General Specifications

GS 36J04B10-01E

Models NTPB001 – NTPB010
Exaquantum/Batch
Plant Information Management System

■ GENERAL

Exaquantum/Batch is an intelligent and scalable ISA-88 based Batch PIMS (Plant Information Management System). It provides an analysis and reporting application that collects, stores and displays current and historical data from batch production, equipment and recipe viewpoints.

This enables your production and recipe management, process engineering, quality management and operations staff to easily access batch information for decision support, production planning and scheduling, analysis, process improvement and quality purposes.

Exaquantum/Batch is the ideal productivity improvements tool that enables you to focus on KPIs (Key Performance Indicators) such as a cycle time and frequency using the web based browsing, analysis and reporting user interface and to develop action plans for process improvements.

■ KEY FEATURES

The key features of Exaquantum/Batch are:

1. 'Out of the box' integration with Yokogawa's CENTUM VP and CENTUM CS 3000 for Batch control systems, providing immediate usability and benefits without complex engineering and database configuration.

2. Standard data analysis providing:
   • Automatic calculation and charting of cycle times and unit utilization for each batch.
   • Automatically calculated performance ratings for each batch.
   • Comparison of batches to peer groups.
   • A powerful tool for sorting and comparing batch history data.

3. A customizable web based user interface providing:
   • Batch, master recipe and equipment data accessible from one place – BatchWeb.
   • Ad-hoc web access to data without custom display generation.
   • Secure data storage with minimal administration.

4. Optional 21 CFR Part 11 capable functionality through the use of electronic records and signatures.

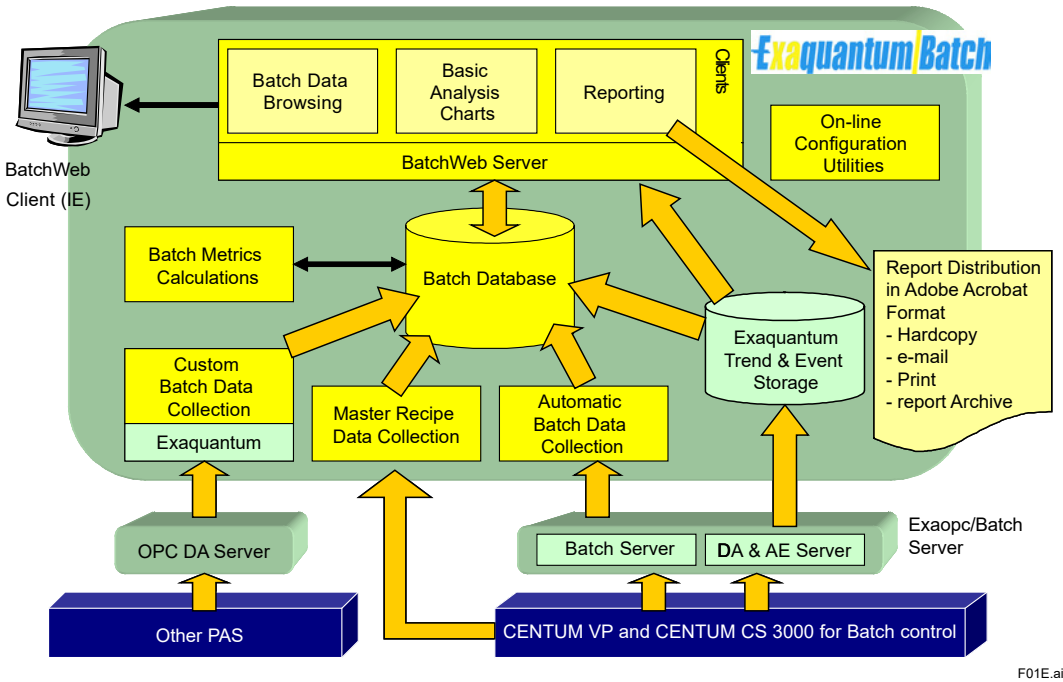

Figure: Exaquantum/Batch Overview

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■ BENEFITS

- Market new products in less time.
- Reduced material costs.
- Increased productivity and plant utilization.
- Production data for improved decision making.
- Powerful data analysis and reporting capabilities leading to quicker batch approval.
- Supports Six Sigma programs.

