

I/A Series[®] Hardware 70 Series Workstations



As a multi purpose workstation and file server running Microsoft[®] Windows NT[®], the 70 Series Workstations perform the following functions:

- Operator interface for display of graphic and textual information via FoxView[™] display manager
- Boot services for Micro-I/A[™] stations and control stations
- File serving tasks
- Support for a broad range of applications Foxboro, Windows NT, third-party, and userdeveloped software

- Interfacing with corporate communication networks and networks at a local or world-wide level using standard Microsoft networking
- With optional I/A Series Integrated Control Software, real-time data acquisition from I/O devices, as well as simple-to-complex process control involving sequence and batch processes.

The 70 Series Workstations are available in several styles to support varying performance requirements. Refer to the appropriate Product Specification Sheet (PSS) for information on a particular style of the 70 Series Workstation.

As symbolized by the **CE** logo, this workstation conforms to the applicable European Union Directives.



Product Specifications

OVERVIEW

Key features of the 70 Series Workstations include:

- A 32-bit Pentium[™] III processor running Microsoft Windows NT for maximum display performance and application expandability
- Scalability that ranges from stand-alone, entrylevel control and I/O station to full network capability on Ethernet or an I/A Series Nodebus
- Advanced bulk storage device handling capabilities, providing support for high capacity hard disk drives, Redundant Array of Independent Disks (RAID) hard disk arrays, diskette drives, and CD-ROM drive
- Optional interfaces to support Workstation Processor (WP70) operator stations, control devices (Micro-I/A station, PLC[™]), and/or to connect with an information network
- Graphical window interface to software
 applications via the FoxView display manager
- Availability of a standard, proven Application Programming Interface (API) for integration with numerous synergistic third-party control and information applications
- Capability of performing optional control and data acquisition functions for direct connection to a variety of I/O devices
- Capability of hosting I/A Series SCADA systems, such as Remote Terminal Units (RTUs) from Bristol Babcock, Inc. and C50 RTUs from The Foxboro Company
- Capability of hosting Micro-I/A stations and other I/A Series control modules
- Desktop integration of I/A Series data using the standard Microsoft data exchange facilities.

In addition to performing functions directly related to information processing and management and optional data acquisition/control, the 70 Series Workstations perform operations such as on-line configuration. It provides a broad range of configuration capabilities including database, display, system definition, and control strategy configuration, and system status monitoring.

The 70 Series Workstations included the following types:

- Application Workstation 70 (AW70)
- Workstation Processor 70 (WP70)
- Server 70

70 SERIES STATION ARCHITECTURE

Networking

The flexibility of I/A Series hardware and software allows an AW70 to be used as a station on a standalone Ethernet network with one or more WP70 operator stations or as a station on an I/A Series Nodebus with other I/A Series stations.

Ethernet

As a station on an Ethernet network, the AW70 can host Micro-I/A stations and Programmable Logic Controllers as well as support communications to other AW70s. WP70s can be used for additional supervisory control and monitoring. See Figure 1 for an example of AW70s stations on an Ethernet network.

Nodebus

As a workstation/file server on an I/A Series node, the AW70 is compatible with other I/A Series stations on the Nodebus and provides host services for any combination of these devices:

- Control Processors
- Micro-I/A Stations
- Information Network Interfaces
- LAN Interfaces
- Gateways/Integrators for Allen-Bradley™ PLCs
- Gateways/Integrators for Modicon[™] Modbus[™] Devices and also interfaces to Foxboro C50 Remote Terminal Units (RTUs)
- Integrators for Modbus Plus Devices
- Device Gateways/Integrators
- Communication Processors.

In addition, other AW70s and WP70s can operate on the same Windows NT based I/A Series Nodebus. See Figure 2 for an example of AW70 configurations on an I/A Series Nodebus.

