BELDEN
SENDING ALL THE RIGHT SIGNALS

2016 Industrial Ethernet
Infrastructure Design Seminar

IEI
Design
Seminar

*Learning trends, technologies and best practices
for industrial networks*

**October 10-13, 2016
Orlando, Florida USA**

BELDEN

GarrettCom®
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tripwire

Learning trends, technologies and best practices for industrial networks

Your industrial network infrastructure is evolving. Join us at the 2016 Industrial Ethernet Infrastructure Design Seminar taking place October 10-13 at the Marriott Orlando World Center in Orlando, Florida to learn best practices for all aspects of your industrial network – from cables and connectivity to industrial IT and cybersecurity.

About the Design Seminar

This seminar brings together people involved with designing and maintaining industrial Ethernet networks with Belden's experts from around the world. People come because the experts are approachable, available, and the event has a practical, no-nonsense, tell-it-like-it-is feel.

- Combines lectures, live demonstrations and hands-on labs
- Introduces best practices for industrial infrastructure
- Inspires with engaging keynote addresses
- Covers spectrum from introductory to advanced level
- Connects you with recognized industry experts
- Promotes peer-to-peer networking and learning

Focus on Industry Trends

From Power Transmission & Distribution to Transportation, from Discrete to Process, the Belden Design Seminar keeps you up-to-date on technologies that impact mission-critical applications.

- Network Design
- Cybersecurity
- Physical Security
- Wireless
- Industrial Internet of Things (IIoT)

Who Should Attend?

This seminar is designed for anyone who is responsible for designing or maintaining mission-critical Ethernet networks:

- Network Design Engineers
- Machine Builders
- System Integrators
- Plant Engineers
- Maintenance Technicians
- IT Professionals
- Professional Engineering Firms

Cost

The seminar price is $900. Register before September 2, 2016 and receive a discount rate of $750.

This cost includes meals and events, classes, hands-on labs, all technical presentations in electronic format, as well as several special events.

Travel and hotel expenses are not included in the seminar price and are the responsibility of each attendee.

Registration

To register, visit our website at www.belden.com/designseminar

NOTE: Class sizes are limited, so seating is being offered on a first-come, first-served basis.

Featured Brands
BELDEN, GarrettCom, HIRSCHMANN, lumberg automation, TOFINO SECURITY, tripwire

Hotel Information

Marriott Orlando World Center

8701 World Center Drive

Orlando, FL 32821

407-239-4200

To reserve your hotel, visit Belden IEI Design Seminar. Book by September 19, 2016 to secure a rate of $179/night.

Event Overview

You should plan to arrive on the afternoon of Monday, October 10. Event registration will be open from 4:00-7:00 p.m. at the Grand Registration Desk. Join us for a welcome reception from 7:00-9:00 p.m. outside on the West Terrace of the hotel.

Breakfast will be available on Tuesday, Wednesday and Thursday mornings beginning at 7:00 a.m., with the seminar starting promptly at 7:45 a.m.

There will be an opening general session on both Tuesday and Wednesday mornings. On Tuesday evening, you're invited to a group dinner and evening event. This event will give you an opportunity to relax and "network" (in the social sense) with other attendees, as well as the staff and management teams from Belden, GarrettCom, Hirschmann, Lumberg Automation, Tofino Security and Tripwire. The seminar will conclude by 5:00 p.m. on Thursday, October 13.

A personalized electronic agenda for the event will be available for download to your personal smart phone or tablet (Android or Apple format).

New This Year

In addition to offering popular courses from previous seminars, this year's agenda includes:

- Ethernet 101
- Remote Access Solutions
- Hands-on Lab: Industrial Cable
- Lecture & Lab: Configuring Switches, Diagnostics and Basic Troubleshooting
- Converging Technologies for Wireless Network Security
- How to Harden and Secure Essential Windows Systems
- Cybersecurity Hot Spots within ICS Networks, Endpoints, and Industrial Control Systems
- How to Efficiently Automate Security and Continuously Monitor ICS Operations

Contact Information

For questions, please contact Kim Spiegel: **phone: 317-818-6359** or **email: Kimberly.Spiegel@Belden.com**

Schedule at a Glance

Day 1	Monday, October 10				
4:00 pm - 7:00 pm	Registration / Information Desk Open				
7:00 pm - 9:00 pm	Welcome Reception - Cocktails and Hors d'oeuvres				

