



Maximize Control Performance

# ProcessDoctor – Tai Ji

## The Challenge

Whether you're implementing a new Model Predictive Control (MPC) project or maintaining an existing MPC application, model identification is the most difficult, time-consuming, and labor-intensive part of the process. A traditional plant test can take weeks of around-the-clock work to complete since the test is conducted manually, one variable at a time. For years, industry has been searching for a method to deploy MPC faster with lower costs and less support, while maintaining safe and effective plant operation. Now there's a solution.

## Dramatically Reduce MPC Testing and Model Identification Time

ProcessDoctor – Tai Ji provides an alternative to traditional step testing and model identification methods that reduces test time by up to 70% and reduces analysis and model identification time by 90%, resulting in significant cost savings for implementing and maintaining MPC applications. ProcessDoctor – Tai Ji module is based on Dr. Yucai Zhu's industry-proven Tai-Ji ID technology and automates the identification process from test design to model validation.

ProcessDoctor – Tai Ji has 3 critical advantages over traditional step test and model identification methods:

1. **It's Automatic:** testing and model ID is done automatically under computer control rather than manually by engineering personnel.
2. **It's Multivariable:** multiple MVs are tested simultaneously, so the total test time is much shorter than single variable tests.
3. **It's Closed Loop:** tests can be performed closed loop (MPC and/or PID), resulting in fewer disturbances and fewer operator interventions.

With ProcessDoctor – Tai Ji, MPC testing & model identification is faster, easier, and more effective than ever.

## Faster Deployment & Lower Costs

ProcessDoctor – Tai Ji presents many advantages over traditional testing methods:

- **Faster Deployment:** Quicker testing and identification means lower costs for both implementing and maintaining MPC applications. In addition, the financial benefits associated with MPC are realized more quickly.
- **Easy to Use:** It requires less operator intervention than traditional tests to maintain signal-to-noise ratios while still maintaining CVs within operating constraints.
- **Minimizes Disturbances:** Closed loop testing reduces disturbances to the unit, so that fewer operator interventions are required during testing. The result is a more effortless test with lower impact on the unit and product quality.
- **Better Quality Models:** Traditional methods step single variables over a 12 – 24 hour period. ProcessDoctor – Tai Ji steps many variables simultaneously, typically over a minimum 48 hour period, resulting in a far richer data set for model identification.

"ProcessDoctor – Tai Ji impressed us with its ability to generate an information rich data set in a manner that was comfortable for the operator. The software's performance quickly overcame our initial reservations about stepping several independent variables simultaneously. It would have taken at least six days of traditional testing to resolve the same number of models that we were able to resolve in only three days with ProcessDoctor Tai Ji, and we never could have matched its performance manually."

*Senior Process Control Engineer*



## ProcessDoctor – Tai Ji

### Dramatic ROI

ProcessDoctor – Tai Ji enables rapid return on investment by reducing the time it takes to test and validate MPC projects by up to 70% !

#### MPC Deployment: Crude Unit Step Test & ID: 44 CV, 9DV, 19 MV

Using traditional methods:

Testing – 20 days x 24 hr/day x \$125/hr = \$60,000

Model ID – 14 days x 8 hr/day x \$125/hr = \$14,000

Total = \$74,000

With ProcessDoctor – Tai Ji:

Testing – 5 days x 24 hr/day x \$125/hr = \$15,000

Model ID – 2 days x 8 hr/day x \$125/hr = \$2,000

Total = \$17,000

**Project Savings = 74,000 – 17,000 = \$57,000**

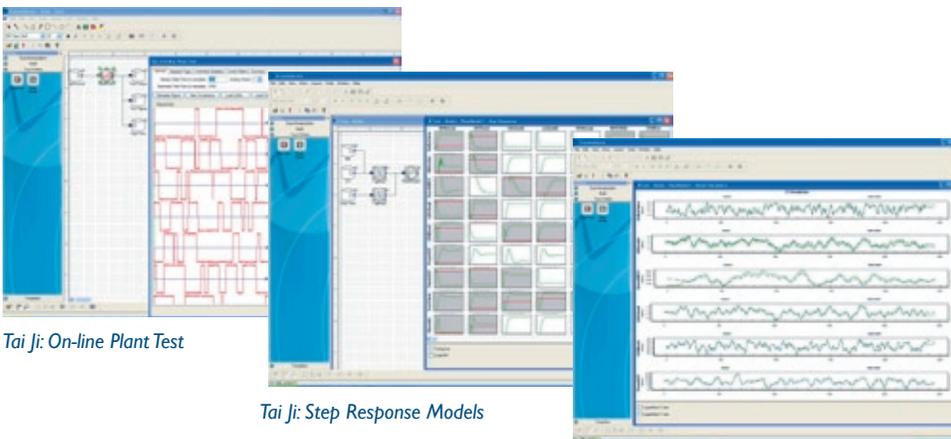
#### Application Maintenance: Large conversion unit generating \$1.2 million/yr in benefits.

ProcessDoctor – Tai Ji Optimization: Maintenance staff used ProcessDoctor – Tai Ji to re-identify the controller model set, improving controller performance by 10% of the annual benefits.

**Project Savings: 10% x \$1,200,000 = \$120,000/year**

### Proven Technology

ProcessDoctor – Tai Ji technology has been used successfully on more than 100 processes world-wide by industry leaders such as ExxonMobil, Dow Chemical, StatOil, BP, and many others.



Tai Ji: On-line Plant Test

Tai Ji: Step Response Models

Tai Ji: Model Validation

#### About ProcessDoctor

ProcessDoctor is Matrikon's complete control asset monitoring and optimization solution. ProcessDoctor protects your control investment and improves performance by providing continuous online monitoring for condition-based maintenance of control assets, including instrumentation, regulatory control, analyzers, online inferentials, and advanced controllers. Use ProcessDoctor to focus engineering and maintenance staff on priority problems: benchmark, diagnose, improve, and sustain control performance while reducing maintenance costs at the same time.

#### About Matrikon

Together with our clients, we're shaping the future of industry:

- Enabling plants to achieve operational excellence by transforming production and operational data into knowledge to predict and prevent problems
- Enabling corporations to achieve business agility by combining market information and enterprise-wide operational data to make informed, intelligent decisions in real time

*Our reach is global, yet our commitment to delivering value is personal...*

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