

National Institute of Research and Development in Mechatronics and Measurement Technique - INCDMTM Bucharest



WHO WE ARE?

- The only national research-development institute in Romania working in the field of mechatronics
- An institution with a vast tradition, established in 1971, and that has been a benchmark in Romanian research so far
- One of the traditional partners of Dacia Renault, a basic pillar of the Romanian economy



STRUCTURE

RESEARCH COMPARTMENTS

☐ SMART MEASUREMENT MECHATRONICS

- ✓ Mechatronic Integrated Control Systems
- ✓ Smart Precision and Control Measurements
- ✓ Complex Automation and Control Systems
- ✓ Smart Thermotechnical Measurements

☐ BIO-MEDICAL MECHATRONICS AND ROBOTICS

- ✓ Biomechatronics (BIOLAB)
- ✓ Smart systems, data acquisition and robotics
- ✓ 'Rapid Prototyping' Laboratory

☐ MECHATRONIC MICRO AND NANOTECHNOLOGIES

- ✓ Process micro- and nanotechnologies
- ✓ Centre of Smart Measurement Technologies (CERTIM)

☐ Accredited laboratories:

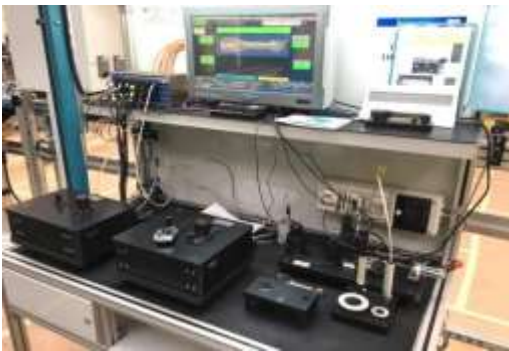
- ✓ LENGTH TESTING LABORATORY
- ✓ PRESSURE AND TEMPERATURE CALIBRATION LABORATORY



SMART MEASUREMENT MECHATRONICS COMPARTMENT

MMI 1: MECHATRONIC INTEGRATED CONTROL SYSTEMS

- Responsible with designing and manufacturing of mechatronic equipment for theme control for parts with complex configurations (engines) within the auto industry: calibers, devices/equipment, pneumatic control stations/devices, advanced calculus devices.
- Other activities include: research, conception, design, execution, testing, adjustment, calibration, commissioning, technical assistance and consulting.



SMART MEASUREMENT MECHATRONICS COMPARTMENT

MMI 2: SMART PRECISION AND CONTROL MEASUREMENTS

Unfolding activities of research, design, execution, experimentation, dissemination, commissioning, technical support and consulting in the following fields:

- Contact and no contact systems with surface macro-geometry
- Defects of the geometry surface of the gear and multiparametric control systems
- Smart systems for multidimensional inspection
- Vibro-acoustic monitoring systems
- Testing systems of resistive moments, strength and fatigue
- Integrated automation systems in the production line
- Algorithms, Procedures and Software of Measurement and Control
- Machine/operator protection systems
- Smart marking solutions



SMART MEASUREMENT MECHATRONICS COMPARTMENT

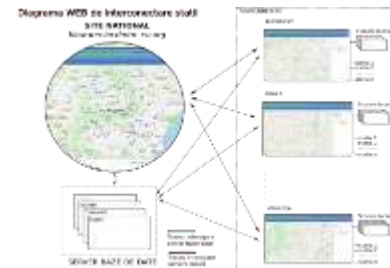
MMI 3: COMPLEX AUTOMATION AND CONTROL SYSTEMS

Developing size measurement and control systems :

- measurement equipment with non-contact probes, based on optical palpation and ultrasound probes
- 3D -measuring techniques and systems
- Automatic displacement and positioning systems
- miniaturized palpation systems

Automatic command and control systems:

