

## Driving Sustainability: Hach's Real Time Control Enhances PreZero's DAF Process

### Problem

DAF units are essential for cleaning industrial wastewater, but unpredictable conditions often lead to reduced treatment performance. Traditional methods like visual checks and manual sampling struggle to control the process. This often leads to unnecessarily high chemical use, unnecessarily high disposal costs, and additional challenges for downstream processes.

### Solution

The Hach<sup>®</sup> RTC-DAF module is ideal here! This smart system, built into a SC4500 transmitter, uses real-time data to fine-tune chemical dosing and optimise solids removal. The result? Clearer water, less chemical waste, and a more efficient process.

### Advantages

With the RTC-DAF, the plant achieved consistently clean water, reduced chemical consumption by 18%, and made operations easier for the team. Furthermore, Hach's expert support ensured that everything ran smoothly.

### PreZero Process Water Treatment Plant

PreZero operates numerous sites across Europe and is a leader in the field of circular economy. At its Austrian facility, PreZero Polymers Austria GmbH operates a modern recycling plant for plastic packaging, where three flotation units play an important role in the process water treatment by efficiently separating solids (Figure 1).

Process water from the plastic washing line, with a flow rate of 120–150 m<sup>3</sup>/h, is collected in a central basin before passing through sieves and into a settling tank. From there, it is pumped to the DAF units, where coagulants and flocculants are automatically dosed. The floated sludge that forms at the surface is removed by scrapers and pumped to silos for further dewatering. The treated water is collected in a clean-water tank and returned to the washing process, enabling a high level of water reuse and operational efficiency.

To further enhance sustainability, improve process stability, and reduce chemical consumption, the plant implemented the Hach RTC-DAF real-time control system—a smart automation solution designed to optimise DAF performance and resource efficiency.



Figure 1: DAF unit of the PreZero process water treatment

## Problem

DAF units are capable of removing particles with a diameter larger than 25 microns from the feed water without the use of chemicals. When coagulants (PAC) and polymers are automatically added, even finer particles below 10 microns can be effectively removed.

At PreZero, chemical dosing was manually controlled via pumps, with the dosage set in proportion to the feed water flow. pH was monitored at two points and adjusted by regulating acid and base dosing pumps. However, manual polymer and coagulant control based solely on flow, visual inspection, or grab sampling did not provide an optimal or consistent process control.

Because influent load conditions can fluctuate within minutes, operators found it challenging to maintain stable treatment performance and to identify a reliable solution for adjusting coagulant and flocculant.

## Solution

The Hach RTC-DAF (Real-Time Control) system optimises DAF performance by intelligently balancing chemical dosing with fluctuating plant load conditions to maximise solids capture and ensure consistently clear effluent water. Integrated into the SC4500 transmitter, the system uses Hach Solitax sc TSS probes installed in the DAF feed and effluent streams to continuously monitor solids loading and effluent quality. Based on these real-time measurements, the RTC-DAF automatically adjusts coagulant and flocculant dosing to maintain the target effluent

TSS setpoint, delivering greater process stability, improved sludge quality, and enhanced overall treatment efficiency (Figure 3)—see next page.

Using a combination of feed-forward and feedback control, the RTC-DAF adjusts a required specific dose rate and automatically fine-tunes to account for changing sludge structure and chemical effectiveness. Typical outputs include flow rate setpoints for coagulant and flocculant dosing, which can be sent directly to chemical feed pumps or the PLC. Users can define minimum and maximum limits, pH influence, and chemical concentration parameters, allowing the system to adapt precisely to plant conditions.

To further support optimal coagulation, the inflow pH can be automatically adjusted to a user-defined value. If the pH remains outside the acceptable range, chemical dosing is temporarily paused to ensure consistent treatment quality. Should input signals such as inflow or TSS data become unavailable, the system seamlessly switches to fallback strategies to avoid a decline in process stability.

All measurement and control data are transmitted to the PLC via Profinet, ensuring reliable integration. Through Hach's secure, cloud-based Mobile Sensor Management (MSM) platform, the Remote Service Team continuously monitors performance, provides proactive optimisation, and offers expert support—helping the plant maintain efficient, stable, and sustainable operation.

