Software Product Description

PRODUCT NAME: BASEstar for VMS, Version 3.0 **SPD 33.17.01**

DESCRIPTION

BASEstar for VMS software facilitates the integration of manufacturing applications with plant equipment, accelerates development of integrated manufacturing systems, and provides an architecture for consistent development of manufacturing applications. BASEstar software has features for manufacturing application integration, device connection and control of plant equipment, and storage and management of device and operator files through its library system.

BASEstar software operates in a distributed VAX processing environment. Its application integration features include: the ability to collect, manage, and distribute plant data, automatically notify applications of critical changes in plant information, and synchronize execution of manufacturing applications. BASEstar software's distributed capabilities allow globally-defined objects to be utilized by applications residing on different nodes in a BASEstar network.

BASEstar device integration software gives generic device access and control for plant equipment through an interface that is independent of device-specific operations and protocols. BASEstar device connection management software is dependent on equipment level communication achieved through BASEstar device access software (DAS), allowing data to be obtained through standard mechanisms and made available throughout the BASEstar network. BASEstar device connection management capabilities can also be used to start and stop device operations, upload from and download to the memory of programmable devices, and other standard functions offered by industrial control devices.

BASEstar library management software provides BASEstar users with a mechanism for storing and tracking file development, controlling access to files, and transferring files to and from devices. The BASEstar library system can track a file from its development stage through testing and production to the archive stage while providing a history of files changes. Through its ability to control distribution of files, the BASEstar library can prevent an outdated control program from running in production.

BASEstar offers three distinct interfaces. The BASEstar menu interface is used by plant personnel in communicating with plant devices, managing device and operator files, and configuring manufacturing system elements. The BASEstar command line interface (CLI) is used by system managers and manufacturing engineers in configuring the BASEstar environment (such as defining users, devices and data points, setting up system security, and recording system events in a central log file). BASEstar software also offers an application programming interface for software developers providing callable services for application and device integration.

BASEstar is licensed as two packages:

- BASEstar for VMS is a development license enabling software developers to integrate manufacturing applications and devices.
- BASEstar Runtime for VMS is a runtime license allowing applications and devices integrated with BASEstar software to run in a BASEstar environment.

Features

Application Integration

- Data Management

  BASEstar software's data management capabilities provide a common mechanism for defining, organizing, and accessing data in an integrated-manufacturing environment. This data comes from a variety of sources including: plant devices, area, plant or work cell applications, and user input.

  BASEstar software defines discrete data elements, called "logical points" to manage manufacturing data. These logical point definitions reference both single data elements and data structures allowing users maximum flexibility in data definition and acquisition. When BASEstar software starts, each point value is set to an initial value or to its last known value. Because BASEstar data is referenced by name, applications are independent of data sources and do not require alteration when sources of data change.

BASEstar data management includes: the ability to access and change point values and definitions, receive notification of point value changes, and obtain point values by performing arithmetic or logical operations through BASEstar expression processing. Through these capabilities, BASEstar software acts as the hub for collecting and distributing current-value manufacturing data to integrated manufacturing applications.

Manufacturing data collected by BASEstar software can be formatted to database specifications and exported to an Rdb/VMS database for use in data analysis applications such as historical trend analysis and statistical quality control.

In addition, BASEstar data can be exported to other external destinations including a database of choice, an application, or another computer system. BASEstar technical documentation describes how to write a database server to export BASEstar data to an external destination.

- Event-driven Messaging

  BASEstar event-driven messaging is a controlled and efficient means of message communication between manufacturing applications. BASEstar messaging isolates applications from networking protocols and communications paths and provides a means by which applications can communicate whether they reside on a single system or are distributed throughout a network.

  BASEstar messaging offers the ability to create, receive and send messages between applications synchronously or asynchronously. It supports three types of messaging: point-to-point messaging, messaging over a circuit between two ports, or messaging to a circuit cluster port that forwards the message to multiple destinations.

- Application Control and Synchronization

  BASEstar application control coordinates the start up and shut down of applications within a distributed manufacturing system. After BASEstar start up is complete, a site-specific startup command file executes to start BASEstar applications. BASEstar applications can also be started by sending a message to a server port which is associated with the executable image of the application to be started. Applications can also be started remotely on any BASEstar system using a BASEstar callable service.

  When BASEstar shuts down, it sends a shutdown message to all application message ports. Any BASEstar application can create a message port to receive this shutdown request and proceed with an orderly shut down.