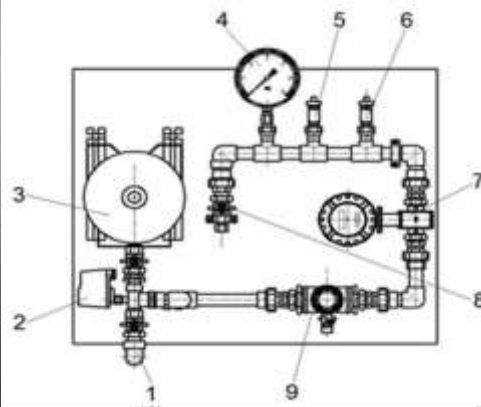
- control systems specific to the acquisition of images in the scope of precision mechanics, electronics, medicine, biology and biotechnology
- metallographic determination systems of material microstructure
- computerized systems for *in vitro* analyses of the development of vegetable hybrids
- embedded systems for various on demand applications
- techniques and systems for complex manufacturing processes



SMART MEASUREMENT MECHATRONICS COMPARTMENT

MMI 4: SMART THERMOTECHNICAL MEASUREMENTS

- Manufacturing of mechatronic systems, based on low and ultrasound temperatures, used in medical recovery in the field of orthopedics, traumatology and rheumatology.
- ❑ Developing, implementing and testing multiparametric analytical probes, based on unconventional sensors, for large scale use in drinking water management systems.



SMART MEASUREMENT MECHATRONICS COMPARTMENT

PRESSURE AND TEMPERATURE CALIBRATION LABORATORY

Field of activity: measurement of the relative pressure of fluids and gases and is recognized by RENAR by the Accreditation Certificate no.: LE009/01.02.2025, according to SR EN ISO/CEI 17025:2018.



SMART MEASUREMENT MECHATRONICS COMPARTMENT LENGTH TESTING LABORATORY (LIL)

- ❓ **Main objective:** performing tests in the field of dimensional metrology by ensuring traceability of results of verifications and tests laboratory environment developing procedures in the field of dimensional control means of periodic calibrations of measuring equipment or testing equipment against calipers belonging the national institutes of metrology and other metrological Laboratories accredited by RENAR.
- ❓ Among the beneficiaries of the laboratory services we mention: SC Automobile Dacia SA, Renault Mécanique Roumanie SRL, Renault Technology Roumanie SRL, SC Lixland SRL, SC Components Auto SA - Topoloveni, SC Plastic Legno Romania, High Performance Structures Inovatie and Development SRL, Gruppo Italiano ImBallaggi SRL.



BIO-MEDICAL MECHATRONICS AND ROBOTICS COMPARTMENT

MBR 1: BIOMECHANICS (BIOLAB) + 'RAPID PROTOTYPING' LABORATORY

- Integrated systems of intelligent sensors for measurement and monitoring of patient physiological parameters.
- Neuro-image guidance systems in cranio-maxillofacial implantology and surgery
- Parts produced by rapid prototype, based on metal powders laser sintering technologies
- 3D printed plastic parts.



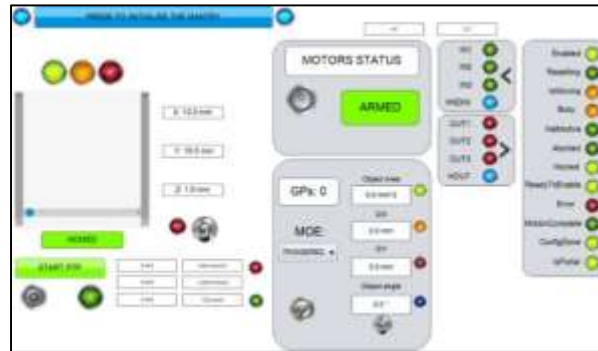
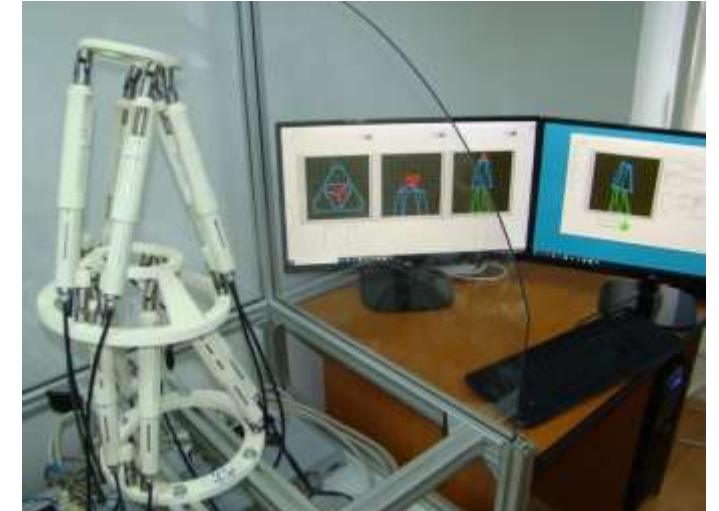
Sistem servo-hidraulic de testare multiaxială MTS



