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Discover the power of e-learning!

# Fieldbus



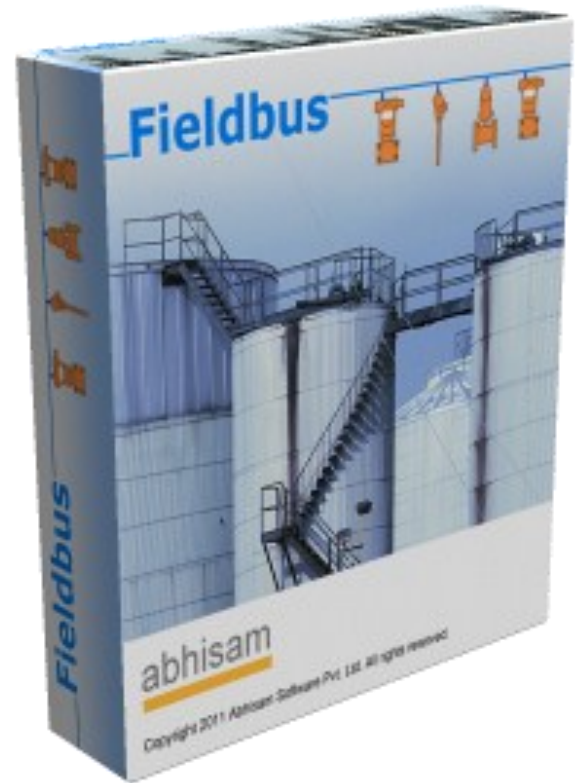


## Introduction

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Fieldbus is a modern automation architecture that is increasingly being adopted in a broad spectrum of industries, including oil and gas, chemicals, petrochemicals, pharmaceuticals, food and beverage, mining, metals processing, pulp and paper and power generation. The adoption of Fieldbus technology has been accelerating recently. User industries are now realizing the benefits of adopting Fieldbus technology in their plants in order to have better control over their processes, achieve higher productivity and increase safety and profitability.

Until now, there have been very few resources available to educate people in understanding and using Fieldbus technology. Classroom courses are rare, and sending people to far away locations is no longer cost effective in today's austere corporate environment.



This e-learning program can be completed anywhere in the world, offering participants total flexibility. The program is self-paced, allowing participants to complete it as quickly or slowly as they wish. What's more-unlike a classroom training course that will fade away from memory after some time, this e-learning course is available to you on your PC or laptop 24 X 7. It gets installed on your computer for as long as you wish, without any time limits at all!

The course incorporates a blend of text, interactive animations, videos and simulations using real-life examples from industry to give the course a practical edge. The course consists of FIVE modules. Starting from Basic Concepts (that covers topics such as Analog and Digital Signals, Control System architectures, various Fieldbus protocols and the OSI Models), it goes on to cover FOUNDATION Fieldbus in great detail. It also covers other popular industry Fieldbus systems, such as HART, Profibus PA and ASi. It then covers the use of Fieldbus technology in hazardous areas. The final module is a Case Study of a Fieldbus project that enables the learner to apply the knowledge gained within a practical application.

The program is sophisticated and interactive, making substantial use of multimedia elements, such as Flash animations, simulations and videos, to promote understanding. It also includes a Self- Assessment test that enables learners to know the level of their own knowledge.

If you wish to deliver this course to a large number of people (like for examples your employees or colleagues), then you can even opt for our hosted version. In this version nobody has to download anything at all, simply login to our Learning Management System over the internet and take the course! We will provide all compliance info including learner login times and scores, for your training records. And if you wish to use your own SCORM compliant Learning Management System (LMS), then we can even stream it to your LMS from our server, so that you can fully integrate the course within your other LMS courses, track scores, monitor training hours and assess your learners.



The following is a Table of Contents of the Fieldbus e-learning course.