Figure 2: Application diagram of RTC-DAF

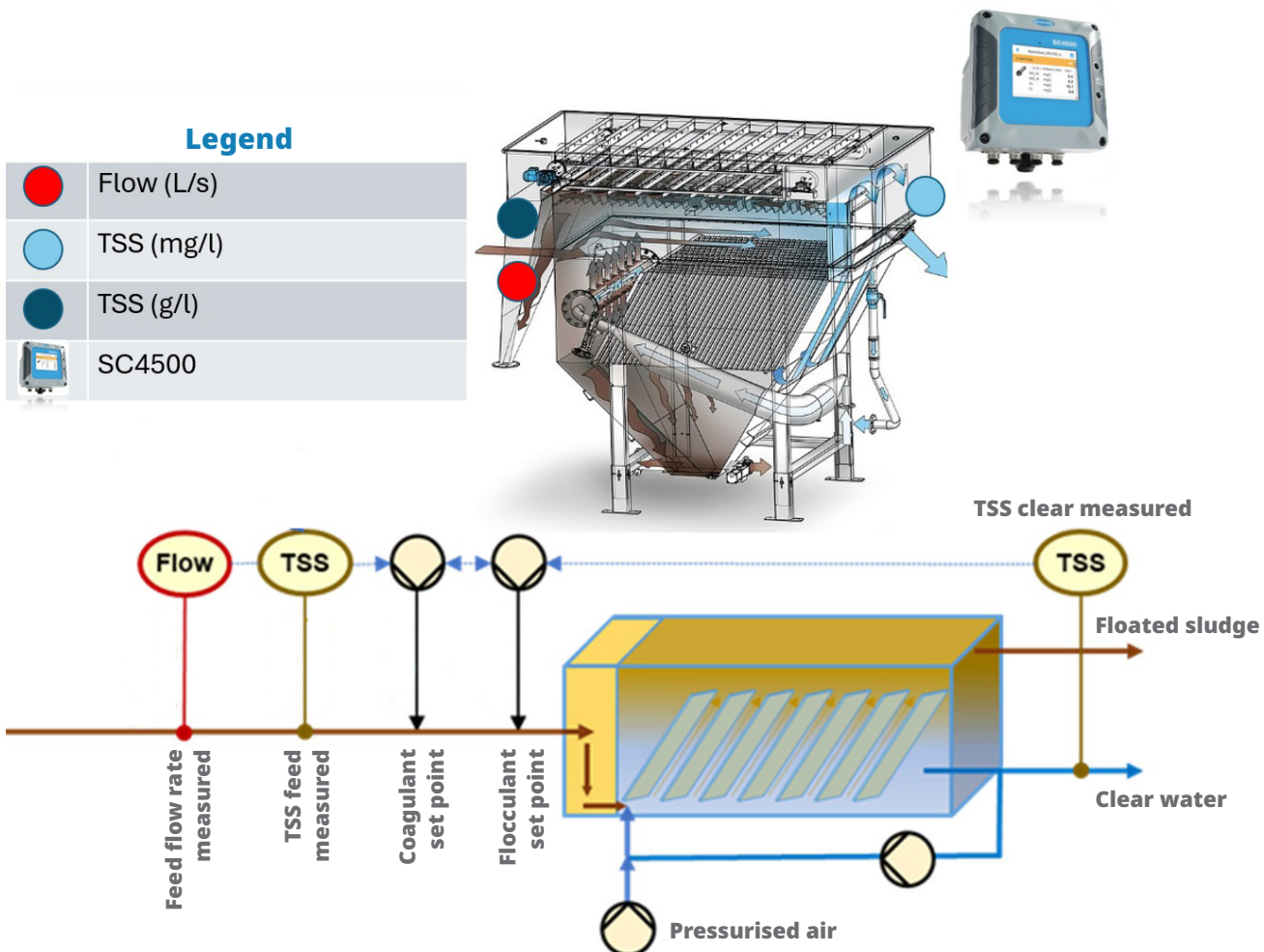
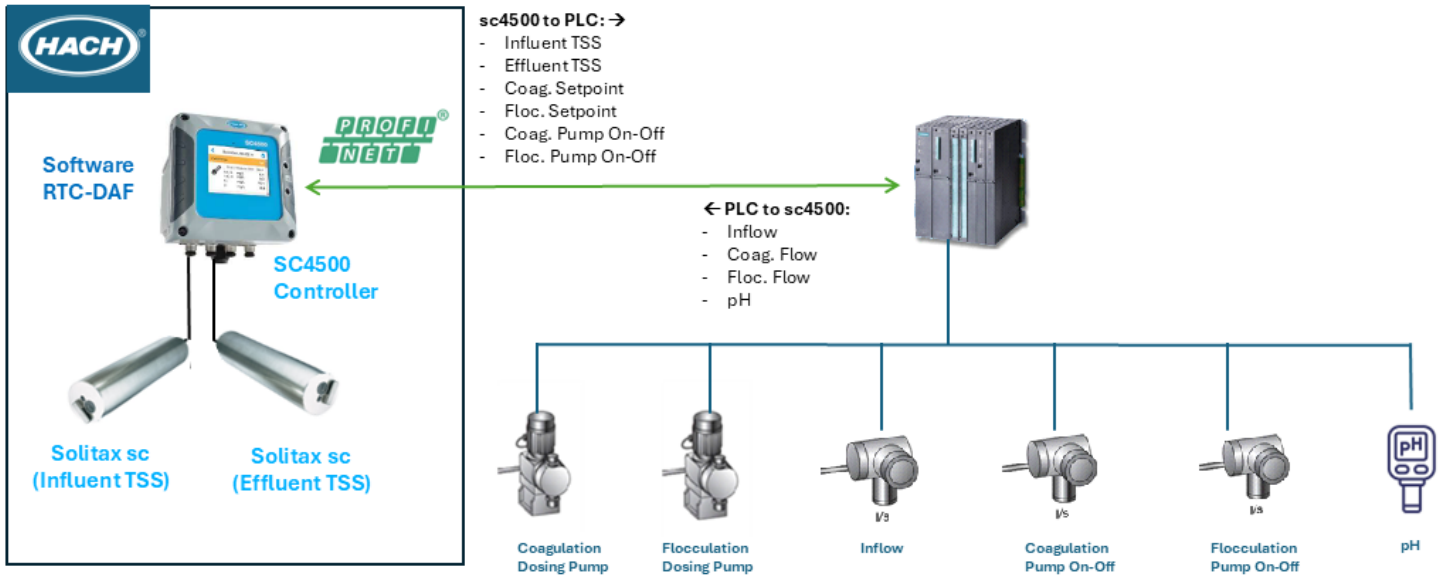


