



SRTmaster™ — Frequently Asked Questions

What is SRTmaster?

SRTmaster is a real-time control system for sludge age, also called solids retention time (SRT). It calculates the waste activated sludge flow continuously from on-line suspended solids and flow measurements, and sends the waste flow setpoint to the plant's SCADA system. The first real-time SRT control system was implemented in 1996 at a 170 MGD biological nutrient removal plant.

Why is a constant sludge age important?

A constant sludge age keeps the food-to-microorganism (F/M) ratio constant, which is the most important condition for an efficient activated sludge process. Too little wasting can overload clarifiers, cause low F/M bulking and foaming, and raise air demand. Too much wasting can cause poor removal of soluble pollutants, low-DO bulking and, where the plant nitrifies, higher chlorine demand. Day-to-day variation in wasting also raises polymer use in sludge thickening.

What is wrong with calculating wasting from laboratory samples?

A grab sample can differ significantly from the daily average because influent and return sludge flows vary. Samples are usually taken only once or twice a day, the gravimetric test takes two to four hours, and an individual test has an average error of about 5%. The waste flow is therefore adjusted late, infrequently and on uncertain data.

How accurate is SRTmaster?

Over the twenty years to 2016, at SRTmaster installations, sludge age has been held within 5% of the setpoint, and within 2.5% most of the time. At the Pomona Water Reclamation Plant of the Los Angeles County Sanitation Districts, the average SRT control error was 0.13 days, less than 2%.

What results have plants achieved?

Published results include: secondary treatment capacity increased by up to 30% through lower sludge volume index (SVI); significant reductions in Nocardia foaming; reduced pin floc and lower chlorine use; polymer for sludge thickening reduced by up to 25%; and laboratory suspended solids tests for process control reduced by as much as 90%. Combined with dissolved oxygen optimization, aeration energy savings of up to 25% have been reported.

Which plants have used it?

The plants described in the published record include Bellingham (Washington), Victor Valley Wastewater Reclamation Authority, Sacramento Regional, East Bay Municipal Utility District,

Oxnard, San Jose/Santa Clara, San Francisco's Oceanside plant, Chico and Topeka, as well as the Pomona plant of the Los Angeles County Sanitation Districts. SRTmaster has been in service at the City of Chico since 2014.

What instruments does it need?

Two suspended solids analyzers (in the mixed liquor and in the return or waste sludge), a waste flow meter, and a flow control element such as a control valve or a variable-speed pump. These can be bought from any supplier. Ekster & Associates sells none of them, but provides recommended performance specifications, including installation requirements that affect accuracy.

What happens if a meter gives a wrong reading or drifts?

Every reading is checked before it is used. Faulty readings are detected and not acted on, and operators are alerted. An activated sludge model detects suspended solids meter drift and alerts operators when recalibration is needed. In the twenty years to 2016 there was no recorded incident of the controller acting on an erroneous input signal. With automatic drift detection, meter calibration was reduced to one to three times per month.

Can operators override it?

Yes. Operators can override SRTmaster at any time and set the sludge age target and the limits within which it operates. Before any waste flow is sent, a safeguard checks that it will not overload the clarifiers or sludge processing, cause excessive variation in wasting, or move the mixed liquor concentration outside the range set by operators.

Does it help sludge thickening?

Yes. A dedicated control function keeps the mass of sludge wasted each day nearly constant. Daily variability of wasted sludge mass has been reduced from 23% to 3% of the daily average, which stabilizes the load on thickeners and reduces polymer use.

How does SRTmaster work with DO/Nmaster?

The two systems share one architecture. Precise sludge age keeps the biomass stable when dissolved oxygen is lowered: at low DO, even a 10% change in sludge age can significantly affect ammonia removal and settleability.

How are the benefits for my plant estimated?

A free plant assessment estimates them. Send one year of operating data and energy bills. You will receive a written estimate of savings in kWh and dollars, the assumptions behind it, any changes required before installation, and a fixed price. If your plant is already operating efficiently, the estimate will say so.

Sources

- Ekster, A. (2016). Twentieth Anniversary of the Real Time Sludge Age Control. *WEFTEC 2016*.
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- Ekster, A. (2001). Automatic Waste Control. *1st IWA International Conference on Instrumentation, Control and Automation*, Malmö, Sweden.
- Ekster & Associates (2025). DO/Nmaster and SRTmaster at the Pomona WRP, project summary.

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