



AQUA-AEROBIC SYSTEMS, INC.

IntelliPro[®]

MONITORING AND CONTROL SYSTEM

IntelliPro®

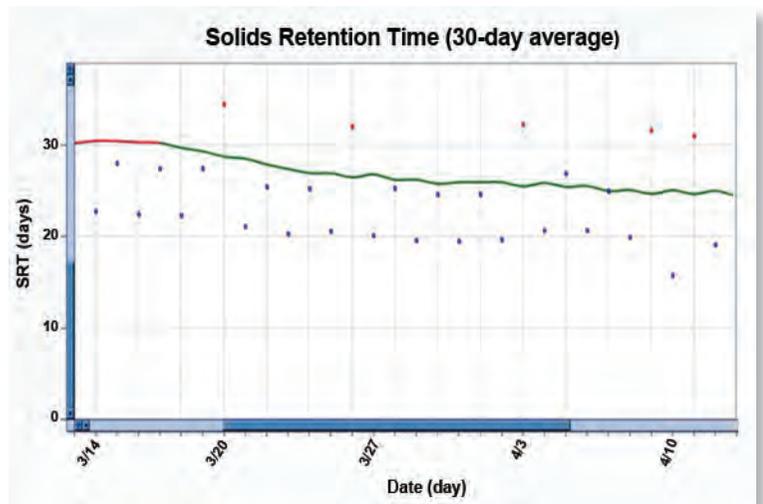
MONITORING AND CONTROL SYSTEM

The demands on wastewater management continue to require higher standards of treatment resulting in the need for time intensive plant optimization. Aqua-Aerobic Systems offers a solution to these challenges with the IntelliPro monitoring and control system. By combining expertise in system integration with decades of experience in biological treatment, the IntelliPro system offers optimum process performance with minimal operator attention.

The IntelliPro system is a personal computer (PC) based program that interfaces with the biological system's programmable logic controller (PLC) via a network connection. The combination of process monitoring with integrated comparative analysis and proactive control of the process makes the IntelliPro system a powerful process optimization tool. The system is designed to offer an essential link between operations, equipment and treatment objectives, influencing the treatment process by proactively responding to changes as they occur. Real-time process troubleshooting and operator guidance is provided through the comprehensive BioAlert® process notification and optimization program. The IntelliPro system efficiently manages plant performance by assisting operators in optimizing the treatment process and further reducing energy and operating costs.

System Features and Advantages

- Calculation of key process operating variables
- Active (Automatic) or Passive (Monitor) system adjustment to enhance energy efficiency and process control
- Real-time and historical graphical process trending; trends are stored so the operator can compare day-to-day operation to determine how the system is performing
- All settings are user-friendly and adjustable to provide flexibility of the system's operation
- Reduces operator's sampling time
- BioAlert™ process notification provides corrective action to reduce operational interruptions and upsets
- Online operation and maintenance support
- Remote troubleshooting available for on-demand assistance



Graphical representation of calculated process parameters, including a daily average, helps the operator monitor process performance over time.

IntelliPro® Operation

Process information is gathered from the in-basin instrumentation. The system interprets the data and performs process calculations that assist the operator in improving the process performance.

Reacts to system conditions by proactively making changes to the process. The operator can choose to let the IntelliPro system make a change or simply be notified of a potential change.

Operating parameters are calculated at regular intervals. Data is analyzed and evaluated through algorithms in the IntelliPro system, allowing a powerful array of process monitoring and automatic control functions for optimum process management.



IntelliPro® Screen Captures Displaying Typical Features

IntelliPro® Options

IntelliPro systems can be utilized in Aqua-Aerobic treatment processes, or other applications with the Flow Characterization IntelliPro system.

Aqua-Aerobic Treatment Processes

IntelliPro systems are customized for all Aqua-Aerobic biological treatment systems. The system provides monitoring and control of the most common treatment plant operating parameters. This can include dissolved oxygen (D.O.) control, solids management, pH/temperature monitoring, cycle control, and enhanced troubleshooting and trending. In addition, operators can benefit from the calculations of the key process operating variables such as food to mass (F/M) ratio and solids retention time (SRT).

IntelliPro systems can be customized to meet strict nutrient removal requirements. Automated control of nitrate, ammonia, oxidation reduction potential (ORP), and phosphate is featured in the system. This promotes optimization of aerobic, anoxic and anaerobic periods to enhance nitrification, denitrification and phosphorus uptake, and also allows for automated control of chemical addition (metal salt and supplemental carbon) based on process requirements.

IntelliPro systems are available with these Aqua-Aerobic treatment processes:

- AquaSBR® Sequencing Batch Reactors
- AquaPASS® Phased Activated Sludge Systems
- Aqua-Aerobic MBR® Membrane Bioreactors
- Aqua MixAir® Aeration Systems