■ BATCH DATA FUNCTIONS OVERVIEW

Exaquantum/Batch incorporates the field proven Exaquantum Data Historian. Users can analyze batch data through web clients and generate reports for improved decision making.

● Data Collection

Exaquantum/Batch includes the standard Exaquantum PIMS functions for trend, event and alarm data collection. In addition, Exaquantum/Batch provides the following two methods of data collection.

1. Automatic Batch Data Collection (ABDC)

ABDC is used to collect data from CENTUM VP and CENTUM CS 3000 for Batch control systems automatically. This is the primary method of data collection used by Exaquantum/Batch and once configured, will collect master recipe, equipment, batch and control recipe data without the need for complex engineering.

The detection of new master recipes or changes to existing recipes will trigger the collection of the master recipe allowing the master recipe contents at any point in time to be reconstructed.

2. Custom Batch Data Collection (CBDC)

CBDC is used to collect data from CENTUM VP and CENTUM CS 3000 for Batch control systems that do not use the Yokogawa batch package, batch control systems from other manufacturers or any OPC Data Access 2.05a enabled control or MES system.

● Data Storage and Integrity

Batch data is stored in a Microsoft SQL Server database. An internal log is maintained to provide an audit trail of user actions. To maintain the reliability and integrity of batch data, the following methods are used:

- Access Control – controls access to data collection and configuration tools.
- Audit Trail – logs all instances of manual data manipulation to a user name.
- Electronic Signature – requests approval of all changes and additions to Exaquantum/Batch data through user names and passwords. This is an optional feature that must be specified when purchasing Exaquantum/Batch.

● Batch Metrics

Exaquantum/Batch automatically provides batch metrics based on cycle times and other data in the batch record.

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■ DATA VIEWS OVERVIEW

To enable users to quickly focus on specific information, a number of default 'views' are available through a menu selection. Each view has a number of related views, which may then be selected to display the data in a different format.

