Fakulta strojní VŠB – TUO

Department of Control Systems and Instrumentation

Automatic Control Devices

(Materials for write notes)

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Lecture No. 4

Distributed control systems, teamwork solutions, its implementation and system engineer skills. SCADA/MMI systems, their characteristics and deployment in a hierarchical management structure (1, 4, 17).

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What do you find out?

- Hierarchical structure and distributed control systems.
- Design stages of distributed control systems (advantages of design).
- Selection of technical and program resources.
- Logical structure of applications and distribution of assignment tasks.
- SCADA/MMI systems
  - ControlWeb
  - … .
- Examples... .

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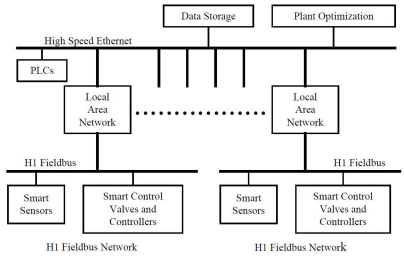
Communication interface bus architecture



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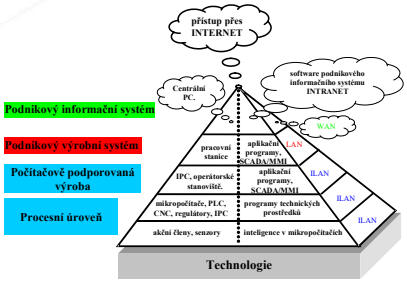
Hierarchical control structure



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Design solutions for distributed control systems

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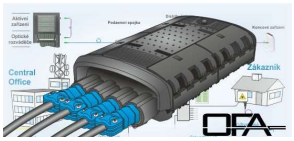
Design stages of distributed control systems

- a) Projecting design,
- b)…



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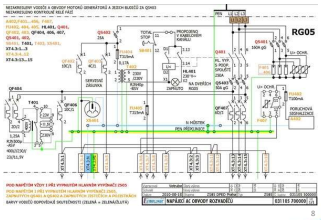
In a distributed system, demands (time and financial) decrease significantly:

- for cabling documentation,
- …



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Local problems of distributed systems can be:

- easier to formulate
- …

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Trends in industrial automation

- **Production flexibility**
- **Continuous increase in productivity**
- **Increasing quality,**
- **Reducing the total cost**

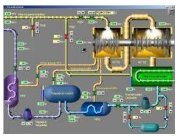
Main features of SCADA/MMI systems

- These **object-oriented systems** work in an integrated development environment.
- …

Main features of SCADA/MMI systems

- The executable result code of a job usually **works in a multi-tasking operating environment**.
- …

Representatives of SCADA/MMI systems



PROMOTIC

Features of SCADA/MMI systems

- Openness
  - OPC client,
  - …
- Modularity
  - local modules,
  - …

Features of SCADA/MMI systems

- Timing

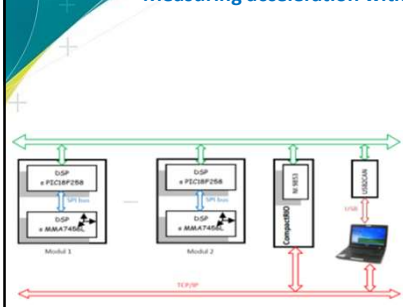
Procedure for solving measurement and control tasks

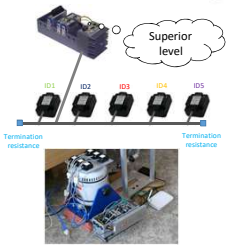
- Assignment analysis
- …

Real solutions of distributed control systems (projects, HS)

- Measuring acceleration with MEMS accelerometers
- Calibration of operational pressure gauges
- Positioning and synchronization of the ultrasound probe - FN Ostrava
- Active vibration damping
- Wireless data transfer of mobile devices
- Management and control of mobile systems using wireless technology
- …..
- A kit system with a PIC series single-chip computer.

Measuring acceleration with MEMS accelerometers





Solution of the StudentCar project

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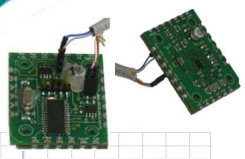
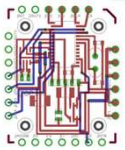
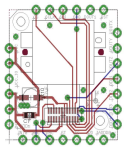
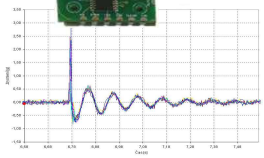
Measuring acceleration with MEMS accelerometers



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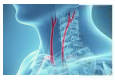
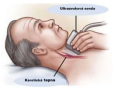
Positioning and synchronization of the ultrasound probe - FN Ostrava

