PROFINET cursus

PROFINET
Theorie & Praktijk
Engineering & Fout zoeken

24 & 25/04, 2 & 3/05/2017

Interreg
2 Seas Mers Zeeën
INCASE
ondernemen in west-vlaanderen
provincie Oost-Vlaanderen
European Regional Development Fund

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PROFINET course

- In depth 4 day course
- Short theoretical overview as introduction
- Followed by detailed theoretical and practical coverage of most subtopics
- A lot of practical exercises => it's what you make of it!
- You work in groups of 2
- Introducing a lot of measuring techniques for analysis and diagnostics
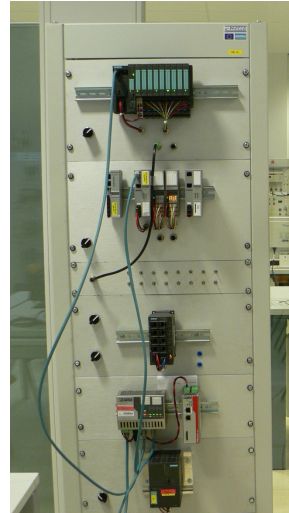- Using new laboratory set-ups

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PROFINET course – Equipment used

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Basic setup is mounted on
2 racks => small footprint

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PROFINET course – Equipment used

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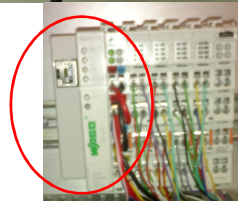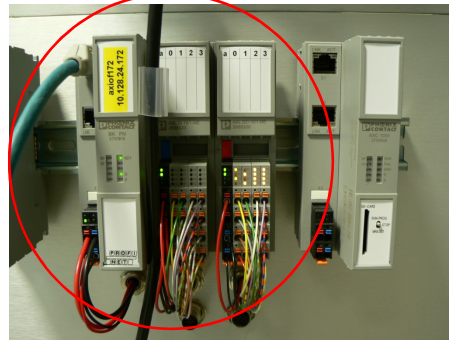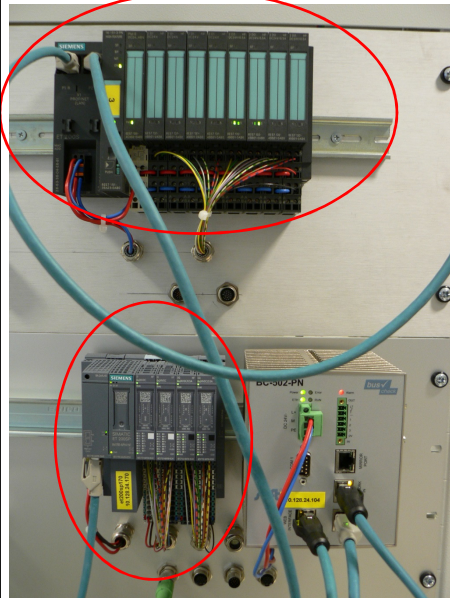Basic setup is mounted on
2 racks => small footprint

Use of 1 or 2 masters
in a network

4

PROFINET course – Equipment used

2 modular slaves per set-up, different vendors

PROFINET course – Equipment used
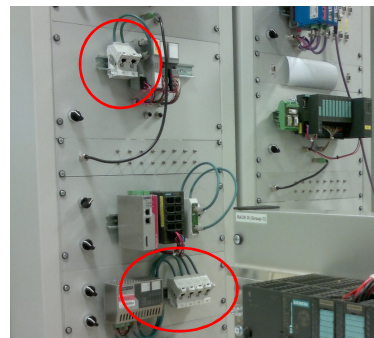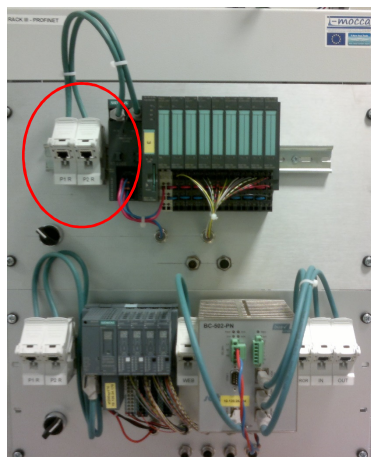
Now mounted using separate sockets for longer lifecycle