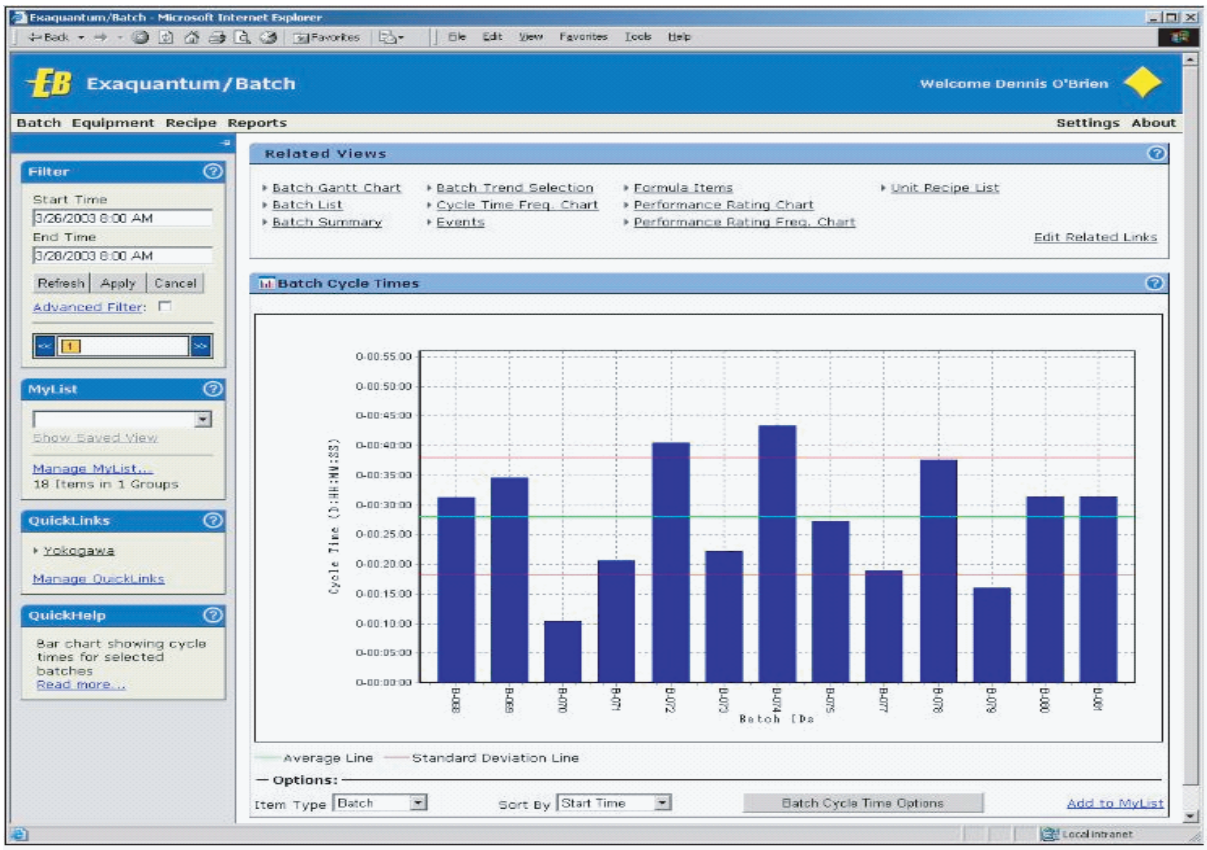

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Figure: Example BatchWeb View

● BatchWeb User Interface

BatchWeb is a web based user interface organized as a web site. Through on-screen menu selections, different sets of continuously updated batch, master recipe and equipment data, from both the Exaquantum and Exaquantum/Batch databases, may be viewed and selected for analysis using standard charts and lists.

● Batch View

Selecting the Batch View displays a list of batch records. By using the filter, batch records may be displayed for any time period and then selected for display in the following standard preformatted views.

View	Description
Batch Summary	Displays a list of a batch's header and equipment properties.
Formula	Displays a list of a batch's formula items.
Unit Recipes	Displays a list of the unit recipes used in a batch.
Events	Displays a list of event messages for one or more batches, unit recipes or units.
Gantt Chart	Displays a chart showing how long each batch and unit recipe took to complete.
Batch Trend Chart	Displays a chart of batch trends based on one or more batch data values from the same or different time periods.
Cycle Time Chart	Displays a chart showing the cycle times for a set of batches or unit recipes.
Cycle Time Frequency Chart	Displays a chart showing the number of batches for a set of cycle time periods.
Performance Rating Chart	Display a chart showing performance ratings for a set of batches or unit recipes.
Performance Rating Frequency Chart	Displays a chart showing the number of batches for a range of performance ratings.

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● Equipment View

Selecting the Equipment View displays a list of units available in the Exaquantum/Batch database from the equipment hierarchy which may then be selected for display in the following standard preformatted views.

View	Description
Equipment Hierarchy	Displays the equipment hierarchy tree for a given point in time.
Change Summary	Displays a table showing how often a unit has been modified.
Unit Usage Table	Displays a list of batches and unit recipes that used a particular unit.
Unit Utilization Chart	Displays a Gantt chart showing how units have been used by unit recipes over time.

● Master Recipe View

Selecting the Master Recipe View display a list of master recipes available in the Exaquantum/Batch database which may then be selected for display in the following standard preformatted views:

- Detail – displays a 'printer friendly' listing of properties for a master recipe.
- Version History – displays an information summary for all or a set of master recipe revisions in the Exaquantum/Batch database.

● Report View

Selecting the Report View displays the Report Archive which provides a list of Exaquantum/Batch reports run, including reports run on events by the Exaquantum/Batch Server. Users may select a report template and manually run reports.