Figure 3: Installation overview

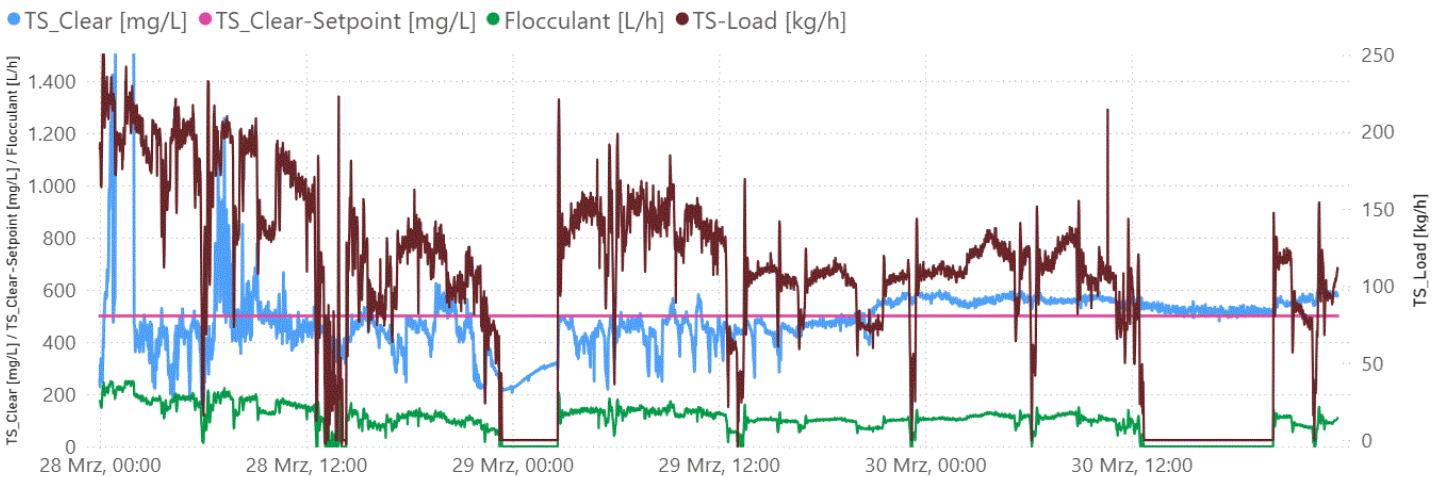


### Results

After commissioning the RTC-DAF system, configuring control parameters, and calibrating the probes, the target TSS value for clear water was set at 500 mg/L. The controller automatically established a feed-forward dosing rate for coagulants and flocculants in real time and continuously refined it through feedback adjustments to maintain the desired effluent water quality.