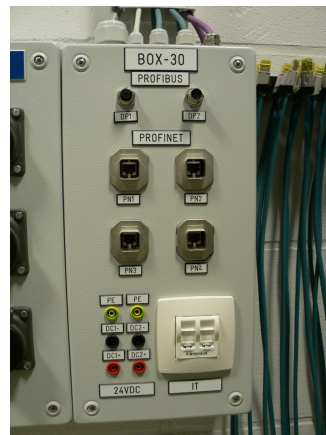**PROFINET course – Equipment used**

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Measurements, Analysis &
Diagnostics: cable testing

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PROFINET course – Equipment used

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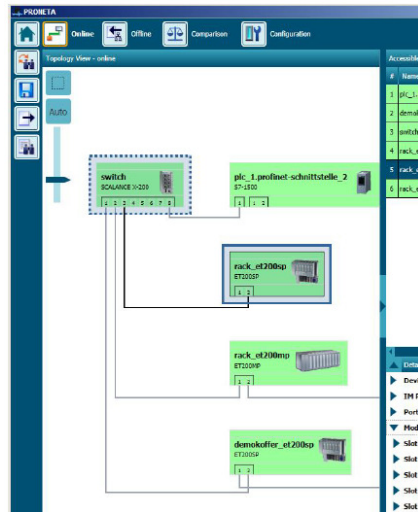Measurements, Analysis &
Diagnostics: Wireshark

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PROFINET course – Equipment used
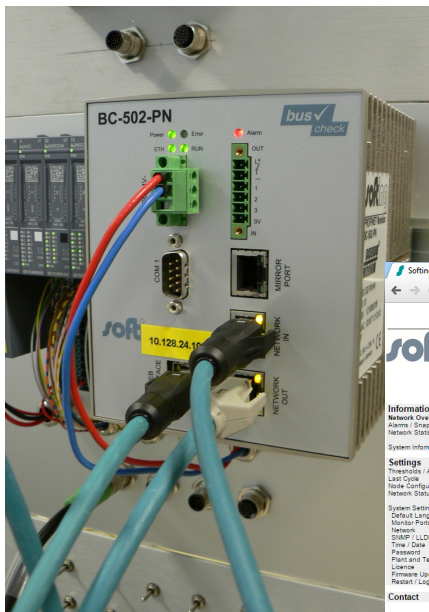
Measurements, Analysis & Diagnostics: Proneta

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PROFINET course – Equipment used

Measurements, Analysis & Diagnostics:
Softing PN Inspektor

New HW version and Software suite are coming …

PROFINET course – Equipment used

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Measurements, Analysis & Diagnostics: oscilloscope (independent decoding of UART characters, link to external measurements, …)

PROFINET course – Equipment used

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Measurements, Analysis & Diagnostics: oscilloscope (independent decoding of UART characters, link to external measurements, …)

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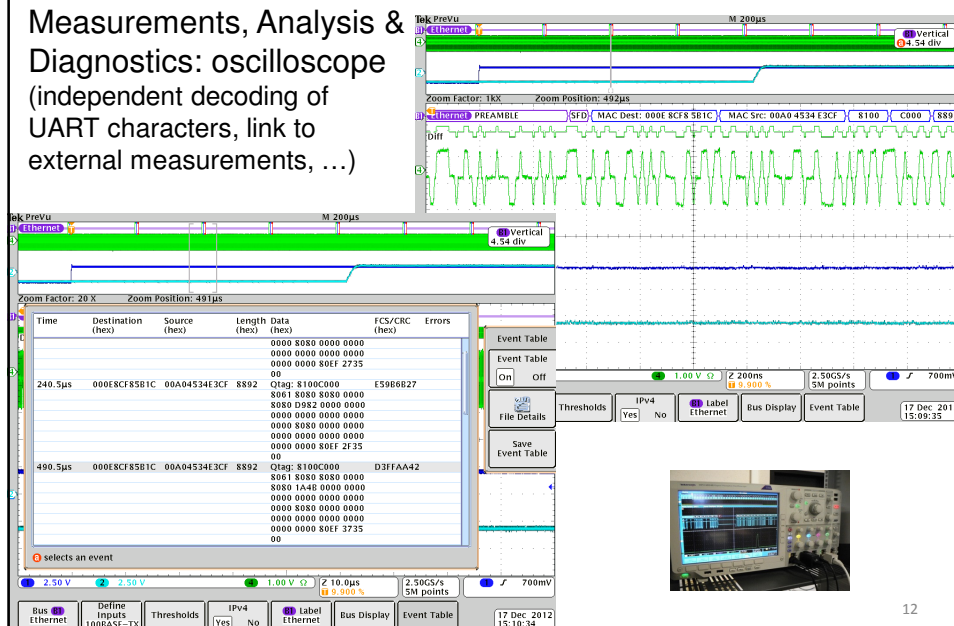
PROFINET course – Equipment used