I/O Interfaces

With I/A Series Integrated Control Software, the AW70⁽¹⁾ can be a primary system component providing data acquisition, regulatory control, and sequential control via software drivers and communication interfaces to a variety of Foxboro and non Foxboro I/O devices. These devices can include: Modbus PCs, GE[™] PCs, Allen-Bradley PLCs, Allen-Bradley Data HighwayPlus[™] PLCs, 760/762 Controllers, SCADA Systems, and so forth.

⁽¹⁾ The control and I/O capabilities of the AW70 may limit its hosting capabilities.



Figure 1. Example of AW70 Configuration on Ethernet

AW70 SOFTWARE

Application Functions

Applications performed by the AW70 range from functions such as the storage of control databases, alarm events, and historical data, to large scale applications such as advanced control, third-party applications, and database management and software development. The following sections describe the major application functions performed.

FoxView

The system's FoxView display manager presents the I/A Series operating environment representing a collection of programs, utilities, and process graphics. Subsets of the operating environment can be configured according to the specific user's tasks. Thus, process operators, process engineers, and software engineers have access via passwords to environments that define their tasks and the functions accessible to them.

FoxView's display manager presents dynamic process operator graphics as well as embedded realtime and historical trending. Additionally, it provides access to both FoxAlert alarm manager for viewing a comprehensive set of process alarm displays and FoxSelect[™] for viewing compounds and blocks in the control database and access to block detail displays. Block detail displays provide a dynamic and interactive visual summary of block operation. See PSS 21S-2B8 B4, FoxView for additional information.

AIM*Historian™

The AW70 can be configured to maintain a history of errors, alarm conditions, and selected operator actions. The occurrence of errors, alarms, and other events in other stations can be stored (for later review and analysis) by sending a message defining the event to the Application Workstation 70. See PSS 21S-6C1 B3, AIM*Historian.



Figure 2. AW70 Configuration on an I/A Series Nodebus

System and Network Management Functions

The AW70 performs system management functions, which include collecting system performance statistics, performing station boot services, providing message broadcasting, handling all station alarms and messages, and maintaining consistent time and date in all system stations.

The AW70 also performs network management functions, which comprise that portion of system management which interfaces deal with the network.

This facilitates integration of AIM*Historian with any database application. See PSS 21S-6C1 B3, AIM*Historian.

File Requests

The AW70 operating system manages all file requests associated with attached bulk storage devices. The Windows NT file system supports access to local files and files on remote stations with the Windows NT operating system.

Software Configuration

Configuration, as used here, refers to the process of entering or selecting parameters to define what a software package does, or to define the environment for a software package. The AW70 supports configuration functions by providing disk space for configuration parameters and by executing the configuration processes.

FoxDraw™

FoxDraw, a process graphic builder and configurator, allows you to modify existing displays or create new displays using state-of-the-art graphical building tools and palettes of Foxboro or user-created control objects. A library of control objects provides a starting point for quickly building new displays. FoxDraw allows the association of process variables to objects in the displays, such as fill levels, color, visibility, size, and location, to provide visual indication of the current control activity. Operator control elements such as push buttons, ramp keys, and sliders are easily incorporated in displays to provide operator interaction with the process. See PSS 21S-2B3 B4 for additional information on FoxDraw.

Control scheme configuration packages include the Integrated Control Configurator and the Intelligent Field Device Configurator for configuring the control database. The Annunciator Configurator or the optional FoxPanels[™] Configurator is available for configuring process alarm notification at the workstation via annunciator panels. The Alarm Manager Configurator allows customization of the format and content of process alarm displays.

AIM*Historian allows you to define and configure data collection types such as point sample, reduction groups, message groups, archive groups, manual data entry groups.

I/A Series Integrated Control Software

Scalable I/A Series Integrated Control Software also allows the Application Workstation 70 to perform control and I/O functions ranging from relatively simple input/output or data acquisition to complex sequential and batch control.

I/A Series Integrated Control Software is scalable, dependent on the number of points controlled and the complexity of the control scheme.