Flow Characterization IntelliPro® System

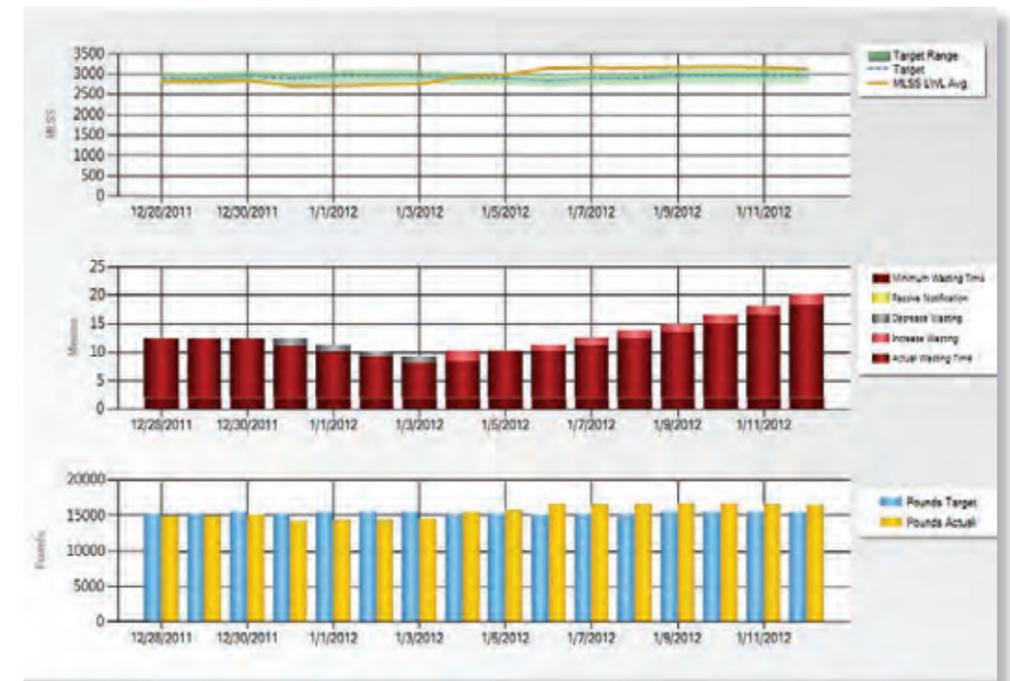
The Flow Characterization IntelliPro system offers full statistical analysis of the influent, effluent and/or recycle streams. Applications include wastewater treatment, drinking water treatment or other custom applications. The system allows for comparison of specified conditions and defined (or required) parameters. This includes but is not limited to Mean (Average), Standard Deviation, Coefficient of Variation (Cv), Variance (v), and Percentiles. The Flow Characterization system can complement other IntelliPro systems, or it can be added as a stand-alone module.

System Status and Process Calculations



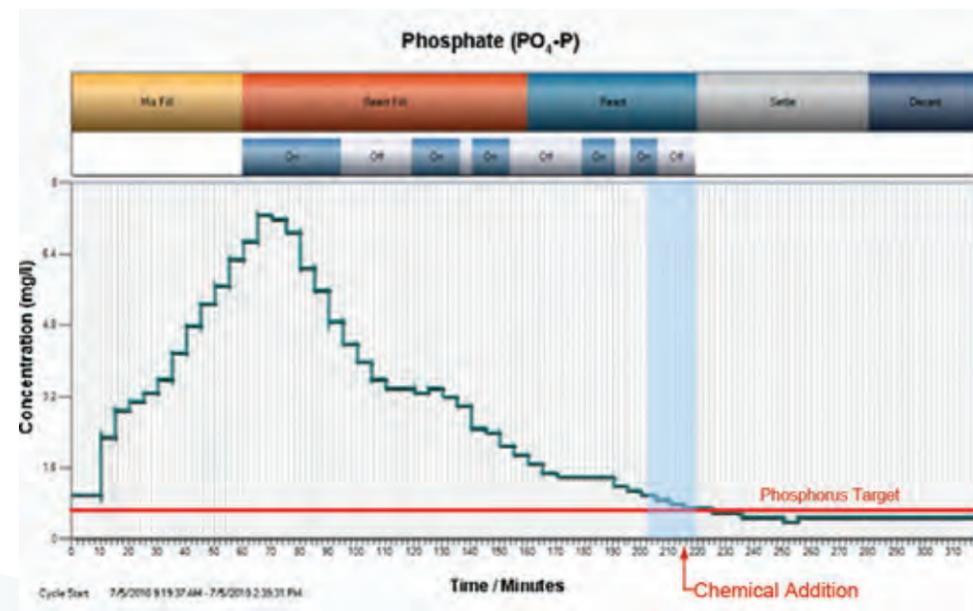
Real-time in-basin parameters, calculated process parameters, and current phase of each basin are always displayed on the Reactor Conditions screen. Data is stored and analyzed.

Mass Control



The system automatically adjusts to influent loading to ensure healthy biomass such as the adjustment of sludge wasting based on targeted MLSS, F/M, or SRT.

Phosphorus Removal



Enhanced biological phosphorus removal followed by chemical addition to achieve phosphorus precipitation.

Statistical Analysis



Stored data in the Flow Characterization Module is used to perform statistical analysis of different parameters of the waste stream to assist operators in optimization of the plant.

IntelliPro®

Typical Applications



Nutrient Removal Optimization

- The calculation of chemical requirements for phosphorus precipitation, and supplemental carbon addition for denitrification are completed automatically by the system.
- The plant reduces its chemical use since dosages are adjusted to real-time conditions through the module.

Solids Management and D.O. Control

- The operators take advantage of the "Active Mode" for D.O. control, reducing electrical consumption and the plant's associated carbon footprint.
- Solids management helps optimize performance by adjusting the MLSS concentration automatically.

In-Basin Instrumentation



Nutrient Removal Instrumentation



Total Suspended Solids Measurement



Network Communication

Providing TOTAL Water Management Solutions

Visit our website at www.aqua-aerobic.com to learn more about the IntelliPro® Monitoring and Control System and our complete line of products and services:

Aeration & Mixing

Biological Processes

Filtration

Membranes

Controls & Monitoring Systems

Aftermarket Products and Services



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