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Measurements, Analysis &
Diagnostics:
Hilscher netANALYZER

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PROFINET course – Equipment used

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Measurements, Analysis &
Diagnostics: accuracy of tools …

Update time

Wireshark accuracy
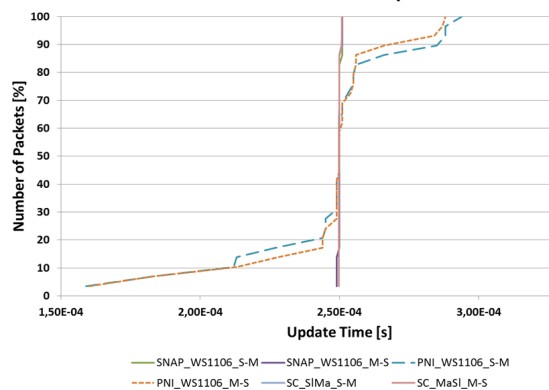
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PROFINET course – Equipment used

Measurements, Analysis & Diagnostics:
TH-Link for PROFINET

TH Scope software for DP and PN, using input from TH-Links

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PROFINET course – Equipment used

Measurements, Analysis & Diagnostics: switches (RT/IRT), webserver IO-controller
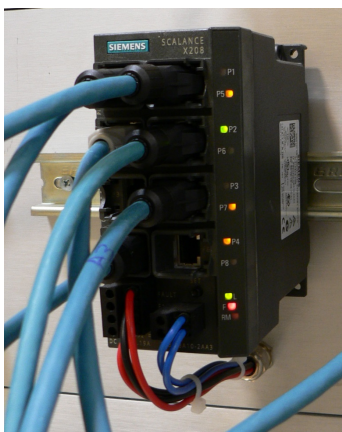
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Extra network components: wireless link, IE-PB link, CP343, …

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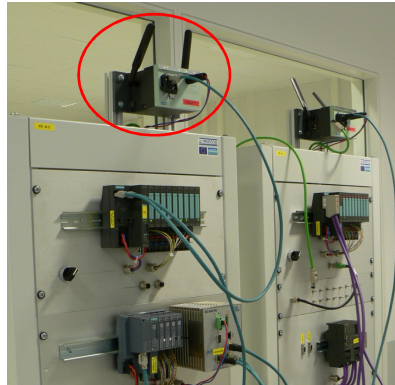
PROFINET course – Equipment used

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Extra network components: … introduced jitter, combined PN and DP networks …

CP343: local-PN-PB jitter
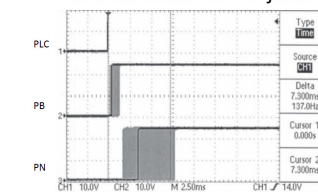
The total local-PN jitter is 8 ms.
PN via CP343 (update time = 2 ms).

IE/PB-link: local-PN-PB jitter
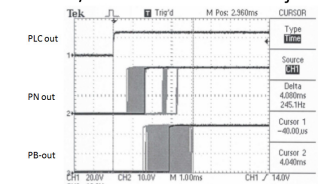
Maximum local-PB delay: 4,8 ms.
It is possible that PB-output is set before PN-output.

Output jitter Profinet wired
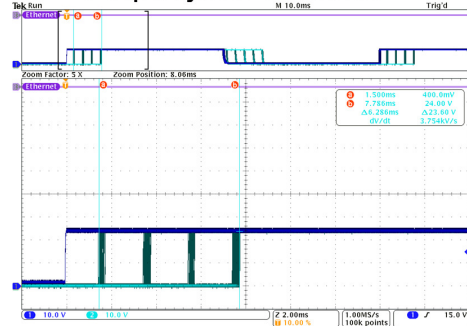
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Extra network components: …
redundancy testing and measuring
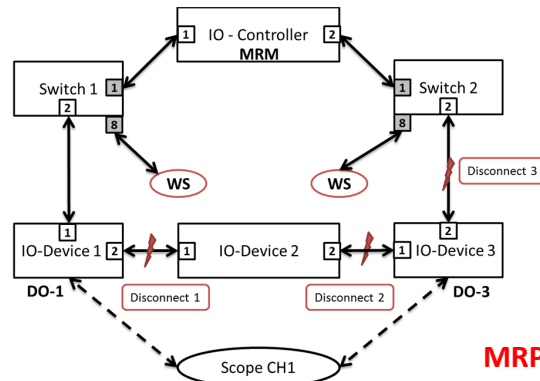
MRP redundancy: recovery
time about 200 ms

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Extra network components: …
redundancy testing and measuring

PRP: Parallel Redundancy Protocol
HSR: High-availability Seamless Redundancy

PRP & HSR redundancy:
extremely fast.

