



# Industrial Ethernet

(CT1)



TRAINING FLYER

Today all manufacturers consider Ethernet essential as a future-proof protocol for communication between various hardware and software platforms - both inside and outside industrial environments.

Ethernet makes it possible to connect many different PLCs and PC-based systems, in a seamless transparent network, which stretches from the factory floor to the boardroom.

## Target Group

Technology training course for System Engineers, Network Designers and Support Technicians who are building, supporting or migrating an Industrial Ethernet network.

## Prerequisites

No previous knowledge of the subject is required. If available, the participant should bring a laptop with Ethernet connection and an operating system CD. Administrator rights are required.

## Objective

In this Industrial Ethernet course the participants will learn details of the technical fundamentals and deployment objectives of the world's most widely used LAN communication protocol. At the end of the course the participants will have a good understanding of Ethernet, as well as its role in industrial networking, both now and in the future. For additional topics related to Industrial Ethernet, the participant should attend the "Industrial Networking (CT2)" training course.

**Languages:** CT1e English, CT1f French, CT1d German

**Duration:** 2 Days

**Schedule / Location / Price:**

[www.belden.com/resources/training](http://www.belden.com/resources/training)

Recommended for the Hirschmann Industrial Backbone Specialist certification examination.

## Seminar Content

### Standardization bodies

- ISO/OSI Layer Model
- IEEE 802
- IETF
- IEC

### The Physics of Ethernet

- Copper-based networks
- Fiber-based networks
- Physical Interfaces
- Bandwidth / Speed
- Half duplex and full duplex
- Ethernet Frame
- Understanding MAC addresses

### Ethernet in Half duplex mode

- Ethernet access method: CMA/CD
- Hubs

### Ethernet in Full duplex mode

- Autonegotiation
- Switches
- Switching Mechanisms
- Forwarding Database
- Delay of Frames

### Network Availability

- Topologies
- Rapid Spanning Tree
- Link Aggregation
- Industrial Redundancies (MRP, PRP, HSR)

### Traffic Control

- Flow Control
- VLANs
- Quality of Service