BIO-MEDICAL MECHATRONICS AND ROBOTICS COMPARTMENT

MBR 2: SMART SYSTEMS, DATA ACQUISITION AND ROBOTICS

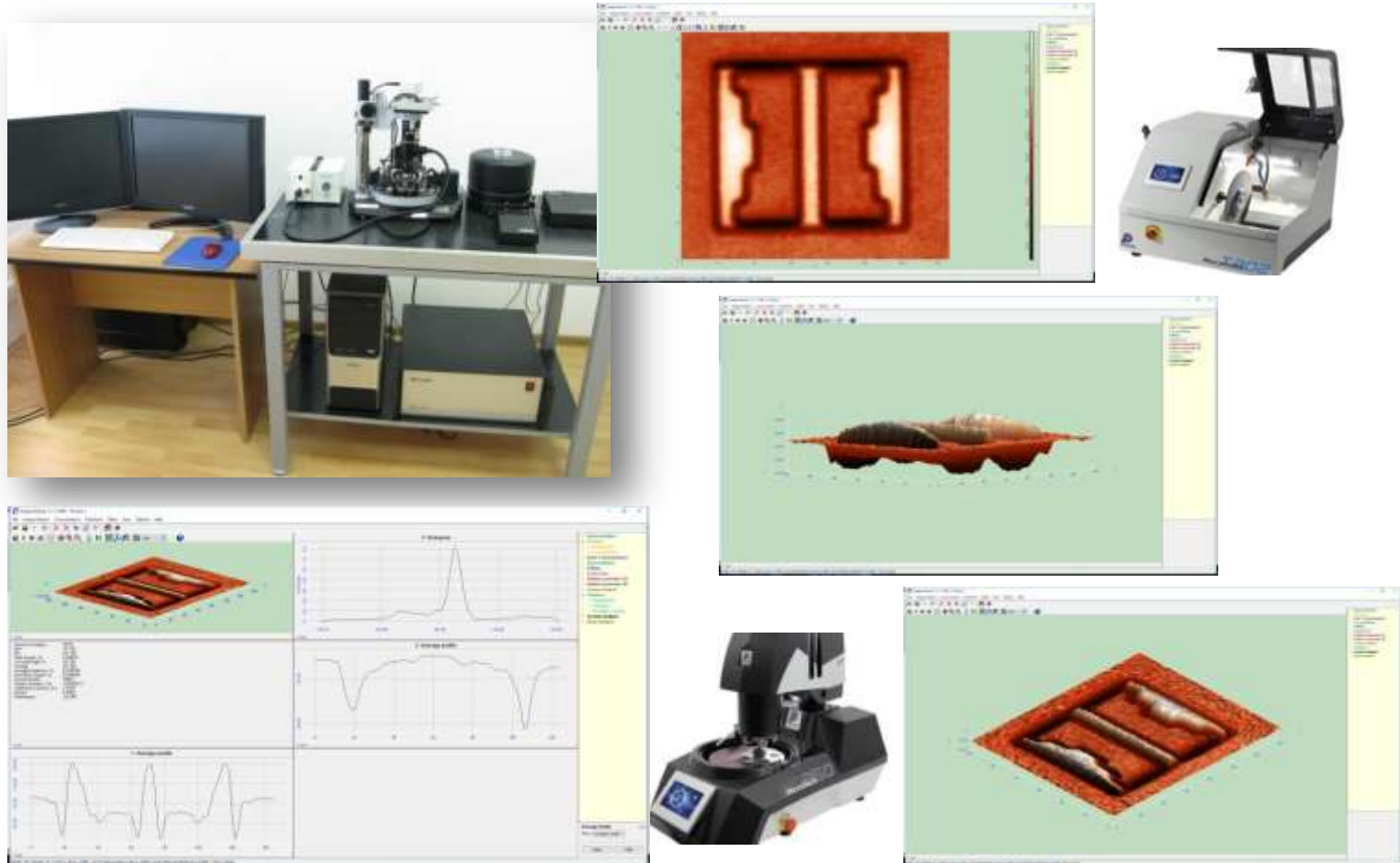
- Developing non industrial robotic systems
- Serial, parallel and hybrid kinematic robots
- Remote controlled or autonomous robots
- Data acquisition systems applied in monitoring potentially dangerous environments



