

Your Innovator for Maximum Performance.

Digital Solutions

www.global-hydro.eu



Global
Hydro

Get the most out of your hydropower plant.



Global Hydro is a leader in the field of hydropower plant technology. We combine innovation, digitalization, and long-term thinking to provide state-of-the-art turnkey solutions.

Excellent guidance is provided from European headquarters at the heart of a strong global organization. We are your partner across the entire life cycle of hydropower projects; whether for new hydropower plants, digital solutions, lifetime service or for the revitalization of existing plants and turbines.

Your vision is our mission!

Enhance performance – with Digital Solutions.

With over 1,000 turbines in operation worldwide, our experience speaks for itself. We channel this expertise from production and operation directly into the development of innovative software solutions. We optimize the efficiency, reliability

and sustainability of turbines and plants with intelligent control, real-time data analysis, predictive maintenance and many other functions. This allows you to boost performance, minimize down-time, and maximize energy output like never before.

Discover the benefits of Global Hydro digital flow!



More efficiency

Maximize your output and streamline maintenance and operating costs with clear insights.



More reliability

Guarantee seamless operations and minimize downtime through predictive analytics.



More performance

Boost plant performance with machine learning and AI-driven optimization strategies.



Overall expertise

We are more than just a software provider – we are experts in all aspects of hydropower.



Data safety

Our commitment to cybersecurity and the safety of your data is unwavering. We undergo regular external audits and utilize the latest technologies.



Rapid assistance

Global Hydro experts are available to ensure issues are identified quickly, and problems are solved efficiently.



Digital revitalization

The installation of additional hardware on-site enables condition monitoring (e.g. of the bearings) and ensures the longevity of your hydropower assets.

Leading the field.

Our software solutions have been developed to take your hydropower plants to the next level – always tailored to your needs and challenges. Enhance the efficiency and reliability of energy production with innovative functions and an intuitive

interface using HerosControl, HydroxConnect and HydroxOptimize. We help you exploit the maximum potential of your infrastructure and accompany you on the path to a successful and sustainable future.



Step-by-step to a customized system.

Control, connect and optimize:

Whatever digital tools you require, our modular software suite supports you at the desired level. HydroxConnect and HydroxOptimize are fully compatible with

turbine and plant control systems from other providers and can be integrated seamlessly. We offer ideal solutions for specific needs – from reliable control to AI-based recommendations for optimized operation.

Time to boost performance.

Global Hydro software suite.



HerosControl

Take the lead!
All-in-one automation
for maximum efficiency

HerosControl is a customizable, fully automated turbine and plant control system that combines advanced visualization and SCADA features for intelligent operation.



HydroxConnect

Time to analyze!
Monitoring and
supervising made easy

HydroxConnect is an advanced IoT SCADA system that allows users to control, monitor, and analyze multiple power plants on one single platform. It also features a communication tool that connects you with Global Hydro experts.



HydroxOptimize

Time to be smart!
Increasing performance
with data intelligence

HydroxOptimize uses machine learning to assist with operation, troubleshooting, predictive maintenance, and data analysis. While the system leverages AI, you are always connected to Global Hydro experts.

HerosControl



Take the lead!

HerosControl is a versatile, standardized software solution that can be customized to meet the unique needs of your hydropower plant. This fully automated turbine and plant control system integrates advanced visualization and SCADA features, offering a complete and intelligent control experience.

HerosControl facilitates easy on-site configuration of operational parameters, allowing the system to perform perfectly – far beyond the basic functions of a traditional turbine governor.

See how HerosControl guarantees next-level efficiency!



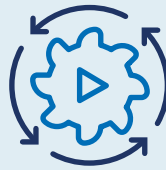
All-in-one automation for maximum efficiency.



Turbine



Hydraulic steel
construction



HerosControl



Switchgear



Generator



Intelligent control of
hydraulic and generator
components



Vibration monitoring



Configuration of
operational parameters

HydroxConnect

Time to analyze!