## Module 1 - Basic Concepts

- Introduction
- Process Control Systems
- Single Loop Controller architecture
- Process Control Systems with Single Loop Controllers
- Traditional Controls-1
- Traditional Controls-2
- DDC to DCS
- DCS
- Automation Hierarchy
- Fieldbus
- Ethernet based buses
- Point to Point Architecture-1
- Point to Point Architecture-2
- Traditional DCS architecture-1
- Traditional DCS architecture-2
- Multi Drop architecture
- PLC based architecture
- Signals & their types
- Types of Signals
- Digital & Analog Signals
- Digital Signals -1
- Digital Signals -2
- Digital Signals -3
- Digital Signals -4
- Clock
- Manchester Encoding
- Field Devices
- Fieldbus Devices
- Analog Network
- Digital Network
- Combination Network
- Topologies -1
- Topologies -2
- Addressing
- Types of Bus networks -1
- Types of Bus networks -2
- Fieldbus Standards -1
- Fieldbus Standards -2
- Current Standards
- Interoperability
- FOUNDATION Fieldbus
- HART
- Profibus
- ASi
- Fieldbus advantages -1
- Fieldbus advantages -2
- Fieldbus advantages -2
- The OSI model
- Using OSI for communication
- Fieldbus OSI Model





## Module 2 - Foundation Fieldbus

- Introduction
- The Fieldbus Foundation
- Physical Layer
- H1 network
- H1 characteristics -1
- H1 characteristics -2
- H1 Segment -1
- H1 Segment -2
- Fieldbus Hardware & Terminology
- H1, H2 & HSE
- Topologies
- Daisy Chain
- Multidrop
- Chicken Foot Topology
- More on Topologies
- Linking Devices
- Handheld Communicators
- Host Communication
- Transmission & Reception
- FF Power supplies -1
- FF Power supplies -2
- FF Power supplies - Isolation
- FF 831
- Power Supply Sizing
- Redundant Power Supply
- Signal Characteristics -1
- Signal Characteristics -2
- Bricks & Couplers -1
- Bricks & Couplers -2
- Device Couplers
- Terminators -1
- Terminators -2
- Cable lengths
- Cable types
- Devices per spur
- Number of devices per segment
- H1 addressing -1
- H1 addressing -2
- DATA link layer
- Communication issues -1
- Communication issues -2
- Communication issues -3
- Communication issues -4
- Cyclic & Acyclic Communication
- Link Master
- Data Buffers
- Scheduled Communication
- Unscheduled Communication
- LAS Function
- Backup LAS
- Live list
- Time Synchronization
- User Layer
- Fieldbus Blocks
- Types of Blocks
- What are function blocks?
- Control in Field -1
- Control in Field -2
- Control in Field -3
- Typical loops using Function Blocks
- Typical loops using Function Blocks
- Representation of the FIC loop
- FIC loop implementation-1
- FIC loop implementation-2
- Location of Function Blocks -1
- Location of Function Blocks -2
- Location of Function Blocks -3
- Types of Function Blocks
- Typical Blocks in a PT
- Flexible Function Blocks
- Block status & modes
- Multiple measurements & blocks
- Multiple measurements & blocks
- Cascade Control Blocks
- Cascade control configuration
- Input Select Function
- Input Select Function
- Macrocycles-1
- Macrocycles-2
- Macrocycles-3
- Macrocycles-4
- Macrocycle optimization-1
- Macrocycle optimization-2
- Macrocycle optimization-3



- What are VCRs?
- More about VCRs
- VCR Limits
- More Function Blocks
- Fieldbus Interoperability
- Device Tests
- HIST
- Host Profiles
- Safety Instrumented Functions
- Traditional approach
- Advantages of FF SIF
- Disadvantages of FF SIF
- Black Channel
- White Channel

