

# General Specifications

## Model NTPC060 Exaquantum Manufacturing Data Exchange



GS 36J40F20-01EN

### ■ GENERAL

Exaquantum Manufacturing Data Exchange (Exaquantum/MDX) provides an ISA-95 interface for transferring process data, alerts, KPIs and schedules between Yokogawa's CENTUM VP and CS 3000 Distributed Control Systems (DCSs) with Enterprise Resource Planning (ERP) systems, such as SAP. SAP users can also view DCS screens using SAP's NetWeaver Portal.

The standards based approach applied to data integration results in a lower Total Cost of Ownership (TCO) by de-coupling the detailed interfaces of each system and using the ISA-95 Enterprise-Control System Interface standard as an intermediate data format.

### ■ SAP NETWEAVER

Seamless data exchange between SAP and the Yokogawa system is achieved within SAP's NetWeaver Portal to provide NetWeaver Portal business users with real-time access to CENTUM VP and Exaquantum Plant Information Management (PIMS) displays and data.

No converting or uploading of Yokogawa displays is required as the same displays available on the Yokogawa platforms are available to NetWeaver Portal users. For example, when a CENTUM VP display changes on the DCS, it is immediately available to NetWeaver Portal users.

Seamless data exchange between the SAP and Yokogawa system enables users to access different data types from SAP, Yokogawa DCS and Exaquantum PIMS via a single NetWeaver thin client.

### ■ KEY BENEFITS

- Lower cost to implement and maintain Plant to Business (P2B) integration.
- Cross-industry support for continuous and batch processes.
- Configurable to handle project specific requirements.
- Enables quicker response to changing business requirements resulting improved business agility.
- Facilitates better management responsiveness using real-time Alerts and their follow-up action hyperlinks in SAP NetWeaver.
- Proactively react to changing production conditions by monitoring KPI values in real-time with drill down hyperlinks to related production system displays in SAP NetWeaver.
- Provides business users access to real-time production information from CENTUM VP and Exaquantum PIMS within SAP NetWeaver.

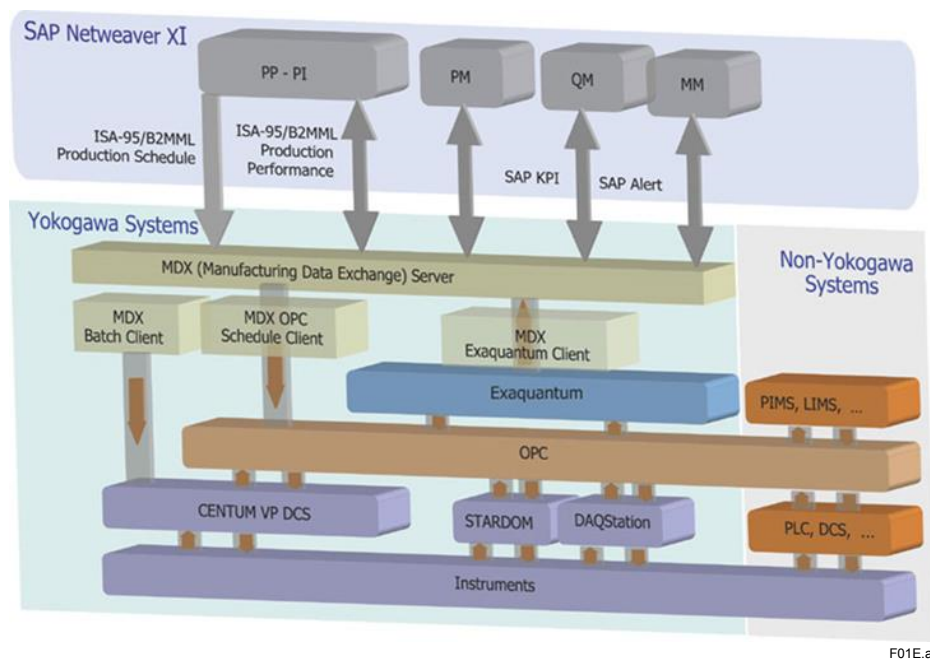


Figure Production Management Interfaces

## Data Integration

MDX is installed on an Exaquantum PIMS platform providing web services that exchange XML files with SAP's exchange Interface (XI) ISA-95 Solutions Package, or other ERP systems, via transfer of XML files directly or through Web Services. This interface supports an exchange of information such as production schedules from the ERP System to CENTUM VP and production performance from Exaquantum returned to the ERP System.

The exchange of production schedules and performance information is performed using ISA-95 standard XML messages that comply with the World Batch Forum's (WBF) Business to Manufacturing Markup Language (B2MML). The use of ISA-95/B2MML provides a loosely coupled system which eliminates the need to understand the detailed interfaces of both the ERP and Yokogawa systems. Instead, each side of the interface maps their unique interfaces to the ISA-95/B2MML standards, which will reduce the cost and complexity of the implementation.

