and reported by a dot matrix printer - for each bridge separately.

Applying controllers, HMI and input/output modules by MITSUBISHI, as well as the CCLink communication protocol, we were able to ensure faultless long-distance communication without the need to amplify the signal "on the way".

In the case of this project, we completed the design, built the switchgears, developed the software (bridge lowering algorithm), created a visualization and constructed the complete electrical installation.

Each support (each span) of the bridge is powered by its own hydraulic system, and the positions of the spans are recorded and sent to the PLC by inclinometers. The hydraulic system consists of variable-capacity pumps which are capable of adjusting the speed of each movement of the bridge lowering sequence without the need to use any proportional valves. Through a control card, each pump (two pumps are installed on each HPU - one of which is always in standby) receives signals from the PLC setting the capacity, with which the pump is to operate. This control type provides very "smooth" movements of each bridge actuator.





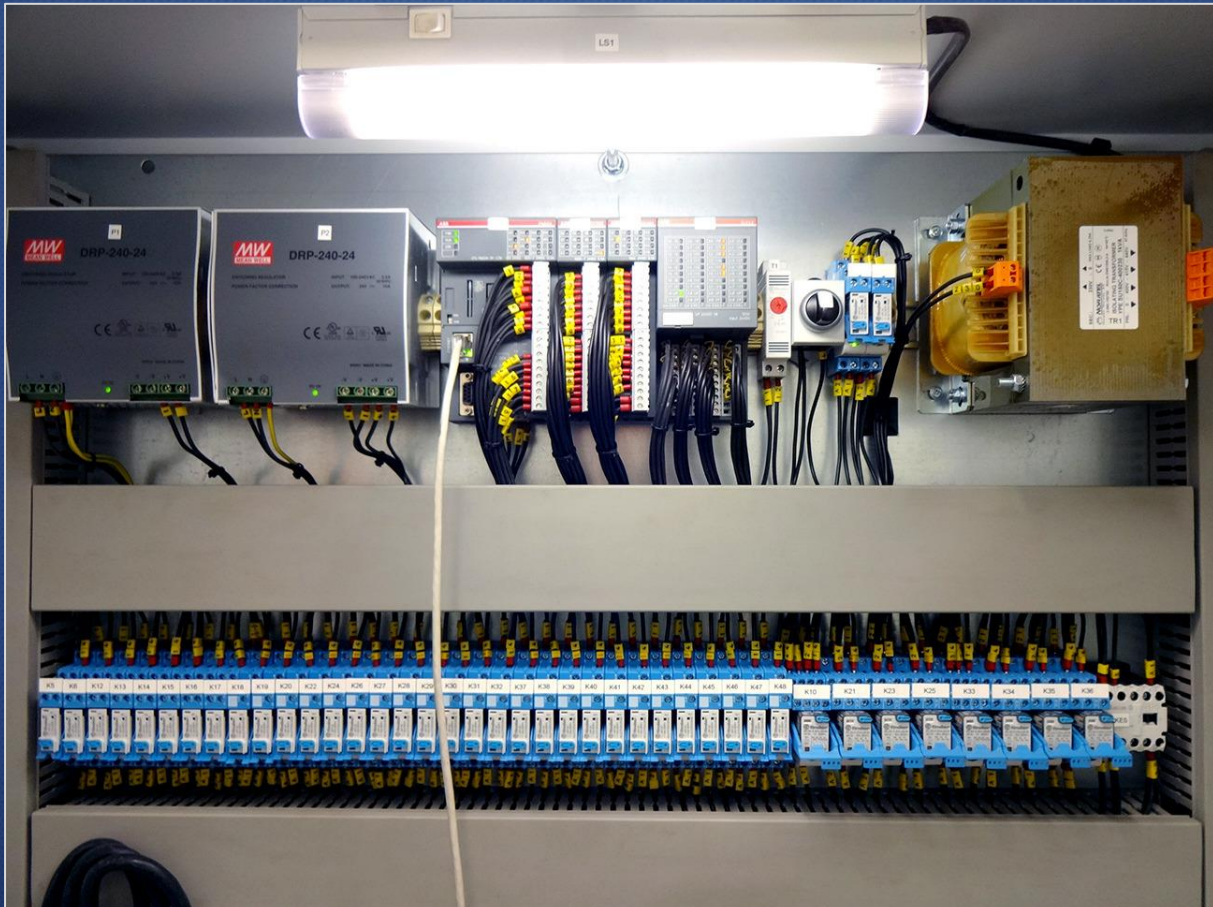
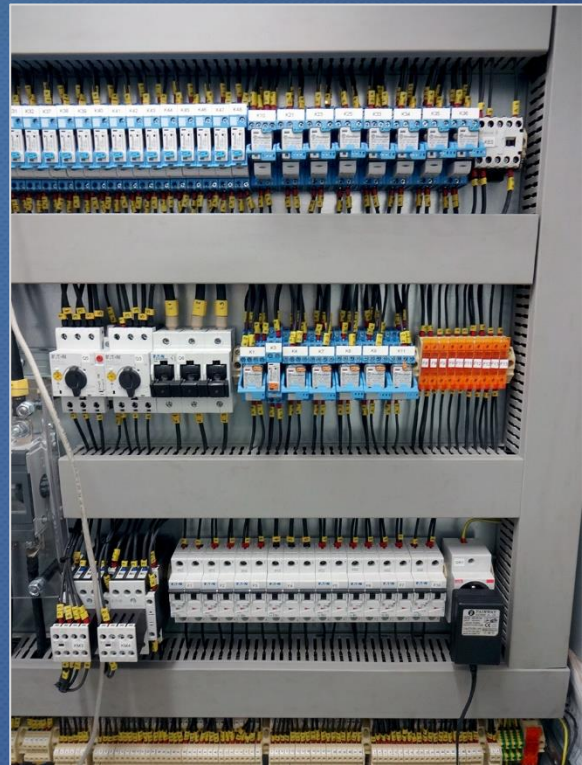
more information about the project: <https://an-elec.com/realizations/bridge-elblag>

2. Power hydraulics control - at sea

We have been developing offshore power hydraulics control systems for many years. We have successfully designed and constructed power hydraulics control systems for ships equipped with boom-type rotation and lift control systems - some of which are up to 70 m long. With an openwork installation of this size, it is necessary to ensure high smoothness of movements.

Furthermore, we have been developing automatic tensioning and tension control systems for conveyor belts, as well as control, locking control and door/bulkhead sealing pressure control systems for ship cargo holds.







Hutnicza 40
81-061 Gdynia, Poland

Tel.: +48 58 668 44 00

Fax: +48 58 668 44 00

Email: info@an-elec.pl

Web: www.an-elec.pl

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