

## Are you ready to put your network knowledge and experience to the test?

Belden invites you to a results-driven learning experience specifically designed to help you pass the certification exam and achieve your goal to become a Certified Ethernet Specialist and Industrial Networking Professional.

**Event:** CT1/Industrial Ethernet and CT2/Industrial Networking Certification Training

**When:** CT1/Industrial Ethernet – October 10-11  
CT2/Industrial Networking – October 12-14

**Where:** Marriott Orlando World Center  
8701 World Center Drive  
Orlando, FL 32821  
407.239.4200  
To reserve your hotel, visit <https://resweb.passkey.com/go/BeldenIEIDesignSeminar2016>  
Book by September 19, 2016 to secure a rate of \$179/night

**Cost:** CT1/Industrial Ethernet – \$695  
CT2/Industrial Networking – \$995

**Register Today:** <https://www.registermyswitch.com/certification.php>

**Bonus:** Combine your certification training with the 2016 Industrial Ethernet Infrastructure Design Seminar, taking place concurrently at the same meeting site. No additional charge with your paid certification course registration. Contact Kim Spiegel to take advantage of one of these options:

- Attend CT1 on October 10-11 and the Design Seminar on October 12-13.
- Attend the Design Seminar on October 10-11 and CT2 on October 12-14 (if you have already taken CT1 and received your HiES certification).

### About the Industrial Ethernet Infrastructure Design Seminar

This event 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.

Through a combination of lecture topics, live demonstrations and hands-on labs, you will learn the information and skills you need to excel with mission-critical networks. Sessions cover both introductory and advanced topics related to key areas of network design, isolation, redundancy, security and more.

To learn more: [www.belden.com/designseminar](http://www.belden.com/designseminar)





**Be certain.  
Belden.**

### Contact Information

For questions, please contact Kim Spiegel: phone: 317-818-6359  
or email: [Kimberly.Spiegel@Belden.com](mailto:Kimberly.Spiegel@Belden.com)



CT1/Industrial Ethernet	CT2/Industrial Networking
<p><b>Target Group</b> Technology training course for Control and System Engineers, Network Designers and Support Technicians who are building, supporting or migrating an Industrial Ethernet network.</p>	
<p><b>Prerequisites</b> No previous knowledge of the subject is required. If available, the participant should bring a laptop with Ethernet connection and administrator rights.</p>	<p><b>Prerequisites</b> Attendance of the Industrial Ethernet (CT1) course. If available, the participant should bring a laptop with Ethernet connection and administrator rights.</p>
<p><b>Objective</b> In this Industrial Ethernet course, the participants will learn the technical fundamental details of the world's most widely used LAN communication protocol. At the end of the course the participants will have a good understanding of the inner workings of Ethernet, particularly as it applies to an industrial environment.</p>	<p><b>Objective</b> This course builds on experience gained from Industrial Ethernet (CT1), providing intense theoretical and practical knowledge about overall network functionality including TCP/IP, IP communication and multicasting. A special emphasis is placed on deploying TCP/IP and multicasting in complex industrial environments. This enables the participants to provide comprehensive support, both for demanding projects and their daily work.</p>
<p><b>Course Curriculum</b></p> <p><b>Physical Aspects of Ethernet</b></p> <ul style="list-style-type: none"> <li>• Copper-based cabling</li> <li>• Fiber-based cabling</li> <li>• MDI / MDI-X Physical Interfaces</li> <li>• Media Testing</li> <li>• Bandwidth / Speed</li> <li>• Half duplex and full duplex</li> <li>• Understanding Ethernet Frames</li> <li>• Address Types</li> <li>• Understanding MAC addresses</li> </ul> <p><b>Ethernet in Half Duplex Mode</b></p> <ul style="list-style-type: none"> <li>• Ethernet access method: CMSA/CD</li> <li>• Media Converter and Hub Functionality</li> </ul> <p><b>Ethernet in Full Duplex Mode</b></p> <ul style="list-style-type: none"> <li>• Autonegotiation/Detecting Duplicate Mismatch</li> <li>• Switch Functionality</li> <li>• Switching Mechanisms</li> <li>• Forwarding Database &amp; Aging Timers</li> <li>• Frame Sequences</li> <li>• Delay of Frames</li> </ul> <p><b>Network Availability</b></p> <ul style="list-style-type: none"> <li>• Topologies</li> <li>• Industrial Redundancies (MRP, PRP, HSR)</li> <li>• Rapid Spanning Tree</li> <li>• Link Aggregation</li> </ul> <p><b>Traffic Control at Layer 2</b></p> <ul style="list-style-type: none"> <li>• Bandwidth</li> <li>• Port Memory Usage</li> <li>• Flow Control</li> <li>• Quality of Service</li> <li>• VLANs</li> </ul> <div style="display: flex; justify-content: space-around; align-items: center;">   </div>	<p><b>Course Curriculum</b></p> <p><b>Internet Protocol</b></p> <ul style="list-style-type: none"> <li>• TCP/IP Protocol Stack</li> <li>• IP Packets</li> <li>• IP-Addresses and Netmask</li> <li>• Supernetting/Classless Inter Domain Routing (CIDR)</li> <li>• ICMP</li> </ul> <p><b>IP communication</b></p> <ul style="list-style-type: none"> <li>• Address Resolution Protocol (ARP)</li> <li>• Static Routing</li> </ul> <p><b>TCP and UDP</b></p> <ul style="list-style-type: none"> <li>• Ports and Services</li> <li>• Datagrams</li> </ul> <p><b>Applications</b></p> <ul style="list-style-type: none"> <li>• SNMP</li> <li>• IEEE1588 Precision Time Protocol</li> <li>• DHCP with Option 82</li> <li>• SNMP</li> </ul> <p><b>Multicasting</b></p> <ul style="list-style-type: none"> <li>• Multicast Addresses</li> <li>• Mapping IP addresses to MAC addresses</li> <li>• IGMP</li> </ul> <p><b>Network Requirements of Industrial Protocols</b></p> <ul style="list-style-type: none"> <li>• PROFINET</li> <li>• EtherNet/IP</li> <li>• Modbus/TCP</li> </ul> <p><b>Security</b></p> <ul style="list-style-type: none"> <li>• 802.1x</li> <li>• Radius</li> <li>• Network Address Translation</li> <li>• Port forwarding</li> <li>• Access Control Lists</li> </ul>

To register:  
[www.beldentraining.com](http://www.beldentraining.com)

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