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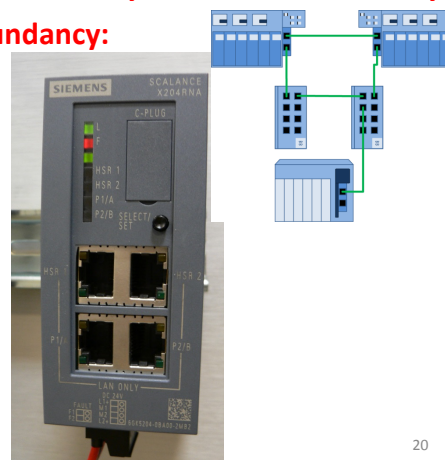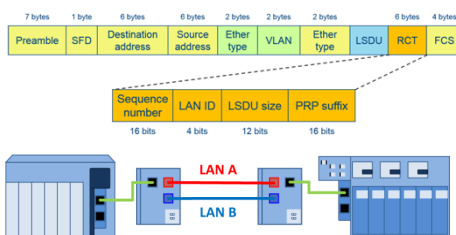Extra network components: … "oversampling" using IRT and isochronous mode

Analog input with oversampling

• Values per cycle, max.	Yes 16
• Resolution, min.	50 μs

Oversampling of e.g. analog inputs using HF ET200 SP

Remote IO

PROFINET IRT
Isochronous mode
E.g. 500 μs
Main CPU is sync master
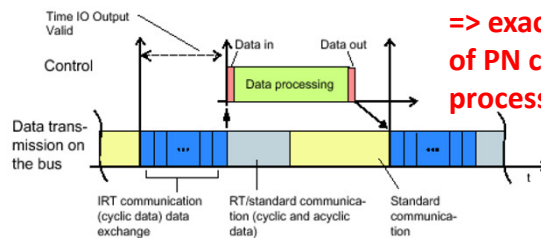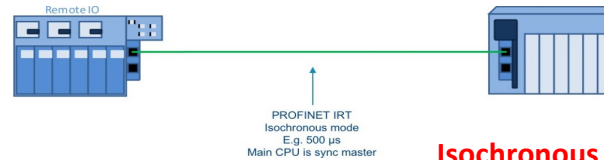
Isochronous processing using OB6x => exact knowledge of the number of PN cycles from actual input => processing => actual output

Time IO Output Valid

Control

Data in   Data out

Data processing

Data transmission on the bus

IRT communication (cyclic data) data exchange

RT/standard communication (cyclic and acyclic data)

Standard communication

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PROFINET course – Equipment used

View on a lab set-up for one group

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In the new lab we can easily patch larger PROFIBUS and PROFINET networks.

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PROFINET course
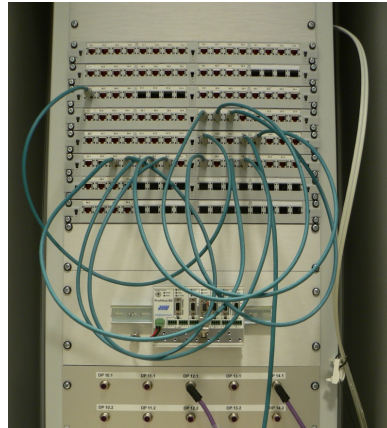
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Very interactive and hands-on:

– **Measurements, configurations, exercises => print the results, make conclusions, add to your course notes**

– **Work on 4 set-ups with equipment from different vendors => a lot of variation**

– **Your account and networkdrive move with you from set-up to set-up => save results, select your printouts, … .**

– **If you have suggestions for exercises, typical errors or set-ups, … => we are constantly adapting the course, making it as (industrially) relevant as possible.**

– **No exam, but many exercises and at the end a test scenario (in a network of 15+ components with all diagnostic hardware and software)**

If possible: extra on IRT and/or oversampling, response measurement drive, etc.

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