

TRIDENT COMPUTER RESOURCES, INC.



Full Function Direct Connect Systems

INTRODUCTION

The operator station is the focus of any simulation system. It is the window through which an operator or an engineer monitors, controls, and manages the process. With today's need for cost-effective solutions, many customers are seeking simulators for applications other than operator training. With that fact in mind, AUDY™ has developed interfaces between its simulation system and a wide variety of Distributed Control Systems (DCS) -- an AUDY™ FULL FUNCTION DIRECT CONNECT SYSTEM (FFDC) which:

- Permits effective control of the simulator;
- Implements AUDY's™ unique simulator/instructor functions;
- Preserves operator station functions;
- Maximizes use of "off-the-shelf" commercial DCS components;
- Provides replication of the control room environment plus maintains the functionality of the Distributed Control System.

AUDY's™ experience in developing FULL FUNCTION DIRECT CONNECT SYSTEMS lends itself to virtually any Distributed Control System. In all instances, the features that rate AUDY's™ instructor station a cut above the rest remain intact.

AUTODYNAMICS™ FFDC Systems are effective, flexible tools which provide several alternative methods for interfacing AUDY's™ high fidelity Power and Process Simulator Systems with Distributed Control Systems. This flexibility enables AUDY™ to offer solutions to a wide range of engineering and training needs.

FFDC Systems allow AUDY™ to satisfy the traditional training market with systems that interface

directly to Distributed Control System hardware. FFDC Systems also allow AUDY™ to respond, with confidence, to customer needs for systems in non-traditional applications, such as:

- Engineering Design Analysis
- Incident Analysis
- Verification and Validation of Process Optimization Results
- Supervisory and Advanced Control Programs

Used in this environment, AUDY™ Full Function Direct Connect Systems provide cost-effective alternatives to more expensive "try it on the plant first" methods.

AUDY™ has developed Full Function Direct Connect Interfaces to the following instrumentation:

- ABB Taylor MOD 300
- ABB Advant DCS
- Foxboro I/A DCS
- Hartmann & Braun Contronic P
- Honeywell TDC3000 Data Hiway Based Systems
- Honeywell TDC3000 LCN Based Systems
- Honeywell TDC3000 UxS
- Rosemont RS-3
- Yokogawa Centum COPS V
- Yokogawa Centum XL
- Yokogawa Centum CS

Additionally, AUDY™ has engineered, designed, or can provide interface hardware and/or software to couple the AUTODYNAMICS™ Simulator Training System directly to a majority of Distributed Control System (DCS) Operator Stations, including but not limited to:

- Bailey Controls INFI 90
- Fisher Provox
- Rosemount RS-3
- Siemens Teleperm M
- Toshiba Tosdic
- Westinghouse WDPF
- Yokogawa Centum CS
- and others

DCS SYSTEM COMPONENTS

An AUDY™ Full Function Direct Connect System is comprised of four (4) interconnecting components:

- Distributed Control System
Standard vendor-supplied hardware and software
- FFDC Interface
Provides a communications path between the Distributed Control System and the Simulator System
- Process Simulation
AUDY's™ high fidelity model of the plant and the processes it represents
- Simulator Control
Allows the engineer or instructor to initiate commands to enable the simulator to execute:
 - Freeze/Operate Modes
 - Performance Monitoring
 - Automatic Exercises
 - Malfunction Initiation
 - Process Variable Control Functions
 - Process Variable Monitoring
 - Process Snapshot
 - Process Backtrack
 - Initial Conditions Initiation
 - Simulation Startup and Stop
 - Time Scale Changes
 - Report Production
 - Logging Functions
 - Instrumentation Override

Since actual instrumentation varies from vendor to vendor, AUDY's™ engineers must approach the methods used for each interface on a case-by-case basis. In all cases, the interface provides a communications path between the Distributed Control System and the Simulator System.

The technical characteristics of a specific DCS and the intended use of the Direct Connect Simulator will determine the degree of simulator functionality that will be implemented.

An AUDY™ Full Function Direct Connect System provides plants with:

- Operator Stations identical to actual control system instrumentation
- Easy conversion between simulation use and actual operations use
- "Test Bed" for new instrumentation vendor software
- Hardware for maintenance as well as operator training and engineering studies
- AUDY's™ unique simulation features
- Use of actual plant instrument configurations and process graphics

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