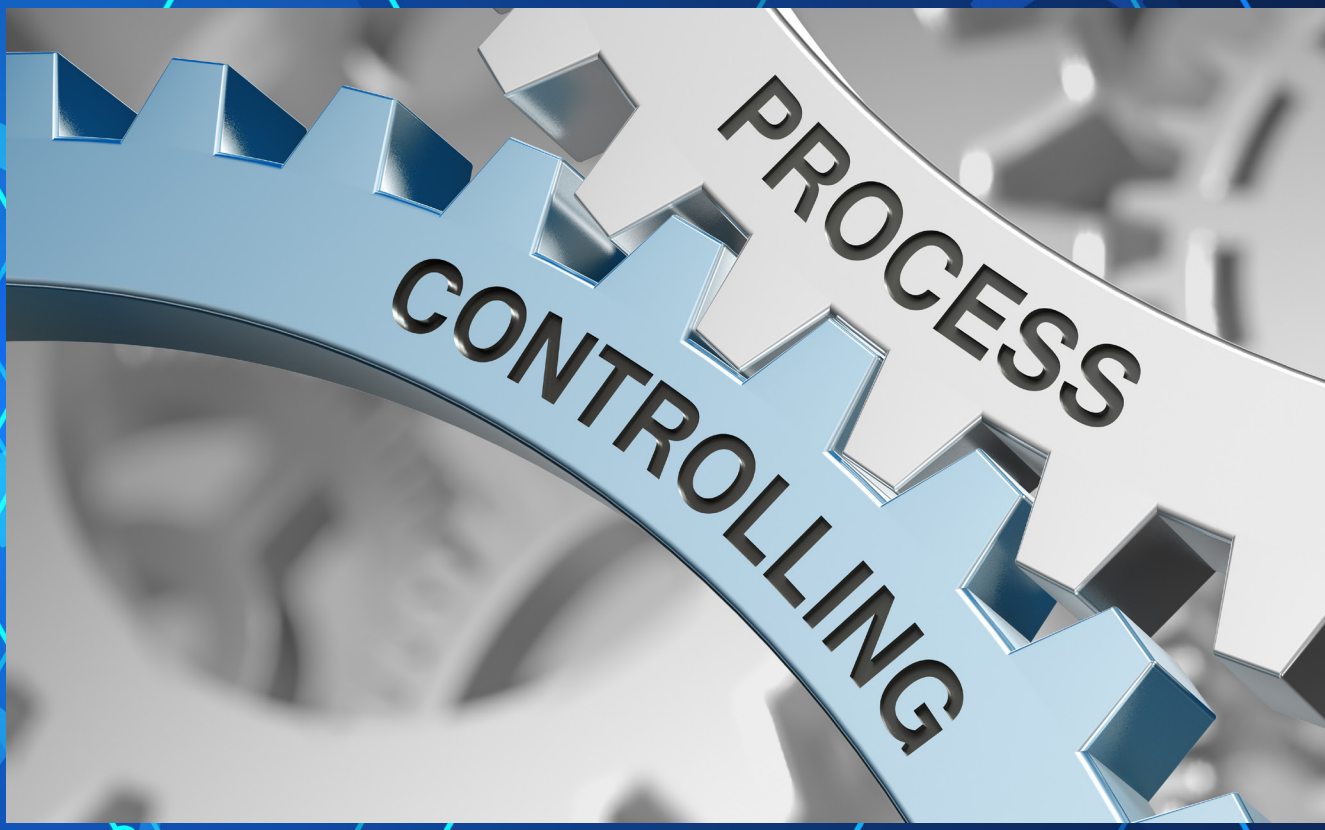
WHITE PAPER

INDUSTRIAL INDEXING SYSTEMS, INC.

Precision Speed Control: Medical Applications



Bioprocess control stations and benchtop bioreactors use servo motor controls to implement more sophisticated bioreactor control strategies.

