

General Specifications

Model NTPC003 Exaquantum Alarm Master Database



GS 36J40A30-01EN

■ PROBLEM

Poor alarm management is one of the leading causes of downtime and has contributed to some of the worst recorded industrial accidents. Changes to alarm setpoints through lack of alarm management can potentially lead to safety failures, lost production and equipment damage. Engineering time can also be lost due to poor or incorrect record keeping.

■ SOLUTION

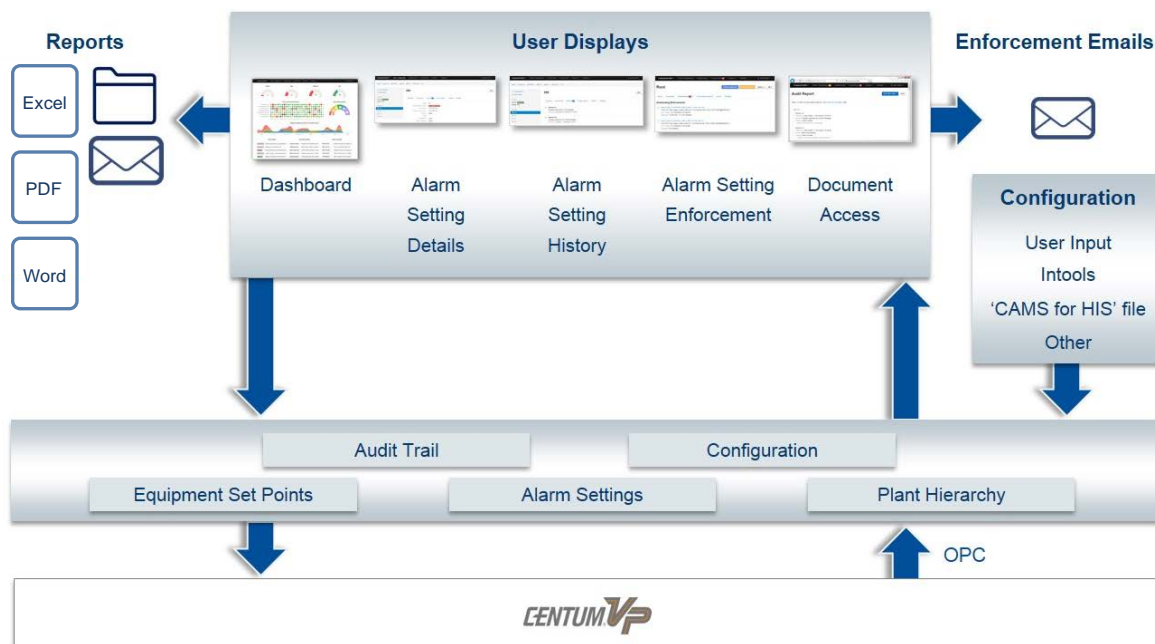
Exaquantum Alarm Master Database (Exaquantum/AMD; hereafter referred to as 'AMD') is based on ISA-18.2 and assists managers and supervisors in monitoring, assessing and auditing the behavior of alarm setpoints and configuration as part of an alarm documentation and rationalization program.

■ BENEFITS

- Standardizes alarm configurations to reduce errors
- Improves employee efficiency by providing web access to information held in one central database
- Confidence is enhanced by ensuring all changes are correct and consistent
- Regulatory compliance is supported by the availability of a detailed audit trail
- Low engineering configuration time required due to the ability of AMD to import the configuration from files, Distributed Control Systems (DCS), Consolidated Alarm Management System (CAMS) and other systems
- Lower insurance premiums

■ KEY FEATURES

- Supports the ISA-18.2 Alarm Rationalization objectives for Management of Change (MOC)
- MOC through version control and audit history
- Notification of alarm setpoint changes to ensure approved setpoint values are enforced
- Mode based alarm setpoint enforcement and monitoring
- Manual or automatic enforcement of alarm setpoints
- Storage and versioning of important alarm design and philosophy documents
- Each alarm setpoint can have a percentage deadband which is used during the monitoring process to determine whether an enforcement should be raised
- Remote management of DCS alarm setpoints and CAMS alarm attributes
- Reports differences in configuration between AMD, DCS and CAMS
- Set of filtered alarm reports based on search criteria such as the rationalization status or alarm priority
- Configuration import and export enabling integration between disparate systems
- Centralized repository to record all stakeholder requests and comments as an input to the MOC process
- Custom alarm attributes cater for numerous system configurations
- Process setpoints are supported
- Alarm dashboard provides an overview of the key configuration and processes allowing users to quickly diagnose problem areas



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■ INTRODUCTION

There is an increasing move to adopt the CCR (Central Control Room) operations concept largely due to staff rationalization and the need to improve decision making.