Day 2	Tuesday, October 11				
7:00 am - 5:00 pm	Registration / Information Desk Open				
7:00 am - 7:45 am	Breakfast				
	Grand 5	**Grand 6**	**Grand 1 & 2**	**Grand 7B**	**Grand 3 & 4**
7:45 am - 8:15 am	Opening Welcome				
	Session 1				
8:15 am - 9:45 am	Industrial Ethernet Infrastructure Design Best Practices (General Session)				
9:45 am - 10:15 am	Morning Break				
	Session 2				
10:15 am - 11:45 am	Industrial Networking Best Practices: Real-World Suggestions for Your Network	Introduction to Network Redundancy	Ethernet 101	Hands-on Lab: Intro to Industrial Wireless – Setting Up an Access Point	Hands-on Lab: Intro to Cybersecurity & Tofino
11:45 am - 12:45 pm	Lunch				
12:45 pm - 1:45 pm	Keynote Speaker				
	Session 3				
1:45 pm - 3:15 pm	Industrial Networking Best Practices: Selecting Copper & Fiber Cable/Connectors	Cool Things Your Switch Can Do That You Don't Know About	Lecture & Lab: Configuring Switches, Diagnostics and Basic Switch Troubleshooting	Advanced Lecture & Lab: Industrial Wireless – Popular Configurations Beyond Basic Access Points	Hands-on Lab: Deep Packet Inspection (Modbus TCP, EtherNet/IP, DNP3)
3:15 pm - 3:45 pm	Break				Break
	Session 4				
3:45 pm - 5:15 pm	Industrial Networking Best Practices: Selecting Active Components	Remote Access Solutions			How to Harden and Secure Essential Windows Systems
5:15 pm - 5:30 pm	Evening Assembly				
6:15 pm - 10:00 pm	Dinner & Social Event				

Day 3	Wednesday, October 12				
7:00 am - 5:00 pm	Registration / Information Desk Open				
7:00 am - 7:45 am	Breakfast				
	Grand 5	**Grand 6**	**Grand 1 & 2**	**Grand 7B**	**Grand 3 & 4**
7:45 am - 8:15 am	Morning Welcome & Belden Keynote				
	Session 5				
8:15 am - 9:45 am	Live Demo: Industrial High-Speed Ethernet LAN Setup from Scratch (General Session)				
9:45 am - 10:15 am	Morning Break				
	Session 6				
10:15 am - 11:45 am	Top 10 Tech Tips to Avoid Tech Support	Remote Access Solutions	Network Isolation & Segmentation	Industrial Networking Best Practices: Selecting Active Components	Hands-on Lab: Basic Routing & Firewall Setup with EAGLE20-0400 Multi-Port Firewall
11:45 am - 12:45 pm	Lunch				
12:45 pm - 1:45 pm	Keynote Speaker				
	Session 7				
1:45 pm - 3:15 pm	Security Inside - Applying Security Features Using Hardware That You Already Have	Industrial Networking Best Practices: Real-World Suggestions for Your Network	Advanced Lecture & Lab: Network Segmentation with Layer 3 Switches	Lecture & Lab: The Importance of Network Management & Visualization	Hot Topic - Industrial Internet of Things
3:15 pm - 3:45 pm	Break				Break
	Session 8				
3:45 pm - 5:15 pm	Integrating Network Management into DCS/PLC/HMI/SCADA Systems	Introduction to Network Redundancy			How to Efficiently Automate Security and Continuously Monitor ICS Operations
5:15 pm - 5:45 pm	Evening Assembly & Belden Keynote				

Schedule at a Glance (Continued)

Day 4	Thursday, October 13				
7:00 am - 12:00 pm	Registration / Information Desk Open				
7:00 am - 7:45 am	Breakfast				
	Grand 5	Grand 6	Grand 1 & 2	Grand 7B	Grand 3 & 4
7:45 am - 8:15 am	Morning Welcome & Belden Keynote				
	Session 9				
8:15 am - 9:45 am	Network Isolation & Segmentation	Converging Technologies for Wireless Network Security	Advanced Lecture & Lab: Understanding & Configuring Network Redundancy	Hands-On Lab: Industrial Cable	Hands-on Lab: Basic Routing & Firewall Setup with EAGLE20-0400 Multi-Port Firewall
9:45 am - 10:15 am	Break			Break	
	Session 10				
10:15 am - 11:45 am	Security Inside - Applying Security Features Using Hardware That You Already Have	Live Demo: Using Lumberg I/O in a Device Level Ring (DLR) Application		Hands-on Lab: Intro to Industrial Wireless – Setting Up an Access Point	Hands-on Lab: Intro to Cybersecurity & Tofino
11:45 am - 1:00 pm	Lunch				
	Session 11				
1:00 pm - 2:30 pm	Industrial Networking Best Practices: Selecting Copper & Fiber Cable/Connectors	Cybersecurity Hot Spots within ICS Networks, Endpoints, and Industrial Control Systems	Advanced Lecture & Lab: Network Segmentation with Layer 3 Switches	Advanced Lecture & Lab: Industrial Wireless – Popular Configurations Beyond Basic Access Points	Hands-on Lab: Deep Packet Inspection (Modbus/TCP, EtherNet/IP and DNP3)
2:30 pm - 3:00 pm	Break				Break
	Session 12				
3:00 pm - 4:30 pm	Integrating Network Management into DCS/PLC/HMI/SCADA Systems	Cool Things Your Switch Can Do That You Don't Know About			How to Efficiently Automate Security and Continuously Monitor ICS Operations
4:30 pm - 4:45 pm	Event Close & Farewell				

