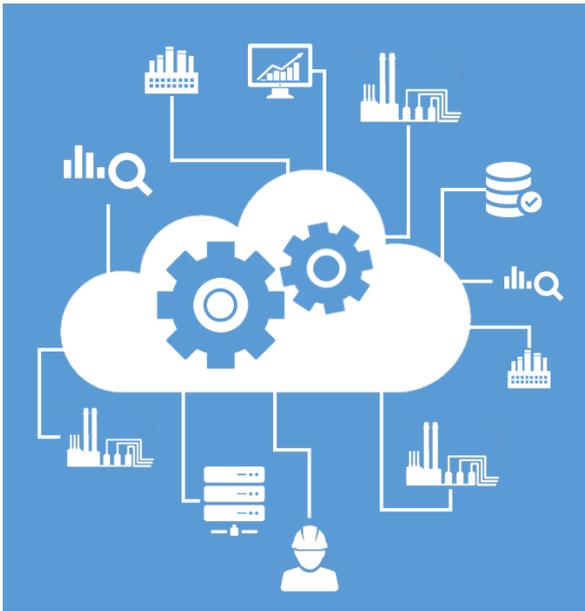


## Application Note



# The sky's the limit with ten sites controlled in the cloud



## Analyze A&E and PID controllers across ten plants globally

A leading agribusiness group required the ability to analyze alarms and PID (proportional integral derivative) controller performance for ten of their production plants worldwide from a cloud-hosted centralized control center. They wanted to analyze alarm performance and improve the operation of their PID controllers from their headquarters, and continue to access plant information locally. A centralized pool of subject matter experts would be able to share analysis, advice and best practices across the ten sites. At the same time, plant data would be available locally to aid plant operations and decision-making.

## Cloud deployed solution from Yokogawa

Yokogawa developed a unique solution that is deployed in a cloud-hosted environment, and provides the data from ten production sites to the centralized control center.

For Alarm & Events data, Exaquantum collects Process Data and Alarms & Events from each plant's control system. Data from all plants are consolidated to a single company level Exaquantum historian deployed in the

cloud, using a secure and reliable data transfer method. An Alarm Reporting and Analysis software solution enables Alarms & Events to be collected and monitored for each plant, generating reports and key performance data (KPIs) for further analysis from the centralized control center.

For PID controller performance, Yokogawa's 'MD Pro' was also installed on the central Exaquantum server to monitor and assist in the tuning of 125 PID Loops from the ten production sites.

PID loop performance and Alarms & Events are displayed in a combined web-based dashboard, providing a single display of key data for each site. The global plant management team have a complete overview of each plant's status and are able to analyze performance and identify operational improvement opportunities.

## What are the benefits?

Having access to data across these plants helps to improve the alarm and safety practices and eliminate errors in loop tuning.

By monitoring and analyzing data, it is possible to implement further improvements which lead to longer term benefits and provide ongoing value including safer alarm management practices, enhanced plant performance, improved operator efficiency, planned maintenance scheduling and cost reductions.

A single dashboard displays the current status of Alarms and PID controller performance from each site, providing a visual indication of plant performance. This allows better integration across the large number of sites helping to support the company's strategic objectives.

By analyzing plant data across multiple sites, it enables processes and equipment to be benchmarked using real plant data for comparison and assessment. Additionally, this information can also be used to establish best practice processes that can be applied across all sites to help identify and set attainable targets and evaluate overall performance.

## A strategic approach

The core strategy for one of Asia's leading agribusiness groups is to develop an integrated business model that encompasses the entire value chain of the agricultural commodity business, from cultivation, processing, merchandising and manufacturing of a wide range of agricultural products. This includes oil palm cultivation, oilseed crushing, edible oils refining, sugar milling and refining, manufacturing of consumer products, specialty fats, oleo chemicals, biodiesel and fertilizers as well as flour and rice milling.

To implement this business strategy, it was important to know the current status of their plants and be able to compare the alarms and PID controller performance from their production sites at a centralized facility.

In the short-term, it was important to ensure alarms and PID data could be accessed allowing analysis and improvements to be realized. In the longer-term, collaboration between the customer and Yokogawa provides the opportunity to further expand this solution by providing Yokogawa's consultation expertise for alarm reduction, alarm rationalization and PID tuning.