■ REPORTS

This powerful Exaquantum/Batch reporting feature provides:

- Secure Microsoft Excel based flexible reporting incorporating data from Batches, Master Recipes, Equipment, Trend values, Alarms and Events.
- Built-in reporting workflow to configure templates, approve templates, assign to report scheduler, run templates to generate reports, approve reports and view reports.
- 21 CFR Part 11 capable option is available, if required.

■ USER ACCESS

Access to BatchWeb is controlled by a System Administrator through the use of Microsoft Windows user accounts and groups.

■ Batch Data Archiving

Batch Data Archiving allows batches and/or reports to be archived for a user selectable date & time range. Once archived, the batch information and/or reports will be removed from the Exaquantum/Batch database.

There is currently no function to restore archived data however Batch data formula can be viewed by using the Archive Details Screen and reports can be viewed using Adobe Reader.

The Exaquantum archive function can be used to archive batch trend data and Alarms & Events.

■ RELIABILITY

● Security function

- IT Security (R3.10 or later)
  Legacy and Standard security levels are available allowing compliance with system security requirements.
- Microsoft SQL Server 2014 Standard (R3.10 or later)
  Exaquantum installation includes Microsoft SQL Server as an Integrated Value Added Solution.
- Exaopc Product Security Support (R3.10 or later)
  Exaquantum/Batch has adopted the same security function as Exaopc (*1) which tightens the security for accessing process control systems (CENTUM VP).
  *1: Exaopc (R3.70 or later) can set limits on data access for each user account connecting to Exaopc.

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■ HARDWARE OPERATING ENVIRONMENT

● When the number of the target FCS is 9 stations or less (Small System)

Exaquantum/Batch server and Exaquantum/Batch Web Server are enable in one PC server.

CPU	Xeon dual core 3 GHz or higher	
Main Memory capacity	Windows Server 2012 Standard 64-bit	8 GB or more
	Windows Server 2012 R2 Standard 64-bit	8 GB or more
	Windows Server 2016 Standard 64-bit	8 GB or more
The disk free space required for installation	Install for Exaquantum/Batch Software	minimum 6 GB
	Install for SQL Server Software	minimum 6 GB
	Work space	minimum 32 GB

● When the target FCS numbers are 10 - 19 stations or less (Middle System)

Please install an Exaquantum/Batch server and the Exaquantum/Batch Web server separately.

Exaquantum/Batch Data Collection Server

CPU	Xeon dual core 3 GHz or higher	
Main Memory capacity	Windows Server 2012 Standard 64-bit	10 GB or more
	Windows Server 2012 R2 Standard 64-bit	10 GB or more
	Windows Server 2016 Standard 64-bit	10 GB or more
The disk free space required for installation	Install for Exaquantum/Batch Server Software	minimum 6 GB
	Install for SQL Server Software	minimum 6 GB
	Work space	minimum 32 GB

Exaquantum/Batch Web server

CPU	Xeon dual core 3 GHz or higher	
Main Memory capacity	Windows Server 2012 Standard 64-bit	8 GB or more
	Windows Server 2012 R2 Standard 64-bit	8 GB or more
	Windows Server 2016 Standard 64-bit	8 GB or more
The disk free space required for installation	Install for Exaquantum/Batch Web Server Software	minimum 2 GB
	Work space	minimum 32 GB

Please contact Yokogawa in case of Large System (Number of FCS; 20 stations or more)

Exaquantum/Batch Administration Client, Excel Add-In client, web client

CPU	Equivalent to Intel Pentium 2 GHz or Core i3 dual core 1.33 GHz or higher	
Main Memory capacity	32-bit OS	2 GB or more
	62 bit OS	4 GB or more
The disk free space required for installation	Install for Exaquantum/Batch Administration Clients	minimum 4 GB
	Work space	minimum 20 GB
Screen resolution	1024 × 768	
Display colors	65536 colors or more	

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■ SOFTWARE OPERATING ENVIRONMENT