HydroxConnect is a cutting-edge IoT SCADA system that empowers investors, plant owners, and operators to control, monitor, and analyze all their power plants seamlessly on a unified platform.

By utilizing the power of cloud infrastructure, each plant sends its live and historical telemetry data, asset status overview and critical notifications in real time – enabling comprehensive parallel oversight of multiple plants.

This tool integrates seamlessly and is compatible with any turbine control system, regardless of the provider.

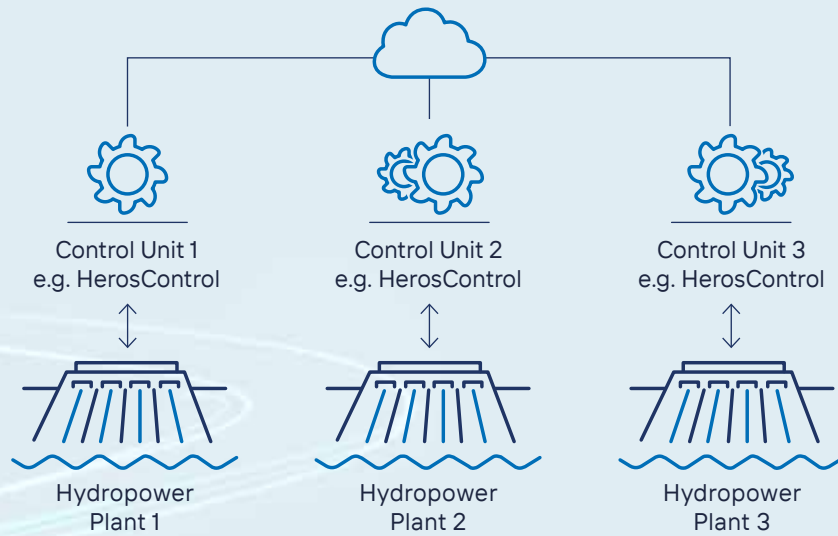
The smart way to web-based fleet monitoring, plant control and management platform for PC or mobile devices – wherever you want!



Monitoring made easy.



Communication tool and chatbot to stay connected with Global Hydro experts.



Monitor and prioritize actions across your entire fleet of hydropower plants.



Improve decision-making by visualizing the most relevant data for specific requirements with customized dashboards.



Increase operational efficiency with centralized monitoring and control from a single location, whether on a mobile device or a PC.

Prevent costly downtime and extend the lifespan of equipment by addressing issues before they escalate.



HydroxOptimize



```
# Add horizontal line at quantile y
annotation_y = 0.5 * quantile_y + 0.5 * percentile_y
annotation_text = 'max = {quantile_y}'

fig.add_hline(y=quantile_y, line=dict(color='black', dash='dash'), row=1, col=1)
fig.add_hline(y=quantile_y, line=dict(color='black', dash='dash'), row=1, col=2)

# Update y axes label for the first column
q1 = y_fleet.quantile(0.25)
q3 = y_fleet.quantile(0.75)
upper_fence = q3 + 1.5 * (q3 - q1)
upper_box_limit = min(upper_fence, y_fleet.max())
lim = 1.1 * max(pdf_tag['value']).max(), upper_box_limit)

update_yaxes(title_text = tag_label, range=[0, lim], row=1, col=1)
```

Time to be smart!

HydroxOptimize is the final expansion stage our Digital Solutions! As part of our comprehensive maintenance package, this machine learning based service assists you with operation, troubleshooting, and data analysis to minimize downtime as well as to optimize efficiency.

