



Features

Designed specifically for the automation of activated sludge processes, the ASASC system has the following unique features which are aimed at improving reliability and increasing efficiency:

- ❖ **Storm flow management** If clarifiers are overloaded with solids during a storm, the ASASC system changes the control algorithm to avoid a solids spill.
- ❖ **Optimization of blower operations** The ASASC system minimizes the energy needed to supply the air. This is accomplished by always maintaining the minimum air pressure needed to sustain the necessary airflow at any given time.
- ❖ **Optimization of pumping operations** The ASASC system minimizes the energy used by the return sludge pumps. This is accomplished by maintaining the minimum hydraulic pressure needed to sustain the necessary sludge return flow rate at any given time.
- ❖ **Equalization of flow distribution among process units** The ASASC system improves clarification by providing uniform solids loading among the clarifiers. It also provides uniform flow distribution among the aerators.
- ❖ **Equalization of solids concentration among aerators** Sometimes, because of flaws related to design or specifics of installed equipment, solids concentration among aerators is unequal. This inequality causes treatment inefficiency. A special control algorithm within the ASASC system is aimed at equalizing the solids concentration among aeration tanks.
- ❖ **Serving as an expert system** The ASASC monitors process conditions and treatment efficiency, informs operators about significant changes, and advises operators about potential causes of these changes. ASASC is an expert system that helps operators maintain peak performance of the activated sludge process. A sophisticated algorithm utilizing a combination of nonparametric statistics, the IAWQ activated sludge model, and fuzzy logic is used for this purpose.



Ekster and Associates, Inc.
1904 Lockwood Ave.
Fremont, CA 94539
Phone (510) 657-7066
Fax (510) 226-7131

The premier off-the-shelf automation system designed by activated sludge process control experts for the wastewater treatment industry

Implementation

The ASASC system is implemented on a stand-alone PC and can control processes directly or be used as a supervisory control system for the existing plant wide control. The open computer architecture of the ASASC system allows it to communicate with any brand of instrumentation and control hardware, using analog or digital protocols, including OPC, Modbus, and others.

Ekster and Associates offers two ASASC control packages:
 ❖ **ASASC S** This package includes software modules for control of activated sludge parameters. This package provides freedom of choice for instrumentation selection as long as instruments meet our specification.
 ❖ **ASASC TS** This package provides a total solution for automatic control of the activated sludge process and includes both control software modules and necessary instrumentation.