Operating System

Operating System	Exaquantum/Batch Data collection Server	Exaquantum/Batch Web Server	Exaquantum/Batch Client
Windows Server 2012 Standard 64-bit	✓	✓	✓
Windows Server 2012 R2 Standard 64-bit	✓	✓	✓
Windows Server 2016 Standard 64-bit	✓	✓	✓
Windows 8.1 Pro 32-bit / 64-bit			✓
Windows 10 Enterprise 2016 LTSC 64-bit			✓
Windows 10 IoT Enterprise 2016 LTSC 64-bit			✓

LTSC: Long-Term Servicing Channel ✓: Supported
Note: Exaquantum is a 32-bit application that can be installed with the WOW64 emulation environment provided with the 64-bit OS.
Note: "Exaquantum/Batch client" includes Exaquantum/Batch Administration client, Excel Add-In client and Web client.

Application Software

Functions	Software Specification
Exaquantum/Batch Web Server	Internet Information Services (IIS) (*1)
Exaquantum/Batch Server Exaquantum/Batch Administration Client Exaquantum/Batch Client	Microsoft Excel or Microsoft Office 2016/2013/2010 (SP2) (*2) (*3)
Exaquantum/Batch Web	Microsoft Internet Explorer 11.0 (*3)
Document Browser	Adobe Reader DC (*3)

*1: Internet Information Services (IIS) is contained in Windows Server OS.
*2: Supported Editions of Excel 2016/2013 are limited only to the following volume license editions:
- Excel 2016 or Excel 2013
- Office Standard 2016 or Office Standard 2013
- Office Professional Plus 2016 or Office Professional Plus 2013

*3: Only the 32-bit version is supported.

Bundled Software

Use cases	Bundled Software
The database only for Exaquantum/Batch	Microsoft SQL Server 2014 Standard (SP3) 64-bit Runtime edition

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■ MODELS AND SUFFIX CODES

Exaquantum/Batch Lite

Exaquantum/Batch Lite is an entry level product. It licenses the use of Exaquantum/Batch for 2 per-seat Clients and a maximum of 10 recipes and 500 Exaquantum tags. Recipes are “Active Recipes” when they are currently active within a CENTUM VP or CENTUM CS 3000 Project. “Tags” are Exaquantum/PIMS data historian tags (data points).
An option for 21 CFR Part 11 is available.
Exaquantum/Batch Lite does not include CBDC, Exaopc or Exaopc/Batch which must be ordered separately, below.
Additional Recipes, Tags and/or Clients can only be purchased by upgrading to Exaquantum/Batch.
The upgrade requires an active annual maintenance contract.

		Description
Model	NTPB010	Exaquantum/Batch Lite
Suffix Codes	-S	Basic Software License
	1	New Order (with Media)
	1	English Version
	-0001	10 Active Recipes/500 Tags
Option Code	/Part11	With 21 CFR Part 11

Exaquantum/Batch

The license for Exaquantum/Batch includes 4 named Batch Web Clients with a maximum of 999 recipes and 5000 Exaquantum tags. Recipes are “Active Recipes” when they are currently active within a CENTUM VP or CENTUM CS 3000 Project. “Tags” are Exaquantum/PIMS data historian tags (data points).
An option for 21 CFR Part 11 is available.
Exaquantum/Batch does not include CBDC or Exaopc/Batch which must be ordered separately, below. Additional Clients may also be ordered below.

		Description
Model	NTPB001	Exaquantum/Batch
Suffix Codes	-S	Basic Software License
	1	New Order (with Media)
	1	English Version
	-0011	10 Active Recipes/1000 Tags (*1)
	-0053	50 Active Recipes/3000 Tags (*2)
	-0095	999 Active Recipes/5000 Tags (*2)
Option Code	/Part11	With 21 CFR Part 11

*1: Include two Exaquantum/Explorer per-seat Client licenses.
*2: Include four Exaquantum/Explorer per-seat Client licenses.