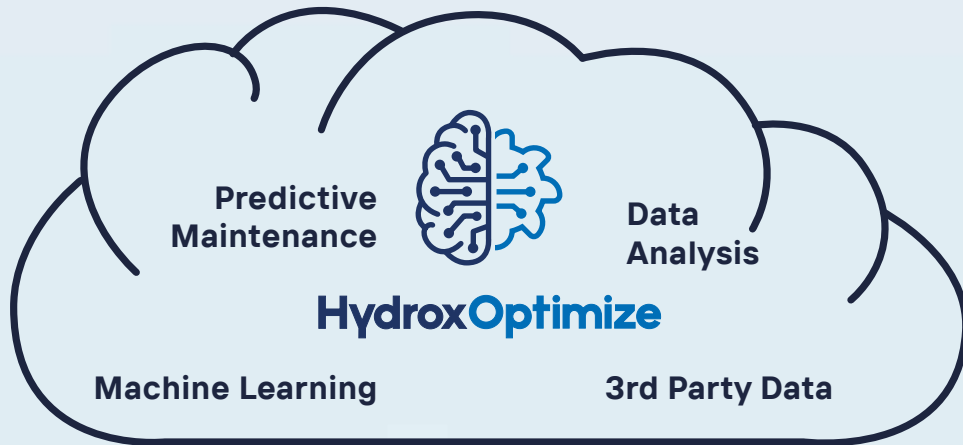
HydroxOptimize keeps plant running consistently at peak performance with data analytics, machine learning models and expert recommendations - regardless of the control system or provider.

Let us help you stay ahead of any challenges and maximize your plant's performance!



Receiving expert recommendations in a regular report.

Increasing performance with data intelligence.



Benefit from our data base of hydropower plants worldwide.



Continuous analysis of operational data to identify unusual patterns and deviations, allow our experts to deliver proactive recommendations.



Minimize inevitable downtime and optimize efficiency to forecast the end of the equipment's lifecycle accurately.

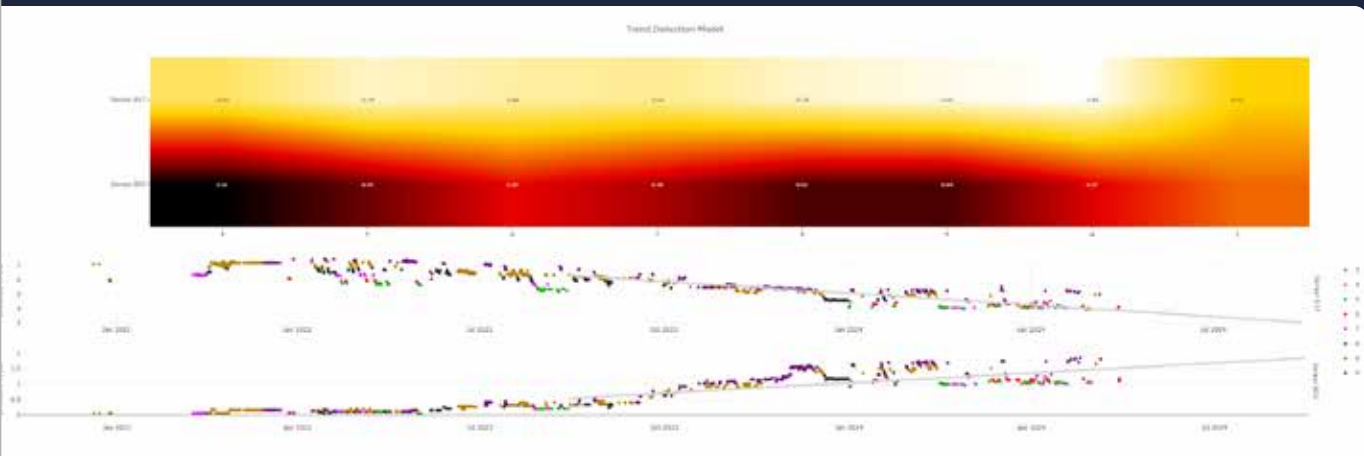
Proven service for maximized hydropower efficiency.

HydroxOptimize has proven its reliability and effectiveness in countless hydropower plants around the world. This innovative software integrates seamlessly with systems to provide accurate data analysis, real-time monitoring,

and intelligent control to maximize performance and reduce downtime.