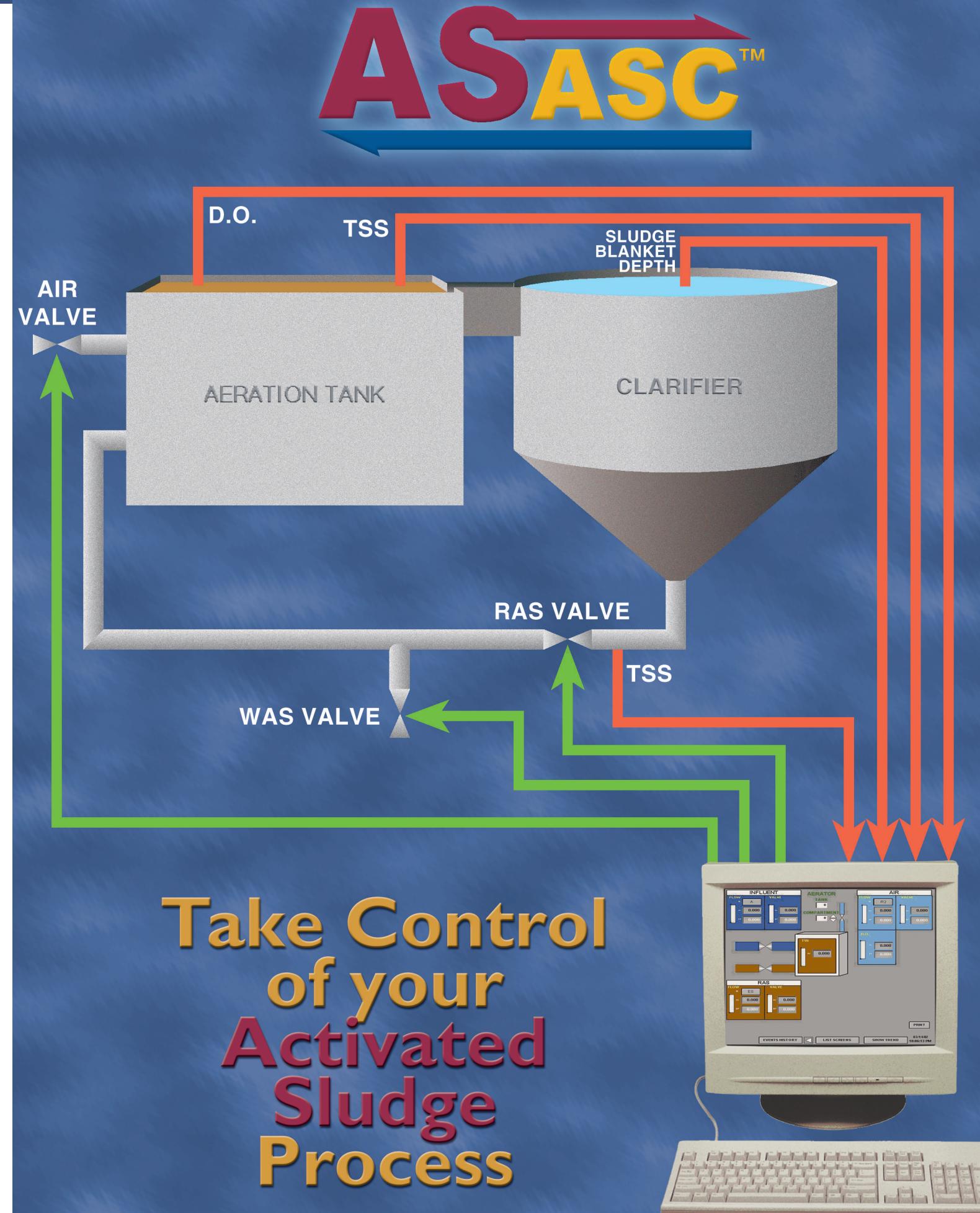
Service

ASASC is accompanied by an unparalleled customer support program designed to help operators of the activated sludge system take full advantage of this revolutionary product. Ekster and Associates offers a full range of services including unique SRT, D.O., and sludge depth optimization.

OUR TRIPLE GUARANTEE:

1. ASASC will improve activated sludge and sludge thickening processes.
2. ASASC will reduce operating costs.
3. ASASC will identify potential process control problems and will suggest possible solutions.

visit
www.srtcontrol.com
for more information



ASASC™ Automation Solution for Activated Sludge Control

ASASC is the world's first turnkey integrated system developed specifically for automatic control of the activated sludge process. The ASASC system is a perfect fit for new and existing treatment plants that want to improve efficiency and reliability of the activated sludge process. Designed with a combination of wastewater treatment process, control theory, and equipment expertise, ASASC is an ideal tool which addresses the challenges and yields the benefits of automation.

The Benefits of Activated Sludge Control Automation

ASASC includes software modules for automatic control of oxygen (air) supply, waste flow, and return clarifier sludge flow. Automating control of each process parameter yields numerous benefits.

Automating oxygen supply using dissolved oxygen (D.O.) criterion yields:

