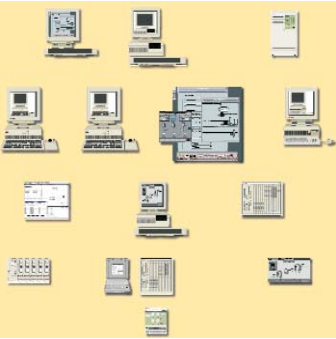


# Advant<sup>®</sup> Product Family



Repair,  
Replacement,  
and  
Automation  
Services

## Background

The Advant Product Family offers advanced power plant control and protection based on decades of Instrumentation and Control (I&C) Systems experience in the worldwide power market and on innovative Advant<sup>®</sup> technology. Advant is a scalable distributed control system that provides efficient solutions for all power plant needs, including reactor protection, engineered safeguards actuation and control, distributed control of plant equipment, and turbine supervisory and control systems. Since the same system components are used for all forms of control, system operation and maintenance tasks become much simpler.

Integration is facilitated by a single uniform programming language: the function-block oriented AMPL.

This design methodology results in clear graphic application program representations that are easily understood by all plant personnel.

## Major Advant Product Descriptions

### Advant Controller 160

The Advant Power Plant Protection System (PPS) is a digital process protection system for both pressurized water reactors and boiling water reactors. Based upon the Advant Controller 160 (AC160) product line, the Advant Power PPS was developed in accordance with codes and standards from Europe, the US, and South Korea.

The AC160 has been commercially dedicated (qualified) and licensed for nuclear plant Class 1E applications. The AC160 was developed for boiler and turbine control and supervisory systems where reliability is a primary factor. It can be applied in stand-alone configurations, that is, Regulatory Guide 1.97 functions, or as an integrated controller in plant safety systems.

Features include:

- Replacement of all input/output (I/O) modules on-line with automatic initialization
- Multiprocessing capability with up to 6 independent modules
- Fully redundant processing modules and central components (communications interfaces and power supplies), thereby eliminating single points of failure.

(Continued on back)

## **Advant Controller 450**

The Advant Controller 450 (AC450) is a high-end, high-performance controller for binary, regulatory, and supervisory control. It can be used stand-alone, or as an integrated controller in a distributed control system. The AC450 can process 5400 I/O points using local and remote interfaces and is designed to operate in demanding industrial environments. Advant Engineering Workstations support program entry, testing, fault tracing, and documentation.

The AC450 is configured with redundant processor modules, each module containing a central processing unit, memory, and switchover function. While the active unit is executing process control functions, the backup unit is on hot stand-by. If a failure is detected in the active module, switchover takes less than 25 ms and is totally bumpless.

## **Advant Station 500 Operator Station**

The Advant Station 500 Operator Station (AS 5000S) features high-powered, RISC-based workstations, supplemented with a special real-time interface board. The workstations run UNIX, Motif, X-Window System, and SQL-compliant relational databases, and are used as operator stations and information management stations. The stations run appropriate combinations of AdvaCommand, AdvaInform, and AdvaBuild software to bring maximum efficiency and ease to each job.

## **Communications**

The Advant Power System uses communication protocols selected to optimally perform each communication task, including:

