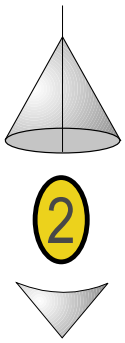


Training and Seminars

- Industrial Ethernet
- Modern communications in automation
- Modernization of plants

for

- Communication
- Industrial networks
- Troubleshooting

Industrial Ethernet

Fit for Ethernet.
Extensive insight into industrial networks.

Why Industrial Ethernet:

Industrial Ethernet is being used in system engineering more and more.
Even providers of fieldbus components appreciate the PC protocols Ethernet and TCP/IP in initiatives such as Profinet, ODVA and others.
High time to deal with this technique and its possibilities.

Ethernet TCP/IP in Automation I – Basics

- 3 day workshop: Around Ethernet and S7 / S5 communications

Limber up in Industrial Ethernet

Target Group:

Engineers and users in the field of planning and maintenance, who want to gain insight that theme

Requirements:

Basic knowledge in PLC programming

Part 1: Ethernet Workshop

a) Basics Ethernet
- Components of an industrial network
- Design of a TCP/IP network with PCs and PLCs
- Ethernet Basics
- TCP/IP protocol

b) Exercises
- Networking exercises
- Frame analysis via recording existing communication
- Application of helpful network tools

c) Forecast
- Ethernet in Automation
- Real time Ethernet
- Ethernet adaption to circumstances in automation

Part 2: PLC Workshop

a) Theory
- Theory PLC networking
- Ethernet communication with S7 / S5
- Connection parameterization of the PLC by using the protocols TCP/IP, ISO (H1) and ISO on TCP (RFC1006)
- Establish Send/Receive Direct communication between S7 and S5 PLCs
- Establish Fetch/Write communication between Client via OPC and S7
- Methodical searching in case of faulty communication

	Order number:	110-1000-01

Ethernet TCP/IP in Automation II – Troubleshooting

Unerring and fast analysis of network errors

- 2 day workshop

TARGET GROUP:
Engineers and users in the field of planning and maintenance

REQUIREMENTS:
Ethernet TCP/IP I or comparable (see page 30)
Basic knowledge in PLC programming

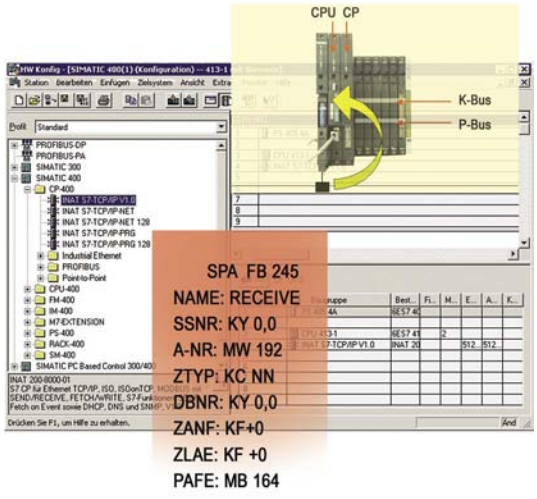
Function of network analyzers considering as example NetSpector
- Overview of the functions; Interpretation of statistics
- Using filters; automatic capturing
- Using trigger

Troubleshooting
- Fault analysis:
  - Send/Receive communication between S7 and S5 PLCs
  - Fetch/Write communication between PC and S7 (OPC communication)
  - together with higher services

You will learn the following:
- Clever procedure with fault analysis?
- Which tools are available?
- When should a network analyzer be used?
- How should a network analyzer be used?

	Order number:	100-2290-02

Ethernet TCP/IP in Automation III – Optimization of PLC communication



Efficient and even faster PLC communication

- 1 day Workshop

TARGET GROUP:
Engineers and users in the field of planning and maintenance

REQUIREMENTS:
Ethernet TCP/IP I or comparable

- Analysis of error messages
- Analysis of status messages
- Optimization of communications performance by efficient data structuring

	Order number:	110-1060-01

for

- OPC
- Remote maintenance
- Wireless LANs

Modern communications in Automation

Insight into OPC.
Review of new communication techniques.