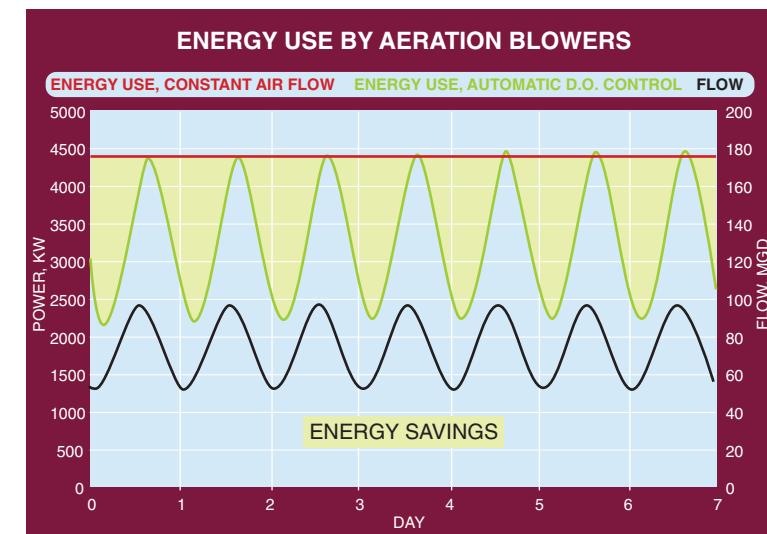
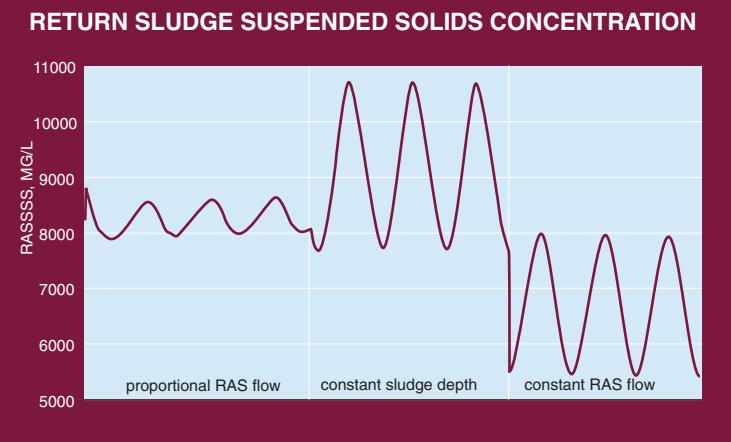
- energy savings by correlating oxygen supply with oxygen demand
- improved treatment efficiency by maintaining constant pollutant removal rate
- improved nutrient removal by limiting the amount of oxygen bled to anaerobic and anoxic compartments
- filament control by selecting floc forming organisms under constant optimum D.O. conditions

Automating waste flow using solids retention time (SRT) criterion yields:

- efficient and reliable treatment by maintaining a constant Food-to-Mass ratio
- filament and foam control by selecting floc forming organisms under a constant Food-to-Mass ratio
- reduced cost of thickening by maintaining stable mass loading on the thickening facility
- reduced energy consumption by maintaining the optimum amount of biomass
- improved nutrient removal by providing a stable microbiological environment for nitrification, denitrification, and phosphorus removal.

Automating clarifier return sludge flow using sludge blanket depth criterion yields:

- reduced effluent TSS and BOD during high flow events by maintaining a constant sludge blanket
- reduced thickening cost by maintaining an increased sludge concentration during times of reduced sludge loading to the clarifier



ASASC Addresses The Challenges of Automatic Control

According to a survey of more than 500 wastewater treatment agencies, only half the parameters at wastewater treatment plants are controlled automatically; and of that half, only half of the control loops are currently in operation. The reasons for such low numbers are the many technical challenges associated with control of wastewater treatment processes. ASASC addresses these challenges using a combination of activated sludge mathematical modeling, statistical analysis, and fuzzy logic.

| CHALLENGE | SOLUTION |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Instrumentation | The ASASC system automatically detects malfunctions, notifies operators, and temporarily switches to a "safe mode." ASASC detects malfunctions using an algorithm that utilizes nonparametric statistics, the International Association of Water Quality (IAWQ) activated sludge mathematical model, and fuzzy logic. |
| Valves | The ASASC system utilizes a specially designed automatic algorithm that monitors the "health" of all valves, informs operators of problems, and switches to a "safe mode" when necessary. |
| Control Loop Tuning | The ASASC system utilizes a combination of feed-forward and PID algorithms. The feed-forward algorithms utilize the IAWQ activated sludge mathematical model and regression analysis, are adaptive (self-learning), and do not require tuning. The PID algorithms require minimum field tuning because they are pretuned using the IAWQ computerized model of the customer's activated sludge process. |
| Control Loop Interaction | The ASASC system utilizes proprietary cascade control algorithms. These algorithms take into account not only the highly interactive nature of the control loops but also the differences in dead time and time constants of the primary, secondary, and tertiary control loops. |