AMD has been designed to meet the requirement of providing secure support within single or geographically distributed facilities.

Alarm Management Support

Alarm management packages can struggle to meet the needs of a full alarm lifecycle. In particular, users often conduct their Alarm Objective Analysis (AOA) process on a greenfield site well before the control system configuration has begun.

Typically many specialists are involved during the AOA process, both internal and external consultants, such as Yokogawa VPS engineers. This is the key period when a large amount of information is created but, due to the lack of tools, much of this information is lost or buried in different documentation stores.

AMD supports the MOC process by providing a number of features to store information into a centralized location and reduce the effort required to conduct each MOC cycle.

■ CAPABILITIES

Plant Hierarchy and Security

Alarm setpoints and tag assignments are stored within a hierarchical structure that is totally configurable to reflect one or more production plants (DCSs).

Access permissions may be assigned for different hierarchy levels to provide or restrict access to an area of the hierarchy based on user roles.

Documents can also be associated with any hierarchy level.

Mode Based Alarm Setpoint Management

A setpoint is a value that has been approved for each alarm limit, such as HH, H, L or LL. Each setpoint value defines the alarm limit which, if exceeded, will raise a DCS alarm, and if monitored by AMD, a possible enforcement.

AMD alarm setpoints can be assigned to a mode (state) providing the ability to adjust for varying plant operations and modes. The alarm setpoint values associated to the latest mode are then used for DCS enforcements and setpoint monitoring.



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Alarm Rationalization Status

Each alarm configured in AMD has a 'Rationalization Status' property. This is used primarily during the AOA or alarm rationalization process to track the progress of alarm updates.

Alarm Versions

Alarms in AMD can be modified and the changes saved numerous times before being versioned. After these saved changes have been reviewed, they can either be committed resulting in a new alarm version or discarded, resulting in the alarm returning to its previous 'committed' state. AMD keeps a versioned record of all committed alarm changes. These alarm versions can be viewed in an 'Audit' report on demand or scheduled for emailing.

Alarm Actions

AMD provides a mechanism to record requests or tasks against individual alarms. These are created as a way to record the outstanding actions for an alarm, such as required alarm modifications, additions or deletions. Once an action has been created, other users can add their comments. Multiple actions can be created per alarm limit and multiple comments can be made for each action. These actions can then be used during the MOC review process to decide what actions need to be taken for each alarm.

AMD also provides (either on demand or via a scheduled email) an 'Alarm Actions' report, which displays a summary of alarms actions and comments.

Enforcements

AMD constantly monitors the DCS(s) events for changes to alarm setpoints. Each DCS setpoint change is compared with the alarm setpoint(s) held in AMD. If a matching setpoint value exists in AMD then no enforcement action will be raised.

AMD can be configured to alert one of more users if the DCS changed setpoint value is unauthorized, i.e. AMD does not contain a matching setpoint. AMD users can then review the alarm setpoint change and choose to either ignore the change or 'enforce' the authorized AMD setpoint value back to the DCS.

AMD supports manual and automatic enforcement of alarm setpoints. If automatic alarm enforcement is enabled then the master AMD setpoint value will be automatically enforced whenever a DCS setpoint is changed to an unauthorized value.

AMD also provides an 'Enforcement' report on demand or scheduled for emailing.

Alarm Setpoint Monitoring

All changes to alarm setpoint values, either from the DCS or through AMD, are presented in the Setpoint Auditing Report. This report displays DCS alarm setpoint changes, AMD manual and automatic enforcements, ignored and superseded setpoints changes.

Document Management

AMD provides the facility to upload and store multiple documents against each plant hierarchy level.

This allows documents detailing alarm philosophies to be uploaded to higher levels in the hierarchy while alarm definitions can be uploaded to an alarm. Versioning is provided so that any changes to a document results in a new version with an associated reason for the change.

Import and Export

AMD provides a mechanism for importing and exporting alarm configuration data such as alarm setpoint values and attributes from, or to, AMD configuration files, DCS and CAMS for HIS systems.

Importing and exporting AMD files can be used as a quick way to make bulk modifications to the alarm configuration and to integrate disparate systems.

