
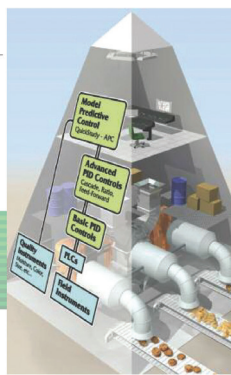



Adaptive Resources — Industrial Automation Experts



QuickStudy™
ADAPTIVE PROCESS CONTROLLER

$$G(z) = \frac{0.0051z^{25} + 0.0125z^{24} + 0.0107z^{23} - 0.0095z^{22} + 0.006z^{21} - 0.0019z^{20}}{1 - 0.1237z^{-1} - 0.4377z^{-2} - 0.2773z^{-3} - 0.0876z^{-4}}$$

$$G(s) = \frac{0.3101s(1 + 0.26s - 0.08s^2)}{1 + 28.51s + 3.52s^2} e^{-14s}$$



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Powerful but Accessible Multi-Variate Control

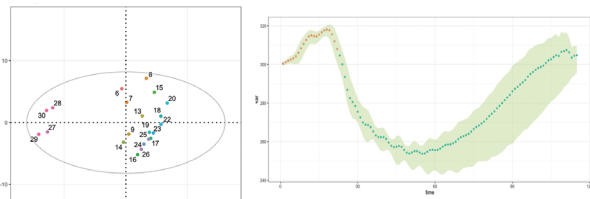
QuickStudy APC is Adaptive's proprietary Windows® based Control Software that is simple to implement and easy to support. QuickStudy creates process models quickly and accurately by studying your existing process as it operates. It doesn't need costly step tests, long set-up times or high-level expertise. The result is improvements in productivity, efficiency and quality.

QuickStudy™ Advantages:

- Reduces process variability, improving product quality and consistency.
- Minimizes transition times for product change-overs and line start-ups.
- Allows lines to be run at higher rates, increasing throughput.
- Tighter control of process decreases raw materials and energy used.
- Increase product quality on existing equipment, increasing profits and reducing capital expenditures.
- Improve plant safety as process variability is reduced resulting in fewer alarm trips, equipment adjustments and shut-downs.
- Enables Sustainability objectives to be achieved.




QuickBatch™
INTELLIGENT BATCH CONTROLLER



$$X = T P' + E$$

$$Y = T Q' + F$$

$$T = X W (P' W)^{-1}$$

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Multi-Variate Model Predictive Batch Control

QuickBatch APC is Adaptive's proprietary Windows® based Control Software that is a multi-variate based closed-loop, model-predictive batch control system. It delivers critical process KPIs, improves product quality, and increases productivity demands. Unique optimization capabilities of QUICKBATCH™ predict end-of-batch quality attributes based on previous end-of-batch processing results.

QuickBatch™ Advantages:

- Initially creates a "Golden Profile" based on historical process data. Once this profile has been established, it automatically manages the within-a-batch dynamics in a closed-loop control manner by implementing self-correcting methods throughout critical points in the batch trajectory in order to arrive at the desired end-of-batch required metrics.
- Takes into account both quality and productivity metrics simultaneously in its decision making process to determine the best controller actions to facilitate.
- Effectively addresses complex multivariate based interactions and interdependencies that take place within a batch.
- Once previous end-of-batch results are realized, establishes optimized process settings to eliminate any drifts in end-of-batch results; corrective measures can also be taken before the next batch is completed.



Ask us about past projects and case studies. www.adaptiveresources.com