Legend: Session Tracks					
Design	Networking	Wireless	Security	Live Demo	Cybersecurity

Session Descriptions

Design	Networking	Wireless	Security	Live Demo	Cybersecurity

| Session Title	Session Description	Sessions
Industrial Ethernet Infrastructure Design Best Practices	Compare your own thoughts and ideas to our high-level best practices for designing industrial network infrastructures. This session looks at segmentation, security, redundancy, physical media and other critical network attributes and is designed to spark your curiosity for topics that will be covered throughout the week.	1 General
Ethernet 101	A foundation class designed to demystify Ethernet. We will examine the OSI Model, Routing vs. Switching, addressing and traffic types and how they relate to each other. Plus, you'll learn the meaning of common Ethernet terms and buzzwords…in everyday language.	2
Industrial Networking Best Practices: Real-World Suggestions for Your Network	Translate high-level best practices into practical suggestions for implementing your industrial Ethernet infrastructure. Step-by-step, we'll guide you through the technology and resources you may not even know is within your reach. Then, you'll learn about the most common pitfalls and how to avoid them. Plus, you'll leave the session knowing just how to plan for the future of your network.	2 & 7
Industrial Networking Best Practices: Selecting Active Components	Given a practical network design, it's up to you to choose the right industrial-grade products to make a great network infrastructure. Understand what features to evaluate and how to match them against your specific environment and needs. You'll learn how to choose the right products to elevate your network's performance to its maximum benefit level.	4 & 6
Industrial Networking Best Practices: Selecting Copper & Fiber Cable/Connectors	In today's market, Ethernet switches and routers steal the spotlight. But at the core of your network, you still need the cables and connectors that are the workhorses for your network performance. In this session, you'll learn how to properly specify fiber and copper cables, cordsets and connectors. Plus, you'll also gain insight to installation best-practices that ensure your industrial applications perform flawlessly.	3 & 11
Top 10 Tech Tips to Avoid Technical Support	Avoid all that frustrating downtime, listening to bad music and waiting on technical support. Let Belden's technical team give you the inside scoop on how to stay off the phone and on track. There are decades of experience behind this session. You'll get answers to many frequently asked questions – from multicast and IGMP to Duplex Mismatch and where to find engineering drawings.	6
Remote Access Solutions	Interested in learning the pros and cons of the many remote access solutions available on the market? In this session, you will explore different technologies including phone modems, cellular modems, cloud-based access, VPN and more. We will compare and contrast where these technologies best fit within certain applications and industries and demonstrate the basics to set up a robust solution.	4 & 6
Hands-on Lab: Industrial Cable	You've heard that cables and connectors can be the most important components in an industrial network. They can be the most common culprit of network downtime compared to more sophisticated network components such as switches, routers and even firewalls. This session will dissect practical examples and applications to give you insight on choosing the right Industrial Ethernet cable and RJ45 and M12 connectors. Lastly, you will finalize and test your own industrial patch cord using field installable, industrial, shielded RJ45 connectors.	9
