



AUTOMATION TECHNOLOGY

FLP6000EOS Energy Optimizing Software Increases Motion Path Efficiency

Optional add-on for the ARATEC® Positioning Solution System



Industrial conveyor systems, such as stacker cranes, hoists, overhead cranes, shuttles or elevators, incur operating costs on a regular basis. To keep those expenses at a minimum and to enable plant operators to leverage the benefits of potential savings, PSI Technics developed the Energy Optimizing Software FLP6000EOS for the ARATEC® Positioning Solution System.

FLP6000EOS was specifically developed for systems with multiple axes and is available as an optional add-on for the ARATEC® Positioning Solution System.

ARATEC® provides time-optimized controls that enable logistic facilities to operate at maximum capacity. FLP6000EOS enables you to precisely reduce operating expenses to achieve optimum positioning performance.

Situation Prior to EOS Optimization:

The energy consumption of a conventional motor drive (IEC energy class EFF2) is approximately proportional to the maximum travel speed (v_{max}) and the energy required for acceleration.

Example 1: Speed Optimization

- >> A stacker crane with 2 axes is positioned conventionally by two separately controlled drives (e.g. with the ICS5000). Positioning takes place using predefined static speed values. PSI Technics' FLP6000EOS automatically controls multiple axes in dynamic mode and adjusts the vehicle's speed to any given situation.
- >> By automatically calculating the optimum motion path the FLP6000EOS predicts the required positioning time. When receiving a travel command, the FLP6000EOS calculates the estimated travel time for both axes.
- >> The FLP6000EOS works independently of ARATEC®, which means that no PLC adjustment is required.

Example 2: Throughput Optimization

- >> By analyzing either the already traveled distances or by using the parameters of the warehouse process computer, the FLP6000EOS calculates an average warehouse throughput time. By using the parameters of the warehouse process computer, the FLP6000EOS can reduce the velocity of both axes.
- >> Users can enter an expected capacity utilization value in the FLP6000EOS software. The software then uses this percentage value as a basis for motion path adjustments.

YOUR ADVANTAGE:

- >> Reduces the amperage by up to 30%
- >> Optimized energy consumption
- >> Saves energy by reducing braking and acceleration ramps
- >> Reduces mechanical wear and power consumption
- >> Extends the facility's life span
- >> Easy to operate; no programming skills required
- >> No additional setup software required

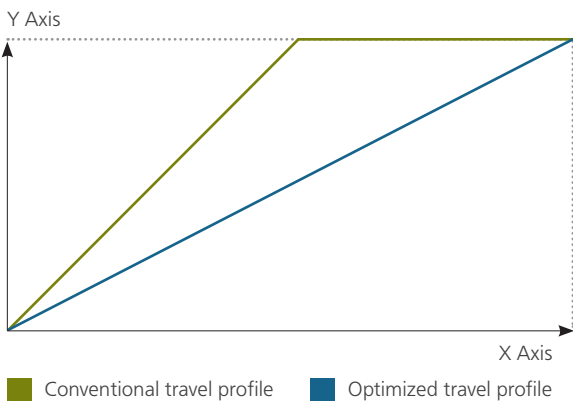
Sample Applications
Stacker cranes, hoists, crane systems, shuttle cars, elevators, conveyor systems, etc.



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Diagram 1

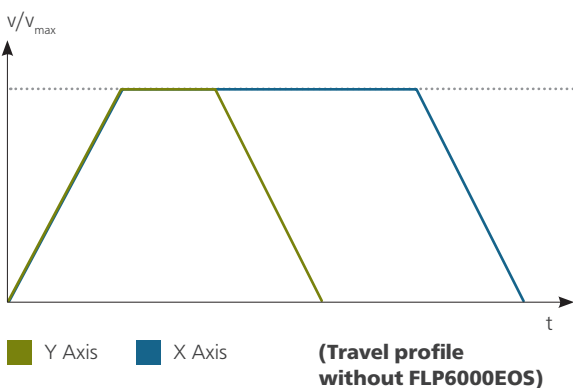


1: Positioning a vehicle with two axes

The system receives a travel command (X 20 m, Y 10 m). With a conventional travel profile (green line), both axes are positioned with maximum speed. The vehicle's Y axis has a shorter travel distance and reaches the target position faster. Using the optimized travel profile (blue line), the speed of the vehicle's y axis is adjusted to the speed of the vehicle's x axis. Since the y axis reaches the target destination faster, the FLP6000EOS decreases the axis' final speed, drastically reducing the energy consumption for this axis and both axes reach the target position at the same time.

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Diagram 2



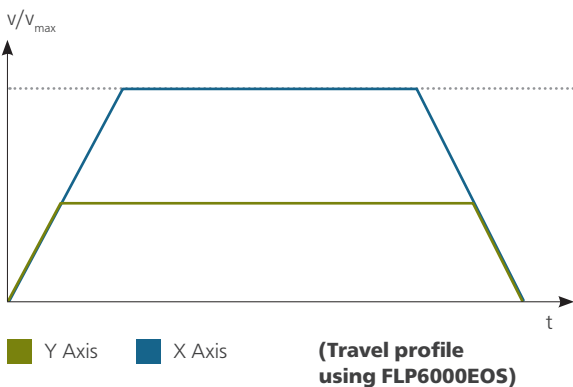
2: Conventional travel profile $v(t)$ for both axes

3: Optimized travel profile

After the FLP6000EOS calculates and optimizes the travel profile, the y axis' final speed can be reduced to less than half of v_{max} . The maximum power input for this travel profile is reduced by 30%.

The FLP6000EOS module considerably increases positioning efficiency, saves energy and reduces maintenance costs to increase the life span of industrial facilities and ensure a fast return on investment.

Diagram 3



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