Pohybový systém s ultrazvukovou sondou

Vyhodnocovací zařízení ultrazvukové sondy

Video signál

RS 232

Pacientský monitor

Trigrovací jednotka na basi PIC

Trigrovací signál

RS 232

PC s konfiguračním programem a možnosti záznamu obrazu

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Positioning and synchronization of the ultrasound probe - FN Ostrava



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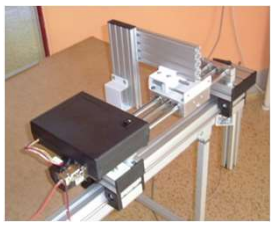
Positioning and synchronization of the ultrasound probe - FN Ostrava



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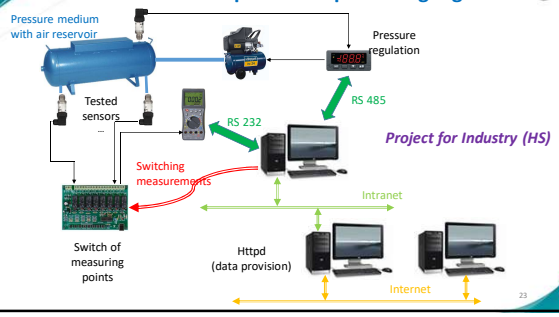
Calibration of operational pressure gauges



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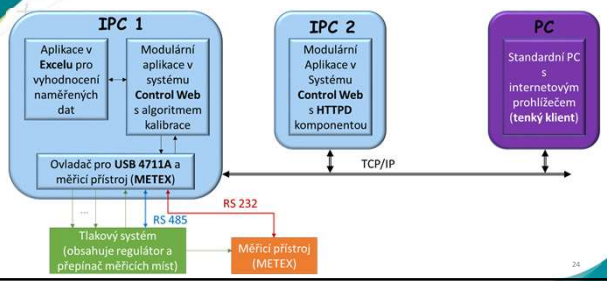
Calibration of operational pressure gauges



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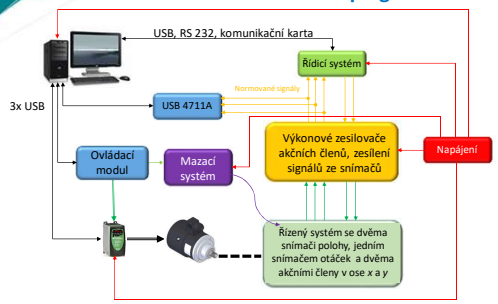
Active vibration damping



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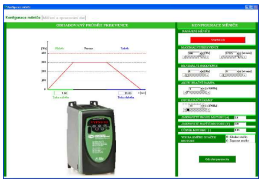
Active vibration damping



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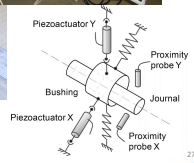
Active vibration damping



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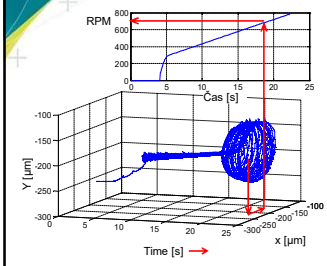
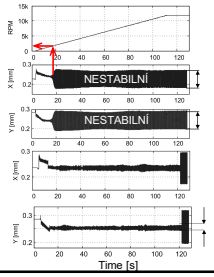
Active vibration damping

Rotor instability



The effect of active vibration damping



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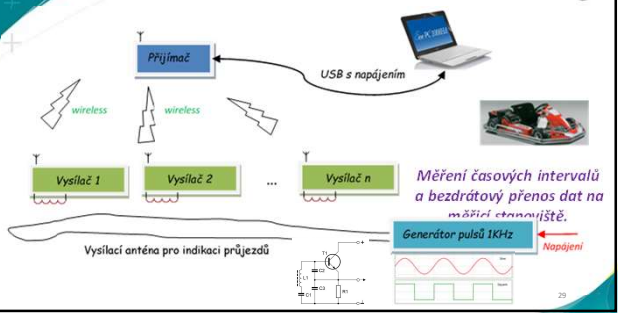
Wireless data transfer of mobile devices



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Wireless data transfer of mobile devices

Distribuce celkového algoritmu na submobilní moduly

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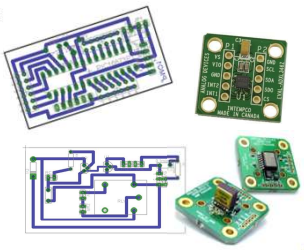
A kit system with a PIC series single-chip computer

Support in the design of distributed control systems

- …



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What was the content of the lecture

- Hierarchical structure and distributed control systems.
- Design stages of distributed control systems (advantages of design).
- Selection of technical and program resources.
- Logical structure of applications and distribution of assignment tasks.
- SCADA/MMI systems
  - ControlWeb
  - … .
- Examples... .

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Katedra automatizační techniky a řízení

Thank you for your attention …

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