Live Demo: Industrial High-Speed Ethernet LAN Setup from Scratch	Witness an Industrial Ethernet Network being built from the ground up. See exactly how to integrate configurations for redundancy, security, wireless, network isolation and network management. This session will give you an unparalleled experience in witnessing the rapid deployment of the different concepts and theories talked about in other sessions, but in a real-world scenario.	5 General
Live Demo: Using Lumberg I/O in a Device Level Ring (DLR) Application	Aim for uninterrupted operation of your machines. Installing a Device Level Ring on your I/O hardware automatically switches data modules to an alternative ring when a connection is broken. This session puts you up-close-and-personal with implementing a DLR on a programmable logic controller (PLC) and a distributed I/O device.	10
Hot Topic - Industrial Internet of Things	HOT TOPIC: You've heard the rumblings: "The Internet of Things (IoT) is coming. It will change how you do business." Tap into Belden's expertise and understand what's really happening. We'll guide you through the data jungle and help clarify the state of the IoT world today. Then, we'll take you to the next level and look at the future that IoT promises, including affected technologies and possible advancements.	7
Cool Things Your Switch Can Do That You Don't Know About	HOT TOPIC: Become your facility's network superhero. Valuable, time-saving benefits are hiding in plain sight inside your Hirschmann and GarrettCom switches. We'll give you the keys to unlock all the secret functions for better network performance and productivity. Knowing how to tap into this treasure will make you the go-to expert of your operation.	3 & 12
Lecture & Lab: Configuring Switches, Diagnostics and Basic Troubleshooting	In this class, you will work with live switches, from powering them up to learning best practices for addressing parameters to commissioning the switch for your application. We will also share optional and recommended diagnostic and monitoring features as well as principles of troubleshooting your switch and what to look out for. Ease of use and familiarity is the goal.	3 & 4 combined
Network Isolation & Segmentation	Dramatically improve your network's performance, security and ease of maintenance simply by isolating traffic. This session looks at the reasons why you would want to isolate network segments. It also shows you various ways to deliver this isolation – including the use of VLANs, routers/Layer 3 switches and firewalls. **This is a prerequisite to the Advanced Lecture & Lab: Network Segmentation with Layer 3 Switches.**	6 & 9
Advanced Lecture & Lab: Network Segmentation with Layer 3 Switches	Learn how Layer 3 routing can be used to separate local area networks into multiple Layer-3 subnets using Physical and VLAN Based Router Interfaces. Examine why, when and how Layer 3 routing takes place in a network and the types of routing protocols used. Then, put the practical theory to work by configuring the various routing methodologies in a multiple network environment. **(Note: There is a prerequisite for this lab. See Network Isolation & Segmentation.)**	7 & 8 combined 11 & 12 combined
Introduction to Network Redundancy	Improve your network availability. New redundancy protocols give you more options than ever before. Learn the design and application details of these modern, cutting edge protocols so you can make the best choice for your network. Bonus: you'll see a live demonstration of a zero-packet-loss redundancy method.	2 & 8
Advanced Lecture & Lab: Understanding & Configuring Network Redundancy	If you're a ruggedized network veteran, it's time to dive deeper. This beyond-the-basics course combines an expert presentation with an experiential lab on current redundancy mechanisms. You'll gain new application insights to improving reliability and availability. Then, you'll have the opportunity to apply these ideas, using real Hirschmann products.	9 & 10 Combined