Areas of Application

With the spread of PCs and the network techniques it is possible to access production data,
to visualize and to archive in manifold ways
The training familiarizes you with the possibilities as well as with the limits and risks of these techniques.

OPC Plug ´n´ Play Automation

- 2 day training with theory and practice

After these 2 days the participants are able to appraise every OPC Server and Client and to start them up.

Target group:

Engineers and users in the field of planning and project planning, who want to gain insight that theme

Requirements:

PC knowledge, basic knowledge programming

1) Introduction to OPC
- OLE for Process Control
- OPC Foundation, OPC Europe, activities

2) Basics OPC
- Overview OPC specifications
- Data Access 2.05/3.0
- Alarm & Event
- Historical batch data
- Forecast: OPC and XML

3) OPC in network
- DCOM configuration
- Data transfer via OPC and Ethernet
- Data transfer via OPC and Modbus/TCP
- Data transfer via OPC and MPI
- Forecast: OPC and XML

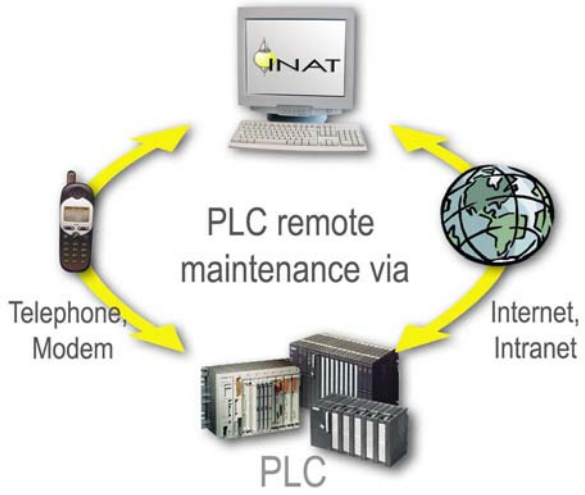
4) OPC communication with S7 / S5 PLCs
- Design in principle
- Communication blocks in the PLC
- Optimization of OPC communication in PLC programm

5) OPC-Clients
- Overview: Clients on the market
- Configuration of typical Clients (IFIX, Intouch, WinCC...)
- Introduction to development of a simple OPC Client for connecting with data bases and for visualization with Visual Basic based on OPC Data Access

6) Troubleshooting
- Error classification
- Error handling
- Troubleshooting

	Order number:	100-1030-01

Remote maintenance of S7 and S5 PLCs



S7- / S5 remote maintenance

- 1 day seminar

TARGET GROUP:
Engineers and users in the field of production plants and engineering who want to assure competitive advantage via remote maintenance

REQUIREMENTS:
Basic knowledge PLC and PC

1) Introduction remote maintenance
- Overview of available solutions
- Basics of PC communication
- Basics of PLC communication

2) Overview remote maintenance via Modem
- Using PSTN and ISDN Modems
- Examples

3) Overview remote maintenance via DSL
- Forecast: ADSL, SDSL, VDSL
- Practical adoption

4) Remote maintenance via Internet
- Theoretical Basics
- Ethernet TCP/IP Basics
- Practical adoption

5) Example for Routing configuration

6) Secure data transfer via Virtual Private Networks
- VPN Software solutions
- Hardware solutions
- Costs

7) Using software for remote maintenance
- Theoretical Basics
- Practical adoption

8) Analysis of the running communication
- Using Monitoring Tools
- Interpretation of the running communication with network analyzers

	Order number:	100-1040-01

Wireless LANs in Automation

- 1 day seminar

Wireless to the future – INAT shows you the way

TARGET GROUP:
Engineers, planners and users, who want to get survey of status of wireless LANs

REQUIREMENTS:
Basic knowledge PLC and PC

1) Introduction WLANs
- WLAN and other radio technology
- Legislation

2) Network types

3) Physical Basics
- Transfer media
- 802.11 Standards
- Frequency Hopping Technology
- Direct Sequence Technology