Software I/O drivers provide the capability to communicate with:

- Fieldbus Modules (FBMs) and Cluster I/O Fieldbus Cards (FBCs) via Fieldbus Processors
- Other I/O controllers such as Allen-Bradley PLCs, Modicon devices, 760 Series family of devices, GE/FANUC[™] PCs
- Foreign devices such as gas analyzers, turbines, sequence-of-events monitors, paper machine gauges

- A wide variety of Dynamic Data Exchange (DDE) and OPC based devices
- I/O data acquisition systems, such as Foxboro or Bristol Babcock, Inc. SCADA systems.

Application Data Exchange

AIM*DataLink[™] allows applications such as spreadsheets, databases, and analysis packages to receive automatic change-driven updates of real-time data objects and to use updates to recalculate data and redraw charts.

User Application Program Execution

The AW70 also executes user application programs. These can be application packages such as optimization software, test data collections, special data reductions, or other packages that you may have developed consistent with the I/A Series Application Program Interface (API) as well as standard Windows[®] applications.

Optional Application Packages

The system supports the following optional application packages:

- <u>FoxCAE</u>[™] engineering software provides tools and routines for the engineering of an I/A Series control database. You can perform database engineering and automatic loop documentation.
- <u>FoxAnalyst</u> is an advanced trend analysis application for data review and comparison designed to serve plant operators in the control room as well as process engineers and supervisors.
- <u>FoxPanels</u> software provides soft alarm panels, either emulated hardware annunciator panels or custom alarm panels. These alarm panels are configurable for operator notification of alarms via annunciator indicators and horns and for operator response. Selecting a soft alarm panel's button accesses a configured display and/or executes a configured program or a command.
- <u>AIM*DataLink</u> provides an improved user interface to navigate between functions and an ODBC Historian interface for querying AIM*Historian to correlate I/A Series information with other information. It also supports desktop collection and integration of I/A Series data using DDE (Dynamic Data Exchange), OLE (Object Linking and Embedding) 2.0, and OLE automation.

- <u>Standard RTU software</u> packages from Bristol Babcock, Inc. installed on the AW70 allow configuration of the network of RTUs and the control schemes that execute in the RTUs, from an AW70. The linked executables can be downloaded to the RTUs over the communication channels. A Database Generation utility (available from The Foxboro Company) on the AW70 for Bristol Babcock, Inc. RTUs extracts network and RTU configuration information from the RTU configuration files and automatically generates an associated I/A Series control database.
- <u>AIM*Historian</u> provides enterprise-wide capability for collection, storage, and retrieval of historical process information. AIM*Historian can run on both I/A Series systems or on network servers, and can collect information both from I/A Series and proprietary automation systems.
 AIM*Historian repositories are easily integrated with Microsoft personal productivity applications and relational databases.
- <u>The Server 70</u> provides remote engineering and operations via access to I/A Series displays. The Server 70 supports remote invocation of the following I/A Series applications:
 - FoxView
 - Alarm Manager
 - FoxDraw
 - Integrated Control Configurator (ICC) in the AW70 version
 - System Management Display Handler (SMDH)

For additional details, refer to PSS 21S-1B4 B3.

Diagnostics

The AW70 utilizes the following standard Windows NT diagnostic tests to detect and/or isolate faults:

- Power-up self-checks
- Run-time diagnostics.

Power-up self-checks initiate when power is applied to the station. These checks perform sequential tests on the various functional elements. Any malfunction detected during the power-up self-checks is reported by messages in the Windows NT Event Viewer.

On-Line Documentation Facilities

Support facilities include on-line user Help and electronic documentation. User Help provides on-line information about the Foxboro equipment and software packages. I/A Series Electronic User Documentation is CD-ROM-based.