Session Descriptions

| Design | Networking | Wireless | Security | Live Demo | Cybersecurity |

Session Title	Session Description	Sessions
Lecture & Lab: The Importance of Network Management & Visualization	There are many methods to interface with network devices. Each has its place – but what combination is right for your application? Now, you can put a solid network management strategy into action. This session helps you identify the best approach for your needs. You then move from theory into practice as you learn how easy it is to implement a network management system using Industrial HiVision.	7 & 8 Combined
Integrating Network Management into DCS/PLC/HMI/SCADA Systems	Seamlessly integrate your network with the most common tools used in automation and SCADA systems. The session showcases how you can take advantage of Hirschmann's industrial profiles for EtherNet/IP and PROFINET to facilitate faster, safer, and higher quality manufacturing.	8 & 12
Hands-on Lab: Basic Routing & Firewall Setup with EAGLE20-0400 Multi-Port Firewall	Learn how to install and quickly configure the new Eagle20-0400 Multi-Port Firewall for your production environment. In this session, you'll learn to configure Physical and VLAN Based Router Interfaces, Static Routes, IP Masquerading and 1:1 NAT, plus Incoming and Outgoing Firewall Rules that will elevate the security posture of your industrial networks.	6 & 9
Security Inside – Applying Security Features Using Hardware That You Already Have	Expand the benefits of the Hirschmann and GarrettCom managed switches and routers you already have installed. This practical session leads you on a discovery adventure, revealing all the hidden, helpful secrets to improving your entire network security plan. The real value isn't just unearthing these gems, but in understanding how you can apply them – NOW.	7 & 10
Converging Technologies for Wireless Network Security	Explore best practices for securing your industrial wireless network. We will investigate existing features and functions such as VLANs, Radius, Firewalls and Intrusion Detection. As each topic is expanded, you will also learn about the direct impact on the security of your overall network infrastructure.	9
Hands-on Lab: Intro to Industrial Wireless - Setting Up an Access Point	Set up your own wireless Access Point – no previous experience required. Step-by-step, this session leads you through the process, using the latest Hirschmann OpenBAT wireless technology. It's a learn-by-doing methodology that guarantees you'll go home with skills you can immediately put to work in your facility.	2 & 10
Advanced Lecture & Lab: Industrial Wireless – Popular Configurations Beyond Basic Access Points	Take your lab experience beyond simple access point implementation to include Access Client, Point-to-Point and Point-to-Multi-Point applications. Plus, you'll explore options for site planning and see a full demonstration of available site planning tools. The entire session propels you to optimum wireless network performance.	3 & 4 Combined 11 & 12 Combined
Hands-on Lab: Intro to Cybersecurity & Tofino	This class introduces you to the basics of cybersecurity and best practices, including defense in depth and zone & conduits. Come learn not only what is available to you in today's security arena, but also how to configure devices to help secure your network. The hands-on lab will teach you how to use the Tofino Security Appliance and Tofino Configurator to set basic firewall rules, operational modes and live testing. These are the first steps to protecting your network with the Tofino Security Appliance. This lab actively engages you so you'll walk away with the comfort level to tackle your next project with confidence. **This is a pre-requisite for the Hands-on Lab: Deep Packet Inspection (Modbus/TCP, EtherNet/IP and DNP3).**	2 & 10
Hands-on Lab: Deep Packet Inspection (Modbus/TCP, EtherNet/IP and DNP3)	Learn how to implement ISA IEC 62443 best practices to increase the reliability and security of your system. This session examines deep packet inspection (DPI) and explains how it is used to ensure that only desired traffic flows between segments of your network. Using the Tofino Security Appliance, you'll experience the implementation process for yourself, increasing your skills with all industrial Ethernet protocols. **(Note: There is a prerequisite for this lab. See Hands-on Lab: Intro to Cybersecurity & Tofino.)**	3 & 11
How to Harden and Secure Essential Windows Systems	What if you still have old XP, Win98 or Windows Server 2003 systems that are out of support and remain vulnerable to a raft of possible exploits -- but they're still useful, required and running applications and services it would be too disruptive to alter? And further, even if you upgrade, the Windows OS continues to be a source of many exploitable vulnerabilities. This session explores hardening techniques you can do today to significantly increase your security and improve reliability and availability of those systems against disruption. Attendees will receive an Industrial Hardening Guide for Windows/Windows Embedded Systems.	4
Cybersecurity Hot Spots within ICS Networks, Endpoints, and Industrial Control Systems	Cybersecurity "Hot Spots" really exist in industrial environments, and this session examines the most common weaknesses that you'll encounter within industrial networks, endpoints, and industrial control systems. You'll get expert, practical guidance, based on true field experience, for what can be done and how to improve your cybersecurity posture with the least amount of change and delivering the highest impact.	11
How to Efficiently Automate Security and Continuously Monitor ICS Operations	Know your assets! This session offers a technology demonstration of Tripwire Configuration Compliance Manager (Tripwire CCM) for Industrial Automation. You will participate in a hands-on demonstration of assessing PLC, RTU, IED, DCS, HMI and other types of industrial systems against configuration weaknesses, vulnerabilities, ICS-CERT advisories and vendor advisories. We will use Rockwell FactoryTalk AssetCentre as an example system for how to do this non-invasively.	8 & 12

What attendees had to say about the 2015 IEI Design Seminar:

"I would highly recommend this event to others. Good content and pace."
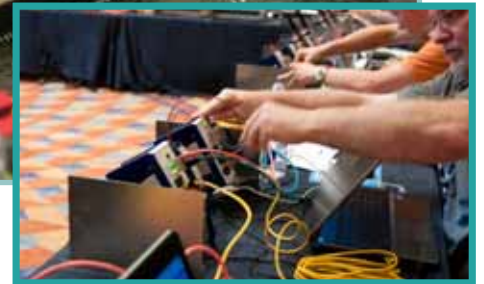
"I was looking for a starting point to begin to resolve issues. After this class, I feel much more aware of the technologies and concepts."

"The information presented will help with taking the proper steps to setting up any network."

"I learned many things, validated many more and had a great time doing it."

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