## Project Specifications

Project specifications were agreed to provide the following:

- Process data for 125 PID Loops from each site provided to the cloud-hosted central data center
- Alarms & Events from all sites provided to the cloud-hosted central data center
- Display PID Loop data, Alarms & Events information within a web based application
- PID Loop performance, Alarms & Events displayed in a combined dashboard
- Drill down functionality included Country, Site (City), Plant/Unit, Sub Plant/Section, Equipment, Tag (data point)

## Project Implementation and Highlights

### Implementation

The ten sites included four non-Yokogawa plant control systems. To access the Process Data and Alarms & Events, a number of new interfaces needed to be developed before the system could be implemented. New interfaces were developed for GE, Citect and Kepware for Citect.

## SITE IMPLEMENTATION

Asia	7 sites
Europe	2 sites
Oceania	1 site

### Plant Hierarchy Expansion

Yokogawa increased the number of plant hierarchy layers to seven to address the additional requirement of this global scale application. This feature is now standard in the alarm reporting and analysis package.

### PID Loop Performance

For PID performance monitoring, MD Pro was installed at the cloud-hosted central data center to collect and display PID performance data. The MD Pro Offline Tool was connected at each production site, providing valuable plant information and data to the local team.

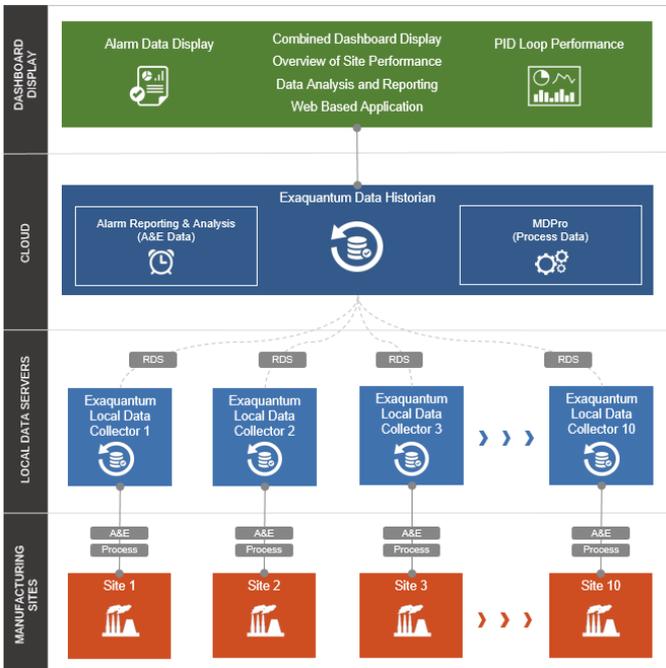
### Combined Dashboard

Yokogawa created a combined dashboard displaying both alarms and process data together in a single location accessible through a web-based application. By utilizing the alarm reporting and analysis software and MD Pro, Yokogawa was able to provide visual display of status for analysis and insight of plant data across multiple sites.



## System Architecture

Alarms & Events and Process Data follows the same system architecture



## Cloud Deployment

Global plant management wanted to view the current status for all ten sites from a cloud-hosted centralized data center on Amazon Cloud. Our solution was deployed in the cloud, and monitors alarm performance and improves the operation of their PID controllers.

## Corporate Dashboard & Reporting

Essential to the project was a combined dashboard to display both alarms and process data together. Reports can be generated that highlight key performance data that can be shared and distributed within the global management team to assist with plant improvements and allow comparisons to be undertaken. With consistent and standardized data and information from the ten sites, control systems and locations, this really adds value for the customer.

## Diversity of control systems

One of the challenges of this project was how we would get data from non-Yokogawa control systems. Four of the ten sites had non-Yokogawa control systems, so interfaces were specially developed to access the data at these four plants and make it available to the central data

## Key Takeaways

### Project Size and Scalability

Yokogawa delivered a scalable solution across ten sites. During implementation two challenges were identified, Firstly, data was not being synchronized due to the geographic locations and time zone differences between sites. Secondly, an additional plant hierarchy layer was required to increase the plant hierarchy layers to seven for full analysis. Yokogawa were successful in overcoming these challenges and worked with the customer to resolve these issues.



## References

- Exaquantum Alarm Reporting and Analysis
- Exaquantum Remote Data Synchronization
- Exaquantum Plant Information Management System

## Source Information

For more information, please contact [sales@ymx.yokogawa.com](mailto:sales@ymx.yokogawa.com)

All sales materials and information are available on the PESN site at

<http://globalcyber.jp.ykgw.net/pesn/index.htm>