As part of a project, both the ERP and Yokogawa teams would define the names and locations of the data to be exchanged and map this project specific data to their own interfaces.

## Production Schedule

The content of production schedules is project specific and may contain a minimal amount of information such as the ERP system's control recipe ID, order ID and product and material codes for the product produced. Equally, it may contain very detailed information such as formulation values, setpoints/target values, equipment assignments and scheduled start/stop times.

MDX has been designed to support both batch and continuous processes. Each process type will have different characteristics of data in a production schedule, as will different industries and applications within each process type. Either CENTUM VP or CENTUM VP Batch may be used on the Yokogawa side of the interface.

Configuration is via XML files that are part of the Yokogawa interface. Configuration files are used to identify the data mapping from the ISA-95/B2MML production schedule to the CENTUM VP or CENTUM VP Batch system. When a CENTUM VP system is used, the production schedule data is mapped to CENTUM VP function blocks. For CENTUM VP Batch, the production schedule data is mapped to common block data items using the CENTUM VP Batch schedule interface.

When a production schedule is received from the ERP system, the data in the schedule is downloaded to the CENTUM VP system. Depending on the project's requirements, production may start automatically or a manual step may be required to review the schedule and initiate production.

## Production Performance

As with the production schedule, the content of ISA-95/B2MML production performance messages sent to the ERP system are also project specific. A production performance message may contain any information collected by Exaquantum or Exaquantum/Batch as well as any data that Exaquantum can obtain from other connected data sources.

Examples of information are:

- actual amounts of material used in production
- amount of product produced
- amount of time major equipment was used
- labor used in production.

Configuration of the production performance message is performed using MDX's report package, which is Excel based and uses Microsoft Query to fetch data from ODBC data sources. The B2MML XML message is created in Excel and queries are created to obtain the data values for the message. Any data stored in Exaquantum, or Exaquantum/Batch, may be included, as well as data in other systems that have an ODBC data source. Trend or snapshot values, event messages, batch formula or result values from Exaquantum and Exaquantum/Batch may be included plus data from laboratory systems or other production systems.

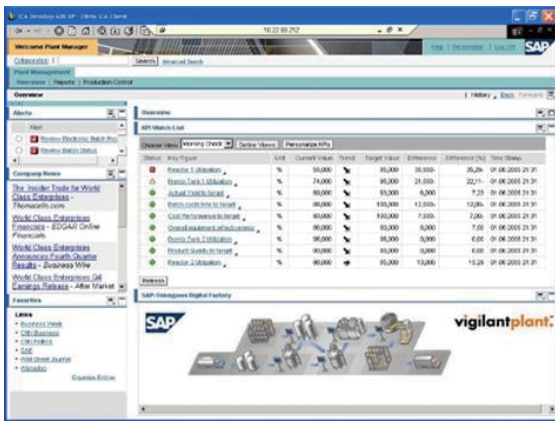
Production performance messages may be triggered by an event, such as the end of a production run, grade changeover, or batch, or on a time basis, such as hourly, shift end, daily or weekly.

When received by the ERP system, the data in production performance messages may be mapped to different modules. Typically for SAP, this type of data is stored in the Business Warehouse (BW) module and used within the PP-PI module.

### Visualization Integration

SAP's NetWeaver portal is a web based user interface that can display SAP ERP data as well as data and displays from other systems. The portal also supports real-time alerts and KPI updates to enable management by exception, closing the loop between business plans/goals, their execution and feedback to business users.

Yokogawa has worked with SAP to provide real-time data to the portal's alert function and KPI watch list including CENTUM VP and Exaquantum real-time displays. The screen below shows the portal's Overview tab containing Alerts and KPI data provided by a Yokogawa production system.



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### SAP Alerts

Alerts provide real-time notification of events issued from CENTUM VP where applications engineers can use standard CENTUM VP features like PRINT messages from Sequence Tables or SEBOL to send Alerts to SAP portal users in real-time. The PRINT messages are read by Exaquantum and sent to MDX where they are placed in an XML file for display in the NetWeaver portal.

Each alert includes descriptive information and one or more URLs. The URLs can be used by the NetWeaver users to access SAP or Yokogawa displays as follow-up actions to the alert. For example, if a current production run fails a quality test or is taking longer than expected in a specific step then CENTUM VP can send an alert to the correct NetWeaver portal user role so corrective action can be taken quickly and proactively.

### SAP KPIs

Key Performance Indicators (KPIs) can be configured for each project and are displayed within the portal's KPI Watch List. This watch list provides real-time data for each KPI to provide portal users with the latest data available.