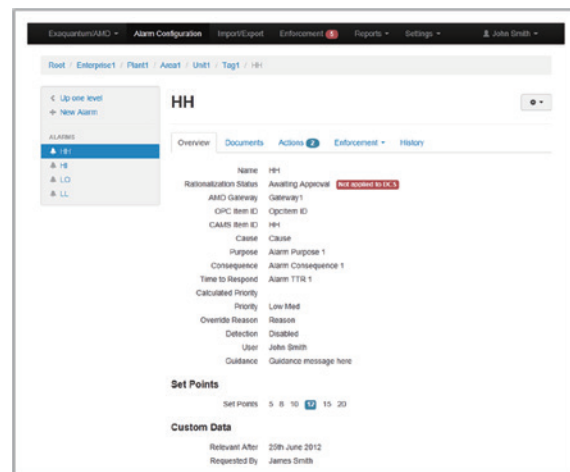
DCS and CAMS for HIS Integration

When installed on a Yokogawa DCS site, the DCS is the primary source for the alarm setpoint values.

Yokogawa CAMS for HIS can provide AMD with the plant hierarchy and the alarm attributes such as the priority, severity, consequence, etc.

System Audit

The Cross Reference Report allows an audit to be performed that will list any inconsistencies with the alarm information held in AMD when compared to the information held in the DCS(s) and CAMS for HIS(s) (if present).



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■ INSTALLATION SCENARIOS

AMD can be either installed at a site that has no pre-existing control system or an existing site where one or more control systems are operational.

Greenfield Site

At a Greenfield site, AMD can be used to create the initial alarm configuration during the alarm philosophy and design phase. When the DCS and CAMS for HIS (if provided) systems are installed, the AMD master alarm setpoints can then be downloaded to the control systems and alarm attributes downloaded to CAMS for HIS making the configuration simple, fast and error free.

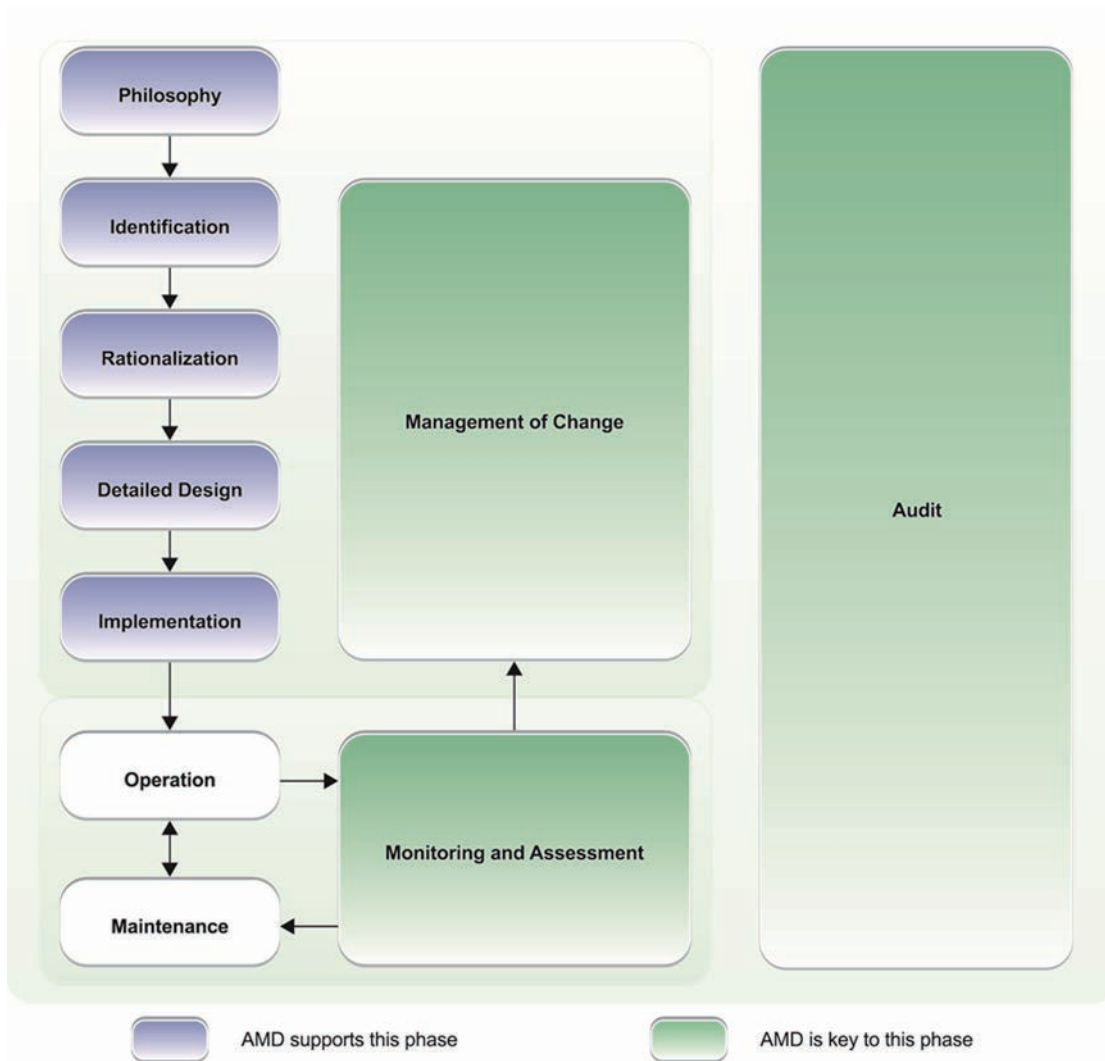
Existing DCS(s)