## Module 3 - HART, Profibus & ASi

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- Introduction
  - HART
  - HART Introduction
  - Master Slave network
  - Principle of operation -1
  - Principle of operation -2
  - FSk
  - HART Communicator
  - HART PC Configurator
  - HART Versions
  - HART 7 features
  - PSK
  - Point to Point Network
  - Multi Drop mode
  - Scan times
  - HART Commands
  - HART Hybrid Loop
  - HART Signals
  - DD files
  - Multiple process variables
  - Profibus
  - History
  - Fieldbus philosophy
  - Profibus DP
  - Profibus PA
  - Profinet & other profiles
  - Similarities with FF
  - Differences with FF
  - Architecture -1
  - Architecture -2
  - Segment couplers -1
  - Segment couplers -2
  - Number of devices
  - Standards
  - OSI Model & Profibus
  - Profibus PA blocks
  - Control in field?
  - ASICs
  - GSD files
  - FDT
  - Asset Management
  - ASi bus
  - Why Asi bus?
  - ASi Bus characteristics -1
  - ASi Bus characteristics -2
  - ASi Bus characteristics -3
  - ASi Bus characteristics -4
  - ASi Bus Topologies
  - ASi Bus Topologies
  - ASi Cable
  - ASi Masters
  - ASi ASIC
  - ASi Slaves
  - ASi addressing -1
  - ASi addressing -2
  - ASi Certification
  - ASi Power Supplies
  - Safety at work -1
  - Safety at work -2
  - Safety Monitor Working -1
  - Safety Monitor Working -2
  - PLC Safety Monitor
  - ASi Installation -1
  - ASi Installation -2
  - ASi Installation -3
  - ASi Installation -4



## MODULE 4 - Fieldbus in hazardous areas

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- Using traditional explosionproof methods
- Fieldbus using Intrinsic safety -1
- Fieldbus using Intrinsic safety -2
- Fieldbus using Intrinsic safety -3
- Fieldbus using Intrinsic safety -4
- Fieldbus using Intrinsic safety -5
- Fieldbus using Intrinsic safety -6
- Fieldbus using Intrinsic safety -7
- FISCO
- FISCO Topology
- FISCO Conditions
- FISCO Advantages
- FNICO
- FNICO with repeaters
- FNICO & Ex-ic
- Field Barriers & High Energy Trunks

## MODULE 5 - Case Study of a Fieldbus Project

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- The Project
- The plant & process
- The P & ID
- Fieldbus Architecture
- Engineering for Fieldbus-1
- Engineering for Fieldbus-2
- The new P & ID
- Segment Allocation -1
- Segment Allocation -2
- Segment Allocation -3
- Fieldbus Hardware
- Instruments
- Junction Boxes & Wiring Blocks
- Power Supply
- Cable
- Max Cable Length
- Terminators
- Fieldbus Software - 1
- Fieldbus Software - 2
- Installation - 1
- Installation - 2
- Format for checking
- Configuration -1
- Configuration -2
- Commissioning
- Trouble Shooting - 1
- Trouble Shooting - 2
- Completion of project

### Self Assessment Test

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This self-assessment test helps learners evaluate their own knowledge about **Fieldbus**. The test consists of several questions.

### Online Certification Exam

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After completing the Fieldbus e-learning course, the learner can take the Abhisam Online Certification Exam. Every learner will have a unique Login and password. Questions are of various types, pulled in from a large database developed by Abhisam. On passing, the learner earns a Certificate of Competency in Fieldbus. The Certificate bears the unique ID number of the learner and can be furnished as a proof of training and competency in Fieldbus to current and prospective employers and/or clients.



## Sample Certificate



## HAZOP Demo

By now you have seen how detailed and comprehensive the course is. A brief demo of the Fieldbus course can either be viewed online or downloaded from the Abhisam website. Please click <http://www.abhisam.com/freetrialcourses.htm> to do this.

## Demo of the full version

If you need a demo of the full version (say for presenting to your management), we can arrange a live online demo, where we will step you through the entire course. This will require a high speed internet connection at your end.

## AVAILABLE VERSIONS

The Fieldbus e-learning course is available in several versions as outlined below. The contents are the same in all these versions, only the delivery is different.