70 SERIES WORKSTATION HARDWARE

The 70 Series Workstations, in conjunction with their peripherals, perform both application functions and workstation functions. For specific hardware specifications, refer to:

- AW70: PSS 21H-4U2 B4
- AW70, Style B: PSS 21H-4U4 B4
- WP70: PSS 21H-4U3 B4
- Server 70: PSS 21H-4U5 B4
- RAID: PSS 21H-3E2 B4

Bulk Storage Devices

The Enhanced Internal Device Electronics (EIDE) Interface or the Small Computer System Interface (SCSI) allow economical flexibility in the utilization of internal peripheral devices. The quantities and types of EIDE and/or SCSI internal bulk storage devices supported include:

- One system hard disk drive⁽²⁾
- One CD-ROM drive
- One optional tape drive
- Optional external Redundant Array of Independent Disks (RAID1, RAID5, or RAID 10)
- Optional internal RAID1 or RAID10 (Server 70)

Redundant Array of Independent Disks (RAID)

RAID systems are an extremely flexible and costeffective subsystem solution for data storage requirements. A RAID system incorporates multiple hard disk drives and interfaces to 50 Series and 70 Series processors. Any one drive can be added or removed from the RAID system while it is operational (called hot swapping). RAID systems are supported by the 70 Series, Style B processors and Server 70. Each RAID system appears as a single hard drive to the processor.

In the AW70 Style B, the RAID system is offered in either a RAID1 or RAID5 configuration. The RAID1 configuration is a basic, low cost, disk mirroring system.

The Server 70, in addition to the optional external RAID1 or RAID5, offers an optional internal RAID1 or RAID10 configuration that is housed in the processor mini-tower.

⁽²⁾ Refer to the appropriate PSS to determine the specific hard drive capacity for each 70 Series Workstation.

Floppy Controller

The floppy controller supports:

• An internal 1.44 MB diskette drive

Network Communication Interfaces

Ethernet

The electrical interfacing between the AW70 and an Ethernet network is via an Ethernet interface card.

I/A Series Nodebus

The electrical interfacing between the 70 Series Workstation and the I/A Series Nodebus requires an AUI/Ethernet interface card and a Dual Nodebus Interface module or Dual Nodebus Interface Extender module (refer to PSS 21H-7B2 B4).

Interfacing to I/O Devices

Electrical interfacing between the 70 Series Workstation with I/A Series Integrated Control Software and the various I/O devices is accomplished as followed:

- A serial interface card for RS-232-C connectivity to Modicon (Modbus) Programmable Logic Controllers, Allen-Bradley PLCs
- An Ethernet card for connectivity to the PLCs on an Allen-Bradley Ethernet, GE FANUC Programmable Logic Controllers, or a Bristol Babcock, Inc. RTU interface
- An Allen-Bradley PKTX card for connectivity to A-B PLCs on an Allen-Bradley Data HighwayPlus.

The Server 70 does not support all the I/O described above. Refer to the *Server 70 Software Overview* Product Specification (PSS 21S-1B4 B3) for additional details.

Workstation Components

The workstation components provide user interface to all system workstation display functions.

These components allow command and data entry for the 70 Series Workstation display pointer manipulation and control. Workstation components used in conjunction with the 70 Series Workstation include:

- Alphanumeric Keyboard
- Optional Annunciator and Annunciator/Numeric Keyboards (one or two)
- 15-inch Workstation CRT Monitor
- Optional 17- or 21-inch CRT Workstation Monitor
- Optional 20.1-inch Flat LCD Monitor
- Mouse or Optional Trackball
- Integrated Sound

- Optional 2- or 4-Display Configuration
- Optional Touchscreen (21-inch CRT only).

Hard Copy Device Connection

The 70 Series Workstation's serial or parallel ports can be used for the connection of one of the following optional hard-copy devices:

- Dot-Matrix Printer 80
- Color Dot-Matrix Printer 132
- Color PostScript[™] Printer
- Color PCL3[™] Printer

Mounting Options

The 70 Series Workstations are available in minitower configurations and can be optionally mounted in or on I/A Series Modular Industrial Consoles, depending on the type of workstation. Refer to the:

- *Modular Industrial Console* Product Specification Sheet (PSS 21H-4D2 B4),
- *Metal Enclosures* Product Specification Sheet (PSS 21H-5C1 B3),
- *Molded Structural Foam Enclosures* Product Specification Sheet (PSS 21H-5B1 B3)

or, the specific 70 Series station Product Specification Sheet for additional details.

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