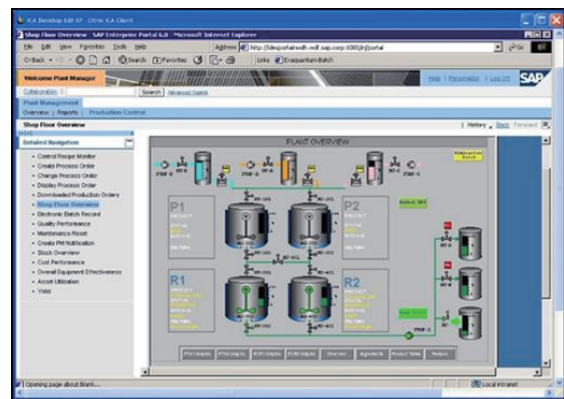
Among the information for each KPI included in the watch list is a status indication, name, an associated URL for drill-down, current value, KPI value trend indication and time and date of the last value update. KPI values are sent from Exaquantum to NetWeaver on an event or time basis and may be any numerical value collected by Exaquantum.

### SAP NetWeaver Display Integration

In addition to the Overview tab, NetWeaver portal tabs can be configured, each with a sub-menu which can display CENTUM VP and Exaquantum displays. The screen below shows a CS 3000 HIS (Human Interface Station) graphic displayed within a NetWeaver portal.

The Yokogawa displays shown in the portal are the same displays as viewed within Yokogawa systems. Any web enabled Yokogawa display, such as the Terminal Server HIS implementation, can be displayed in the portal including those accessible within Yokogawa's VTSPortal. When CENTUM VP displays are shown, the CENTUM VP HIS login dialogue box can be used to further limit access to CENTUM VP displays.

NetWeaver portal users can be given full access to the CENTUM VP HIS displays, including use of display links and drill down capability. The Yokogawa displays are not pre-loaded to the NetWeaver portal or converted in order to be accessed.



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### Summary

The Yokogawa ERP interface Exaquantum/MDX enables the real-time exchange of production schedules and performance data using the ISA-95/ B2MML standards. MDX also provides the ability to view real-time alerts and KPI data in a SAP environment and to present Yokogawa production system displays within the NetWeaver portal.

## ■ HARDWARE AND SOFTWARE REQUIREMENTS

### Minimum Hardware and Software Specifications

Component	Minimum Hardware Specifications
Exaquantum/MDX Server	As listed in the Exaquantum R2.85 GS 36J04A10-01E for an Exaquantum Server
Exaquantum/MDX Web Server	As listed in the Exaquantum R2.85 GS 36J04A10-01E for an Exaquantum Web Server
Exaquantum/MDX Web Clients	As listed in the Exaquantum R2.85 GS 36J04A10-01E for an Exaquantum Web Client

Component	Software Specifications
Exaquantum/MDX Server	As listed in the Exaquantum R2.85 GS 36J04A10-01E for an Exaquantum Server
Exaquantum/MDX Web Server	As listed in the Exaquantum R2.85 GS 36J04A10-01E for an Exaquantum Web Server
Exaquantum/MDX Web Clients	As listed in the Exaquantum R2.85 GS 36J04A10-01E for an Exaquantum/Web Client

## ■ MODELS AND SUFFIX CODES

### Exaquantum/MDX Product

		Description
<b>Model</b>	NTPC060	Exaquantum/MDX Product
<b>Suffix Codes</b>	-S	Basic Software License
	1	New Order (with Media)
	1	English version
	-SERV□	Enter the number of Exaquantum/MDX Server Licenses (1 - 9)
	-SSPC□	Enter the number of Exaquantum/MDX PP/PP-PI Connector (Single Plant) Server Licenses (1 - 9)
	-SMPC□	Enter the number of Exaquantum/MDX PP/PP-PI Connector (Multiple Plant) Server Licenses (1 - 9)
-SUSM□	Enter the number of upgraded Exaquantum/MDX PP/PP-PI Connector Single Plant to Multiple Plant Server Licenses (1 - 9)	

### Maintenance Service for Exaquantum/MDX

		Description
<b>Model</b>	NTMC060	Maintenance Service for Exaquantum/MDX
<b>Suffix Codes</b>	-S	Annual Contract
	1	Always 1
	1	Always 1
	-SERV□	Enter the number of Exaquantum/MDX Server Licenses (1 - 9)
	-SSPC□	Enter the number of Exaquantum/MDX PP/PP-PI Connector (Single Plant) Server Licenses (1 - 9)
	-SMPC□	Enter the number of Exaquantum/MDX PP/PP-PI Connector (Multiple Plant) Server Licenses (1 - 9)
-SUSM□	Enter the number of upgraded Exaquantum/MDX PP/PP-PI Connector Single Plant to Multiple Plant Server Licenses (1 - 9)	

## ■ ORDERING INFORMATION

Specify the model and suffix codes.

## ■ TRADEMARKS

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