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Real Time Networks

View Course Details

COURSE DATES AND TIMES

Expanding PLC functionality with networking:

Although PLCs opened the door for on-the-floor visual communication, it was their integration with networking devices that offered manufacturers a new level of visibility and control by combining real-time Ethernet with visualization, control, and communication capabilities.

To meet the growing operation needs of industrial automation, networks continue to expand, offering monitoring and control capabilities in areas not previously possible. Device networks are now using fieldbus-to-Ethernet integration to develop enterprise-wide control networks. Merging networking functionality with PLCs enables users to off-load main processor tasks for distributed control in the field, placing control-level devices closer to the action. Additionally, by combining control with distributed I/O, manufacturers can lower their total cost of operation by streamlining data acquisition, communication, and factory-wide connectivity.

Networking: For PLCs to become a networking tool, users must have the necessary bandwidth that allows real-time industrial Ethernet. Because connection and communication requirements are expanding, PLCs must increase support for multiple network technologies. While there is no one-size-fits-all industrial network for all of the advanced I/O solutions, PLCs can connect the enterprise layer to the plant as needed by accommodating multiple protocols. Because network protocols add functionality, PLCs are necessary components for driving and supporting these additional functions.

Maintaining these industrial automation networks continues to be a key component in ensuring these integrated system continue functioning. A reliable network is paramount. Therefore, maintaining network availability is crucial. This requires the system to support the necessary bandwidth and high data transmission rates to meet application specifications, as well as data protection during maintenance operations and fast recoveries if connection failures occur.

Along with speed and availability, redundancy is important for continued performance and reliability. Prolonged periods of unplanned system downtime can become a potential threat to

plant productivity. However, redundancy technologies not only provide msec-level network recovery, but they can also substantially reduce deployment costs.

Students will learn how to select the proper real time network for the application and implement the desired performance; capacity and robustness for horizontal and vertical integration.

LEARNING OBJECTIVES

Students who attend our Real Time Networking training course will understand how to use network, in real time, various devices in larger automated industrial electrical systems. Our intensive two-day training courses uses a combination of interactive exercises, practical applications, and case studies.

Our Real Time Networking Training Course Students will learn:

- Legacy Allen Bradley Real time networks
- Rockwell Real time Networks
- Industrial ETH Network;
- Software and Hardware Networks convertors
- Implementation of safety and redundant networks

WHO SHOULD ATTEND

- PLC Programmers
- electrical and electronic technicians and technologists
- electrical engineers

Automation specialists in the industrial, consulting, and utility fields involved in design, operation and maintenance who require knowledge of electrical system automation techniques.

STUDENTS RECEIVE

- This Course Includes Our Latest Programmable Logic Controller Handbook!! (Value $20)
- **$100 Coupon** Toward any Future Electricity Forum Event (Restrictions Apply)
- 1.2 Continuing Education Unit (CEU) Credits (12 Professional Development Hours)
- **FREE** Magazine Subscription (Value $25.00)
- Course Materials in Paper Format

Real Time Networking Training Program

DAY ONE

Session 1: Introduction to Real Time Networking

- General topology of real time application
- Redundancy requirements for real time applications
- Data flow in a deterministic network

Session 2: Typical requirements and applications for deterministic networks

- Motion control application
- Safety industrial loops and Safety Systems
- Real time measurements and control

Session 3: Most important Protocols used in Real Time Networking

- DH+; RIO; Device Net; Control Net; SERCOS; MODBUS; PROFIBUS; LANWorks; Industrial Ethernet

Session 4: Parameters and Settings of Allen Bradley Real Time Networks

- Parameters of DH+ and Remote I/O
- Hardware incorporating the Allen Bradley network
- Bridges to Eth to RIO or DH+

Session 5: Applications of Allen Bradley Networks

- PLC Communications via Allen Bradley Networks, MSG instructions
- Touch Screens communicating on Allen Bradley network
- Computer adapters for Allen Bradley network

Session 6: Parameters of Rockwell Real Time Networks

- Parameters and settings of Device Net
- Parameters and settings of Control Net
- Parameters and Settings of SERCOS Network