Bioreactors Leverage Precise Speed Control

Industrial Indexing Systems has the experience and expertise to provide electronic motion control systems ideally suited for machines developed for OEM and End-User applications. Turnkey solutions combine IIS developed software and hardware to deliver engineered control systems, right down to cabinets and panels from our UL-rated shop.

Precise speed control is enabling reliable results in a variety of medical bioreactor applications. Knowing the speed is set and regulated within a tolerance of +/- 0.1 RPM for an extended period assures consistent results in applications ranging from mixing liquids or pumping.

Bioprocess Control Stations

Bioprocess control stations are universal platforms capable of meeting the changing needs of all segments of the biotech and pharmaceutical sciences. Suitable for microbial to cell culture, scaling up to scale down methods and, batch to fed-batch processing, new solutions have the right combination of features within an ultra-compact footprint.

Bioreactor control systems offer many features including, easy-to-use graphical user interfaces (GUI). Systems now monitor and control the pH, dissolved oxygen (DO), and temperature with PID control. Implementing a bioreactor motor/temperature control algorithm enables realtime signals to control the mixer's servo motor and turn the heater on or off under computer control.

New benchtop scale bioreactors are targeting both mammalian and microbial models. These units can seamlessly transition between autoclavable and single-use bioreactors using an embedded magnetic coupling drive providing low maintenance and eliminating any contamination. Specific bioreactor agitation is created using a low friction magnetic agitator connected to a servo-driven motor. Agitators are suitable for cell cultures, microbial upstream bioprocesses, and autoclavable and single-use vessels.

Servos provide effective solutions for medical applications

Luminary Motion Technology

Medical device manufacturers use Luminary servo drive technology from Industrial Indexing Systems (IIS) to easily configure these applications using a digital drive interface option. The digital drive interface option bypasses the standard analog circuit path to allow access to the digital registers, which control the operation of the speed control loop. Using the universal RS-485 device bus with Modbus RTU as its connectivity scheme, the digital drive is reachable from various HMI, PLC, and PC type controllers.

Controlling Speed

The drive's speed control loop consists of a circuit to monitor and control the motor's torque using a speed command as the input target value. In this control loop process, the speed of the motor shaft is measured on a periodic time-based and compared to the input target value.

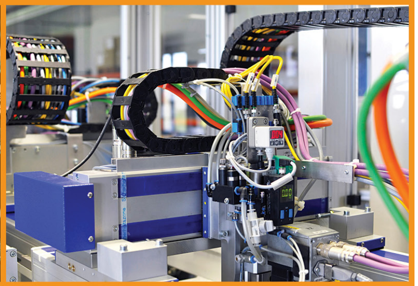
Any difference between the two values is applied as a correction to the torque control as needed to accelerate or decelerate the motor shaft back to the desired speed. The shaft speed stays constant, within a small tolerance, due to the quick reaction time of the correction applied to the torque control loop.

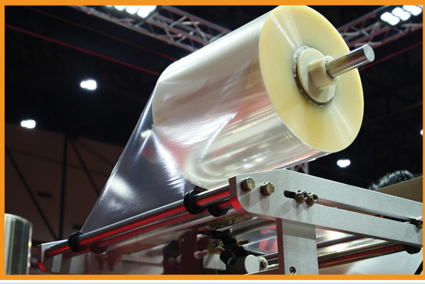
The IIS Team	Headquarters in Victor NY
	
Discover how our advanced motion control components and superior support can redefine your operations. Let's embark on a journey to operational excellence. Ready to elevate the efficiency, consistency, and repeatability in your operations? Call us today at (585)924-9181 to discuss your application.	Our location houses all critical departments: Applications Engineering, R&D, Production, Warehouse, Panel Shop, Quality Control, Sales, Marketing, and Customer Support. Having everything under one roof speeds communications and provides better service to our customers.

Check out our IIS InMotion Blog for the Servo Motion Control Professional ~ https://www.iis-servo.com/blog/





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626 Fishers Run, Victor, NY. 14564 ~ (585) 924-9181 ~ info@iis-servo.com ~ www.iis-servo.com