  BASEstar synchronization services give software developers a sophisticated mechanism for synchronizing application processing in a distributed environment. These services also provide a means to synchronize access to user-specified resources.

Device Integration

- Device Access and Control

  BASEstar for VMS software enables applications to interact with plant devices without knowing any of their physical characteristics such as location, protocol, or device-specific data formats. BASEstar uses device access software modules to provide device access and control capabilities including:

  — Allocating devices for exclusive use

  — Reading data from/writing data to devices by address

  — Reading data from/writing data to devices by name

  — Starting/stopping devices and device programs

  — Selecting device programs for execution

  — Reading status and diagnostic information from devices

  — Uploading files or device programs from devices

  — Downloading files or device programs to devices

  — Deleting files from devices

  — Displaying file directories on devices

  — Deallocating devices

The implementation of the specific DAS determines which operations are available.

- Data Collection

  BASEstar software collects data from plant devices upon request, at regular pre-defined intervals, or when generated by the device. Polling is a means of collecting data by reading specified address registers in the memory of a programmable device at predefined intervals. Pollsets define the set of points from which data is collected.

  In addition to polling, BASEstar software can also receive unsolicited data from plant equipment. The ability to collect unsolicited data directly from a device eliminates the processing overhead involved in continuously polling devices to receive data.

- Device Access Software (DAS)

  Manufacturing devices from various vendors use different data protocols and command structures when connecting to a computer system. BASEstar uses special modules called device access software (DAS) to communicate between BASEstar and the device controllers of a particular manufacturer. BASEstar software includes DAS modules for RS-232 devices and for DECnet and TCP/IP networks.

  BASEstar software now includes two DAS modules. The RS-232 DAS enables communication with devices having an RS-232 serial port. The DECnet and TCP/IP DAS enables communication with applications and devices through DECnet and TCP/IP networking software to integrate applications running on an MS-DOS® personal computer or on a UNIX® system with BASEstar device connection management software.

  BASEstar device access software is available for leading industrial control devices from many vendors. In addition, BASEstar technical documentation explains how to develop DAS modules for any plant device.

Library Management

The BASEstar library system provides BASEstar users with a mechanism for storing and tracking file development, controlling access to files, and transferring files to and from devices.

The BASEstar library system is accessed through the menu interface and allows users to:

- Set library and default directories
- Compare, edit, purge, and list the files in a library
- Create, delete, and copy directories
- Create, delete, and rename files
- Transfer library files in and out of the library
- Assign files into specific groups for manipulation
- Upload, download, and compare files between the VAX host and a plant device

The BASEstar library system provides a number of device communication features. Using the library, programs can be downloaded from the library to a device. Conversely, programs can also be uploaded from a device into the BASEstar library system to be archived as the latest production version. BASEstar library management software can also be used to compare the version of a file stored on a programmable device with a version of the file stored in the library.

BASEstar library functions used with plant devices require installation of library, device connection management, and device access software for each node targeted to perform device communication functions. The BASEstar library system supports communication with devices on the local node. Files in the library system on a node are referenced by the library system on that node. Device operations can be transferred to and from devices on that node. The BASEstar library system supports a maximum of 20 concurrent users and a maximum of 2,500 files, each consisting of a single generation.

Configuration Management

- Named Objects

  The BASEstar environment is a collection of named objects such as plant devices, users, and data point values (i.e., alarm and status data, production counts, etc.). Manufacturing applications need access to these resources by functional use rather than in a manner that is system-dependent and organized by the physical locations of objects. BASEstar named objects including logical points, devices, and groups can be organized as collections and referenced by application programs using BASEstar group services. In addition, objects can be defined with local or global scope. Local objects are known only on the local system. Global objects can be referenced by name by any application in a BASEstar domain.

- Distributed Capabilities

  BASEstar system objects are defined with a characteristic known as "scope" indicating how they can be accessed within a BASEstar network. BASEstar objects with a local scope are known by name only on systems where they were defined. BASEstar objects with a global scope can be accessed by any application within a BASEstar domain by referencing the object name only. Local objects can also be referenced by any application within a BASEstar domain, but can only be referenced remotely by specifying the node name along with the object name.

- Security

  BASEstar software offers security through access control lists (ACLs) which can be assigned to BASEstar objects such as systems, users, devices, and points. VMS identifiers in conjunction with ACLs provide a means to grant or deny access to an object for a specific user or group of users. BASEstar security allows a system manager to provide security only where it is needed. Access between BASEstar systems can also be restricted where isolation of BASEstar systems is required.