Session 7: Implementation and structures of Allen Bradley & Rockwell Networks

- Real time network implementation example using Allen Bradley and Rockwell Networks

- Scheduling the Rockwell Networks: Control Net & Device Net
- Parameter Optimization for Rockwell Networks

Session 8: Hardware Selection; Topology and Software required to implement Rockwell Real Time Network

- Configuration of the Control Net Network based on requirements
- Selection of the transmission Media
- Duplex Networks Setup and advantages
- Interconnection of Control Net Network to other Networks

Session 9: Bridges and Convertors for real time Networks

- Setting up RIO & DH+ Networks for communication with ETH Network
- Optimisation and applications of DH+ and RIO Networks

Session 10: Modbus Networks and applications

- Parameters of Modbus Communication
- The five types of MODBUS Network
- Selection of MODBUS Network

Session 11: Profibus Networks and applications

- Profibus Network Parameters and Solutions
- Profinet Network parameters and implementation
- Interconnecting Profibus and Profinet

Session 12: Software protocol convertors

- Hardware solutions for network convertors implementation: AnyBus Convertor
- Software solution for network convertors implementation: Keep Sever

Session 13: Keep Server example of implementation for Oil Extraction Application

- Flow Boss S600 Emerson to Rockwell PLC communication example

Session 14: HART communications and applications

- Smart Metering and interconnection to the data acquisition card via HART Protocol
- HART Network scheduling devices and procedures
- HART Network parameters and optimization
- Application of HART Network in OIL Industry

DAY TWO

Session 15: Implementation of a Control Net Real time network

- Demonstration of the Control Net Functionality using a Demo Box
- Parameters visualization for a Control Net Network

Session 16: Hardware planning and configuration for Control Net

- Selecting RG-6 or Fiber Optic based on Speed and volum of information
- Configuration of the Control Net, length of cables, amplifiers, end of line Caps
- Calculation of the Control Net Media Based on distance of communication

Session 17: Setting up the Keeper for Control Net

- Demonstration of a new Keeper Setup using RS-Networks for Control Net
- Parameters –setup and validation using RS-NETWORKS for CONTROL NET

Session 18: Using Real Time Networks in a Plant PAX Application

- Setting up the PLANT PAX for floor communication
- Real Time Data Acquisition for Plant PAX Application

Session 19: Other Real time Networks and Applications:

- Backnet; Lan Works parameters and applications
- Fire Systems and Building Automation Systems

Session 20: Industrial Ethernet, parameters, performance and applications

- Industrial ETH devices: ETAP Card
- Motion Drives using Industrial ETH
- Configuration of Industrial ETH Networks using RS-NETWORKS for ETH

Session 21: RS-Networks for Device Net and ETH, application

- Rs-Networks for Device Net parameter settings
- Configuration and requirements for Device Net Network

Session 22: Debugging Control net Network

- RS-Networks for Control Net used for fault identification
- Erasing the Keeper
- Setting up a Backup Keeper
- Fault Handler for device Net in RS-LOGIX 5000
- Maintenance and firmware upgrade for Control Net
- Using KFC-15 for Control net setup and CIP verification

Session 23: Debugging Device net Network

- Capturing Device Net Faults using RS-Networks for Device Net
- Fault Handler for Device Net in RS-Logix 5000
- Maintenance of the Device Net Network, firmware upgrade

Session 24: Stratix 8000 and CISCO Routers for real time applications

- Applications of industrial ETH Router
- Accesing Tags directly in STARTIX 8000

Session 25: Integrating a multiprotocol Real Time netwok

Session 26: Example of integration of a multi network Real time network

Session 27: Wireless; Blue Tooth and Radio communication pros and cons

COURSE TIMETABLE

Both days:
Start: 8:00 a.m.
Coffee Break: 10:00 a.m.
Lunch: 12:00 noon (not included with course)
Restart: 1:15 p.m.
Finish: 4:30 p.m.

Contact us Today for a FREE quotation to deliver this course at your company's location.

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