As shown in the figures below, the RTC-DAF system can maintain or even reduce the desired TS concentration in clear water by adjusting the chemical dosage depending on the load. This results in stable operation, improved sludge quality and a significant reduction in chemical consumption—and thus greater operational and cost efficiency.

Figure 4: Profile of TSS measurements, set point for effluent, and flocculant dosing



## Distribution TSS Clear

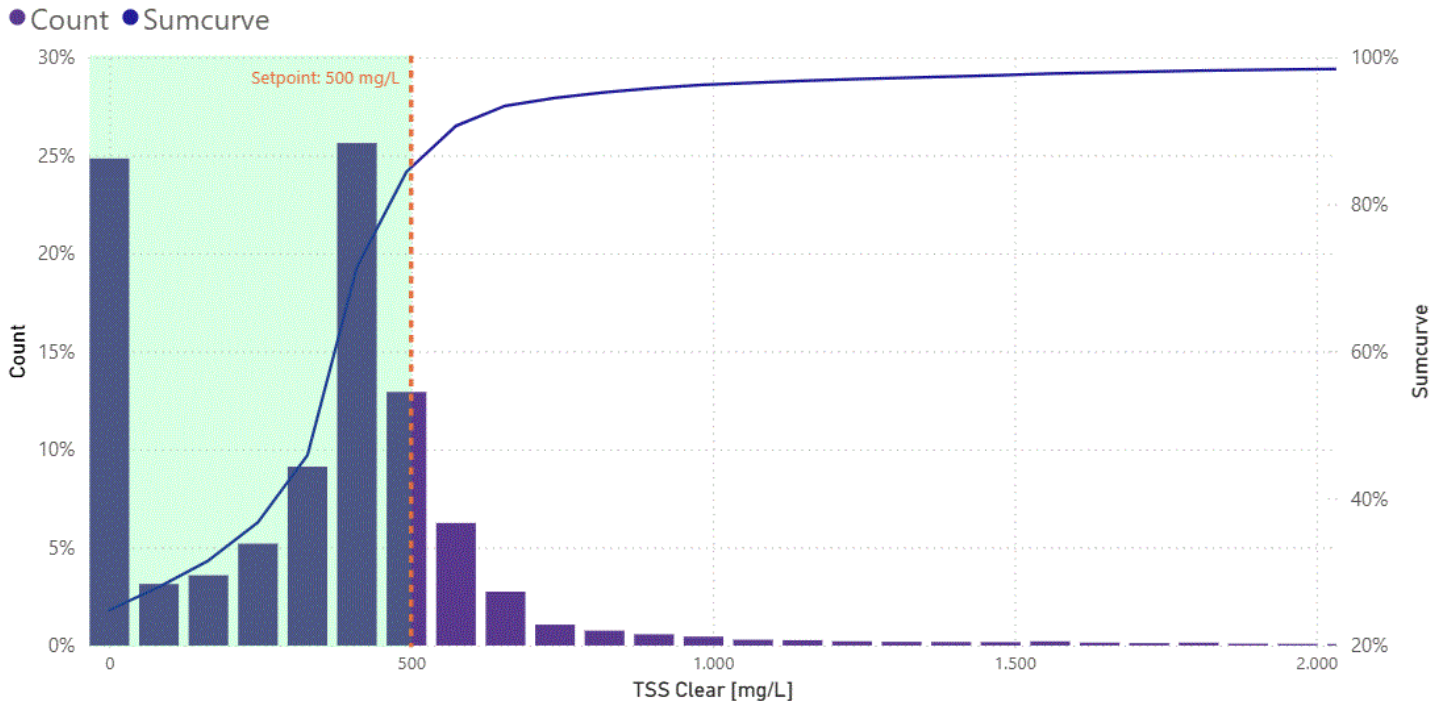


Figure 5: Average TSS Clear Value and Distribution

## Conclusion

The RTC-DAF system was quick and easy to install, upgrading the existing DAF units to a state-of-the-art automated control solution. All measurement and control functions are managed through Hach's cloud-based MSM platform, allowing operators to monitor performance in real time and adjust key parameters remotely for maximum flexibility and process transparency.

By maintaining clear water quality consistently below the target value, the RTC-DAF delivered measurable performance improvements. The intelligent control prevented overdosing, reduced excess sludge, and optimised solids capture efficiency.

On average, the monthly TSS in the treated water reached 478 mg/L, while chemical consumption was reduced by 18% compared to conventional operation, achieving both cost savings and sustainable process optimisation.

**Author:**  
**Metin Baran**  
 Remote Monitoring and  
 Application Specialist  
 Hach Lange GmbH