Join the many operators who trust HydroxOptimize to boost their hydropower potential!

Use case 1 Identifying potential issues: Wear of gap rings.



The challenge

Unplanned downtime at hydropower plants results in significant costs and operational inefficiencies. Operators face the challenge of detecting potential problems early enough to make timely repairs and avoid system failures.

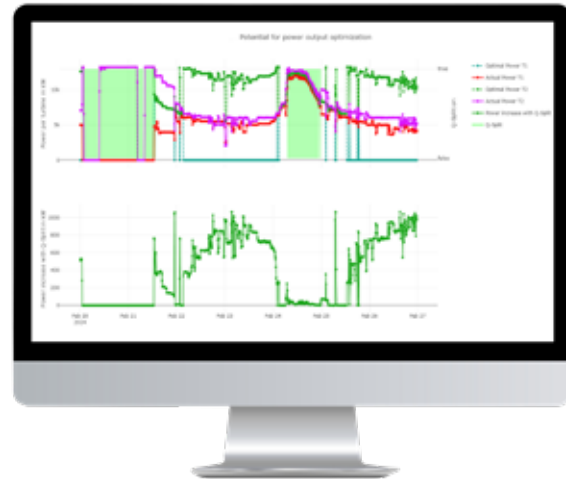
The solution

Using state-of-the-art machine learning technology and statistical analysis, HydroxOptimize identifies potential issues accurately. For example, our system detected an abnormal pressure increase behind a labyrinth seal and predicted repair necessity more than six months in advance.

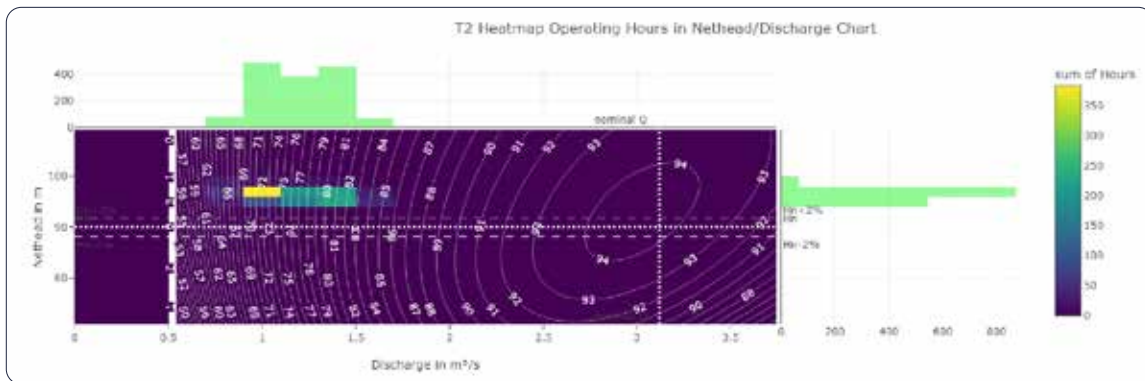
The benefit

Proactive analysis enabled the customer to schedule the repair and restore the turbine to full efficiency before an unplanned outage occurred. This saved time and money and prevented unnecessary downtime.

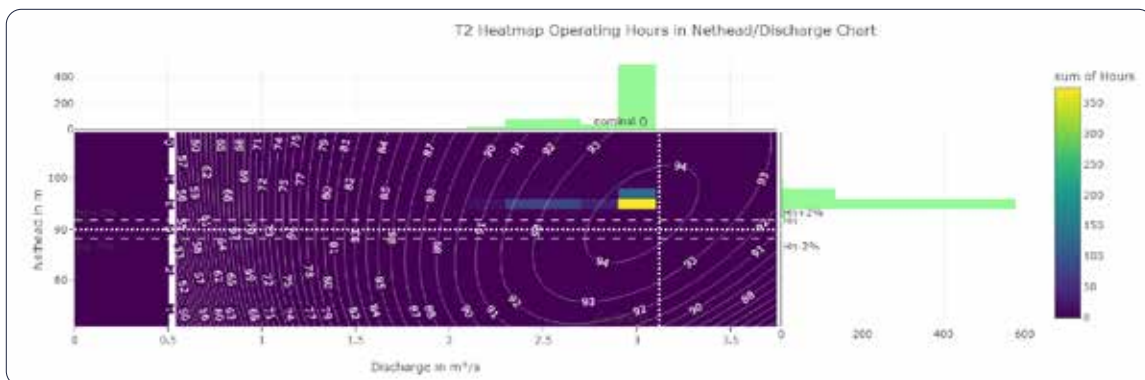
Use case 2 Operational optimization: enhancing energy efficiency with Q-Split.



