

Symphony Operating Management System

Frequently Asked Questions

Q1. We are looking for a simple control system that is easy to operate. Is Symphony too complex for my operators?

While industry standard, aeration control systems are conceptually simple, they are not easy to operate or tune. Standard control systems use the PID algorithm to adjust for errors. This control algorithm is initialized for each control loop at system commissioning. For tight control, retuning is often required as process conditions change. The control algorithms featured in Symphony are relational so operators understand how the system accounts for errors. The system also supports user preferences so now the system performs within the limits set by the operator. Symphony controls are also self-tuning, so high precision and accuracy are provided over the life of the system.

Q2. EDI is a leader in aeration; are the controls an EDI product as well?

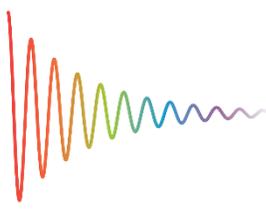
Symphony is an umbrella program. For technologies other than aeration, Symphony partners with the best appropriate technology for each plant. For controls, EDI enjoys an exclusive, strategic partnership with BioChem Technology, Inc. (BCT). BCT (www.biochemtech.com) is the industry's leading biological process and aeration controls supplier. BCT brings extensive experience and has demonstrated operations in plants including some of the largest (1BGD) in the world.

Q3. My current aeration (PID) control system is out of tune; can Symphony tune my system?

PID retuning is a laborious procedure and you'll need a controls expert or the OEM to do this work. Additionally, the system may need to be retuned whenever the process and operating conditions change.

Q4. How does Symphony improve the performance of my existing equipment?

Symphony improves process and equipment performance by attacking operating inefficiencies within the plant. Non-optimized setpoints, under and over-aeration, control system pressure losses, and wear and tear on control equipment and blowers are all reduced with Symphony.



Q5. I'm interested in Symphony, but how do I determine what I need?

Symphony solutions are specific to your needs. Just fill out the [Symphony Objectives Survey](#) and a Symphony Advisor will contact you to review how Symphony can address your needs.

Q6. I have a multitude of objectives, where do I start?

Your Symphony Advisor will work with you to map out potential solutions. Symphony proposals typically include budgetary costs for hardware and services, return on investment expectations, and payment options.

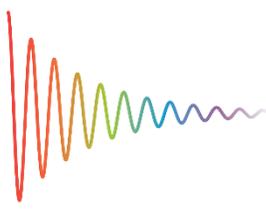
Q7. With Symphony (other than equipment upgrades), am I buying controls, a service, or both?

Physical equipment upgrades (aeration, blowers, mixers, instruments, actuators, valves, and parts and service) can be provided as part of your Symphony upgrade, or you can source them directly.

The Maestro Operations Control module is a stand-alone control panel that interfaces with your existing SCADA system or it can be setup to function directly with the instruments and blower MCP (master control panel). Two control systems are currently available;

- BIOS (Bioprocess Intelligent Optimization System) – proprietary, ammonia-based, feed-forward system adjusts process setpoints in real-time to deliver the intended level of treatment at the lowest possible energy requirement. Existing customers report process improvements up to 25% or a 3mg/L improvement in effluent TIN.
- PAL (Predictive Aeration Logic) – patented, aeration control system provides unparalleled automation precision, accuracy, and operating efficiency for the highest level of operational control and energy use. Existing customers have reduced energy use up to 50% or \$30,000 per year for a 1 MGD plant.

The Maestro Management Control module supplements the Operations Control module. In addition to expanded control functionality, the Management modules includes a Management service package (renewable 5yr contract). The program includes annual plant visits, onsite staff training, and one-on-one meetings with Management to review business objectives. Recommendations for new operating objectives that arise from these meetings will be provided in a service call report. This collaboration helps ensure that Symphony is meeting the full needs of the plant for the term of the installation.



Q8. Who supports the Symphony system at my plant?

- Information on the key personnel that support the Symphony program is available at www.symphony-water.com.
- For process or control support, information on key personnel at BioChem Technology, our Symphony controls partner, is available at www.biochemtech.com.

Q9. What warranty is provided with a Symphony upgrade?

A one year workmanship and materials warranty is standard. A two-year extended warranty for the control system is available at a cost of 5%. Warranties are limited to the cost of the replacement part only.

Q10. Do you provide performance guarantees with the BIOS and PAL control solutions?

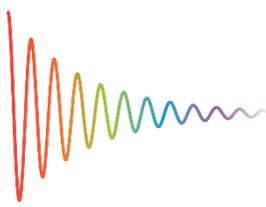
- Yes; the BIOS control system guarantees that the process setpoints will represent the best operating condition to yield the desired level of treatment performance. The full terms of the guarantee are detailed in the proposal.
- Yes; the PAL control system guarantees that the aeration system will operate within a 0.5mg/L control band, 95% of the time, and one control valve will be maintained in a mostly open position 100% of the time. The full terms of the guarantee are detailed in the proposal.

Q11. My plant has a SCADA system with a PLC and PID aeration control system; what changes are required to upgrade to a PAL control system?

No direct changes are required. The PAL system overlays the existing system and the original system is maintained as a system back-up.

Q12. My plant has a SCADA system; can PAL or BIOS be integrated with this system?

Yes; the addition of new instruments can be integrated into the existing SCADA system, or interface directly with the Maestro Controller. If a local system integrator is servicing your system, collaboration with this resource is recommended.



Q13. I have HACH and YSI instruments at my plant; do I need to replace these and if so what brand?

No; PAL and BIOS feature an open interface architecture which supports any brand of instrument, PLC, etc. A recommended bill of material for upgrade projects is provided. These items can be purchased as part of the Symphony package or sourced separately.

Q14. How does PAL interface with the blowers at my plant?

For highest operating efficiency, PAL interacts with the blower control panel with a total airflow signal. This eliminates the pressure PID blower control loop and reduces the operating discharge pressure at the blower by as much as 1psig. This increases savings and the operating capacity of the blower. PAL supports all blower technologies and suppliers and we have operating systems with Turblex™, ABS™ HST, Aerzen™, Neuros™, Atlas-Copco™, and many others.

Q15. Why do I need PAL and BIOS?

Optimized performance will not be delivered without proper process setpoints and tight operations to these setpoints; BIOS evaluates and varies setpoints to provide desired performance and lowest energy use, and PAL operates the aeration components to these setpoints. Your Symphony Advisor will work with you to demonstrate how these critical functions work together to deliver desired performance.

Q16. How will I benefit from the Management Module?

Effective Utility Management programs and improved rate-payer value require a focus beyond effluent compliance. The Management Program of Symphony including the Service Module is an important tool to support these broader business outcomes.