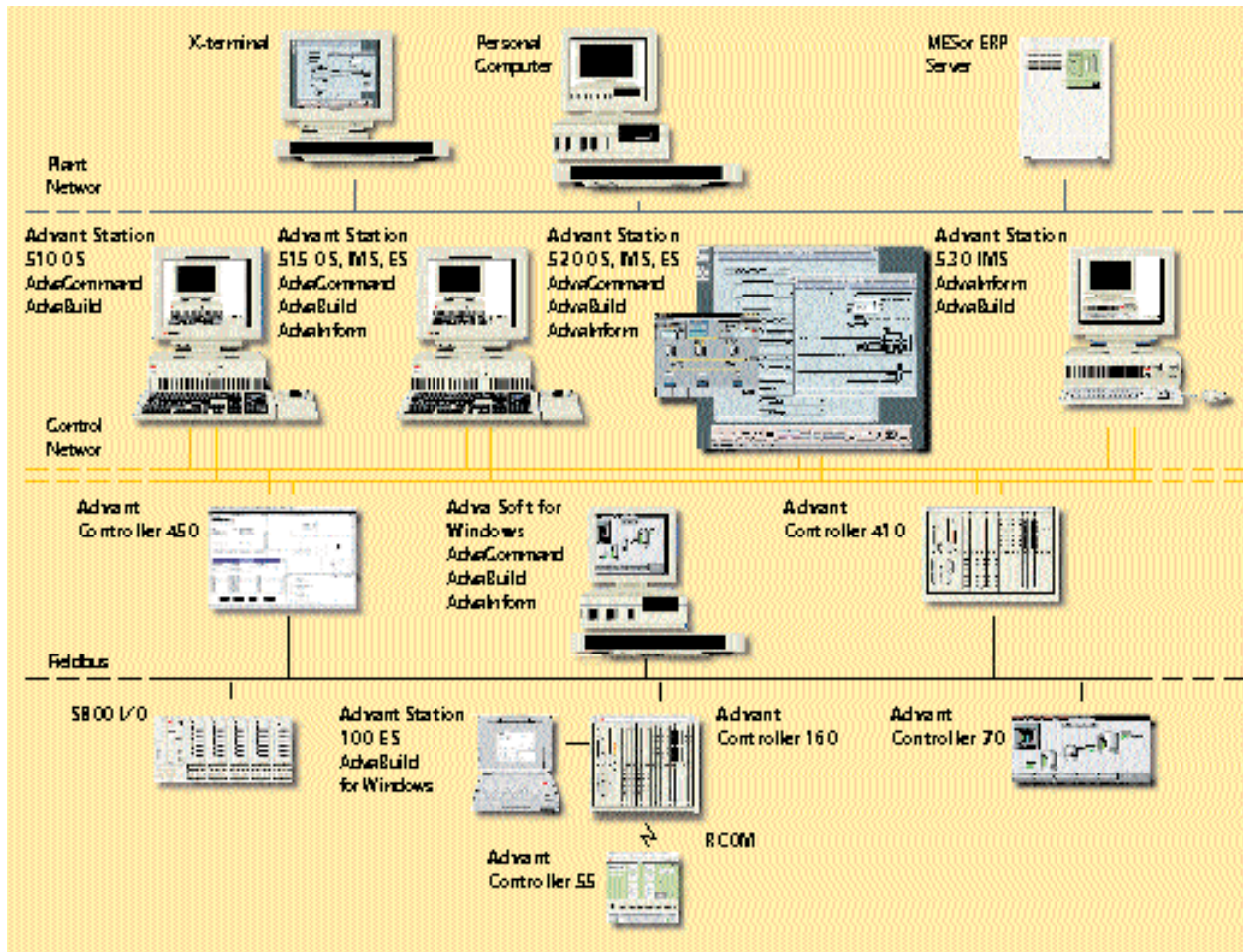
- TCP/IP at the plant network level for file transfers and client server database transactions between both internal and external stations
- MasterBus 300 (IEEE 802.3) for plant and control networks
- Advant Fieldbus 100 to deterministically interconnect controllers

## **Benefits**

Advant Power includes real-time and historical information management functions, offering insight into all aspects of power generation. Advant manages all safety and control functions in a single hardware and software product family. Complete horizontal and vertical integration permits operators to supervise and control the entire plant from a single workstation, and allows plant management to examine key aspects of power generation in real time. Advant Power includes a comprehensive scope of applications addressing specific needs of power plants based on Westinghouse in-depth knowledge and experience in power generation.

## **Experience**

Decades of digital systems experience have gone into the design and development of the Advant Product Family. Advant safety-related systems are currently being applied in the Oskarshamn 1 plant with Ulchin 5 and 6 safety systems scheduled for commissioning in 2002. Recent applications of Advant for non-safety control include Forsmark, Barseback, and Oskarshamn, to name a few. With thousands of control systems installed worldwide, Westinghouse is committed to supporting your current and future control and protection system needs.



Advant® Open Control System Product Structure

Westinghouse Electric Company  
Box 355  
Pittsburgh, PA 15230

[www.westinghousenuclear.com](http://www.westinghousenuclear.com)

January 2004

NS-RRAS-0010 (72899)