At a site where one or more DCSs are present, AMD can be used to obtain the alarm setpoints from each DCS. The plant hierarchy and alarm attributes can be provided by CAMS for HIS or from an imported file.

The DCS team may choose to conduct a review of these settings once a DCS has been configured to decide if any changes are required.

Non-Yokogawa Systems

AMD has been designed to interface with third party control systems and CAMS (if present). Please contact your local Yokogawa office for assistance.



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AMD capabilities for supported phases

- Document Management
- Alarm Rationalization Status
- Import and Export of alarm details
- DCS and CAMS for HIS Integration
- Creation and Management of Alarms details

AMD capabilities for key phases

- State based setpoints and the master setpoint
- Enforcement of setpoint values
- Alarm Versions
- System Audit
- Document Management
- DCS and CAMS for HIS Integration
- Alarm Actions

■ HARDWARE AND SOFTWARE REQUIREMENTS

Minimum Hardware and Software Specifications

| Component | Minimum Hardware and Software Specification |
|-----------------------------------|--|
| Exaquantum/AMD Server | <p>For detailed specification information, refer to the following description in "Exaquantum GS (GS 36J04A10-01E)."</p> <p>Hardware:</p> <ul style="list-style-type: none"> ● Hardware Operating Environment "Exaquantum Server" <p>Software:</p> <ul style="list-style-type: none"> ● Software Operating Environment "Exaquantum Server" <p>For detailed supported revision, please refer to "GS 36J40W10-01EN."</p> |
| Exaquantum/AMD Web Server | <p>For detailed specification information, refer to the following description in "Exaquantum GS (GS 36J04A10-01E)."</p> <p>Hardware:</p> <ul style="list-style-type: none"> ● Hardware Operating Environment "Web Server" <p>Software:</p> <ul style="list-style-type: none"> ● Software Operating Environment "Exaquantum Web Server" <p>For detailed supported revision, please refer to "GS 36J40W10-01EN."</p> |
| Exaquantum/AMD Web Clients | <p>For detailed specification information, refer to the following description in "Exaquantum GS (GS 36J04A10-01E)."</p> <p>Hardware:</p> <ul style="list-style-type: none"> ● Hardware Operating Environment "Exaquantum Use PCs" <p>Software:</p> <ul style="list-style-type: none"> ● Software Operating Environment "User PCs for Exaquantum/Explorer, Exaquantum/Web Client" <p>For detailed supported revision, please refer to "GS 36J40W10-01EN."</p> |

The Exaquantum/AMD Release Notes provide exact details of the supported hardware and software. If AMD will be installed on a different version of Exaquantum, please contact Yokogawa for assistance.

■ MODELS AND SUFFIX CODES

Exaquantum/AMD Product

| | | Description |
|---------------------|---------|---|
| Model | NTPC003 | Exaquantum/AMD Product |
| Suffix Codes | -S | Basic Software License |
| | 1 | New Order (with Media) |
| | 1 | English version |
| | -SV□□ | Enter the number of Exaquantum/AMD Server Licenses (01 - 99) |
| | -YYYY | Select an Option Code |
| Option Codes | /WC□□ | Enter the number of new or additional per-seat Exaquantum/AMD Web Client Licenses (01 - 99) |
| | /PC□□ | Enter the number of additional Exaquantum/AMD Plant Connector Licenses (01 - 04) |

Maintenance Service for Exaquantum/AMD

| | | Description |
|---------------------|------------|---|
| Model | SV3NTMC003 | Maintenance Service for Exaquantum/AMD |
| Suffix Codes | -S | Annual Contract |
| | 1 | Always 1 |
| | 1 | Always 1 |
| | -SV□□ | Enter the number of Exaquantum/AMD Server Licenses (01 - 99) |
| | -YYYY | Select an Option Code |
| | -N | New |
| | -R | Renewal |
| Option Codes | /WC□□ | Enter the number of per-seat Exaquantum/AMD Web Client Licenses (01 - 99) |
| | /PC□□ | Enter the number of Exaquantum/AMD Plant Connector Licenses (01 - 99) |

■ ORDERING INFORMATION

Specify the model and suffix codes.

■ TRADEMARKS

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