4) Increase of Scope: Antennas

5) TCP/IP and Wireless networks
- Roaming
- MobileIP
- TCP/IP in Wireless LAN

6) Network analysis in Wireless networks

7) Troubleshooting in Wireless networks

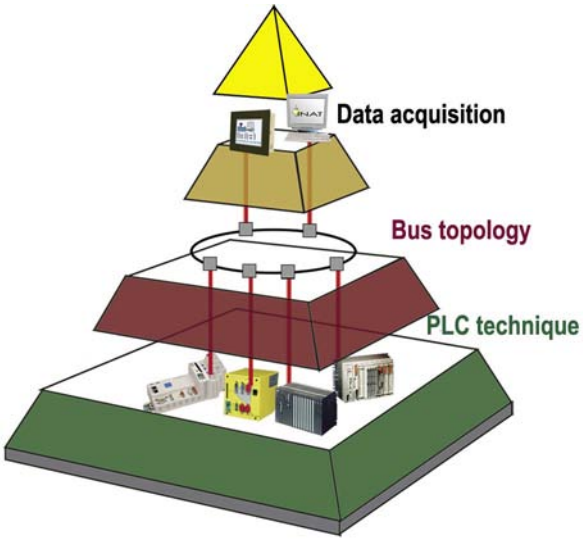
8) Security of Wireless networks

9) Industrial use of WLAN

10) Further development of WLANs

	Order number:	100-1080-01

Basics of Automation systems S7 / S5 including exercises



Components in the Automation Pyramid

Target Group:

The participants will learn the design and function of Simatic PLCs. They will configure and start up S7 and S5 PLCs. They will understand the standardized PLC structure and the corresponding programs. They will understand differences between the several block types and different program designs. They will be able to deal with diagnosis. All these themes will be reinforced by programming exercises. As hardware S5-115U and S7-300 PLCs with its periphery is used.

Requirements:

Basic knowledge PC and automation systems

1) Module 1: duration 2 days
- Design of automation systems (Hardware components ⇨ Hardware configurator)
- Working with Step 7 Siemens programming software (Creating a project, symbol editor, online functions)
- Program: Blocks FC, FB, OB, DB with S7 and S5, Program structure, handling alarms

2) Module 2: duration 5 days
- Binary relations (AND / OR relation)
- Memory function
- Transfer function (Load / Transfer)
- Comparison functions
- Format functions
- Timer functions
- Counter functions
- Data types

3) Module 3: duration 1 day
- Finding software errors
- Troubleshooting with Step 7
- Troubleshooting with hardware faults
- Software faults

4) Module 4: duration 3 days
- Design and Parameterization of Profibus DP
- Design and Parameterization of Industrial Ethernet

5) Module 5: duration 1 day
- Integration of urges (e.g. MM420)
- Coupling with process visualization systems

		Order numbers:
	Module 1	110-1300-01
	Module 2	110-1300-02
	Module 3	110-1300-03
	Module 4	110-1300-04
	Module 5	110-1300-05
	Complete package, Modules 1-5	110-1300-06

for

- S5 ⇨ S7
- ISO (H1) ⇨ TCP/IP

Modernization of plants

S5 Retrofitting.
Integration of PLCs into modern company communication.

Areas of Application

You are responsible for upgrading the existing plant equipped with S5 PLCs in ISO (H1) and TCP/IP networks and are looking for alternative solutions to the expensive complete backfitting? In these seminars you will learn how to rise to the challenge „modernization of plants“ in an effective way.

Modernization of plants

Overview in the modernization jungle

- 2 day Workshop

Target Group:

Responsibility in the field of production plants and engineering

Requirements:

- Ethernet TCP/IP I or comparable (see page 30)
- Basic knowledge PC and S7 / S5

- Does the following apply to you?
  – “There is lack of memory in the CPU!”
  – “My network is overloaded!”
  – “My visualization is from DOS era!”
  – “My ISO (H1) CPs need to be integrated to the TCP/IP network!”
  – “How long will spare parts be available?”
- In this seminar you will learn how to approach these problems and more. Possibilities and applications will be discussed.

- Analysis of a running S5 program
- Migration S5 / X5 example
- Link the X5 to Industrial Ethernet
- Programming techniques
- What has to be taken into account with different CPU types?
- What has to be taken into account with indirect addressing?
- Upgrade from X5 to X7
- S5 becomes a S7 – Which steps have to be taken?
- X7 in the Step 7 project

Inexpensive modernization of plants with X5 / X7

	Order number:	110-1100-01