Exaquantum/Batch Clients (BatchWeb)

The standard version of Exaquantum/Batch includes 4 per-seat user licenses however additional user licenses may be purchased. Additional BatchWeb Clients cannot be ordered with Exaquantum/Batch Lite.

		Description
Model	NTPB002	Exaquantum/Batch
Suffix Codes	-S	Basic Software License
	1	Always 1
	1	English Version
	-XX	Enter the exact number of additional Clients required

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Exaquantum/Batch Custom Batch Data Collection (CBDC) Package
This package provides a Custom Batch Data Collection interface for Exaquantum/Batch.
CBDC can be ordered with Exaquantum/Batch Lite or Exaquantum/Batch.
Exaquantum/Batch could support one ABDC and 15 CBDC systems.
When there is a requirement for both Automatic Batch Data Collection (ABDC) and Custom Batch Data Collection (CBDC), please contact Yokogawa in advance.

		Description
Model	NTPB003	Exaquantum/Batch Options
Suffix Codes	-S	Basic Software License
	1	New Order (with Media)
	1	English Version
	-0001	Custom Batch Data Collection Package

Note: Multiple Project Connection of CENTUM Batch system is not supported.

■ ANNUAL MAINTENANCE CONTORACT

The product is supplied without the manufacturer's warranty costs. A warranty is obtained by purchasing an Annual Maintenance Contract (AMC), which covers a specified (contract) time period (usually 1 year). It is mandatory that an AMC(s) is purchased when a Solution Based Software license product is ordered. The AMC will start on the date that the license product is delivered to the Yokogawa Sales Office. You cannot order an optional software product, unless an active AMC for the existing Solution Based Software license has been purchased.

For more details of the maintenance service, please refer to the "Maintenance Services for Solution-Based Software Package" (GS 36J20A10-01E).

Exaquantum/Batch Maintenance Service

		Description
Model	SV3NTMB001	Maitenance Service for Exaquantum/Batch
Suffix Codes	-S	Annual contract
	1	Always 1
	1	Always 1
	-0011	10 Active Recipes / 1,000 Tags
	-0053	50 Active Recipes / 3,000 Tags
	-0095	999 Active Recipes / 5,000 Tags
	-1153	10 Active Recipes / 1,000 Tags to 50 Recipes / 3,000 Tags
	-1195	10 Active Recipes / 1,000 Tags to 999 Recipes / 5,000 Tags
	-5395	50 Active Recipes / 3,000 Tags to 999 Recipes / 5,000 Tags
	-9999	No Upgrade of Active Recipes and Tags
	-YYYY	Select Option Code
	-N	New
	-R	Renewal
Option Codes	/PART11	With 21 CFR Part 11
	/WC□□	Enter Additioal client licenses in □□ (01 - 99)
	/CBDC	Custom Batch Data Collection Interface
	/CBDCCNF	Custom Batch Data Collection Interface Configuration

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Exaquantum/Batch Maintenance Service

		Description
Model	SV3NTMB010	Maitenance Service for Exaquantum/Batch Lite
Suffix Codes	-S	Standard
	1	Batch Lite
	1	English
	-0001	10 Active Recipes / 500 Tags
	-0111	10 Active Recipes / 500 Tags to 10 Recipes / 1,000 Tags
	-0153	10 Active Recipes / 500 Tags to 50 Recipes / 3,000 Tags
	-0195	10 Active Recipes / 500 Tags to 999 Recipes / 5,000 Tags
	-9999	No Upgrade of Active Recipes and Tags
	-YYYY	Select Option Code
	-N	New
	-R	Renewal
Option Codes	/PART11	With 21 CFR Part 11
	/PART11N	With 21 CFR Part 11 (New)
	/PART11U	With 21 CFR Part 11 (Upgrade)
	/WC□□	Enter Additioal client licenses in □□ (01 - 99)
	/CBDC	Custom Batch Data Collection Interface
	/CBDCCNF	Custom Batch Data Collection Interface Configuration

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