MECHATRONIC MICRO- AND NANOTECHNOLOGIES COMPARTMENT

MNTM 1: PROCESS MICRO- AND NANOTECHNOLOGIES

- Research on the development of micro/nanostructures of composite materials (multilayer deposits with different properties - adhesion, hardness, anti-corrosion protection, tribological properties, etc.);
- Systemic tribo-technological research regarding the processing, characterization and experimentation of hard micro/nanometric composite structures, extra-hard-coating with titanium nitrous materials through physical-chemical procedures;
- Specialized mechatronic technologies for processing and using biocompatible materials in medical applications.



MECHATRONIC MICRO- AND NANOTECHNOLOGIES COMPARTMENT

MNTM 2: CENTRE OF SMART MEASUREMENT TECHNOLOGIES (CERTIM)

CERTIM Centre ensures the integration of the research-development-development activity from INCDMTM Bucharest in the field of **intelligent laser measurement**, in the economic activity, based on knowledge, emerging in the development region of Bucharest-Ilfov, as well as in the European Research Area (ERA).

CERMISO is a research center for the optimization of smart miniaturized autonomous equipment (MIADA), having direct applications in the security and security of objectives and quick intervention in disasters in hard-to-reach areas.



„IJOMAM” SCIENTIFIC JOURNAL

- **International Journal of Mechatronics and Applied Mechanics** (eISSN: 2559-6497) is an open-access scientific journal edited quarterly and included in the following international databases: Scopus, EiCompendex, EBSCO, and ProQuest.
- The editor-in-chief of the publication is the scientific director of the Institute, and the honorary editor-in-chief is a famous researcher in the Diaspora.
- The topics addressed by journal papers cover three main fields: Mechatronics (I), Applied Mechanics (II) and Artificial Intelligence (III), each managed by a Co-Editor in Chief. The first two main fields are structured in four sub-areas.
- The eight resulting sub-areas are: robotics and automation, measurement systems and image processing, modelling and simulation of mechatronic systems and manufacturing processes, electronics and cyber-physical systems, materials science, structural mechanics, fluid mechanics, and technology of measurement and instrumentation.



„ICORSE” INTERNATIONAL CONFERENCE

- Each September, INCDMTM organizes ICoRSE - the International Conference on Reliable Systems Engineering.
- All the conference articles that pass the "Peer-Review" type assessment are included in the conference proceedings, published by the prestigious Swiss Publishing House Springer, in the collection *Lecture Notes* of the book series Networks and Systems that is indexed in Scopus and sent for consideration of inclusion in *Web of Science*.
- For further information, please go to www.icorseng.eu.



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