- Event Logging

  BASEstar event logging provides the ability to centrally record BASEstar application, system, and network events such as object definitions, point value changes, downloads to device memory, as well as errors and other diagnostic information. Events can be logged from an application program, as well as the menu menu interface and CLI. In addition, application developers can retrieve the text of an event message and use it for system integration and debugging purposes.

- System Configuration and Tuning

  BASEstar software uses a system parameter database to size memory resident database sections, select performance tradeoffs, and alter the customizable characteristics of a BASEstar system. These parameters can be changed using the BASEstar CLI.

  BASEstar software has command procedure for tuning BASEstar systems. When run on a fully-configured VAX host, the procedure analyzes current VMS resource utilization and provides suggested values for SYSGEN and BASEstar parameter settings, as well as VMS process quota settings. A system manager can use the suggested values as guidelines in setting parameters to maximize system resource utilization.

Interfaces

- Menu Interface

  BASEstar software has a menu interface for users who need to manage BASEstar library files or communicate with plant devices. The BASEstar menu interface provides a means for integrating the menu systems of various applications into one menu hierarchy. Internationalization of the BASEstar menu interface is supported through text message utilities used to translate BASEstar user messages into local languages.

- Command Line Interface (CLI)

  The BASEstar CLI is a DCL-like interface for use by system managers, process engineers, and application programmers in configuring, managing, and maintaining a BASEstar system.

- Application Programming Interface (API)

  BASEstar software's application programming interface allows software programmers to create and integrate manufacturing applications using BASEstar functions. Through the use of the API, BASEstar software can be completely embedded within an integrated manufacturing system.

INSTALLATION

Digital recommends that a customer's first purchase of this software product include Digital Installation Services. These services provide for installation of the software product by an experienced Digital Software Specialist.

For subsequent purchases of this product only experienced customers should attempt installation. Digital recommends that all other customers purchase Digital's Installation Services.

Customer Responsibilities

Before installation of the software, the customer must:

- Previously have installed all requisite software and hardware including terminals.
- Make available for a reasonable period of time, as mutually agreed by Digital and the customer, all hardware, communication facilities and terminals that are to be used during installation.

Delays caused by any failure to meet the responsibilities will be charged at the then prevailing rate for time and materials.

HARDWARE REQUIREMENTS

VAX, MicroVAX, VAXstation, or VAXserver configuration as specified in the System Support Addendum (SSA 33.17.01-x).

SOFTWARE REQUIREMENTS*

For Systems Using Terminals (No DECwindows Interface):

- VMS Operating System
- VAX FMS is required only if the Menu System will be used. It is not required for basic BASEstar operation.

* Refer to the System Support Addendum for availability and required versions of prerequisite/optional software (SSA 33.17.01-x).

ORDERING INFORMATION

Software Licenses:

BASEstar for VMS: QL-YU9A*-**
BASEstar Runtime for VMS: QL-YUAA*-**

Software Media:

BASEstar for VMS: QA-YU9AA-**
BASEstar Runtime for VMS: QA-YUAAA-**

Software Documentation:

BASEstar for VMS: QA-YU9AA-GZ
BASEstar for VMS RT: QA-YUAAA-GZ
System Management: QA-YU9AB-GZ
General User: QA-YU9AC-GZ
Programming: QA-YU9AD-GZ

Software Product Services:

For VMS: QT-YU9A*-**

For VMS Runtime: QT-YUAA*-**

* Denotes variant fields. For additional information on available licenses, services and media refer to the appropriate price book.

SOFTWARE LICENSING

This software is furnished under the licensing provisions of Digital Equipment Corporation's Standard Terms and Conditions. For more information about Digital's licensing terms and policies, contact your local Digital office.

LICENSE MANAGEMENT FACILITY SUPPORT

This layered product supports the VMS License Management Facility. License units for this product are allocated on a CPU-capacity basis.

For more information on the License Management Facility, refer to the VMS Operating System Software Product Description (SPD 25.01.xx) or the *License Management Facility* manual of the VMS Operating System documentation set.

SOFTWARE PRODUCT SERVICES

A variety of service options are available from Digital. For more information, contact your local Digital office.

SOFTWARE WARRANTY

Warranty for this software product is provided by Digital with the purchase of a license for the product as defined in the Software Warranty Addendum of this SPD.

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