The Creation of an Autonomous Measurement System Based on Arduino for Monitoring Local Parameters in Aviation Structures

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Premises

- Autonomy of the system
- Using of the very distributed components
- Opened system for further development

Objectives achieved

The objective of creating an autonomous compact system for measuring local load parameters on light aircraft during testing was achieved.

Implementation methods

1. General Schematic Design, 2. Components Selection, 3. Design of housing and mechanical components, 4. Software Development, 5. System Prototyping, 7. System Assembly, 8. Testing and Debugging, 9. Accuracy evaluation

Obtained results

- Autonomous module for measuring the parameters of structural stresses of aircraft, installed separately from other systems. The module allows measuring stresses from 6 half-bridges strain gauges.
- The module for wind tunel force evaluation was designed.
- An onboard module for light aircraft has been designed.

Another information about the project

- Silesian University of Technology.
  During the project execution, the first version of the strain gauge module was developed, which had 4 channels for connecting half-bridges strain gauges. It had unstable parameters. After the consultation with the Silesian University of Technology partners, such as „ATP Aviation” firm the second version of device was developed. It has 6 channels for half-bridges strain gauges, more stable parameters, and more reliable box.
  Second module for fuselage was developed too and tested in the laboratory conditions without of box.

- Zhejiang Normal University.
  Assembled strain gauge module for force evaluation tested in wind tunnel laboratory . They want to use developed system for measuring 5 load parameters for fundamental research in wind tunnel.

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