### Standard Version (Single PC license, Windows)

This version allows the learner to download and install the course on any one PC/laptop running Windows OS (XP, Vista, 7 or 8). It also includes one seat for the online exam and certification. Internet access is required for license activation and periodic verification. The online exam must be taken within one year of purchase of the license.

### Professional Version (Dual PC license, Windows)

This version allows the learner to download and install the course on any TWO PCs /laptops running Windows OS (XP, Vista, 7 or 8). It also includes one seat for the online exam and certification. Internet access is required for license activation and periodic verification. The online exam must be taken within one year of purchase of the license.

### Online Version (Windows, Mac or tablets)

This version is for those users who do not wish to install the course on their PCs/laptops/Macs. Access is online through our web based Learning Management System, using a standard browser such as Internet Explorer or Mozilla Firefox. The browser must allow Flash content to display animations. Access is also possible via tablets (however Flash has to be enabled on the tablet). Access is for a period of ONE WEEK. This version includes one seat to take the online exam and certification.

### Enterprise Version (Cloud based)

This version is for enterprises who wish to train their employees in Fieldbus. Every learner gets access to the online version of Fieldbus on our Learning Management System via a standard browser such as Internet Explorer or Mozilla Firefox. Access is also possible via tablets (however Flash has to be enabled on the tablet). The Enterprise version is available for groups of 10 or more learners. Access is valid for a period of ONE YEAR and includes an exam seat and certification for every learner.

### SCORM version

For enterprises that have their own SCORM compatible Learning Management Systems (LMS), we also have a SCORM version. This enables the Fieldbus e-learning course to be run in their own LMS. Only a license file needs to be uploaded to the LMS. The course is streamed directly from our server to the client's LMS.

### Why you should get this course

As plants and facilities become more and more automated, with a lesser and lesser appetite for risk, it is only natural that the use of Fieldbus to protect people, assets and the environment, will grow. It is extremely important that if you are involved in the specification, designing, usage or carrying out any other activity that concerns Fieldbus, Emergency Shutdown Systems or similar safety related automation; you must understand these systems thoroughly.

Additionally, you get an opportunity to take our online test and get certified as a competent person, who understands and can carry out work related to Fieldbus. This is great to prove your worth to current and prospective employers or clients.










### Why you should get this course from Abhisam

Abhisam Software is an e-learning company actively involved in training and education of technical personnel like you. Abhisam Software is not a vendor of Safety Instrumented Systems, nor a system integrator, nor a consultant. **Therefore the course is entirely vendor neutral.** This is important to you, as some of the "free" course providers have their own axes to grind, which you should keep in mind. Our other courses on **Hazardous Area Instrumentation, RFID, Gas Monitors** and **HAZOP** have become very popular and we count many engineers and technicians working in many industries and companies, including several Fortune 500 companies), as well as universities and government organizations, as our customers and end users. To the best of our knowledge there is no other course that compares to this presently, available in the market, for such a price.





## VERSIONS

Feature	Online	Standard	Professional	Cloud	SCORM
All Modules	✓	✓	✓	✓	✓
Self Assessment Test	✓	✓	✓	✓	✓
Online Exam & Certification	✓	✓	✓	✓	✓
Access	Online access only	Download to any one PC/laptop	Download to any TWO PCs/laptops	Online access only	Via your own LMS
Access Duration	One week	Three Years	Three Years	One Year	One Year
Operating Systems*	 or  or 			 or  or 	 or 
Devices*	PC/Laptop/Mac/Tablet	PC	PC	PC/Laptop/Mac/Tablet	PC/Laptop/Mac
Ideal for	Individuals	Individuals	Individuals	Organizations	Organizations

\* The Tablet Device should allow Flash (swf) files to run. The courses can be viewed on the iPad only with the Puffin browser (which allows Flash to run).

### How to order

This course can be ordered in a variety of ways, by online payment via credit or debit card, via wire transfer payments, physical checks, Paypal or several other options. Ask us for details.

**Please send your requirements to**

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