Potential power output with Q-Split



Inefficient partload operation turbine 2



Optimal operation turbine 2

The challenge

To maximize energy output, operators must avoid inefficient part-load operation and ensure that their equipment is running at the highest possible efficiency. Manual monitoring and adjustment during operation is a major issue.

The solution

The HydroxOptimize Q-Split algorithm solves this problem by optimizing distribution of discharge across the turbines, automatically ensuring maximum energy efficiency.

The benefit

Several customers have produced hundreds of MWh more per year by using this solution to avoid unnecessary part load operation. This allowed them to reduce operational costs and maximize energy output – with a fully automated and highly efficient solution.

Your challenges. Our mission.

Hydropower operators face a wide range of challenges – from reliable control to optimizing performance and maximizing efficiency. Global Hydro provides the tools you need to overcome these obstacles.



	HerosControl		
	ADVANCED CONTROL (TURBINE & GENERATOR)	FULL POWER PLANT AUTOMATION	FLEET MONITORING AND MANAGEMENT
MINIMIZING RISKS			
Unplanned downtimes and aging infrastructure	Proven, stable and reliable system	–	–
Retirement of experienced workforce	–	Designed for fully unmanned operation	Management of whole fleet from any location
Managing maintenance and the need for demand-driven upgrades	–	Implemented maintenance notifications	–
OPTIMIZING OPERATIONS			
Maximizing energy output	Basic discharge management	–	–
Production scheduling such as day ahead forecast	–	–	Interacts with operation at anytime
Reducing wear from factors like sediment and cavitation	–	Easy adjustment to changing conditions	–

Discover how this innovative software suite addresses unique needs to drive your hydropower plant towards a more efficient, successful, and sustainable future.

HydroxConnect		HydroxOptimize		
SUPPORT PLATFORM	DATA ANALYSIS PLATFORM	FLEET AUTOMATION AND OPTIMIZATION	MACHINE LEARNING MODELS	EXPERT REPORTS & RECOMMENDATIONS
—	Easy trend analysis	—	Identifying potential issues	Expert-driven analysis and actionable recommendations
Quick and easy access to Global Hydro experts	—	—	Minimizing manual inspections	Guidance from hydro specialists
—	—	—	Demand-driven upgrades	—
—	Recognizing deviations and deriving suitable actions	Advanced energy and discharge management	Detecting performance decay and optimizing performance limits	Identifying operational inefficiencies
—	—	Enabling modern energy markets	—	—
Smart connection to comprehensive knowledge	—	Optimal economic balance between production and wear	ML based sediment detection	—

Visionary power. Wherever you want.

Hydropower Plants

**Your technology leader for
water-to-wire.**

From design to implementation and commissioning of plant and turbines – we guide you through every step of the process. Our customized solutions are crafted to meet your specific needs and ensure seamless integration.

Revitalization

**Your expert for powerplant
upgrades.**

We upgrade existing systems to the latest standards, offering enhancements that boost the efficiency, reliability, and sustainability of your plant.

Lifetime Service

**Your partner for maximum
availability.**

We ensure that hydropower systems operate at their peak throughout their entire lifespan. We provide proactive monitoring, expert maintenance, and timely upgrades.



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